

The order of this data package is as follows:

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

Comments:



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

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

SAMPLE ID: CAWA-17-134190

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06-02-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	13:33		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-68		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	1 LITER POLY	1	HNO3	Y	NA
	WSP-8082-PCB	1 LITER AMBER GLASS	3	ICE		NA
	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	2	HCL		10-day Quick turn
	WSP-8270C- SVOA	1 LITER AMBER GLASS	2	ICE		NA
	WSP-8290-D/F	1 LITER AMBER GLASS	2	ICE		NA
	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE		10-day Quick turn
	WSP-CN(T)	250 ML POLY	1	NAOH		NA
	WSP-GrossA/B	1 LITER POLY	1	HNO3		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP-RAD	1 GAL POLY	1	HNO3		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

## SAMPLE COMMENTS:

Sampled  $\approx$  40' ft. from running diesel generator.

## LOCATION COMMENTS:

None



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

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

SAMPLE ID: CAWA-17-134190

WORK ORDER:

## FIELD PARAMETERS:

Sample Time	<u>13:43</u>	HH:MM	Dissolved Oxygen	<u>6.21</u>	Flow (in gpm)	<u>5.76</u>
Oxidation-Reduction Potential	<u>161.5</u>		pH	<u>7.93</u>	Specific Conductance	<u>125.5</u>
Temperature	<u>14.1</u>		Turbidity	<u>125.7</u>		

COLLECTED BY (PRINT): D. Jaramillo, A. Vigil

RELINQUISHED BY (Printed Name) <u>ANDREW VIGIL</u> (Signature) <u>Andrew Vigil</u>	Date/Time <u>06/2/2017</u> <u>1500</u>	RECEIVED BY (Printed Name) <u>K. Greene</u> (Signature) <u>[Signature]</u>	Date/Time <u>6/2/17</u> <u>15100</u>
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

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

SAMPLE ID: CAWA-17-133394

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06-02-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	13:33		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-68		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FB	
TOP DEPTH:	1		SAMPLE USAGE:	QC	
BOTTOM DEPTH:	1		EXCAVATED:		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
1	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE	1	1

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT):

D. Jaramillo, A. Vigil

RELINQUISHED BY (Printed Name) Daniel S. ... (Signature) [Signature]	Date/Time 1500 6/2/17	RECEIVED BY (Printed Name) K. G. ... (Signature) [Signature]	Date/Time 6/2/17 1500
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11258

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

SAMPLE ID: CAWA-17-133396

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06-02-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	13:33		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-68		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	FTB	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	TAU- 513117	HCL	Y	NA

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT):

A. Vigil, D. Jaramila

RELINQUISHED BY (Printed Name) Daniel Jaramila (Signature) [Signature]	Date/Time 6/2/17 1500	RECEIVED BY (Printed Name) K. Green (Signature) [Signature]	Date/Time 6/2/17 15100
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017



**SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**

EVENT ID: 11258

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

SAMPLE ID: CAWA-17-133332

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	06-02-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	13:35		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-68		FIELD PREP:	F	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:	1		SAMPLE USAGE:	INV	
BOTTOM DEPTH:	1		EXCAVATED:		YES / NO (NA)

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT):

A. Vigil, P. Savani, Y. Ho

RELINQUISHED BY (Printed Name) Andrew Vigil (Signature) [Signature]	Date/Time 06/02/2017 1508	RECEIVED BY (Printed Name) K. Green (Signature) [Signature]	Date/Time 6/2/17 15:00
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 05/30/2017

## DATA VALIDATION REPORT

Chain Of Custody No. 2017-1649

### 1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
424747	EPA:120.1	1				
424747	EPA:150.1	1				
424747	EPA:160.1	1				
424747	EPA:170.0	1		1	1	
424747	EPA:245.2	2				
424747	EPA:300.0	1				
424747	EPA:310.1	1				
424747	EPA:335.4	1				
424747	EPA:350.1	1				
424747	EPA:351.2	1				
424747	EPA:353.2	1				
424747	EPA:365.4	1				
424747	EPA:900	1				
424747	EPA:901.1	1				
424747	EPA:905.0	1				
424747	HASL-300:AM-241	1				
424747	HASL-300:ISOPU	1				
424747	HASL-300:ISOU	1				
424747	SM:A2340B	1				
424747	SW-846:6010C	1				
424747	SW-846:6020	1				
424747	SW-846:6850	1				
424747	SW-846:8082	1				
424747	SW-846:8260B			1	1	
424747	SW-846:8270D	1			1	
424747	SW-846:9060	1				



## DATA VALIDATION REPORT

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
424747	EPA:120.1	1671823	1671823	1										1				2			
424747	EPA:150.1	1671988	1671988	1										1				2			
424747	EPA:160.1	1672860	1672860	1					1					1				1			
424747	EPA:170.0	NA	NA	1		1	1														
424747	EPA:245.2	1671798	1671792	2					1	1				1				1			
424747	EPA:300.0	1671680	1671680	1					1					1				1			
424747	EPA:310.1	1671987	1671987	1						1				2				1			
424747	EPA:335.4	1671534	1671533	1					1	1				1				1			
424747	EPA:350.1	1671935	1671933	1					1	1				1				1			
424747	EPA:351.2	1671942	1671941	1					1	1				1				1			
424747	EPA:353.2	1671832	1671832	1					1					1				2			
424747	EPA:365.4	1671937	1671936	1					1	1				1				1			
424747	EPA:900	1671754	1671754	1					1	1	1			1				1			
424747	EPA:901.1	1671920	1671920	1					1					1				1			
424747	EPA:905.0	1671753	1671753	1					1	1				1				1			
424747	HASL-300:AM-241	1672176	1672176	1					1					1				1			
424747	HASL-300:ISOPU	1672177	1672177	1					1					1				1			
424747	HASL-300:ISOU	1672178	1672178	1					1					1				1			
424747	SM:A2340B	1674389	1674389	1																	
424747	SW-846:6010C	1671565	1671563	1					1	1				1				1			
424747	SW-846:6020	1671589	1671587	1					1	1				1				1			
424747	SW-846:6850	1671834	1671833	1					1	1	1			1							
424747	SW-846:8082	1672047	1672046	1					1	1				1	1						
424747	SW-846:8082	1674002	1674001						1					1	1						
424747	SW-846:8260B	1671196	1671196			1			4					7							
424747	SW-846:8260B	1674343	1674343				1		1					2							
424747	SW-846:8270D	1671167	1671166	1			1		1	1	1			1							
424747	SW-846:9060	1671529	1671529	1					1					1	1			1			

2. Distribution Of Analytes In EDD.

## DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133306	1203805835	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133332	1203805836	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-17-133332	424747001	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203805834	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133306	1203806296	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133332	1203806297	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-17-133332	424747001	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203806295	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-133332	424747001	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-17-134176	1203808588	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203808587	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203808586	MB	1	0	0	0
EPA:170.0	VOC	CAWA-17-133332	424747001	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-133394	424747002	FB	1	0	0	0
EPA:170.0	VOC	CAWA-17-133396	424747003	FTB	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-132523	1203805740	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAMO-17-132523	1203805742	MS	0	0	1	0
EPA:245.2	INORGANIC	CAWA-17-133332	424747001	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-17-134190	424747005	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1203805739	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203805738	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-133332	424747001	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-17-134176	1203805355	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203805354	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203805353	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133332	1203806285	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133332	1203806287	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-17-133332	424747001	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203806283	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203808726	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAPA-17133356	1203805010	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAPA-17133356	1203805012	MS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-17-134190	424747005	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203805009	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203805008	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-17-133353	1203806103	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-17-133353	1203806104	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-17-133332	424747001	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203806102	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203806101	MB	1	0	0	0

## DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:351.2	GENERAL CHEMISTRY	CAPA-17-133355	1203806128	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-17-133355	1203806129	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-17-134190	424747005	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203806127	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203806126	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-133332	424747001	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-17-134176	1203805866	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203805864	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203805863	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	MSGP-17-132059	1203805867	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-133332	424747001	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-134176	1203806120	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAWA-17-134176	1203806121	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203806113	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203806112	MB	1	0	0	0
EPA:900	RAD	CAWA-17-134190	424747005	REG	2	0	0	0
EPA:900	RAD	CAWA-17-134191	1203805588	DUP	2	0	0	0
EPA:900	RAD	CAWA-17-134191	1203805589	MS	0	0	2	0
EPA:900	RAD	CAWA-17-134191	1203805590	MSD	0	0	2	0
EPA:900	RAD	LCS	1203805591	LCS	0	0	2	0
EPA:900	RAD	MB	1203805587	MB	2	0	0	0
EPA:901.1	RAD	CAWA-17-134190	1203806066	DUP	5	0	0	0
EPA:901.1	RAD	CAWA-17-134190	424747005	REG	5	0	0	0
EPA:901.1	RAD	LCS	1203806067	LCS	0	0	3	0
EPA:901.1	RAD	MB	1203806065	MB	5	0	0	0
EPA:905.0	RAD	CAWA-17-134190	424747005	REG	1	0	0	0
EPA:905.0	RAD	CAWA-17-134191	1203805584	DUP	1	0	0	0
EPA:905.0	RAD	CAWA-17-134191	1203805585	MS	0	0	1	0
EPA:905.0	RAD	LCS	1203805586	LCS	0	0	1	0
EPA:905.0	RAD	MB	1203805583	MB	1	0	0	0
HASL-300:AM-241	RAD	CAWA-17-134190	1203806728	DUP	1	0	0	0
HASL-300:AM-241	RAD	CAWA-17-134190	424747005	REG	1	0	0	0
HASL-300:AM-241	RAD	LCS	1203806729	LCS	0	0	1	0
HASL-300:AM-241	RAD	MB	1203806727	MB	1	0	0	0
HASL-300:ISOPU	RAD	CAWA-17-134190	1203806731	DUP	2	0	0	0
HASL-300:ISOPU	RAD	CAWA-17-134190	424747005	REG	2	0	0	0
HASL-300:ISOPU	RAD	LCS	1203806732	LCS	0	0	1	0
HASL-300:ISOPU	RAD	MB	1203806730	MB	2	0	0	0
HASL-300:ISOU	RAD	CAWA-17-134190	1203806734	DUP	3	0	0	0
HASL-300:ISOU	RAD	CAWA-17-134190	424747005	REG	3	0	0	0



## DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
HASL-300:ISOU	RAD	LCS	1203806735	LCS	0	0	1	0
HASL-300:ISOU	RAD	MB	1203806733	MB	3	0	0	0
SM:A2340B	INORGANIC	CAWA-17-133332	424747001	REG	1	0	0	0
SW-846:6010C	INORGANIC	CAPA-17-133353	1203805073	DUP	17	0	0	0
SW-846:6010C	INORGANIC	CAPA-17-133353	1203805074	MS	0	0	17	0
SW-846:6010C	INORGANIC	CAWA-17-133332	424747001	REG	17	0	0	0
SW-846:6010C	INORGANIC	LCS	1203805072	LCS	0	0	17	0
SW-846:6010C	INORGANIC	MB	1203805071	MB	17	0	0	0
SW-846:6020	INORGANIC	CAPA-17-133353	1203805128	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAPA-17-133353	1203805129	MS	0	0	11	0
SW-846:6020	INORGANIC	CAWA-17-133332	424747001	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203805127	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203805126	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-17-133353	1203805877	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-17-133353	1203805878	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-17-133332	424747001	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203805876	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203805875	MB	1	0	0	0
SW-846:8082	PESTPCB	CAWA-17-134190	424747004	REG	8	2	0	0
SW-846:8082	PESTPCB	LCS	1203806424	LCS	0	2	2	0
SW-846:8082	PESTPCB	LCS	1203811337	LCS	0	2	2	0
SW-846:8082	PESTPCB	LCSD	1203806429	LCSD	0	2	2	0
SW-846:8082	PESTPCB	LCSD	1203811338	LCSD	0	2	2	0
SW-846:8082	PESTPCB	MB	1203806423	MB	8	2	0	0
SW-846:8082	PESTPCB	MB	1203811336	MB	8	2	0	0
SW-846:8082	PESTPCB	WST35-17-135775	1203806425	MS	0	2	2	0
SW-846:8260B	VOC	CAWA-17-133394	424747002	FB	80	3	0	0
SW-846:8260B	VOC	CAWA-17-133396	424747003	FTB	80	3	0	0
SW-846:8260B	VOC	LCS	1203804344	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203804345	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203806304	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203806305	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203806750	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203806751	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203807986	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203812151	LCS	0	3	70	0
SW-846:8260B	VOC	LCS	1203812152	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203804343	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203806303	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203806749	MB	80	3	0	0

## DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
SW-846:8260B	VOC	MB	1203807982	MB	80	3	0	0
SW-846:8260B	VOC	MB	1203812150	MB	80	3	0	0
SW-846:8270D	SVOC	CAWA-17-133394	424747002	FB	80	6	0	0
SW-846:8270D	SVOC	CAWA-17-134190	1203805362	MS	0	6	76	0
SW-846:8270D	SVOC	CAWA-17-134190	1203805363	MSD	0	6	76	0
SW-846:8270D	SVOC	CAWA-17-134190	424747005	REG	80	6	0	0
SW-846:8270D	SVOC	LCS	1203804284	LCS	0	6	76	0
SW-846:8270D	SVOC	MB	1203804283	MB	80	6	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-17133356	1203805984	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-17-134190	424747005	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203805982	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	LCSD	1203805983	LCSD	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203805981	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	1203805071	METHOD BLANK	SW-846:6010C	W	Zinc	-4.22	J	ug/L	10.0
MB	1203806101	METHOD BLANK	EPA:350.1	W	Ammonia as Nitrogen	0.0385	J	mg/L	0.050
MB	1203806126	METHOD BLANK	EPA:351.2	W	Total Kjeldahl Nitrogen	0.0715	J	mg/L	0.100

## DATA VALIDATION REPORT

Field Sample ID	Blank Lab	Blank Type	Analytical Method	Parameter Name	Blank Lab Result	Blank Lab Units	Lab Result	Lab Qualifier	Lab Detection Limit	Detect Flag	Detect to Nondetect Factor	Detect to Estimated Factor	Use Factors
CAWA-17-133332	1203806101	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	0.0385	mg/L	0.0951		0.050	Y	5	100	Y
CAWA-17-134190	1203806126	METHOD BLANK	EPA:351.2	Total Kjeldahl Nitrogen	0.0715	mg/L	0.403		0.100	Y	5	100	Y
CAWA-17-133332	1203805071	METHOD BLANK	SW-846:6010C	Zinc	-4.22	ug/L	10.0	U	10.0	N			

6. Any surrogate recoveries outside the control limits?

Field Sample ID	Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Spike Recovery	Upper Limit	Lower Limit	Rejection Limit
CAWA-17-134190	424747004	SW-846:8082	4cmx	1672047	06-09-2017	17	122	33	10
CAWA-17-134190	424747004	SW-846:8082	PCB-209	1672047	06-09-2017	23	138	35	10
CAWA-17-134190	424747005	SW-846:8270D	4-Terphenyl-d14	1671167	06-07-2017	9	121	36	
CAWA-17-134190	424747005	SW-846:8270D	Fluorobiphenyl[2-]	1671167	06-07-2017	10	112	32	
CAWA-17-134190	424747005	SW-846:8270D	Fluorophenol[2-]	1671167	06-07-2017	5	88	15	
CAWA-17-134190	424747005	SW-846:8270D	Nitrobenzene-d5	1671167	06-07-2017	10	115	36	
CAWA-17-134190	424747005	SW-846:8270D	Phenol-d5	1671167	06-07-2017	3	91	15	
CAWA-17-134190	424747005	SW-846:8270D	Tribromophenol[2,4,6-]	1671167	06-07-2017	7	124	32	

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

Field Sample ID	MS Lab Sample ID	MSD Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Sample Matrix	MS Spike Recovery	MSD Spike Recovery	MS Upper Limit	MS Lower Limit	MS Reject Limit	RPD	RPD Limit
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Atrazine	1671166	06-07-2017	W	26	23	129	42		14	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Azobenzene	1671166	06-07-2017	W	38	34	120	38		12	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Benzidine	1671166	06-07-2017	W	5	4	130	15		43	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Bis(2-chloroethoxy)methane	1671166	06-07-2017	W	42	39	118	42		8	30



## DATA VALIDATION REPORT

Field Sample ID	MS Lab Sample ID	MSD Lab Sample ID	Analytical Method	Parameter Name	Analysis Lot ID	Analysis Date	Sample Matrix	MS Spike Recovery	MSD Spike Recovery	MS Upper Limit	MS Lower Limit	MS Reject Limit	RPD	RPD Limit
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Bis(2-ethylhexyl)phthalate	1671166	06-07-2017	W	36	33	131	38		8	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Bromophenyl-phenylether[4-]	1671166	06-07-2017	W	40	36	121	39		11	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Butylbenzylphthalate	1671166	06-07-2017	W	39	34	129	40		13	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Di-n-butylphthalate	1671166	06-07-2017	W	41	38	128	41		9	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Di-n-octylphthalate	1671166	06-07-2017	W	29	27	134	37		5	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Dichlorobenzidine[3,3'-]	1671166	06-07-2017	W	29	26	124	34		13	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Dichlorophenol[2,4-]	1671166	06-07-2017	W	39	39	111	40		1	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Diethylphthalate	1671166	06-07-2017	W	42	38	127	43		9	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Dimethyl Phthalate	1671166	06-07-2017	W	42	38	128	45		10	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Dimethylphenol[2,4-]	1671166	06-07-2017	W	39	36	107	39		7	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Dinitrotoluene[2,4-]	1671166	06-07-2017	W	41	37	125	45		8	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Dinitrotoluene[2,6-]	1671166	06-07-2017	W	40	36	124	46		11	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Hexachlorobenzene	1671166	06-07-2017	W	40	35	118	40		13	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Hexachlorocyclopentadiene	1671166	06-07-2017	W	23	21	79	26		12	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Hexachloroethane	1671166	06-07-2017	W	31	28	94	29		9	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Isophorone	1671166	06-07-2017	W	42	38	120	43		9	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Nitroaniline[2-]	1671166	06-07-2017	W	38	35	121	41		7	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Nitrophenol[2-]	1671166	06-07-2017	W	37	38	115	39		2	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Pyridine	1671166	06-07-2017	W	7	7	93	24		5	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Tetrachlorophenol[2,3,4,6-]	1671166	06-07-2017	W	36	38	128	40		3	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Trichlorophenol[2,4,5-]	1671166	06-07-2017	W	35	35	120	42		3	30
CAWA-17-134190	1203805362	1203805363	SW-846:8270D	Trichlorophenol[2,4,6-]	1671166	06-07-2017	W	38	38	124	39		0	30

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

## 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
R-68	2017-1649	CAWA-17-133332	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen	U	UJ	I4	N	0.0951	mg/L	0.0951	mg/L			W	06/02/2017		1671935	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Acenaphthene	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Acenaphthylene	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	0.0485	pCi/L	0.0485	pCi/L	0.0809	0.0182	W	06/02/2017		1672176	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Aniline	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Anthracene	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	PESTPCB	SW-846:8082	Aroclor-1016	U	UJ	P3a	N	0.108	ug/L	0.108	ug/L			W	06/02/2017		1672047	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	PESTPCB	SW-846:8082	Aroclor-1221	U	UJ	P3a	N	0.108	ug/L	0.108	ug/L			W	06/02/2017		1672047	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	PESTPCB	SW-846:8082	Aroclor-1232	U	UJ	P3a	N	0.108	ug/L	0.108	ug/L			W	06/02/2017		1672047	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	PESTPCB	SW-846:8082	Aroclor-1242	U	UJ	P3a	N	0.108	ug/L	0.108	ug/L			W	06/02/2017		1672047	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	PESTPCB	SW-846:8082	Aroclor-1248	U	UJ	P3a	N	0.108	ug/L	0.108	ug/L			W	06/02/2017		1672047	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	PESTPCB	SW-846:8082	Aroclor-1254	U	UJ	P3a	N	0.108	ug/L	0.108	ug/L			W	06/02/2017		1672047	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	PESTPCB	SW-846:8082	Aroclor-1260	U	UJ	P3a	N	0.108	ug/L	0.108	ug/L			W	06/02/2017		1672047	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	PESTPCB	SW-846:8082	Aroclor-1262	U	UJ	P3a	N	0.108	ug/L	0.108	ug/L			W	06/02/2017		1672047	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Atrazine	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Azobenzene	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Benzidine	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y

# DATA VALIDATION REPORT

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
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Benzo(a)anthracene	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Benzo(a)pyrene	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Benzo(b)fluoranthene	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Benzo(g,h,i)perylene	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Benzo(k)fluoranthene	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Benzoic Acid	U	UJ	SV3a	N	20.0	ug/L	20.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Benzyl Alcohol	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Bis(2-chloroethoxy)methane	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Bis(2-chloroethyl)ether	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Bis(2-ethylhexyl)phthalate	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Bromophenyl-phenylether[4-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Butylbenzylphthalate	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	RAD	EPA:901.1	Cesium-137	UI	U	R5a	N	8.23	pCi/L	8.23	pCi/L	4.84	3.35	W	06/02/2017	1671920	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Chloro-3-methylphenol[4-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Chloroaniline[4-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Chloronaphthalene[2-]	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Chlorophenol[2-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Chlorophenyl-phenyl[4-] Ether	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Chrysene	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	-1.04	pCi/L	-1.04	pCi/L	5.12	1.42	W	06/02/2017	1671920	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Di-n-butylphthalate	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Di-n-octylphthalate	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Dibenz(a,h)anthracene	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Dibenzofuran	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Dichlorobenzene[1,2-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Dichlorobenzene[1,3-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Dichlorobenzene[1,4-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Dichlorobenzidine[3,3'-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Dichlorophenol[2,4-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Diethylphthalate	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Dimethyl Phthalate	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Dimethylphenol[2,4-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017	1671167	VAL	Y	



# DATA VALIDATION REPORT

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
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Dinitro-2-methylphenol[4,6-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Dinitrophenol[2,4-]	U	UJ	SV3a	N	20.0	ug/L	20.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Dinitrotoluene[2,4-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Dinitrotoluene[2,6-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Dinoseb	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Dioxane[1,4-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Diphenylamine	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Fluoranthene	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Fluorene	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Hexachlorobenzene	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Hexachlorobutadiene	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Hexachlorocyclopentadiene	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Hexachloroethane	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Indeno(1,2,3-cd)pyrene	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Isophorone	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Methylnaphthalene[1-]	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Methylnaphthalene[2-]	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Methylphenol[2-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Methylphenol[3-,4-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Naphthalene	U	UJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	1.79	pCi/L	1.79	pCi/L	9.85	2.63	W	06/02/2017		1671920	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Nitroaniline[2-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Nitroaniline[3-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Nitroaniline[4-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Nitrobenzene	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Nitrophenol[2-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Nitrophenol[4-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Nitroso-di-n-butylamine[N-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Nitroso-di-n-propylamine[N-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Nitrosodiethylamine[N-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Nitrosodimethylamine[N-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Nitrosopyrrolidine[N-]	U	UJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y

## 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-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Oxybis(1-chloropropane)[2,2']	U	JJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Pentachlorobenzene	U	JJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Pentachlorophenol	U	JJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Phenanthrene	U	JJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Phenol	U	JJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0.0256	pCi/L	0.0256	pCi/L	0.073	0.0135	W	06/02/2017		1672177	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	-0.00427	pCi/L	-0.00427	pCi/L	0.0774	0.0128	W	06/02/2017		1672177	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	-29.1	pCi/L	-29.1	pCi/L	81.5	20.7	W	06/02/2017		1671920	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Pyrene	U	JJ	SV3a	N	1.00	ug/L	1.00	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Pyridine	U	JJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	1.37	pCi/L	1.37	pCi/L	5.28	1.23	W	06/02/2017		1671920	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	0.138	pCi/L	0.138	pCi/L	0.339	0.102	W	06/02/2017		1671753	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Tetrachlorobenzene[1,2,4,5]	U	JJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Tetrachlorophenol[2,3,4,6-]	U	JJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	GENERAL CHEMISTRY	EPA:351.2	Total Kjeldahl Nitrogen	J		I4a	Y	0.403	mg/L	0.403	mg/L			W	06/02/2017		1671942	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Trichlorobenzene[1,2,4-]	U	JJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Trichlorophenol[2,4,5-]	U	JJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	SVOC	SW-846:8270D	Trichlorophenol[2,4,6-]	U	JJ	SV3a	N	10.0	ug/L	10.0	ug/L			W	06/02/2017		1671167	VAL	Y
R-68	2017-1649	CAWA-17-134190	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	0.0924	pCi/L	0.0924	pCi/L	0.136	0.0275	W	06/02/2017		1672178	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 qualify. The analyte is detected in the sample.
P3a	The surrogate is < the Lower Acceptance Level (LAL) but >=10%R. Follow the external laboratory limits located within the associated data package.
R5	Analyte is not detected because the amount reported is less than the MDC.
R5a	The analyte should be regarded as rejected because spectral interferences prevent positive identification of the analytes.

## DATA VALIDATION REPORT

### Reason Code

### Description

SV3a

The surrogate is < the Lower Acceptance Level (LAL) but >=10%R. Follow the external laboratory limits located within the associated data package.

U\_LAB

The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-133332	R-68	REG	EPA:120.1	0	1
CAWA-17-133332	R-68	REG	EPA:150.1	0	1
CAWA-17-133332	R-68	REG	EPA:160.1	0	1
CAWA-17-133332	R-68	REG	EPA:170.0	0	1
CAWA-17-133332	R-68	REG	EPA:245.2	0	1
CAWA-17-133332	R-68	REG	EPA:300.0	0	4
CAWA-17-133332	R-68	REG	EPA:310.1	0	2
CAWA-17-133332	R-68	REG	EPA:350.1	0	1
CAWA-17-133332	R-68	REG	EPA:353.2	0	1
CAWA-17-133332	R-68	REG	EPA:365.4	0	1
CAWA-17-133332	R-68	REG	SM:A2340B	0	1
CAWA-17-133332	R-68	REG	SW-846:6010C	0	17
CAWA-17-133332	R-68	REG	SW-846:6020	0	11
CAWA-17-133332	R-68	REG	SW-846:6850	0	1
CAWA-17-133394	R-68	FB	EPA:170.0	0	1
CAWA-17-133394	R-68	FB	SW-846:8260B	0	80
CAWA-17-133394	R-68	FB	SW-846:8270D	0	80
CAWA-17-133396	R-68	FTB	EPA:170.0	0	1
CAWA-17-133396	R-68	FTB	SW-846:8260B	0	80
CAWA-17-134190	R-68	REG	EPA:245.2	0	1
CAWA-17-134190	R-68	REG	EPA:335.4	0	1
CAWA-17-134190	R-68	REG	EPA:351.2	0	1
CAWA-17-134190	R-68	REG	EPA:900	0	2
CAWA-17-134190	R-68	REG	EPA:901.1	0	5
CAWA-17-134190	R-68	REG	EPA:905.0	0	1
CAWA-17-134190	R-68	REG	HASL-300:AM-241	0	1
CAWA-17-134190	R-68	REG	HASL-300:ISOPU	0	2
CAWA-17-134190	R-68	REG	HASL-300:ISOU	0	3
CAWA-17-134190	R-68	REG	SW-846:8082	0	8
CAWA-17-134190	R-68	REG	SW-846:8270D	0	80

## DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-134190	R-68	REG	SW-846:9060	0	1

June 15, 2017

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

Re: LANL- WQH Water Samples  
Work Order: 424747  
SDG: 2017-1649

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 06, 2017, and analyzed for GC Semivolatile PCB, 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,



Adrian Melendrez for  
Valerie Davis  
Project Manager

Chain of Custody: 2017-1649  
Enclosures



**ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)**  
**LANL- WQH Water Samples**  
**Work Order #: 424747**  
**SDG: 2017-1649**



## Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	5
Data Review Qualifier Flag Definition Sheet.....	11
Volatile Analysis.....	14
Case Narrative.....	15
Sample Data Summary.....	20
Quality Control Summary.....	27
Quality Control Data.....	63
Semi-Volatile Analysis.....	112
Case Narrative.....	113
Sample Data Summary.....	119
Quality Control Summary.....	126
Quality Control Data.....	141
Miscellaneous.....	154
Perchlorates by LCMSMS Analysis.....	156
Case Narrative.....	157
Sample Data Summary.....	163
Quality Control Summary.....	165
Quality Control Data.....	168
PCB Analysis.....	174

Case Narrative.....	175
Sample Data Summary.....	180
Quality Control Summary.....	182
Quality Control Data.....	188
Miscellaneous.....	193
Metals Analysis.....	195
Case Narrative.....	196
Sample Data Summary.....	202
Quality Control Summary.....	207
General Chem Analysis.....	221
Case Narrative.....	222
Sample Data Summary.....	253
Quality Control Summary.....	257
Miscellaneous.....	264
Radiological Analysis.....	267
Case Narrative.....	268
Sample Data Summary.....	283
Quality Control Summary.....	286

# Case Narrative

**Case Narrative for  
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)  
LANL- WQH Water Samples  
Workorder #: 424747  
SDG # : 2017-1649**

**June 15, 2017**

**Laboratory Identification:**

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

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on June 06, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

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

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
424747001	CAWA-17-133332
424747002	CAWA-17-133394
424747003	CAWA-17-133396
424747004	CAWA-17-134190
424747005	CAWA-17-134190

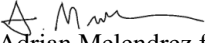
**Case Narrative**

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: GC Semivolatile PCB, 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.

  
Adrian Melendrez for  
Valerie Davis  
Project Manager

**List of current GEL Certifications as of 15 June 2017**

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



# **Chain of Custody and Supporting Documentation**





Laboratories LLC

## SAMPLE RECEIPT &amp; REVIEW FORM

Client: <u>ESHL</u>		SDG/AR/COC/Work Order: <u>424747</u>	
Received By: <u>ZKW</u>		Date Received: <u>6/6/17</u>	
Carrier and Tracking Number		Circle Applicable: <input checked="" type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other <u>5908 1782 1683 - 4°C</u> <u>5908 1782 1650 - 3°C</u> <u>5908 1782 1709 - 5°C</u> <u>5908 1782 1661 - 5°C</u> <u>5908 1782 1672 - 4°C</u> <u>5908 1782 1694 - 4°C</u> <u>5908 1782 1640 - 5°C</u>	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> 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 None Other: *all temperatures are recorded in Celsius TEMP: <u>See Above</u>
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 ___ No <input checked="" type="checkbox"/> N/A ___ Sample ID's and containers affected: <u>Both Vials for 171333638 and 1 vial for 17133364</u> <u>rechecked and signed</u>
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:
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>We received sample CAWA-17-134191 5/31/17 @ 8:54</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 also rec'd 2 VOA vials for CAWA-17-13394 not indicated on the CoC.  
 \* We only rec'd 1 VOA vial for WSTMD-17-136839

PM (or PMA) review: Initials

MCH

Date

6/7/17

Page

1

of 1

GL-CHL-SR-001 Rev 5

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

SHIP DATE: 05JUN17  
ACTWGT: 51.0 LB MAN  
CAD: 0014176/CAFE2916

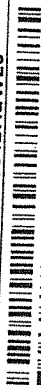
BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

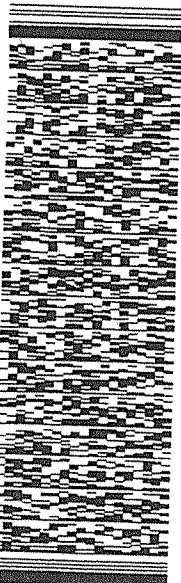
CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWEO



FedEx  
Express



TUE - 06 JUN 10:30A  
PRIORITY OVERNIGHT

2 of 2

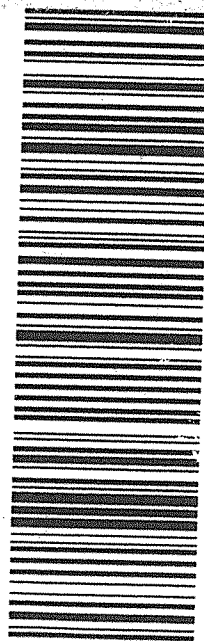
MPS# 5908 1782 1650

Mstr# 5908 1782 1640

0201

X7 RBWA

29407  
SC-US CHS



Part # 156148V-434 RIT2 06/15 8.9

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

SHIP DATE: 05JUN17  
ACTWGT: 50.0 LB MAN  
CAD: 0014176/CAFE2916

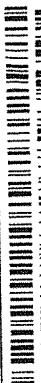
BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

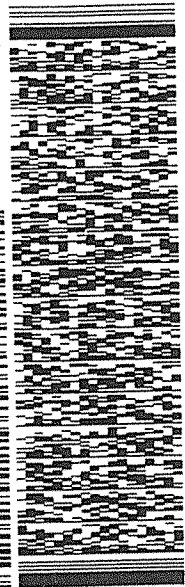
CHARLESTON SC 29407

(843) 566-8171

REF: 21PD0ASRGW04BAGWEO



FedEx  
Express



TUE - 06 JUN 10:30A  
PRIORITY OVERNIGHT

1 of 2

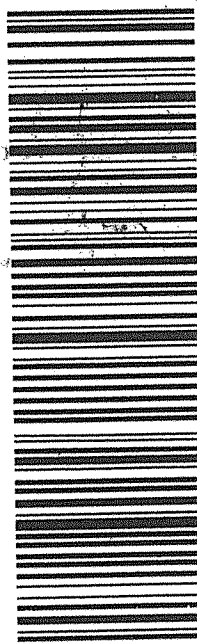
TRK# 5908 1782 1683

0201

## MASTER ##

X7 RBWA

29407  
SC-US CHS



Part # 156148V-434 RIT2 06/15 8.9

538C1/A502/329B

4c

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: 05JUN17  
ACTWGT: 52.0 LB MAN  
CAD: 0014176/CAFE2916

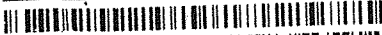
BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWE0



FedEx  
Express



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: 05JUN17  
ACTWGT: 53.0 LB MAN  
CAD: 0014176/CAFE2916

BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWE0



FedEx  
Express



1 of 2  
TRK# 5908 1782 1640  
0201  
## MASTER ##

X7 RBWA

2940  
SC-US CH

TUE - 06 JUN 10:30  
PRIORITY OVERNIGHT



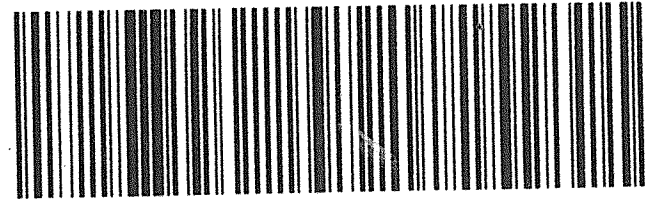
2 of 2  
MPS# 5908 1782 1672  
0263  
Mstr# 5908 1782 1661

X7 RBWA

2940  
SC-US CH

TUE - 06 JUN 10:30  
PRIORITY OVERNIGHT

Part # 156148V-434 RIT2 06/15



SHIP DATE: 05 JUN17  
ACTWGT: 52.0 LB MAN  
CAD: 0014176/CAFE2916

BILL SENDER

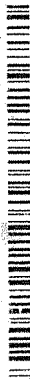
ORIGIN ID:SAFA (505) 665-9966  
KEITH GREENE  
LOS ALAMOS NATL LAB.  
TA00 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

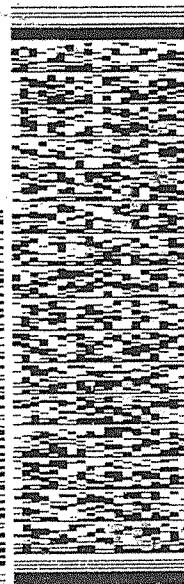
CHARLESTON SC 29407

(843) 556-8171

REF: 21PD0ASRGW04BAGWE0



FedEx  
Express

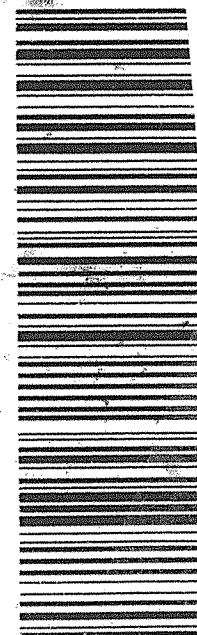


TUE - 06 JUN 10:30  
PRIORITY OVERNIGHT

2 of 2  
MPS# 5908 1782 1694  
0263  
Mstr# 5908 1782 1683

X7 RBWA

29407  
SC-US CHS



Part # 156148V-434 RIT2 06/15

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

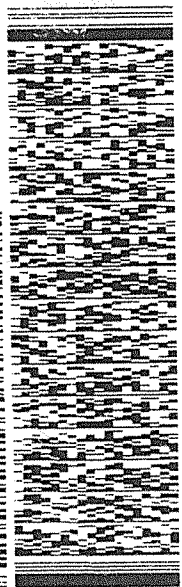
BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171  
REF: 21PD0ASRGW04BAGWEO

FedEx  
Express

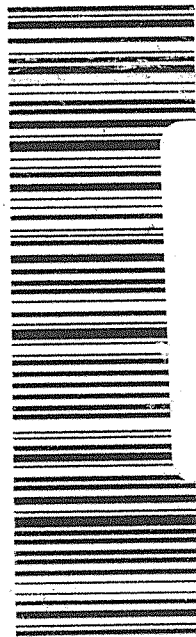


TUE - 06 JUN 10:30A  
PRIORITY OVERNIGHT

TRK# 5908 1782 1709

X7 RBWA

29407  
SC-US CHS



RT 257  
ST F1  
5 10:30  
E 1709  
06.06

Part # 156148V-434 R1T2 06/15

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

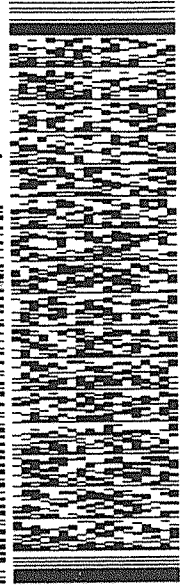
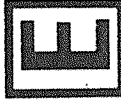
BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171  
REF: 21PD0ASRGW04BAGWEO

FedEx  
Express



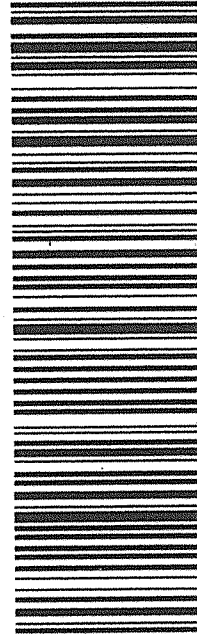
TUE - 06 JUN 10:30A  
PRIORITY OVERNIGHT

TRK# 5908 1782 1661

## MASTER ##

X7 RBWA

29407  
SC-US CHS



Part # 156148V-434 R1T2 06/15

538C1/AS02/3298

116131508120101



# **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 #: 2017-1649  
Work Order #: 424747**

**Method/Analysis Information**

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

Analytical Method: SW-846:8260B

Analytical Batch Number: 1671196 1674343

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424747002	CAWA-17-133394
424747003	CAWA-17-133396
1203804346	424596006(CAWA-17-134191) Post Spike (PS)
1203804347	424596006(CAWA-17-134191) Post Spike (PS)
1203804348	424596006(CAWA-17-134191) Post Spike Duplicate (PSD)
1203804349	424596006(CAWA-17-134191) Post Spike Duplicate (PSD)
1203806749	Method Blank (MB)
1203806750	Laboratory Control Sample (LCS)
1203806751	Laboratory Control Sample (LCS)
1203807982	Method Blank (MB)
1203807986	Laboratory Control Sample (LCS)
1203812150	Method Blank (MB)
1203812151	Laboratory Control Sample (LCS)
1203812152	Laboratory Control Sample (LCS)
1203812153	424747002(CAWA-17-133394) Post Spike (PS)
1203812154	424747002(CAWA-17-133394) Post Spike (PS)
1203812155	424747002(CAWA-17-133394) Post Spike Duplicate (PSD)
1203812156	424747002(CAWA-17-133394) 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**

Target analytes were detected in the blank 1203807982 (MB) below the reporting limit.

##### **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**

Samples 424596006 (CAWA-17-134191) and 424747002 (CAWA-17-133394) were 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**

**Data Exception (DER) Documentation**

A Data exception reports (DERs) was not generated to document procedural anomalies that may deviate from referenced SOP or contractual documents.

**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 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:

<b>Instrument ID</b>	<b>Instrument</b>	<b>System Configuration</b>	<b>Column ID</b>	<b>Column Description</b>	<b>P &amp; T Trap</b>
VOA4.I	Hewlett Packard 6890/5973 GC/MS w/ OI 4560/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: 2017-1649 GEL Work Order: 424747

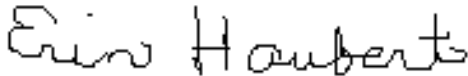
#### The Qualifiers in this report are defined as follows:

- \* 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: 16 JUN 2017

Title: Data Validator

# **Sample Data Summary**

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2017-1649

Lab Sample ID: 424747002

Date Collected: 06/02/2017 13:33

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAWA-17-133394

Batch ID: 1674343

Run Date: 06/15/2017 14:37

Prep Date: 06/15/2017 14:37

Data File: 061517V4\4M415.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1649

Lab Sample ID: 424747002

Date Collected: 06/02/2017 13:33

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAWA-17-133394

Batch ID: 1674343

Run Date: 06/15/2017 14:37

Prep Date: 06/15/2017 14:37

Data File: 061517V4\4M415.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

Page 3 of 3

SDG Number: 2017-1649

Lab Sample ID: 424747002

Date Collected: 06/02/2017 13:33

Date Received: 06/06/2017 09:05

Matrix: W

Client: ARSL004

Method: SW-846:8260B

Project: ESHL00114

SOP Ref: GL-OA-E-038

Batch ID: 1674343

Inst: VOA4.I

Dilution: 1

Run Date: 06/15/2017 14:37

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/15/2017 14:37

Data File: 061517V4\4M415.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	50.4	50.0	ug/L 101	(71%-134%)
Bromofluorobenzene	49.3	50.0	ug/L 99	(70%-131%)
Toluene-d8	51.0	50.0	ug/L 102	(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**

SDG Number: 2017-1649

Lab Sample ID: 424747003

Date Collected: 06/02/2017 13:33

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAWA-17-133396

Batch ID: 1671196

Run Date: 06/08/2017 16:08

Prep Date: 06/08/2017 16:08

Data File: 060817V4\4L417.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00



**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1649

Lab Sample ID: 424747003

Date Collected: 06/02/2017 13:33

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAWA-17-133396

Batch ID: 1671196

Run Date: 06/08/2017 16:08

Prep Date: 06/08/2017 16:08

Data File: 060817V4\4L417.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.97	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1649

Lab Sample ID: 424747003

Date Collected: 06/02/2017 13:33

Date Received: 06/06/2017 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Client ID: CAWA-17-133396

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 16:08

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 16:08

Data File: 060817V4\4L417.D

Column: DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.3	50.0	ug/L 103	(71%-134%)
Bromofluorobenzene	54.4	50.0	ug/L 109	(70%-131%)
Toluene-d8	49.6	50.0	ug/L 99	(74%-124%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown siloxane	12.205	23.5	ug/L	0	J
	unknown siloxane	14.576	56.9	ug/L	0	J
	unknown	16.533	18.6	ug/L	0	J

# **Quality Control Summary**

**Volatile**  
**Surrogate Recovery Report**

Page 1 of 1

**SDG Number: 2017-1649****Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203806750	LCS for batch 1671196	101	101	108
1203806751	LCS for batch 1671196	109	102	113
1203806749	MB for batch 1671196	106	101	111
424747003	CAWA-17-133396	103	99	109
1203804346	CAWA-17-134191PS	90	98	99
1203804348	CAWA-17-134191PSD	98	100	100
1203807986	LCS for batch 1671196	102	98	109
1203807982	MB for batch 1671196	97	98	109
1203804347	CAWA-17-134191PS	97	94	105
1203804349	CAWA-17-134191PSD	96	94	106
1203812151	LCS for batch 1674343	98	100	94
1203812152	LCS for batch 1674343	99	100	104
1203812150	MB for batch 1674343	102	105	105
424747002	CAWA-17-133394	101	102	99
1203812153	CAWA-17-133394PS	92	103	96
1203812155	CAWA-17-133394PSD	98	102	97
1203812154	CAWA-17-133394PS	103	101	105
1203812156	CAWA-17-133394PSD	104	100	106

**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 8

SDG Number: 2017-1649

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	87.0	87	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	832	67	56-131
67-64-1	PS Acetone	250	0.00 U	96.3	39	25-155
74-88-4	PS Iodomethane	250	0.00 U	196	78	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	201	80	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	220	88	48-133
78-93-3	PS 2-Butanone	250	0.00 U	127	51	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	175	70	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	158	63	33-138
75-09-2	PS Methylene chloride	50.0	1.24 J	38.0	73	62-123
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	38.6	77	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	44.4	89	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	48.2	96	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	43.2	86	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	46.1	92	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	46.0	92	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	47.5	95	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	38.9	78	59-130
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	37.6	75	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	41.5	83	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	41.9	84	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	41.6	83	69-127

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-1649

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	39.9	80	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	40.5	81	71-130
67-66-3	PS Chloroform	50.0	0.00 U	40.5	81	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	39.8	80	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	39.6	79	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	41.8	84	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	40.3	81	69-130
71-43-2	PS Benzene	50.0	0.00 U	40.0	80	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	41.0	82	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	41.5	83	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	39.8	80	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	42.2	84	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	40.3	81	70-134
108-88-3	PS Toluene	50.0	0.00 U	41.0	82	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	42.5	85	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	39.3	79	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	39.4	79	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	40.8	82	60-130
124-48-1	PS Dibromochloromethane	50.0	0.00 U	37.6	75	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	40.1	80	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	41.0	82	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	42.8	86	61-130

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 8

SDG Number: 2017-1649

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	44.4	89	62-131
100-42-5	PS Styrene	50.0	0.00 U	46.1	92	59-135
75-25-2	PS Bromoform	50.0	0.00 U	41.6	83	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	42.4	85	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	37.1	74	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	36.7	73	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	40.9	82	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	42.2	84	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	44.2	88	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	42.3	85	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	41.4	83	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	43.8	88	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	43.3	87	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	44.1	88	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	44.6	89	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	40.8	82	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	40.2	80	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	43.0	86	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	31.0	62	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	39.3	79	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	38.0	76	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	38.8	78	52-135

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 4 of 8

SDG Number: 2017-1649

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804346

Instrument: VOA4.I

Analysis Date: 06/08/2017 17:35

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	37.3	75	50-133
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00 U	43.9	88	71-133
95-50-1	PS 1,2-Dichlorobenzene	50.0	0.00 U	40.4	81	60-125
71-36-3	PS n-Butyl alcohol	5000	0.00 U	3980	80	60-140



Volatile  
Quality Control Summary  
Spike Recovery Report

Page 5 of 8

SDG Number: 2017-1649

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	84.4	84	59-132	3	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	975	78	56-131	16	0-20
67-64-1	PSD Acetone	250	0.00 U	112	45	25-155	15	0-20
74-88-4	PSD Iodomethane	250	0.00 U	198	79	66-133	1	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	198	79	61-141	1	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	239	95	48-133	8	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	148	59	25-143	15	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00 U	201	81	61-127	14	0-20
591-78-6	PSD 2-Hexanone	250	0.00 U	178	71	33-138	12	0-20
75-09-2	PSD Methylene chloride	50.0	1.24 J	38.8	75	62-123	2	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	40.6	81	33-164	5	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	44.1	88	53-139	1	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	48.6	97	58-140	1	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	44.3	89	59-146	3	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	46.4	93	65-129	1	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	45.2	90	65-141	2	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	51.0	102	69-127	7	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	38.8	78	59-130	0	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00 U	40.6	81	69-132	8	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	41.6	83	65-127	0	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	41.9	84	67-127	0	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	41.1	82	69-127	1	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 6 of 8

SDG Number: 2017-1649

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
594-20-7	PSD 2,2-Dichloropropane	50.0	0.00 U	39.2	78	66-137	2	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00 U	40.9	82	71-130	1	0-20
67-66-3	PSD Chloroform	50.0	0.00 U	39.9	80	71-129	2	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00 U	39.7	79	69-139	0	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00 U	38.6	77	67-130	3	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00 U	40.8	82	66-143	2	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00 U	41.8	84	69-130	4	0-20
71-43-2	PSD Benzene	50.0	0.00 U	39.2	78	66-125	2	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00 U	41.1	82	65-131	0	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00 U	41.3	83	67-127	1	0-20
74-95-3	PSD Dibromomethane	50.0	0.00 U	42.2	84	72-129	6	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00 U	42.8	86	70-138	2	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00 U	41.7	83	70-134	3	0-20
108-88-3	PSD Toluene	50.0	0.00 U	40.2	80	60-126	2	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00 U	43.4	87	69-135	2	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00 U	41.7	83	66-125	6	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00 U	41.3	83	67-124	5	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00 U	40.1	80	60-130	2	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00 U	38.7	77	68-143	3	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00 U	42.1	84	71-127	5	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00 U	40.5	81	64-124	1	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00 U	41.5	83	61-130	3	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 7 of 8

SDG Number: 2017-1649

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	43.4	87	62-131	2	0-20
100-42-5	PSD Styrene	50.0	0.00 U	45.7	91	59-135	1	0-20
75-25-2	PSD Bromoform	50.0	0.00 U	43.8	88	64-138	5	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00 U	40.0	80	55-133	6	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00 U	39.2	78	62-129	6	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00 U	38.1	76	70-124	4	0-20
108-86-1	PSD Bromobenzene	50.0	0.00 U	40.3	81	62-124	1	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00 U	40.3	81	50-133	5	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00 U	42.4	85	53-135	4	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00 U	40.8	82	56-128	4	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00 U	39.7	79	53-130	4	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00 U	42.4	85	55-135	3	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00 U	41.7	83	53-132	4	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00 U	42.1	84	50-138	4	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00 U	43.0	86	49-138	4	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00 U	39.6	79	56-126	3	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00 U	39.4	79	55-125	2	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00 U	41.3	83	43-142	4	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00 U	36.4	73	62-141	16	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00 U	38.9	78	40-147	1	0-20
91-20-3	PSD Naphthalene	50.0	0.00 U	43.2	86	62-134	13	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00 U	41.0	82	52-135	6	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 8 of 8

SDG Number: 2017-1649

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804348

Instrument: VOA4.I

Analysis Date: 06/08/2017 18:04

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
120-82-1	PSD 1,2,4-Trichlorobenzene	50.0	0.00 U	39.1	78	50-133	5	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	44.2	88	71-133	1	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	40.0	80	60-125	1	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	4640	93	60-140	15	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 2

SDG Number: 2017-1649

Sample Type: Post Spike

Client ID: CAWA-17-134191PS

Matrix: W

Lab Sample ID 1203804347

Instrument: VOA4.I

Analysis Date: 06/09/2017 22:30

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	240	96	49-141
76-13-1	PS Trichlorotrifluoroethane	250	0.00 U	206	82	57-149
107-05-1	PS Allyl chloride	250	0.00 U	230	92	54-128
107-13-1	PS Acrylonitrile	250	0.00 U	242	97	59-129
107-12-0	PS Propionitrile	250	0.00 U	240	96	58-131
126-98-7	PS Methacrylonitrile	250	0.00 U	247	99	59-134
80-62-6	PS Methyl methacrylate	250	0.00 U	249	99	62-135
97-63-2	PS Ethyl methacrylate	250	0.00 U	244	98	60-136
78-83-1	PS Isobutyl alcohol	2500	0.00 U	2450	98	60-143
126-99-8	PS 2-Chloro-1,3-butadiene	50.0	0.00 U	35.4	71	63-146

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 2

SDG Number: 2017-1649

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-134191PSD

Matrix: W

Lab Sample ID 1203804349

Instrument: VOA4.I

Analysis Date: 06/09/2017 22:59

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
107-02-8	PSD Acrolein	250	0.00 U	240	96	49-141	0	0-20
76-13-1	PSD Trichlorotrifluoroethane	250	0.00 U	210	84	57-149	2	0-20
107-05-1	PSD Allyl chloride	250	0.00 U	235	94	54-128	2	0-20
107-13-1	PSD Acrylonitrile	250	0.00 U	242	97	59-129	0	0-20
107-12-0	PSD Propionitrile	250	0.00 U	234	94	58-131	3	0-20
126-98-7	PSD Methacrylonitrile	250	0.00 U	251	100	59-134	1	0-20
80-62-6	PSD Methyl methacrylate	250	0.00 U	252	101	62-135	1	0-20
97-63-2	PSD Ethyl methacrylate	250	0.00 U	251	100	60-136	3	0-20
78-83-1	PSD Isobutyl alcohol	2500	0.00 U	2450	98	60-143	0	0-20
126-99-8	PSD 2-Chloro-1,3-butadiene	50.0	0.00 U	37.2	74	63-146	5	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 4

SDG Number: 2017-1649

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	88.8	89	71-127
75-05-8	LCS Acetonitrile	1250	0.0	948	76	61-125
67-64-1	LCS Acetone	250	0.0	263	105	48-157
74-88-4	LCS Iodomethane	250	0.0	210	84	72-128
75-15-0	LCS Carbon disulfide	250	0.0	213	85	69-138
108-05-4	LCS Vinyl acetate	250	0.0	245	98	67-125
78-93-3	LCS 2-Butanone	250	0.0	226	90	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	208	83	66-124
591-78-6	LCS 2-Hexanone	250	0.0	246	98	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	45.6	91	40-160
74-87-3	LCS Chloromethane	50.0	0.0	39.4	79	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	44.0	88	65-137
74-83-9	LCS Bromomethane	50.0	0.0	46.6	93	63-137
75-00-3	LCS Chloroethane	50.0	0.0	50.4	101	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	53.8	108	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	51.4	103	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	43.8	88	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	38.9	78	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	43.0	86	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	45.0	90	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	44.3	89	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	44.0	88	75-123

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-1649

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	47.8	96	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	42.2	84	76-125
67-66-3	LCS Chloroform	50.0	0.0	43.9	88	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	46.1	92	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	44.0	88	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	47.3	95	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	44.4	89	74-122
71-43-2	LCS Benzene	50.0	0.0	42.7	85	72-121
79-01-6	LCS Trichloroethylene	50.0	0.0	45.9	92	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	42.6	85	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	42.8	86	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	46.0	92	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	45.2	90	78-131
108-88-3	LCS Toluene	50.0	0.0	43.1	86	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	47.1	94	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	42.9	86	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	42.0	84	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	42.5	85	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	41.6	83	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	44.0	88	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	42.3	85	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	44.5	89	73-125



Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-1649

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	44.3	89	74-126
100-42-5	LCS Styrene	50.0	0.0	46.2	92	72-130
75-25-2	LCS Bromoform	50.0	0.0	49.2	98	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	46.3	93	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	41.7	83	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	41.5	83	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	43.2	86	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	44.9	90	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	46.5	93	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	43.7	87	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	44.5	89	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	46.5	93	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	46.2	92	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	46.0	92	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	47.2	94	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	42.4	85	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	42.3	85	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	45.5	91	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	39.5	79	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	43.5	87	72-136
91-20-3	LCS Naphthalene	50.0	0.0	45.7	91	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	43.7	87	70-130

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 4 of 4

SDG Number: 2017-1649

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806750

Instrument: VOA4.I

Analysis Date: 06/08/2017 09:24

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	42.5	85	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	46.3	93	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	42.7	85	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	4640	93	63-138

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-1649

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203806751

Instrument: VOA4.I

Analysis Date: 06/08/2017 10:50

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	248	99	61-148
107-05-1	LCS Allyl chloride	250	0.0	246	98	59-125
107-13-1	LCS Acrylonitrile	250	0.0	256	102	65-122
107-12-0	LCS Propionitrile	250	0.0	257	103	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	259	104	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	264	106	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	257	103	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2650	106	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	41.9	84	66-147

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-1649

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671196

Matrix: WATER

Lab Sample ID 1203807986

Instrument: VOA4.I

Analysis Date: 06/09/2017 14:13

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1671196

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	279	112	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	238	95	61-148
107-05-1	LCS Allyl chloride	250	0.0	251	100	59-125
107-13-1	LCS Acrylonitrile	250	0.0	262	105	65-122
107-12-0	LCS Propionitrile	250	0.0	264	106	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	266	106	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	269	108	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	261	104	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2710	108	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	42.3	85	66-147

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 4

SDG Number: 2017-1649

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1674343

Matrix: WATER

Lab Sample ID 1203812151

Instrument: VOA4.I

Analysis Date: 06/15/2017 10:16

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1674343

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	109	109	71-127
75-05-8	LCS Acetonitrile	1250	0.0	1300	104	61-125
67-64-1	LCS Acetone	250	0.0	368	147	48-157
74-88-4	LCS Iodomethane	250	0.0	266	106	72-128
75-15-0	LCS Carbon disulfide	250	0.0	273	109	69-138
108-05-4	LCS Vinyl acetate	250	0.0	249	100	67-125
78-93-3	LCS 2-Butanone	250	0.0	318	127	55-138
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	263	105	66-124
591-78-6	LCS 2-Hexanone	250	0.0	333	133	56-140
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	53.4	107	40-160
74-87-3	LCS Chloromethane	50.0	0.0	54.0	108	58-135
75-01-4	LCS Vinyl chloride	50.0	0.0	59.9	120	65-137
74-83-9	LCS Bromomethane	50.0	0.0	49.2	98	63-137
75-00-3	LCS Chloroethane	50.0	0.0	50.7	101	69-129
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	50.7	101	69-138
60-29-7	LCS Ethyl ether	50.0	0.0	50.8	102	72-125
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	53.6	107	66-126
75-09-2	LCS Methylene chloride	50.0	0.0	47.7	95	68-119
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	52.0	104	76-128
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	54.7	109	71-124
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	52.8	106	73-123
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	54.0	108	75-123

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-1649

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1674343

Matrix: WATER

Lab Sample ID 1203812151

Instrument: VOA4.I

Analysis Date: 06/15/2017 10:16

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1674343

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	54.1	108	72-138
74-97-5	LCS Bromochloromethane	50.0	0.0	53.2	106	76-125
67-66-3	LCS Chloroform	50.0	0.0	51.4	103	76-123
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	52.9	106	74-136
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	51.9	104	72-129
56-23-5	LCS Carbon tetrachloride	50.0	0.0	55.4	111	72-140
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	51.4	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	53.9	108	74-125
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	51.1	102	73-121
74-95-3	LCS Dibromomethane	50.0	0.0	52.6	105	78-123
75-27-4	LCS Bromodichloromethane	50.0	0.0	53.7	107	77-131
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	53.5	107	78-131
108-88-3	LCS Toluene	50.0	0.0	51.0	102	71-121
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	54.8	110	78-131
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	50.6	101	74-118
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	50.3	101	74-118
127-18-4	LCS Tetrachloroethylene	50.0	0.0	54.2	108	69-129
124-48-1	LCS Dibromochloromethane	50.0	0.0	50.5	101	76-137
106-93-4	LCS 1,2-Dibromoethane	50.0	0.0	53.0	106	78-122
108-90-7	LCS Chlorobenzene	50.0	0.0	52.0	104	74-120
100-41-4	LCS Ethylbenzene	50.0	0.0	52.4	105	73-125

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-1649

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1674343

Matrix: WATER

Lab Sample ID 1203812151

Instrument: VOA4.I

Analysis Date: 06/15/2017 10:16

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1674343

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	53.4	107	74-126
100-42-5	LCS Styrene	50.0	0.0	56.6	113	72-130
75-25-2	LCS Bromoform	50.0	0.0	58.3	117	72-136
98-82-8	LCS Isopropylbenzene	50.0	0.0	53.3	107	70-130
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	49.4	99	70-126
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	49.6	99	74-122
108-86-1	LCS Bromobenzene	50.0	0.0	51.3	103	74-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	52.5	105	67-128
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	55.1	110	70-129
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	53.0	106	71-124
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	50.5	101	69-125
98-06-6	LCS tert-Butylbenzene	50.0	0.0	56.1	112	72-130
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	54.3	109	70-126
135-98-8	LCS sec-Butylbenzene	50.0	0.0	55.7	111	70-131
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	57.1	114	71-131
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	51.7	103	72-121
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	50.3	101	71-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	54.8	110	68-134
96-12-8	LCS 1,2-Dibromo-3-chloropropane	50.0	0.0	49.0	98	68-141
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	52.4	105	72-136
91-20-3	LCS Naphthalene	50.0	0.0	56.5	113	72-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	53.6	107	70-130

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 4 of 4

SDG Number: 2017-1649

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1674343

Matrix: WATER

Lab Sample ID 1203812151

Instrument: VOA4.I

Analysis Date: 06/15/2017 10:16

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1674343

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	52.5	105	71-129
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	55.7	111	79-127
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	51.6	103	74-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	6030	121	63-138



Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 1

SDG Number: 2017-1649

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1674343

Matrix: WATER

Lab Sample ID 1203812152

Instrument: VOA4.I

Analysis Date: 06/15/2017 11:14

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1674343

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	280	112	60-140
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	243	97	61-148
107-05-1	LCS Allyl chloride	250	0.0	266	106	59-125
107-13-1	LCS Acrylonitrile	250	0.0	245	98	65-122
107-12-0	LCS Propionitrile	250	0.0	242	97	64-124
126-98-7	LCS Methacrylonitrile	250	0.0	252	101	64-126
80-62-6	LCS Methyl methacrylate	250	0.0	250	100	69-127
97-63-2	LCS Ethyl methacrylate	250	0.0	260	104	66-130
78-83-1	LCS Isobutyl alcohol	2500	0.0	2400	96	65-135
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	41.5	83	66-147

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-1649

Sample Type: Post Spike

Client ID: CAWA-17-133394PS

Matrix: W

Lab Sample ID 1203812153

Instrument: VOA4.I

Analysis Date: 06/15/2017 16:33

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1674343

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	104	104	59-132
75-05-8	PS Acetonitrile	1250	0.00 U	1000	80	56-131
67-64-1	PS Acetone	250	0.00 U	325	130	25-155
74-88-4	PS Iodomethane	250	0.00 U	244	98	66-133
75-15-0	PS Carbon disulfide	250	0.00 U	243	97	61-141
108-05-4	PS Vinyl acetate	250	0.00 U	193	77	48-133
78-93-3	PS 2-Butanone	250	0.00 U	270	108	25-143
108-10-1	PS 4-Methyl-2-pentanone	250	0.00 U	254	102	61-127
591-78-6	PS 2-Hexanone	250	0.00 U	332	133	33-138
75-71-8	PS Dichlorodifluoromethane	50.0	0.00 U	45.7	91	33-164
74-87-3	PS Chloromethane	50.0	0.00 U	49.8	100	53-139
75-01-4	PS Vinyl chloride	50.0	0.00 U	54.1	108	58-140
74-83-9	PS Bromomethane	50.0	0.00 U	45.0	90	59-146
75-00-3	PS Chloroethane	50.0	0.00 U	46.8	94	65-129
75-69-4	PS Trichlorofluoromethane	50.0	0.00 U	46.5	93	65-141
60-29-7	PS Ethyl ether	50.0	0.00 U	46.1	92	69-127
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00 U	47.6	95	59-130
75-09-2	PS Methylene chloride	50.0	0.00 U	44.4	89	62-123
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00 U	46.3	93	69-132
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00 U	49.7	99	65-127
75-34-3	PS 1,1-Dichloroethane	50.0	0.00 U	49.7	99	67-127
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00 U	50.2	100	69-127

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-1649

Sample Type: Post Spike

Client ID: CAWA-17-133394PS

Matrix: W

Lab Sample ID 1203812153

Instrument: VOA4.I

Analysis Date: 06/15/2017 16:33

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1674343

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
594-20-7	PS 2,2-Dichloropropane	50.0	0.00 U	48.8	98	66-137
74-97-5	PS Bromochloromethane	50.0	0.00 U	50.2	100	71-130
67-66-3	PS Chloroform	50.0	0.00 U	48.0	96	71-129
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00 U	48.5	97	69-139
563-58-6	PS 1,1-Dichloropropene	50.0	0.00 U	47.5	95	67-130
56-23-5	PS Carbon tetrachloride	50.0	0.00 U	50.3	101	66-143
107-06-2	PS 1,2-Dichloroethane	50.0	0.00 U	46.4	93	69-130
71-43-2	PS Benzene	50.0	0.00 U	47.6	95	66-125
79-01-6	PS Trichloroethylene	50.0	0.00 U	50.3	101	65-131
78-87-5	PS 1,2-Dichloropropane	50.0	0.00 U	49.2	98	67-127
74-95-3	PS Dibromomethane	50.0	0.00 U	46.6	93	72-129
75-27-4	PS Bromodichloromethane	50.0	0.00 U	50.0	100	70-138
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00 U	50.7	101	70-134
108-88-3	PS Toluene	50.0	0.00 U	48.6	97	60-126
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00 U	51.2	102	69-135
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00 U	47.4	95	66-125
142-28-9	PS 1,3-Dichloropropane	50.0	0.00 U	45.8	92	67-124
127-18-4	PS Tetrachloroethylene	50.0	0.00 U	50.7	101	60-130
124-48-1	PS Dibromochloromethane	50.0	0.00 U	45.8	92	68-143
106-93-4	PS 1,2-Dibromoethane	50.0	0.00 U	48.0	96	71-127
108-90-7	PS Chlorobenzene	50.0	0.00 U	49.6	99	64-124
100-41-4	PS Ethylbenzene	50.0	0.00 U	50.0	100	61-130

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 8

SDG Number: 2017-1649

Sample Type: Post Spike

Client ID: CAWA-17-133394PS

Matrix: W

Lab Sample ID 1203812153

Instrument: VOA4.I

Analysis Date: 06/15/2017 16:33

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1674343

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	50.8	102	62-131
100-42-5	PS Styrene	50.0	0.00 U	54.0	108	59-135
75-25-2	PS Bromoform	50.0	0.00 U	52.1	104	64-138
98-82-8	PS Isopropylbenzene	50.0	0.00 U	51.5	103	55-133
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00 U	42.6	85	62-129
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00 U	43.6	87	70-124
108-86-1	PS Bromobenzene	50.0	0.00 U	49.7	99	62-124
103-65-1	PS n-Propylbenzene	50.0	0.00 U	50.6	101	50-133
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00 U	53.2	106	53-135
95-49-8	PS 2-Chlorotoluene	50.0	0.00 U	51.3	103	56-128
106-43-4	PS 4-Chlorotoluene	50.0	0.00 U	49.7	99	53-130
98-06-6	PS tert-Butylbenzene	50.0	0.00 U	53.1	106	55-135
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00 U	52.7	105	53-132
135-98-8	PS sec-Butylbenzene	50.0	0.00 U	53.3	107	50-138
99-87-6	PS 4-Isopropyltoluene	50.0	0.00 U	54.2	108	49-138
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00 U	50.2	100	56-126
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00 U	49.6	99	55-125
104-51-8	PS n-Butylbenzene	50.0	0.00 U	51.3	103	43-142
96-12-8	PS 1,2-Dibromo-3-chloropropane	50.0	0.00 U	37.2	74	62-141
87-68-3	PS Hexachlorobutadiene	50.0	0.00 U	48.2	96	40-147
91-20-3	PS Naphthalene	50.0	0.00 U	46.7	93	62-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00 U	48.6	97	52-135

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 4 of 8

SDG Number: 2017-1649

Sample Type: Post Spike

Client ID: CAWA-17-133394PS

Matrix: W

Lab Sample ID 1203812153

Instrument: VOA4.I

Analysis Date: 06/15/2017 16:33

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1674343

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	46.8	94	50-133
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00 U	53.3	107	71-133
95-50-1	PS 1,2-Dichlorobenzene	50.0	0.00 U	49.2	98	60-125
71-36-3	PS n-Butyl alcohol	5000	0.00 U	4530	91	60-140

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 5 of 8

SDG Number: 2017-1649

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133394PSD

Matrix: W

Lab Sample ID 1203812155

Instrument: VOA4.I

Analysis Date: 06/15/2017 17:03

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1674343

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	103	103	59-132	1	0-20
75-05-8	PSD Acetonitrile	1250	0.00 U	1170	93	56-131	15	0-20
67-64-1	PSD Acetone	250	0.00 U	365	146	25-155	12	0-20
74-88-4	PSD Iodomethane	250	0.00 U	253	101	66-133	4	0-20
75-15-0	PSD Carbon disulfide	250	0.00 U	252	101	61-141	4	0-20
108-05-4	PSD Vinyl acetate	250	0.00 U	229	92	48-133	17	0-20
78-93-3	PSD 2-Butanone	250	0.00 U	307	123	25-143	13	0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00 U	260	104	61-127	2	0-20
591-78-6	PSD 2-Hexanone	250	0.00 U	332	133	33-138	0	0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00 U	48.5	97	33-164	6	0-20
74-87-3	PSD Chloromethane	50.0	0.00 U	50.8	102	53-139	2	0-20
75-01-4	PSD Vinyl chloride	50.0	0.00 U	56.2	112	58-140	4	0-20
74-83-9	PSD Bromomethane	50.0	0.00 U	46.7	93	59-146	4	0-20
75-00-3	PSD Chloroethane	50.0	0.00 U	48.5	97	65-129	4	0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00 U	47.7	95	65-141	3	0-20
60-29-7	PSD Ethyl ether	50.0	0.00 U	50.1	100	69-127	8	0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00 U	49.1	98	59-130	3	0-20
75-09-2	PSD Methylene chloride	50.0	0.00 U	46.3	93	62-123	4	0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00 U	50.3	101	69-132	8	0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00 U	50.7	101	65-127	2	0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00 U	51.1	102	67-127	3	0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00 U	51.9	104	69-127	3	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 6 of 8

SDG Number: 2017-1649

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133394PSD

Matrix: W

Lab Sample ID 1203812155

Instrument: VOA4.I

Analysis Date: 06/15/2017 17:03

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1674343

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
594-20-7	PSD 2,2-Dichloropropane	50.0	0.00 U	51.0	102	66-137	4	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00 U	52.2	104	71-130	4	0-20
67-66-3	PSD Chloroform	50.0	0.00 U	49.2	98	71-129	2	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00 U	49.9	100	69-139	3	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00 U	49.3	99	67-130	4	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00 U	52.1	104	66-143	4	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00 U	50.2	100	69-130	8	0-20
71-43-2	PSD Benzene	50.0	0.00 U	48.6	97	66-125	2	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00 U	50.7	101	65-131	1	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00 U	50.5	101	67-127	3	0-20
74-95-3	PSD Dibromomethane	50.0	0.00 U	50.0	100	72-129	7	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00 U	52.4	105	70-138	5	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00 U	51.8	104	70-134	2	0-20
108-88-3	PSD Toluene	50.0	0.00 U	48.6	97	60-126	0	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00 U	53.7	107	69-135	5	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00 U	49.0	98	66-125	3	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00 U	48.5	97	67-124	6	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00 U	50.6	101	60-130	0	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00 U	48.7	97	68-143	6	0-20
106-93-4	PSD 1,2-Dibromoethane	50.0	0.00 U	51.6	103	71-127	7	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00 U	49.7	99	64-124	0	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00 U	50.1	100	61-130	0	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 7 of 8

SDG Number: 2017-1649

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133394PSD

Matrix: W

Lab Sample ID 1203812155

Instrument: VOA4.I

Analysis Date: 06/15/2017 17:03

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1674343

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	51.0	102	62-131	1	0-20
100-42-5	PSD Styrene	50.0	0.00 U	55.1	110	59-135	2	0-20
75-25-2	PSD Bromoform	50.0	0.00 U	57.3	115	64-138	10	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00 U	50.5	101	55-133	2	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00 U	47.2	94	62-129	10	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00 U	47.6	95	70-124	9	0-20
108-86-1	PSD Bromobenzene	50.0	0.00 U	49.7	99	62-124	0	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00 U	49.9	100	50-133	2	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00 U	52.7	105	53-135	1	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00 U	51.1	102	56-128	0	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00 U	48.7	97	53-130	2	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00 U	52.7	105	55-135	1	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00 U	51.8	104	53-132	2	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00 U	52.1	104	50-138	2	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00 U	53.1	106	49-138	2	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00 U	49.4	99	56-126	2	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00 U	48.3	97	55-125	3	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00 U	50.1	100	43-142	2	0-20
96-12-8	PSD 1,2-Dibromo-3-chloropropane	50.0	0.00 U	44.3	89	62-141	17	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00 U	47.7	95	40-147	1	0-20
91-20-3	PSD Naphthalene	50.0	0.00 U	51.5	103	62-134	10	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00 U	49.8	100	52-135	3	0-20



Volatile  
Quality Control Summary  
Spike Recovery Report

Page 8 of 8

SDG Number: 2017-1649

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133394PSD

Matrix: W

Lab Sample ID 1203812155

Instrument: VOA4.I

Analysis Date: 06/15/2017 17:03

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1674343

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
120-82-1	PSD 1,2,4-Trichlorobenzene	50.0	0.00 U	47.7	95	50-133	2	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00 U	53.8	108	71-133	1	0-20
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00 U	49.3	99	60-125	0	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00 U	5460	109	60-140	19	0-20

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 2

SDG Number: 2017-1649

Sample Type: Post Spike

Client ID: CAWA-17-133394PS

Matrix: W

Lab Sample ID 1203812154

Instrument: VOA4.I

Analysis Date: 06/15/2017 17:31

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1674343

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	300	120	49-141
76-13-1	PS Trichlorotrifluoroethane	250	0.00 U	263	105	57-149
107-05-1	PS Allyl chloride	250	0.00 U	273	109	54-128
107-13-1	PS Acrylonitrile	250	0.00 U	270	108	59-129
107-12-0	PS Propionitrile	250	0.00 U	263	105	58-131
126-98-7	PS Methacrylonitrile	250	0.00 U	276	110	59-134
80-62-6	PS Methyl methacrylate	250	0.00 U	275	110	62-135
97-63-2	PS Ethyl methacrylate	250	0.00 U	270	108	60-136
78-83-1	PS Isobutyl alcohol	2500	0.00 U	2680	107	60-143
126-99-8	PS 2-Chloro-1,3-butadiene	50.0	0.00 U	44.0	88	63-146

Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 2

SDG Number: 2017-1649

Sample Type: Post Spike Duplicate

Client ID: CAWA-17-133394PSD

Matrix: W

Lab Sample ID 1203812156

Instrument: VOA4.I

Analysis Date: 06/15/2017 18:01

Dilution: 1

Analyst: VXY1

Purge Vol: 5 mL

Batch ID: 1674343

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
107-02-8	PSD Acrolein	250	0.00 U	298	119	49-141	0	0-20
76-13-1	PSD Trichlorotrifluoroethane	250	0.00 U	266	106	57-149	1	0-20
107-05-1	PSD Allyl chloride	250	0.00 U	281	113	54-128	3	0-20
107-13-1	PSD Acrylonitrile	250	0.00 U	266	106	59-129	2	0-20
107-12-0	PSD Propionitrile	250	0.00 U	266	106	58-131	1	0-20
126-98-7	PSD Methacrylonitrile	250	0.00 U	275	110	59-134	0	0-20
80-62-6	PSD Methyl methacrylate	250	0.00 U	276	110	62-135	0	0-20
97-63-2	PSD Ethyl methacrylate	250	0.00 U	279	112	60-136	3	0-20
78-83-1	PSD Isobutyl alcohol	2500	0.00 U	2660	106	60-143	1	0-20
126-99-8	PSD 2-Chloro-1,3-butadiene	50.0	0.00 U	45.2	90	63-146	3	0-20

## Method Blank Summary

Page 1 of 1

SDG Number:	2017-1649	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1671196	Instrument ID:	VOA4.I	Data File:	060817V4\4L407.D
Lab Sample ID:	1203806749	Prep Date:	06/08/2017 11:19	Analyzed:	06/08/17 11:19
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 1671196	1203806750	060817V4\4L403A.D	06/08/17	0924
02 LCS for batch 1671196	1203806751	060817V4\4L406A.D	06/08/17	1050
03 CAWA-17-133396	424747003	060817V4\4L417.D	06/08/17	1608
04 CAWA-17-134191PS	1203804346	060817V4\4L420.D	06/08/17	1735
05 CAWA-17-134191PSD	1203804348	060817V4\4L421.D	06/08/17	1804

## Method Blank Summary

Page 1 of 1

SDG Number:	2017-1649	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1671196	Instrument ID:	VOA4.I	Data File:	060917V4\4L508.D
Lab Sample ID:	1203807982	Prep Date:	06/09/2017 14:42	Analyzed:	06/09/17 14:42
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
07 LCS for batch 1671196	1203807986	060917V4\4L507A.D	06/09/17	1413
08 CAWA-17-134191PS	1203804347	060917V4\4L524.D	06/09/17	2230
09 CAWA-17-134191PSD	1203804349	060917V4\4L525.D	06/09/17	2259

## Method Blank Summary

Page 1 of 1

SDG Number: 2017-1649

Client: ARSL004

Matrix: WATER

Client ID: MB for batch 1674343

Instrument ID: VOA4.I

Data File: 061517V4\4M409A.D

Lab Sample ID: 1203812150

Prep Date: 06/15/2017 11:43

Analyzed: 06/15/17 11:43

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 1674343	1203812151	061517V4\4M406A.D	06/15/17	1016
02 LCS for batch 1674343	1203812152	061517V4\4M408A.D	06/15/17	1114
03 CAWA-17-133394	424747002	061517V4\4M415.D	06/15/17	1437
04 CAWA-17-133394PS	1203812153	061517V4\4M419.D	06/15/17	1633
05 CAWA-17-133394PSD	1203812155	061517V4\4M420.D	06/15/17	1703
06 CAWA-17-133394PS	1203812154	061517V4\4M421.D	06/15/17	1731
07 CAWA-17-133394PSD	1203812156	061517V4\4M422.D	06/15/17	1801

# Quality Control Data

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1649</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804346</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 17:35</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 17:35</b>				
<b>Data File:</b>	<b>060817V4\4L420.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		43.9	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		39.8	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		37.1	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		39.3	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		41.9	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		38.9	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		39.6	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		38.8	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		36.7	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		37.3	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		43.3	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		31.0	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		40.1	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		40.4	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		40.3	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		41.5	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		44.2	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		40.8	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		39.4	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		40.2	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		39.9	ug/L	0.300	1.00
78-93-3	2-Butanone		127	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		42.3	ug/L	0.300	1.00
591-78-6	2-Hexanone		158	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		41.4	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		44.6	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		175	ug/L	1.50	5.00
67-64-1	Acetone		96.3	ug/L	1.50	10.0
75-05-8	Acetonitrile		832	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		40.0	ug/L	0.300	1.00
108-86-1	Bromobenzene		40.9	ug/L	0.300	1.00
74-97-5	Bromochloromethane		40.5	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		42.2	ug/L	0.300	1.00
75-25-2	Bromoform		41.6	ug/L	0.300	1.00



**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1649</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804346</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 17:35</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 17:35</b>				
<b>Data File:</b>	<b>060817V4\4L420.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		43.2	ug/L	0.300	1.00
75-15-0	Carbon disulfide		201	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		41.8	ug/L	0.300	1.00
108-90-7	Chlorobenzene		41.0	ug/L	0.300	1.00
75-00-3	Chloroethane		46.1	ug/L	0.300	1.00
67-66-3	Chloroform		40.5	ug/L	0.300	1.00
74-87-3	Chloromethane		44.4	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		37.6	ug/L	0.300	1.00
74-95-3	Dibromomethane		39.8	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		38.6	ug/L	0.300	1.00
60-29-7	Ethyl ether		47.5	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		42.8	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		39.3	ug/L	0.300	1.00
74-88-4	Iodomethane		196	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		42.4	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		38.0	ug/L	1.00	10.0
91-20-3	Naphthalene		38.0	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		46.1	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		40.8	ug/L	0.300	1.00
108-88-3	Toluene		41.0	ug/L	0.300	1.00
79-01-6	Trichloroethylene		41.0	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		46.0	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		220	ug/L	1.50	5.00
75-01-4	Vinyl chloride		48.2	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		41.6	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		40.3	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		87.0	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		3980	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		43.0	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		42.2	ug/L	0.300	1.00
95-47-6	o-Xylene		44.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		44.1	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804346	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 17:35	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 17:35		
<b>Data File:</b> 060817V4\4L420.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		37.6	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		43.8	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		41.5	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		42.5	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	44.9	50.0	90	(71%-134%)
Bromofluorobenzene	49.6	50.0	99	(70%-131%)
Toluene-d8	48.9	50.0	98	(74%-124%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804347	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 22:30	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 22:30		
<b>Data File:</b> 060917V4\4L524.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		35.4	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		240	ug/L	1.50	5.00
107-13-1	Acrylonitrile		242	ug/L	1.50	5.00
107-05-1	Allyl chloride		230	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804347	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 22:30	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 22:30		
<b>Data File:</b> 060917V4\4L524.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		244	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2450	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		247	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		249	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		240	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		206	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

Page 3 of 3

<b>SDG Number:</b>	<b>2017-1649</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804347</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/09/2017 22:30</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/09/2017 22:30</b>				
<b>Data File:</b>	<b>060917V4\4L524.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.5	50.0	97	(71%-134%)
Bromofluorobenzene	52.5	50.0	105	(70%-131%)
Toluene-d8	46.8	50.0	94	(74%-124%)

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1649</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804348</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/08/2017 18:04</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/08/2017 18:04</b>				
<b>Data File:</b>	<b>060817V4\4L421.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		44.2	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		39.7	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		39.2	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		41.7	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		41.9	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		38.8	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		38.6	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		41.0	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		38.1	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		39.1	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		41.7	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		36.4	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		42.1	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		40.0	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		41.8	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		41.3	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		42.4	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		39.6	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		41.3	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		39.4	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		39.2	ug/L	0.300	1.00
78-93-3	2-Butanone		148	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		40.8	ug/L	0.300	1.00
591-78-6	2-Hexanone		178	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		39.7	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		43.0	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		201	ug/L	1.50	5.00
67-64-1	Acetone		112	ug/L	1.50	10.0
75-05-8	Acetonitrile		975	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		39.2	ug/L	0.300	1.00
108-86-1	Bromobenzene		40.3	ug/L	0.300	1.00
74-97-5	Bromochloromethane		40.9	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		42.8	ug/L	0.300	1.00
75-25-2	Bromoform		43.8	ug/L	0.300	1.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804348	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 18:04	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 18:04		
<b>Data File:</b> 060817V4\4L421.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		44.3	ug/L	0.300	1.00
75-15-0	Carbon disulfide		198	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		40.8	ug/L	0.300	1.00
108-90-7	Chlorobenzene		40.5	ug/L	0.300	1.00
75-00-3	Chloroethane		46.4	ug/L	0.300	1.00
67-66-3	Chloroform		39.9	ug/L	0.300	1.00
74-87-3	Chloromethane		44.1	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		38.7	ug/L	0.300	1.00
74-95-3	Dibromomethane		42.2	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		40.6	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	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		41.5	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		38.9	ug/L	0.300	1.00
74-88-4	Iodomethane		198	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		40.0	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		38.8	ug/L	1.00	10.0
91-20-3	Naphthalene		43.2	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		45.7	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		40.1	ug/L	0.300	1.00
108-88-3	Toluene		40.2	ug/L	0.300	1.00
79-01-6	Trichloroethylene		41.1	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		45.2	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		239	ug/L	1.50	5.00
75-01-4	Vinyl chloride		48.6	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		41.1	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		41.7	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		84.4	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4640	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		41.3	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		40.3	ug/L	0.300	1.00
95-47-6	o-Xylene		43.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		42.1	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804348	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/08/2017 18:04	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/08/2017 18:04		
<b>Data File:</b> 060817V4\4L421.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		40.6	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		42.4	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		41.6	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		43.4	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.9	50.0	98	(71%-134%)
Bromofluorobenzene	49.9	50.0	100	(70%-131%)
Toluene-d8	49.8	50.0	100	(74%-124%)



**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804349	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 22:59	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 22:59		
<b>Data File:</b> 060917V4\4L525.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		37.2	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		240	ug/L	1.50	5.00
107-13-1	Acrylonitrile		242	ug/L	1.50	5.00
107-05-1	Allyl chloride		235	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 05/31/2017 08:54	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203804349	<b>Date Received:</b> 06/02/2017 09:00	
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134191PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 22:59	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 22:59		
<b>Data File:</b> 060917V4\4L525.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		251	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2450	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		251	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		252	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		234	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		210	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1649</b>	<b>Date Collected:</b>	<b>05/31/2017 08:54</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203804349</b>	<b>Date Received:</b>	<b>06/02/2017 09:00</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-134191PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/09/2017 22:59</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/09/2017 22:59</b>				
<b>Data File:</b>	<b>060917V4\4L525.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	47.9	50.0	96	(71%-134%)
Bromofluorobenzene	53.0	50.0	106	(70%-131%)
Toluene-d8	47.1	50.0	94	(74%-124%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2017-1649

Lab Sample ID: 1203806749

Client Sample: QC for batch 1671196

Client ID: MB for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 11:19

Prep Date: 06/08/2017 11:19

Data File: 060817V4\4L407.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2017-1649

Matrix: WATER

Lab Sample ID: 1203806749

Client Sample: QC for batch 1671196

Client: ARSL004

Project: QC

Client ID: MB for batch 1671196

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 11:19

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 11:19

Data File: 060817V4\4L407.D

Column: DB-624

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

Volatile  
Certificate of Analysis  
Sample Summary

Page 3 of 3

SDG Number: 2017-1649

Lab Sample ID: 1203806749

Client Sample: QC for batch 1671196

Client ID: MB for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 11:19

Prep Date: 06/08/2017 11:19

Data File: 060817V4\4L407.D

Matrix: WATER

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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
1634-04-4	tert-Butyl methyl ether	U	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	U	1.00	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	53.1	50.0	ug/L 106	(71%-134%)
Bromofluorobenzene	55.5	50.0	ug/L 111	(70%-131%)
Toluene-d8	50.7	50.0	ug/L 101	(74%-124%)

## Tentatively Identified Compound Summary

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

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2017-1649

Lab Sample ID: 1203806750

Client Sample: QC for batch 1671196

Client ID: LCS for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 09:24

Prep Date: 06/08/2017 09:24

Data File: 060817V4\4L403A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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		46.3	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		46.1	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		41.7	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		42.9	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		44.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		43.8	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		44.0	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		43.7	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		41.5	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		42.5	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		46.2	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		39.5	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		44.0	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		42.7	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		44.4	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		42.6	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		46.5	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		42.4	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		42.0	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		42.3	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		47.8	ug/L	0.300	1.00
78-93-3	2-Butanone		226	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		43.7	ug/L	0.300	1.00
591-78-6	2-Hexanone		246	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		44.5	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		47.2	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		208	ug/L	1.50	5.00
67-64-1	Acetone		263	ug/L	1.50	10.0
75-05-8	Acetonitrile		948	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		42.7	ug/L	0.300	1.00
108-86-1	Bromobenzene		43.2	ug/L	0.300	1.00
74-97-5	Bromochloromethane		42.2	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		46.0	ug/L	0.300	1.00
75-25-2	Bromoform		49.2	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1649

Lab Sample ID: 1203806750

Client Sample: QC for batch 1671196

Client ID: LCS for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 09:24

Prep Date: 06/08/2017 09:24

Data File: 060817V4\4L403A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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		46.6	ug/L	0.300	1.00
75-15-0	Carbon disulfide		213	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		47.3	ug/L	0.300	1.00
108-90-7	Chlorobenzene		42.3	ug/L	0.300	1.00
75-00-3	Chloroethane		50.4	ug/L	0.300	1.00
67-66-3	Chloroform		43.9	ug/L	0.300	1.00
74-87-3	Chloromethane		39.4	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		41.6	ug/L	0.300	1.00
74-95-3	Dibromomethane		42.8	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		45.6	ug/L	0.300	1.00
60-29-7	Ethyl ether		51.4	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		44.5	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		43.5	ug/L	0.300	1.00
74-88-4	Iodomethane		210	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		46.3	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		38.9	ug/L	1.00	10.0
91-20-3	Naphthalene		45.7	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		46.2	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		42.5	ug/L	0.300	1.00
108-88-3	Toluene		43.1	ug/L	0.300	1.00
79-01-6	Trichloroethylene		45.9	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		53.8	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		245	ug/L	1.50	5.00
75-01-4	Vinyl chloride		44.0	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		44.0	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		45.2	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		88.8	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4640	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		45.5	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		44.9	ug/L	0.300	1.00
95-47-6	o-Xylene		44.3	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		46.0	ug/L	0.300	1.00



**Volatile  
Certificate of Analysis  
Sample Summary**

Page 3 of 3

<b>SDG Number:</b>	<b>2017-1649</b>	<b>Matrix:</b>	<b>WATER</b>
<b>Lab Sample ID:</b>	<b>1203806750</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>LCS for batch 1671196</b>	<b>Method:</b>	<b>SW-846:8260B</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>
<b>Run Date:</b>	<b>06/08/2017 09:24</b>	<b>Analyst:</b>	<b>VXY1</b>
<b>Prep Date:</b>	<b>06/08/2017 09:24</b>		
<b>Data File:</b>	<b>060817V4\4L403A.D</b>	<b>Column:</b>	<b>DB-624</b>

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		43.0	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		46.5	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		45.0	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		47.1	ug/L	0.300	1.00
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4		50.5	50.0	ug/L	101	(71%-134%)
Bromofluorobenzene		54.1	50.0	ug/L	108	(70%-131%)
Toluene-d8		50.5	50.0	ug/L	101	(74%-124%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2017-1649

Matrix: WATER

Lab Sample ID: 1203806751

Client Sample: QC for batch 1671196

Client: ARSL004

Project: QC

Client ID: LCS for batch 1671196

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1671196

Inst: VOA4.I

Dilution: 1

Run Date: 06/08/2017 10:50

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/08/2017 10:50

Data File: 060817V4\4L406A.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		41.9	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		291	ug/L	1.50	5.00
107-13-1	Acrylonitrile		256	ug/L	1.50	5.00
107-05-1	Allyl chloride		246	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2017-1649

Lab Sample ID: 1203806751

Client Sample: QC for batch 1671196

Client ID: LCS for batch 1671196

Batch ID: 1671196

Run Date: 06/08/2017 10:50

Prep Date: 06/08/2017 10:50

Data File: 060817V4\4L406A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		257	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2650	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		259	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		264	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		257	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		248	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

Page 3 of 3

<b>SDG Number:</b>	<b>2017-1649</b>	<b>Matrix:</b>	<b>WATER</b>
<b>Lab Sample ID:</b>	<b>1203806751</b>		
<b>Client Sample:</b>	<b>QC for batch 1671196</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>LCS for batch 1671196</b>	<b>Method:</b>	<b>SW-846:8260B</b>
<b>Batch ID:</b>	<b>1671196</b>	<b>Inst:</b>	<b>VOA4.I</b>
<b>Run Date:</b>	<b>06/08/2017 10:50</b>	<b>Analyst:</b>	<b>VXY1</b>
<b>Prep Date:</b>	<b>06/08/2017 10:50</b>		
<b>Data File:</b>	<b>060817V4\4L406A.D</b>	<b>Column:</b>	<b>DB-624</b>

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	54.4	50.0	109	(71%-134%)
Bromofluorobenzene	56.6	50.0	113	(70%-131%)
Toluene-d8	51.0	50.0	102	(74%-124%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2017-1649

Lab Sample ID: 1203807982

Client Sample: QC for batch 1671196

Client ID: MB for batch 1671196

Batch ID: 1671196

Run Date: 06/09/2017 14:42

Prep Date: 06/09/2017 14:42

Data File: 060917V4\4L508.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2017-1649

Lab Sample ID: 1203807982

Client Sample: QC for batch 1671196

Client ID: MB for batch 1671196

Batch ID: 1671196

Run Date: 06/09/2017 14:42

Prep Date: 06/09/2017 14:42

Data File: 060917V4\4L508.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	J	1.21	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

Page 3 of 3

<b>SDG Number:</b> 2017-1649	<b>Matrix:</b> WATER	
<b>Lab Sample ID:</b> 1203807982		
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> MB for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 14:42	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/09/2017 14:42		
<b>Data File:</b> 060917V4\4L508.D	<b>Column:</b> DB-624	

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	48.4	50.0	97	(71%-134%)
Bromofluorobenzene	54.3	50.0	109	(70%-131%)
Toluene-d8	49.2	50.0	98	(74%-124%)

**Tentatively Identified Compound Summary**

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

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2017-1649		<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b> 1203807986			
<b>Client Sample:</b> QC for batch 1671196	<b>Client:</b> ARSL004	<b>Project:</b>	QC
<b>Client ID:</b> LCS for batch 1671196	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b>	GL-OA-E-038
<b>Batch ID:</b> 1671196	<b>Inst:</b> VOA4.I	<b>Dilution:</b>	1
<b>Run Date:</b> 06/09/2017 14:13	<b>Analyst:</b> VXY1	<b>Purge Vol:</b>	5 mL
<b>Prep Date:</b> 06/09/2017 14:13			
<b>Data File:</b> 060917V4\4L507A.D	<b>Column:</b> DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		42.3	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		279	ug/L	1.50	5.00
107-13-1	Acrylonitrile		262	ug/L	1.50	5.00
107-05-1	Allyl chloride		251	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00



**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1649

Lab Sample ID: 1203807986

Client Sample: QC for batch 1671196

Client ID: LCS for batch 1671196

Batch ID: 1671196

Run Date: 06/09/2017 14:13

Prep Date: 06/09/2017 14:13

Data File: 060917V4\4L507A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		261	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2710	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		266	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		269	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		264	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		238	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

Page 3 of 3

<b>SDG Number:</b>	2017-1649	<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b>	1203807986		
<b>Client Sample:</b>	QC for batch 1671196	<b>Client:</b>	ARSL004
<b>Client ID:</b>	LCS for batch 1671196	<b>Method:</b>	SW-846:8260B
<b>Batch ID:</b>	1671196	<b>Inst:</b>	VOA4.I
<b>Run Date:</b>	06/09/2017 14:13	<b>Analyst:</b>	VXY1
<b>Prep Date:</b>	06/09/2017 14:13		
<b>Data File:</b>	060917V4\4L507A.D	<b>Column:</b>	DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.1	50.0	ug/L	102 (71%-134%)
Bromofluorobenzene	54.3	50.0	ug/L	109 (70%-131%)
Toluene-d8	48.9	50.0	ug/L	98 (74%-124%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 3

SDG Number: 2017-1649

Lab Sample ID: 1203812150

Client Sample: QC for batch 1674343

Client ID: MB for batch 1674343

Batch ID: 1674343

Run Date: 06/15/2017 11:43

Prep Date: 06/15/2017 11:43

Data File: 061517V4\4M409A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1649

Matrix: WATER

Lab Sample ID: 1203812150

Client Sample: QC for batch 1674343

Client: ARSL004

Project: QC

Client ID: MB for batch 1674343

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1674343

Inst: VOA4.I

Dilution: 1

Run Date: 06/15/2017 11:43

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/15/2017 11:43

Data File: 061517V4\4M409A.D

Column: DB-624

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

**Volatile  
Certificate of Analysis  
Sample Summary**

Page 3 of 3

<b>SDG Number:</b> 2017-1649	<b>Matrix:</b> WATER	
<b>Lab Sample ID:</b> 1203812150		
<b>Client Sample:</b> QC for batch 1674343	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> MB for batch 1674343	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1674343	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/15/2017 11:43	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/15/2017 11:43		
<b>Data File:</b> 061517V4\4M409A.D	<b>Column:</b> DB-624	

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	50.8	50.0	ug/L 102	(71%-134%)
Bromofluorobenzene	52.3	50.0	ug/L 105	(70%-131%)
Toluene-d8	52.7	50.0	ug/L 105	(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**

SDG Number: 2017-1649

Lab Sample ID: 1203812151

Client Sample: QC for batch 1674343

Client ID: LCS for batch 1674343

Batch ID: 1674343

Run Date: 06/15/2017 10:16

Prep Date: 06/15/2017 10:16

Data File: 061517V4\4M406A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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		55.7	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		52.9	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		49.4	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		50.6	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		52.8	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		53.6	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		51.9	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		53.6	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		49.6	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		52.5	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		54.3	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		49.0	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		53.0	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		51.6	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		51.4	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		51.1	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		51.7	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		50.3	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		50.3	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		54.1	ug/L	0.300	1.00
78-93-3	2-Butanone		318	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		53.0	ug/L	0.300	1.00
591-78-6	2-Hexanone		333	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		50.5	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		57.1	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		263	ug/L	1.50	5.00
67-64-1	Acetone		368	ug/L	1.50	10.0
75-05-8	Acetonitrile		1300	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		51.0	ug/L	0.300	1.00
108-86-1	Bromobenzene		51.3	ug/L	0.300	1.00
74-97-5	Bromochloromethane		53.2	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		53.7	ug/L	0.300	1.00
75-25-2	Bromoform		58.3	ug/L	0.300	1.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2017-1649

Lab Sample ID: 1203812151

Client Sample: QC for batch 1674343

Client ID: LCS for batch 1674343

Batch ID: 1674343

Run Date: 06/15/2017 10:16

Prep Date: 06/15/2017 10:16

Data File: 061517V4\4M406A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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		49.2	ug/L	0.300	1.00
75-15-0	Carbon disulfide		273	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		55.4	ug/L	0.300	1.00
108-90-7	Chlorobenzene		52.0	ug/L	0.300	1.00
75-00-3	Chloroethane		50.7	ug/L	0.300	1.00
67-66-3	Chloroform		51.4	ug/L	0.300	1.00
74-87-3	Chloromethane		54.0	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		50.5	ug/L	0.300	1.00
74-95-3	Dibromomethane		52.6	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		53.4	ug/L	0.300	1.00
60-29-7	Ethyl ether		50.8	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		52.4	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		52.4	ug/L	0.300	1.00
74-88-4	Iodomethane		266	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		53.3	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		47.7	ug/L	1.00	10.0
91-20-3	Naphthalene		56.5	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		56.6	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		54.2	ug/L	0.300	1.00
108-88-3	Toluene		51.0	ug/L	0.300	1.00
79-01-6	Trichloroethylene		53.9	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		50.7	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		249	ug/L	1.50	5.00
75-01-4	Vinyl chloride		59.9	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		54.0	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		53.5	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		6030	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		54.8	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		52.5	ug/L	0.300	1.00
95-47-6	o-Xylene		53.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		55.7	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

Page 3 of 3

<b>SDG Number:</b>	<b>2017-1649</b>	<b>Matrix:</b>	<b>WATER</b>
<b>Lab Sample ID:</b>	<b>1203812151</b>		
<b>Client Sample:</b>	<b>QC for batch 1674343</b>	<b>Client:</b>	<b>ARSL004</b>
<b>Client ID:</b>	<b>LCS for batch 1674343</b>	<b>Method:</b>	<b>SW-846:8260B</b>
<b>Batch ID:</b>	<b>1674343</b>	<b>Inst:</b>	<b>VOA4.I</b>
<b>Run Date:</b>	<b>06/15/2017 10:16</b>	<b>Analyst:</b>	<b>VXY1</b>
<b>Prep Date:</b>	<b>06/15/2017 10:16</b>		
<b>Data File:</b>	<b>061517V4\4M406A.D</b>	<b>Column:</b>	<b>DB-624</b>

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		52.0	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		56.1	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		54.7	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		54.8	ug/L	0.300	1.00
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4		49.2	50.0	ug/L	98	(71%-134%)
Bromofluorobenzene		46.8	50.0	ug/L	94	(70%-131%)
Toluene-d8		50.0	50.0	ug/L	100	(74%-124%)



**Volatile  
Certificate of Analysis  
Sample Summary**

SDG Number: 2017-1649

Lab Sample ID: 1203812152

Client Sample: QC for batch 1674343

Client ID: LCS for batch 1674343

Batch ID: 1674343

Run Date: 06/15/2017 11:14

Prep Date: 06/15/2017 11:14

Data File: 061517V4\4M408A.D

Client: ARSL004

Method: SW-846:8260B

Inst: VOA4.I

Analyst: VXY1

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	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		41.5	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		280	ug/L	1.50	5.00
107-13-1	Acrylonitrile		245	ug/L	1.50	5.00
107-05-1	Allyl chloride		266	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

SDG Number: 2017-1649

Matrix: WATER

Lab Sample ID: 1203812152

Client Sample: QC for batch 1674343

Client: ARSL004

Project: QC

Client ID: LCS for batch 1674343

Method: SW-846:8260B

SOP Ref: GL-OA-E-038

Batch ID: 1674343

Inst: VOA4.I

Dilution: 1

Run Date: 06/15/2017 11:14

Analyst: VXY1

Purge Vol: 5 mL

Prep Date: 06/15/2017 11:14

Data File: 061517V4\4M408A.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		260	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2400	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		252	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		250	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		242	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		243	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

Page 3 of 3

<b>SDG Number:</b>	2017-1649	<b>Matrix:</b>	WATER
<b>Lab Sample ID:</b>	1203812152		
<b>Client Sample:</b>	QC for batch 1674343	<b>Client:</b>	ARSL004
<b>Client ID:</b>	LCS for batch 1674343	<b>Method:</b>	SW-846:8260B
<b>Batch ID:</b>	1674343	<b>Inst:</b>	VOA4.I
<b>Run Date:</b>	06/15/2017 11:14	<b>Analyst:</b>	VXY1
<b>Prep Date:</b>	06/15/2017 11:14		
<b>Data File:</b>	061517V4\4M408A.D	<b>Column:</b>	DB-624

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.3	50.0	99	(71%-134%)
Bromofluorobenzene	52.1	50.0	104	(70%-131%)
Toluene-d8	50.1	50.0	100	(74%-124%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 06/02/2017 13:33	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203812153	<b>Date Received:</b> 06/06/2017 09:05	
<b>Client Sample:</b> QC for batch 1674343	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-133394PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1674343	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/15/2017 16:33	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/15/2017 16:33		
<b>Data File:</b> 061517V4\4M419.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		53.3	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		48.5	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		42.6	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		47.4	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		49.7	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		47.6	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		47.5	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		48.6	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		43.6	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		46.8	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		52.7	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		37.2	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		48.0	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		49.2	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		46.4	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		49.2	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		53.2	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		50.2	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		45.8	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		49.6	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		48.8	ug/L	0.300	1.00
78-93-3	2-Butanone		270	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		51.3	ug/L	0.300	1.00
591-78-6	2-Hexanone		332	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		49.7	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		54.2	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		254	ug/L	1.50	5.00
67-64-1	Acetone		325	ug/L	1.50	10.0
75-05-8	Acetonitrile		1000	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		47.6	ug/L	0.300	1.00
108-86-1	Bromobenzene		49.7	ug/L	0.300	1.00
74-97-5	Bromochloromethane		50.2	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		50.0	ug/L	0.300	1.00
75-25-2	Bromoform		52.1	ug/L	0.300	1.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 06/02/2017 13:33	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203812153	<b>Date Received:</b> 06/06/2017 09:05	
<b>Client Sample:</b> QC for batch 1674343	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-133394PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1674343	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/15/2017 16:33	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/15/2017 16:33		
<b>Data File:</b> 061517V4\4M419.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		45.0	ug/L	0.300	1.00
75-15-0	Carbon disulfide		243	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		50.3	ug/L	0.300	1.00
108-90-7	Chlorobenzene		49.6	ug/L	0.300	1.00
75-00-3	Chloroethane		46.8	ug/L	0.300	1.00
67-66-3	Chloroform		48.0	ug/L	0.300	1.00
74-87-3	Chloromethane		49.8	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		45.8	ug/L	0.300	1.00
74-95-3	Dibromomethane		46.6	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		45.7	ug/L	0.300	1.00
60-29-7	Ethyl ether		46.1	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		50.0	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		48.2	ug/L	0.300	1.00
74-88-4	Iodomethane		244	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		51.5	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		44.4	ug/L	1.00	10.0
91-20-3	Naphthalene		46.7	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		54.0	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		50.7	ug/L	0.300	1.00
108-88-3	Toluene		48.6	ug/L	0.300	1.00
79-01-6	Trichloroethylene		50.3	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		46.5	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		193	ug/L	1.50	5.00
75-01-4	Vinyl chloride		54.1	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		50.2	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		50.7	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		104	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4530	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		51.3	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		50.6	ug/L	0.300	1.00
95-47-6	o-Xylene		50.8	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		53.3	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1649</b>	<b>Date Collected:</b>	<b>06/02/2017 13:33</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203812153</b>	<b>Date Received:</b>	<b>06/06/2017 09:05</b>		
<b>Client Sample:</b>	<b>QC for batch 1674343</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-133394PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1674343</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/15/2017 16:33</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/15/2017 16:33</b>				
<b>Data File:</b>	<b>061517V4\4M419.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		46.3	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		53.1	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		49.7	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		51.2	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	46.2	50.0	92	(71%-134%)
Bromofluorobenzene	47.9	50.0	96	(70%-131%)
Toluene-d8	51.4	50.0	103	(74%-124%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 06/02/2017 13:33	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203812154	<b>Date Received:</b> 06/06/2017 09:05	
<b>Client Sample:</b> QC for batch 1674343	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-133394PS	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1674343	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/15/2017 17:31	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/15/2017 17:31		
<b>Data File:</b> 061517V4\4M421.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		44.0	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		300	ug/L	1.50	5.00
107-13-1	Acrylonitrile		270	ug/L	1.50	5.00
107-05-1	Allyl chloride		273	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1649</b>	<b>Date Collected:</b>	<b>06/02/2017 13:33</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203812154</b>	<b>Date Received:</b>	<b>06/06/2017 09:05</b>		
<b>Client Sample:</b>	<b>QC for batch 1674343</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-133394PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1674343</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/15/2017 17:31</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/15/2017 17:31</b>				
<b>Data File:</b>	<b>061517V4\4M421.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		270	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2680	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		276	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		275	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		263	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		263	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00



**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1649</b>	<b>Date Collected:</b>	<b>06/02/2017 13:33</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203812154</b>	<b>Date Received:</b>	<b>06/06/2017 09:05</b>		
<b>Client Sample:</b>	<b>QC for batch 1674343</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-133394PS</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1674343</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/15/2017 17:31</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/15/2017 17:31</b>				
<b>Data File:</b>	<b>061517V4\4M421.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	51.7	50.0	ug/L 103	(71%-134%)
Bromofluorobenzene	52.3	50.0	ug/L 105	(70%-131%)
Toluene-d8	50.4	50.0	ug/L 101	(74%-124%)

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1649</b>	<b>Date Collected:</b>	<b>06/02/2017 13:33</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203812155</b>	<b>Date Received:</b>	<b>06/06/2017 09:05</b>		
<b>Client Sample:</b>	<b>QC for batch 1674343</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-133394PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1674343</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/15/2017 17:03</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/15/2017 17:03</b>				
<b>Data File:</b>	<b>061517V4\4M420.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		53.8	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		49.9	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		47.2	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		49.0	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		51.1	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		49.1	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		49.3	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		49.8	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		47.6	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		47.7	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		51.8	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane		44.3	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane		51.6	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		49.3	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		50.2	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		50.5	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		52.7	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		48.5	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		48.3	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		51.0	ug/L	0.300	1.00
78-93-3	2-Butanone		307	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene		51.1	ug/L	0.300	1.00
591-78-6	2-Hexanone		332	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene		48.7	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		53.1	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		260	ug/L	1.50	5.00
67-64-1	Acetone		365	ug/L	1.50	10.0
75-05-8	Acetonitrile		1170	ug/L	8.00	25.0
107-02-8	Acrolein	U	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	U	5.00	ug/L	1.50	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		48.6	ug/L	0.300	1.00
108-86-1	Bromobenzene		49.7	ug/L	0.300	1.00
74-97-5	Bromochloromethane		52.2	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		52.4	ug/L	0.300	1.00
75-25-2	Bromoform		57.3	ug/L	0.300	1.00

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 06/02/2017 13:33	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203812155	<b>Date Received:</b> 06/06/2017 09:05	
<b>Client Sample:</b> QC for batch 1674343	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-133394PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1674343	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/15/2017 17:03	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/15/2017 17:03		
<b>Data File:</b> 061517V4\4M420.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane		46.7	ug/L	0.300	1.00
75-15-0	Carbon disulfide		252	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride		52.1	ug/L	0.300	1.00
108-90-7	Chlorobenzene		49.7	ug/L	0.300	1.00
75-00-3	Chloroethane		48.5	ug/L	0.300	1.00
67-66-3	Chloroform		49.2	ug/L	0.300	1.00
74-87-3	Chloromethane		50.8	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		48.7	ug/L	0.300	1.00
74-95-3	Dibromomethane		50.0	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		48.5	ug/L	0.300	1.00
60-29-7	Ethyl ether		50.1	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		50.1	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		47.7	ug/L	0.300	1.00
74-88-4	Iodomethane		253	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		50.5	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.50	5.00
80-62-6	Methyl methacrylate	U	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride		46.3	ug/L	1.00	10.0
91-20-3	Naphthalene		51.5	ug/L	0.300	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		55.1	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		50.6	ug/L	0.300	1.00
108-88-3	Toluene		48.6	ug/L	0.300	1.00
79-01-6	Trichloroethylene		50.7	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		47.7	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	2.00	5.00
108-05-4	Vinyl acetate		229	ug/L	1.50	5.00
75-01-4	Vinyl chloride		56.2	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		51.9	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		51.8	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		103	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		5460	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		50.1	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		49.9	ug/L	0.300	1.00
95-47-6	o-Xylene		51.0	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		52.1	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1649</b>	<b>Date Collected:</b>	<b>06/02/2017 13:33</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203812155</b>	<b>Date Received:</b>	<b>06/06/2017 09:05</b>		
<b>Client Sample:</b>	<b>QC for batch 1674343</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-133394PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1674343</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/15/2017 17:03</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/15/2017 17:03</b>				
<b>Data File:</b>	<b>061517V4\4M420.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
1634-04-4	tert-Butyl methyl ether		50.3	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		52.7	ug/L	0.300	1.00
156-60-5	trans-1,2-Dichloroethylene		50.7	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene		53.7	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	49.1	50.0	98	(71%-134%)
Bromofluorobenzene	48.6	50.0	97	(70%-131%)
Toluene-d8	50.9	50.0	102	(74%-124%)

**Volatile**  
**Certificate of Analysis**  
**Sample Summary**

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 06/02/2017 13:33	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203812156	<b>Date Received:</b> 06/06/2017 09:05	
<b>Client Sample:</b> QC for batch 1674343	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-133394PSD	<b>Method:</b> SW-846:8260B	<b>SOP Ref:</b> GL-OA-E-038
<b>Batch ID:</b> 1674343	<b>Inst:</b> VOA4.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/15/2017 18:01	<b>Analyst:</b> VXY1	<b>Purge Vol:</b> 5 mL
<b>Prep Date:</b> 06/15/2017 18:01		
<b>Data File:</b> 061517V4\4M422.D	<b>Column:</b> DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	U	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	U	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	U	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	U	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	U	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	U	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	U	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	U	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
96-12-8	1,2-Dibromo-3-chloropropane	U	1.00	ug/L	0.500	1.00
106-93-4	1,2-Dibromoethane	U	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	U	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	U	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	U	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	U	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	U	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	U	5.00	ug/L	1.50	5.00
126-99-8	2-Chloro-1,3-butadiene		45.2	ug/L	0.300	1.00
95-49-8	2-Chlorotoluene	U	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	U	5.00	ug/L	1.50	5.00
106-43-4	4-Chlorotoluene	U	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	U	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	U	5.00	ug/L	1.50	5.00
67-64-1	Acetone	U	10.0	ug/L	1.50	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		298	ug/L	1.50	5.00
107-13-1	Acrylonitrile		266	ug/L	1.50	5.00
107-05-1	Allyl chloride		281	ug/L	1.50	5.00
71-43-2	Benzene	U	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	U	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	U	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	U	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1649</b>	<b>Date Collected:</b>	<b>06/02/2017 13:33</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203812156</b>	<b>Date Received:</b>	<b>06/06/2017 09:05</b>		
<b>Client Sample:</b>	<b>QC for batch 1674343</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-133394PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1674343</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/15/2017 18:01</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/15/2017 18:01</b>				
<b>Data File:</b>	<b>061517V4\4M422.D</b>	<b>Column:</b>	<b>DB-624</b>		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
74-83-9	Bromomethane	U	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	U	5.00	ug/L	1.50	5.00
56-23-5	Carbon tetrachloride	U	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	U	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	U	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	U	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	U	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	U	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	U	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	U	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	U	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate		279	ug/L	1.50	5.00
100-41-4	Ethylbenzene	U	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	U	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	U	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol		2660	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		275	ug/L	1.50	5.00
80-62-6	Methyl methacrylate		276	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	1.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
107-12-0	Propionitrile		266	ug/L	1.50	5.00
100-42-5	Styrene	U	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	U	1.00	ug/L	0.300	1.00
108-88-3	Toluene	U	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	U	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	U	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane		266	ug/L	2.00	5.00
108-05-4	Vinyl acetate	U	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	U	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	U	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	U	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	U	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	U	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	U	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	U	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	U	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	U	1.00	ug/L	0.300	1.00

**Volatile  
Certificate of Analysis  
Sample Summary**

<b>SDG Number:</b>	<b>2017-1649</b>	<b>Date Collected:</b>	<b>06/02/2017 13:33</b>	<b>Matrix:</b>	<b>W</b>
<b>Lab Sample ID:</b>	<b>1203812156</b>	<b>Date Received:</b>	<b>06/06/2017 09:05</b>		
<b>Client Sample:</b>	<b>QC for batch 1674343</b>	<b>Client:</b>	<b>ARSL004</b>	<b>Project:</b>	<b>QC</b>
<b>Client ID:</b>	<b>CAWA-17-133394PSD</b>	<b>Method:</b>	<b>SW-846:8260B</b>	<b>SOP Ref:</b>	<b>GL-OA-E-038</b>
<b>Batch ID:</b>	<b>1674343</b>	<b>Inst:</b>	<b>VOA4.I</b>	<b>Dilution:</b>	<b>1</b>
<b>Run Date:</b>	<b>06/15/2017 18:01</b>	<b>Analyst:</b>	<b>VXY1</b>	<b>Purge Vol:</b>	<b>5 mL</b>
<b>Prep Date:</b>	<b>06/15/2017 18:01</b>				
<b>Data File:</b>	<b>061517V4\4M422.D</b>	<b>Column:</b>	<b>DB-624</b>		

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	52.1	50.0	ug/L 104	(71%-134%)
Bromofluorobenzene	52.9	50.0	ug/L 106	(70%-131%)
Toluene-d8	50.2	50.0	ug/L 100	(74%-124%)

# **Semi-Volatile Analysis**



# Case Narrative

**GC/MS Semivolatile  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1649  
Work Order #: 424747**

**Method/Analysis Information**

<b>Procedure:</b>	<b>Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry</b>
Analytical Method:	SW846 3510C/8270D
Prep Method:	SW846 3510C
Analytical Batch Number:	1671167
Prep Batch Number:	1671166

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424747002	CAWA-17-133394
424747005	CAWA-17-134190
1203804283	Method Blank (MB)
1203804284	Laboratory Control Sample (LCS)
1203805362	424747005(CAWA-17-134190) Matrix Spike (MS)
1203805363	424747005(CAWA-17-134190) 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# 39.

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 associated calibration verification standards (ICV or CCV) met the acceptance criteria.

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

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

The 1203804283 (MB) displayed target analytes below the reporting limit. As these analytes were not detected above the reporting limit in the associated sample, the data were reported and qualified accordingly.

##### **Surrogate Recoveries**

Sample (See Below) did not meet surrogate recovery acceptance criteria. Since there is insufficient sample remaining to perform a re-extraction, the results from this extraction are reported.

Sample	Analyte	Value
424747005 (CAWA-17-134190)	2,4,6-Tribromophenol	7* (32%-124%)
	2-Fluorobiphenyl	10* (32%-112%)
	2-Fluorophenol	5* (15%-88%)
	Nitrobenzene-d5	10* (36%-115%)
	Phenol-d5	3* (15%-91%)
	p-Terphenyl-d14	9* (36%-121%)

##### **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 424747005 (CAWA-17-134190) 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. As similar recoveries were displayed in the MS and MSD, the failures were attributed to sample matrix interference and the data were reported.

Sample	Analyte	Value
1203805362 (CAWA-17-134190MS)	Several	See applicable report

1203805363 (CAWA-17-134190MSD)	Several	See applicable report
--------------------------------	---------	-----------------------

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

The relative percent differences (RPD) for the MS and MSD, (See Below), were not within the acceptance limits. The failures were attributed to matrix interference. The data were reported.

Sample	Analyte	Value
1203805362MS and 1203805363MSD (CAWA-17-134190)	Benzidine	43* (0%-30%)

#### **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:**

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

A data exception report (DER) 1640447 was generated for samples 424747005 (CAWA-17-134190), 1203805362 (CAWA-17-134190MS) and 1203805363 (CAWA-17-134190MSD) in this SDG/batch.

##### **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 424747002 (CAWA-17-133394) and 424747005 (CAWA-17-134190) 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:

<b>Instrument ID</b>	<b>Instrument</b>	<b>System Configuration</b>	<b>Column ID</b>	<b>Column Description</b>
MSD3.I	Agilent 7890A/5975C GC/MS w/ 7683 Autosampler	HP7890A/HP5975C	DB-5MS	25m x 0.2mm, 0.33um (5% Phenylmethylpolysiloxane)

#### **Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1649 GEL Work Order: 424747

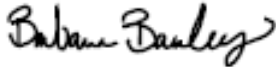
#### The Qualifiers in this report are defined as follows:

- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a surrogate compound
- B The target analyte was detected in the associated blank.
- 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: Barbara Bailey

Date: 14 JUN 2017

Title: Data Validator

# **Sample Data Summary**

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

Page 1 of 3

SDG Number: 2017-1649

Lab Sample ID: 424747002

Date Collected: 06/02/2017 13:33

Date Received: 06/06/2017 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1671167

Inst: MSD3.I

Dilution: 1

Run Date: 06/07/2017 20:38

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 06/07/2017 08:30

Aliquot: 920 mL

Final Volume: 1 mL

Data File: s060717.B\s3f0719.D

Column: DB-5ms

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



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

SDG Number: 2017-1649

Lab Sample ID: 424747002

Date Collected: 06/02/2017 13:33

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAWA-17-133394

Batch ID: 1671167

Run Date: 06/07/2017 20:38

Prep Date: 06/07/2017 08:30

Data File: s060717.B\s3f0719.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
207-08-9	Benzo(k)fluoranthene	U	1.09	ug/L	0.326	1.09
65-85-0	Benzoic acid	U	21.7	ug/L	6.52	21.7
100-51-6	Benzyl alcohol	U	10.9	ug/L	3.26	10.9
85-68-7	Butylbenzylphthalate	U	10.9	ug/L	3.26	10.9
218-01-9	Chrysene	U	1.09	ug/L	0.326	1.09
84-74-2	Di-n-butylphthalate	U	10.9	ug/L	3.26	10.9
117-84-0	Di-n-octylphthalate	U	10.9	ug/L	3.26	10.9
53-70-3	Dibenzo(a,h)anthracene	U	1.09	ug/L	0.326	1.09
132-64-9	Dibenzofuran	U	10.9	ug/L	3.26	10.9
84-66-2	Diethylphthalate	U	10.9	ug/L	3.26	10.9
131-11-3	Dimethylphthalate	U	10.9	ug/L	3.26	10.9
88-85-7	Dinoseb	U	10.9	ug/L	3.26	10.9
122-39-4	Diphenylamine	U	10.9	ug/L	3.26	10.9
206-44-0	Fluoranthene	U	1.09	ug/L	0.326	1.09
86-73-7	Fluorene	U	1.09	ug/L	0.326	1.09
118-74-1	Hexachlorobenzene	U	10.9	ug/L	3.26	10.9
87-68-3	Hexachlorobutadiene	U	10.9	ug/L	3.26	10.9
77-47-4	Hexachlorocyclopentadiene	U	10.9	ug/L	3.26	10.9
67-72-1	Hexachloroethane	U	10.9	ug/L	3.26	10.9
193-39-5	Indeno(1,2,3-cd)pyrene	U	1.09	ug/L	0.326	1.09
78-59-1	Isophorone	U	10.9	ug/L	3.80	10.9
62-75-9	N-Methyl-N-nitrosomethylamine	U	10.9	ug/L	3.26	10.9
924-16-3	N-Nitrosodi-n-butylamine	U	10.9	ug/L	3.26	10.9
55-18-5	N-Nitrosodiethylamine	U	10.9	ug/L	3.26	10.9
621-64-7	N-Nitrosodi--n-propylamine	U	10.9	ug/L	3.26	10.9
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	10.9	ug/L	3.26	10.9
91-20-3	Naphthalene	U	1.09	ug/L	0.326	1.09
98-95-3	Nitrobenzene	U	10.9	ug/L	3.26	10.9
608-93-5	Pentachlorobenzene	U	10.9	ug/L	3.26	10.9
87-86-5	Pentachlorophenol	U	10.9	ug/L	3.26	10.9
85-01-8	Phenanthrene	U	1.09	ug/L	0.326	1.09
108-95-2	Phenol	U	10.9	ug/L	3.26	10.9
129-00-0	Pyrene	U	1.09	ug/L	0.326	1.09
110-86-1	Pyridine	U	10.9	ug/L	3.26	10.9
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	10.9	ug/L	3.26	10.9
111-91-1	bis(2-Chloroethoxy)methane	U	10.9	ug/L	3.26	10.9
111-44-4	bis(2-Chloroethyl) ether	U	10.9	ug/L	3.26	10.9
117-81-7	bis(2-Ethylhexyl)phthalate	U	10.9	ug/L	3.26	10.9

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

Page 3 of 3

SDG Number: 2017-1649

Lab Sample ID: 424747002

Date Collected: 06/02/2017 13:33

Date Received: 06/06/2017 09:05

Matrix: W

Client ID: CAWA-17-133394

Batch ID: 1671167

Run Date: 06/07/2017 20:38

Prep Date: 06/07/2017 08:30

Data File: s060717.B\s3f0719.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
65794-96-9	m,p-Cresols	U	10.9	ug/L	4.02	10.9
99-09-2	3-Nitroaniline	U	10.9	ug/L	3.26	10.9
	<i>m</i> -Nitroaniline					
95-48-7	o-Cresol	U	10.9	ug/L	3.26	10.9
88-74-4	2-Nitroaniline	U	10.9	ug/L	3.26	10.9
	<i>o</i> -Nitroaniline					
100-01-6	4-Nitroaniline	U	10.9	ug/L	3.26	10.9
	<i>p</i> -Nitroaniline					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	68.3	109	ug/L	63 (32%-124%)
2-Fluorobiphenyl	38.1	54.3	ug/L	70 (32%-112%)
2-Fluorophenol	45.3	109	ug/L	42 (15%-88%)
Nitrobenzene-d5	40.3	54.3	ug/L	74 (36%-115%)
Phenol-d5	27.0	109	ug/L	25 (15%-91%)
p-Terphenyl-d14	42.8	54.3	ug/L	79 (36%-121%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000067-66-3	Trichloromethane	2.206	42.1	ug/L	97	NJ
	unknown	2.313	4.72	ug/L	0	J
	unknown	2.425	8.67	ug/L	0	J

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

SDG Number: 2017-1649

Lab Sample ID: 424747005

Date Collected: 06/02/2017 13:33

Date Received: 06/06/2017 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1671167

Inst: MSD3.I

Dilution: 1

Run Date: 06/07/2017 21:07

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 06/07/2017 08:30

Aliquot: 1000 mL

Final Volume: 1 mL

Data File: s060717.B\s3f0720.D

Column: DB-5ms

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

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

SDG Number: 2017-1649

Lab Sample ID: 424747005

Date Collected: 06/02/2017 13:33

Date Received: 06/06/2017 09:05

Matrix: W

Client: ARSL004

Project: ESHL00114

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1671167

Inst: MSD3.I

Dilution: 1

Run Date: 06/07/2017 21:07

Analyst: JLD1

Inj. Vol: 1 uL

Prep Date: 06/07/2017 08:30

Aliquot: 1000 mL

Final Volume: 1 mL

Data File: s060717.B\s3f0720.D

Column: DB-5ms

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

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

Page 3 of 3

**SDG Number:** 2017-1649  
**Lab Sample ID:** 424747005  
  
**Client ID:** CAWA-17-134190  
**Batch ID:** 1671167  
**Run Date:** 06/07/2017 21:07  
**Prep Date:** 06/07/2017 08:30  
**Data File:** s060717.B\s3f0720.D

**Date Collected:** 06/02/2017 13:33  
**Date Received:** 06/06/2017 09:05  
**Client:** ARSL004  
**Method:** SW846 3510C/8270D  
**Inst:** MSD3.I  
**Analyst:** JLD1  
**Aliquot:** 1000 mL  
**Column:** DB-5ms

**Matrix:** W  
  
**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
65794-96-9	m,p-Cresols	U	10.0	ug/L	3.70	10.0
99-09-2	3-Nitroaniline	U	10.0	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	10.0	ug/L	3.00	10.0
88-74-4	2-Nitroaniline	U	10.0	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	10.0	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	10.0	100	ug/L 7 *	(32%-124%)
2-Fluorobiphenyl	10.0	50.0	ug/L 10 *	(32%-112%)
2-Fluorophenol	10.0	100	ug/L 5 *	(15%-88%)
Nitrobenzene-d5	10.0	50.0	ug/L 10 *	(36%-115%)
Phenol-d5	10.0	100	ug/L 3 *	(15%-91%)
p-Terphenyl-d14	10.0	50.0	ug/L 9 *	(36%-121%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000067-66-3	Trichloromethane	2.195	14.7	ug/L	97	NJ

# **Quality Control Summary**

Semi-Volatile  
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2017-1649

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203804283	MB for batch 1671166	48	28	90	81	82	88
1203804284	LCS for batch 1671166	42	26	70	71	81	81
424747002	CAWA-17-133394	42	25	74	70	63	79
424747005	CAWA-17-134190	5 *	3 *	10 *	10 *	7 *	9 *
1203805362	CAWA-17-134190MS	32	28	43	41	39	40
1203805363	CAWA-17-134190MSD	35	28	40	38	39	37

**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: 2017-1649

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671166

Matrix: WATER

Lab Sample ID 1203804284

Instrument: MSD3.I

Analysis Date: 06/07/2017 15:47

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1671166

Inj. Vol: 1 uL

Batch ID: 1671167

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-nitrosomethylam	50.0	0.0	21.7	43	30-88
110-86-1	LCS Pyridine	50.0	0.0	22.2	44	27-89
62-53-3	LCS Aniline	50.0	0.0	36.4	73	49-112
108-95-2	LCS Phenol	50.0	0.0	13.5	27	16-82
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	35.3	71	51-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	34.3	69	49-105
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	27.7	55	37-95
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	28.1	56	38-96
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	29.0	58	39-97
108-60-1	LCS bis(2-Chloro-1-methylethyl)et	50.0	0.0	34.0	68	44-123
100-51-6	LCS Benzyl alcohol	50.0	0.0	30.1	60	44-102
95-48-7	LCS o-Cresol	50.0	0.0	30.3	61	41-101
65794-96-9	LCS m,p-Cresols	50.0	0.0	33.6	67	43-102
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	39.1	78	54-115
67-72-1	LCS Hexachloroethane	50.0	0.0	26.1	52	36-96
98-95-3	LCS Nitrobenzene	50.0	0.0	34.3	69	53-115
78-59-1	LCS Isophorone	50.0	0.0	33.9	68	56-117
88-75-5	LCS 2-Nitrophenol	50.0	0.0	34.1	68	51-113
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	31.1	62	51-104
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	34.8	70	55-114
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	34.6	69	53-109
65-85-0	LCS Benzoic acid	100	0.0	24.3	24	21-74



Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 4

SDG Number: 2017-1649

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671166

Matrix: WATER

Lab Sample ID 1203804284

Instrument: MSD3.I

Analysis Date: 06/07/2017 15:47

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1671166

Inj. Vol: 1 uL

Batch ID: 1671167

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	43.2	86	65-136
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	26.0	52	35-98
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	34.7	69	55-115
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	29.4	59	42-103
91-20-3	LCS Naphthalene	50.0	0.0	33.0	66	44-102
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	30.3	61	45-108
77-47-4	LCS Hexachlorocyclopentadiene	50.0	0.0	19.1	38	34-89
88-06-2	LCS 2,4,6-Trichlorophenol	50.0	0.0	38.5	77	55-120
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	35.1	70	55-116
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	30.8	62	44-107
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	36.9	74	53-121
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	43.7	87	61-139
131-11-3	LCS Dimethylphthalate	50.0	0.0	36.8	74	60-122
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	35.2	70	59-122
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	36.6	73	57-124
208-96-8	LCS Acenaphthylene	50.0	0.0	36.6	73	50-113
83-32-9	LCS Acenaphthene	50.0	0.0	39.7	79	49-112
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	38.6	77	34-122
132-64-9	LCS Dibenzofuran	50.0	0.0	35.0	70	50-111
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	38.5	77	54-122
84-66-2	LCS Diethylphthalate	50.0	0.0	37.7	75	57-122
100-02-7	LCS 4-Nitrophenol	50.0	0.0	10.7	21	15-137

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 4

SDG Number: 2017-1649

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671166

Matrix: WATER

Lab Sample ID 1203804284

Instrument: MSD3.I

Analysis Date: 06/07/2017 15:47

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1671166

Inj. Vol: 1 uL

Batch ID: 1671167

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	40.0	80	52-114
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	38.9	78	52-121
100-01-6	LCS 4-Nitroaniline <i>p-Nitroaniline</i>	50.0	0.0	41.1	82	44-137
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	38.3	77	45-124
122-39-4	LCS Diphenylamine	50.0	0.0	36.9	74	55-113
122-66-7	LCS Azobenzene <i>1,2-Diphenylhydrazine</i>	50.0	0.0	38.2	76	53-115
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	34.9	70	54-116
118-74-1	LCS Hexachlorobenzene	50.0	0.0	34.9	70	54-115
87-86-5	LCS Pentachlorophenol	50.0	0.0	46.2	92	41-116
85-01-8	LCS Phenanthrene	50.0	0.0	39.5	79	55-110
120-12-7	LCS Anthracene	50.0	0.0	39.0	78	56-112
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	37.3	75	57-123
206-44-0	LCS Fluoranthene	50.0	0.0	39.6	79	54-118
129-00-0	LCS Pyrene	50.0	0.0	41.8	84	49-121
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	35.9	72	52-125
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	35.2	70	52-125
56-55-3	LCS Benzo(a)anthracene	50.0	0.0	39.7	79	57-112
218-01-9	LCS Chrysene	50.0	0.0	40.8	82	58-117
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	28.6	57	50-129
205-99-2	LCS Benzo(b)fluoranthene	50.0	0.0	40.9	82	41-118
207-08-9	LCS Benzo(k)fluoranthene	50.0	0.0	46.3	93	42-121
50-32-8	LCS Benzo(a)pyrene	50.0	0.0	40.0	80	40-118

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 4 of 4

SDG Number: 2017-1649

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1671166

Matrix: WATER

Lab Sample ID 1203804284

Instrument: MSD3.I

Analysis Date: 06/07/2017 15:47

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1671166

Inj. Vol: 1 uL

Batch ID: 1671167

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	33.2	66	34-125
53-70-3	LCS Dibenzo(a,h)anthracene	50.0	0.0	36.0	72	38-129
191-24-2	LCS Benzo(ghi)perylene	50.0	0.0	35.5	71	33-131
123-91-1	LCS 1,4-Dioxane	50.0	0.0	22.7	45	38-78
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	37.0	74	54-113
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	30.0	60	44-102
1912-24-9	LCS Atrazine	50.0	0.0	39.2	78	60-131
92-87-5	LCS Benzidine	100	0.0	58.7	59	20-144
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	37.4	75	43-127
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	27.5	55	39-99

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 1 of 8

SDG Number: 2017-1649

Sample Type: Matrix Spike

Client ID: CAWA-17-134190MS

Matrix: W

Lab Sample ID 1203805362

Instrument: MSD3.I

Analysis Date: 06/07/2017 21:36

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1671166

Inj. Vol: 1 uL

Batch ID: 1671167

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-nitrosomethylam	116	0.00 U	44.9	39	25-106
110-86-1	MS Pyridine	116	0.00 U	8.47	7 *	24-93
62-53-3	MS Aniline	116	0.00 U	66.4	57	37-113
108-95-2	MS Phenol	116	0.00 U	32.8	28	23-82
111-44-4	MS bis(2-Chloroethyl) ether	116	0.00 U	47.8	41	39-114
95-57-8	MS 2-Chlorophenol	116	0.00 U	45.4	39	37-108
541-73-1	MS 1,3-Dichlorobenzene	116	0.00 U	37.7	32	27-97
106-46-7	MS 1,4-Dichlorobenzene	116	0.00 U	38.4	33	28-97
95-50-1	MS 1,2-Dichlorobenzene	116	0.00 U	40.1	35	28-99
108-60-1	MS bis(2-Chloro-1-methylethyl)et	116	0.00 U	44.8	39	32-127
100-51-6	MS Benzyl alcohol	116	0.00 U	50.7	44	37-116
95-48-7	MS o-Cresol	116	0.00 U	48.4	42	34-109
65794-96-9	MS m,p-Cresols	116	0.00 U	56.9	49	36-120
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	116	0.00 U	53.3	46	42-118
67-72-1	MS Hexachloroethane	116	0.00 U	35.6	31	29-94
98-95-3	MS Nitrobenzene	116	0.00 U	53.4	46	38-123
78-59-1	MS Isophorone	116	0.00 U	48.4	42 *	43-120
88-75-5	MS 2-Nitrophenol	116	0.00 U	43.3	37 *	39-115
105-67-9	MS 2,4-Dimethylphenol	116	0.00 U	45.4	39	39-107
111-91-1	MS bis(2-Chloroethoxy)methane	116	0.00 U	49.2	42	42-118
120-83-2	MS 2,4-Dichlorophenol	116	0.00 U	44.9	39 *	40-111
65-85-0	MS Benzoic acid	233	0.00 U	58.6	25	17-95

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 2 of 8

SDG Number: 2017-1649

Sample Type: Matrix Spike

Client ID: CAWA-17-134190MS

Matrix: W

Lab Sample ID 1203805362

Instrument: MSD3.I

Analysis Date: 06/07/2017 21:36

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1671166

Inj. Vol: 1 uL

Batch ID: 1671167

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS	4-Chloroaniline	116	0.00	U	75.0	65	44-138
87-68-3	MS	Hexachlorobutadiene	116	0.00	U	36.9	32	26-98
59-50-7	MS	Parachlorometa cresol 4-Chloro-3-methylphenol	116	0.00	U	50.0	43	41-122
91-57-6	MS	2-Methylnaphthalene	116	0.00	U	41.9	36	29-109
91-20-3	MS	Naphthalene	116	0.00	U	47.0	40	31-108
90-12-0	MS	1-Methylnaphthalene	116	0.00	U	43.4	37	33-112
77-47-4	MS	Hexachlorocyclopentadiene	116	0.00	U	26.9	23 *	26-79
88-06-2	MS	2,4,6-Trichlorophenol	116	0.00	U	44.4	38 *	39-124
95-95-4	MS	2,4,5-Trichlorophenol	116	0.00	U	40.2	35 *	42-120
91-58-7	MS	2-Chloronaphthalene	116	0.00	U	42.0	36	29-113
88-74-4	MS	2-Nitroaniline o-Nitroaniline	116	0.00	U	44.1	38 *	41-121
99-09-2	MS	3-Nitroaniline m-Nitroaniline	116	0.00	U	66.5	57	42-144
131-11-3	MS	Dimethylphthalate	116	0.00	U	48.9	42 *	45-128
606-20-2	MS	2,6-Dinitrotoluene	116	0.00	U	46.4	40 *	46-124
121-14-2	MS	2,4-Dinitrotoluene	116	0.00	U	47.1	41 *	45-125
208-96-8	MS	Acenaphthylene	116	0.00	U	49.8	43	35-120
83-32-9	MS	Acenaphthene	116	0.00	U	52.7	45	35-117
51-28-5	MS	2,4-Dinitrophenol	116	0.00	U	53.3	46	27-122
132-64-9	MS	Dibenzofuran	116	0.00	U	47.5	41	38-113
58-90-2	MS	2,3,4,6-Tetrachlorophenol	116	0.00	U	42.3	36 *	40-128
84-66-2	MS	Diethylphthalate	116	0.00	U	48.8	42 *	43-127
100-02-7	MS	4-Nitrophenol	116	0.00	U	25.6	22	17-85

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 3 of 8

SDG Number: 2017-1649

Sample Type: Matrix Spike

Client ID: CAWA-17-134190MS

Matrix: W

Lab Sample ID 1203805362

Instrument: MSD3.I

Analysis Date: 06/07/2017 21:36

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1671166

Inj. Vol: 1 uL

Batch ID: 1671167

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
86-73-7	MS	Fluorene	116	0.00	U	54.2	47	39-117
7005-72-3	MS	4-Chlorophenylphenylether	116	0.00	U	52.7	45	39-121
100-01-6	MS	4-Nitroaniline <i>p-Nitroaniline</i>	116	0.00	U	51.0	44	30-133
534-52-1	MS	2-Methyl-4,6-dinitrophenol	116	0.00	U	47.5	41	32-126
122-39-4	MS	Diphenylamine	116	0.00	U	48.2	41	37-118
122-66-7	MS	Azobenzene <i>1,2-Diphenylhydrazine</i>	116	0.00	U	44.7	38	38-120
101-55-3	MS	4-Bromophenylphenylether	116	0.00	U	46.6	40	39-121
118-74-1	MS	Hexachlorobenzene	116	0.00	U	46.5	40	40-118
87-86-5	MS	Pentachlorophenol	116	0.00	U	45.0	39	35-121
85-01-8	MS	Phenanthrene	116	0.00	U	53.1	46	40-115
120-12-7	MS	Anthracene	116	0.00	U	52.2	45	38-120
84-74-2	MS	Di-n-butylphthalate	116	0.00	U	48.0	41	41-128
206-44-0	MS	Fluoranthene	116	0.00	U	52.5	45	41-119
129-00-0	MS	Pyrene	116	0.00	U	55.0	47	35-128
85-68-7	MS	Butylbenzylphthalate	116	0.00	U	45.1	39 *	40-129
117-81-7	MS	bis(2-Ethylhexyl)phthalate	116	0.00	U	41.6	36 *	38-131
56-55-3	MS	Benzo(a)anthracene	116	0.00	U	53.0	46	39-120
218-01-9	MS	Chrysene	116	0.00	U	55.7	48	41-124
117-84-0	MS	Di-n-octylphthalate	116	0.00	U	33.2	29 *	37-134
205-99-2	MS	Benzo(b)fluoranthene	116	0.00	U	52.5	45	31-122
207-08-9	MS	Benzo(k)fluoranthene	116	0.00	U	60.6	52	33-123
50-32-8	MS	Benzo(a)pyrene	116	0.00	U	51.5	44	32-118

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 4 of 8

SDG Number: 2017-1649

Sample Type: Matrix Spike

Client ID: CAWA-17-134190MS

Matrix: W

Lab Sample ID 1203805362

Instrument: MSD3.I

Analysis Date: 06/07/2017 21:36

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1671166

Inj. Vol: 1 uL

Batch ID: 1671167

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	116	0.00 U	44.5	38	27-121
53-70-3	MS Dibenzo(a,h)anthracene	116	0.00 U	47.6	41	30-125
191-24-2	MS Benzo(ghi)perylene	116	0.00 U	48.0	41	24-126
123-91-1	MS 1,4-Dioxane	116	0.00 U	47.9	41	24-110
930-55-2	MS N-Nitrosopyrrolidine	116	0.00 U	57.4	49	47-119
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	116	0.00 U	40.8	35	32-101
1912-24-9	MS Atrazine	116	0.00 U	30.0	26 *	42-129
92-87-5	MS Benzidine	233	0.00 U	12.6	5 *	15-130
91-94-1	MS 3,3'-Dichlorobenzidine	116	0.00 U	34.3	29 *	34-124
120-82-1	MS 1,2,4-Trichlorobenzene	116	0.00 U	38.9	33	26-102

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 5 of 8

SDG Number: 2017-1649

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-134190MSD

Matrix: W

Lab Sample ID 1203805363

Instrument: MSD3.I

Analysis Date: 06/07/2017 22:05

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1671166

Inj. Vol: 1 uL

Batch ID: 1671167

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
62-75-9	MSD N-Methyl-N-nitrosomethylam	116	0.00 U	46.7	40	25-106	4	0-30
110-86-1	MSD Pyridine	116	0.00 U	8.05	7 *	24-93	5	0-30
62-53-3	MSD Aniline	116	0.00 U	77.4	67	37-113	15	0-30
108-95-2	MSD Phenol	116	0.00 U	33.6	29	23-82	2	0-30
111-44-4	MSD bis(2-Chloroethyl) ether	116	0.00 U	44.8	39	39-114	6	0-30
95-57-8	MSD 2-Chlorophenol	116	0.00 U	46.9	40	37-108	3	0-30
541-73-1	MSD 1,3-Dichlorobenzene	116	0.00 U	34.1	29	27-97	10	0-30
106-46-7	MSD 1,4-Dichlorobenzene	116	0.00 U	34.8	30	28-97	10	0-30
95-50-1	MSD 1,2-Dichlorobenzene	116	0.00 U	36.5	31	28-99	9	0-30
108-60-1	MSD bis(2-Chloro-1-methylethyl)et	116	0.00 U	41.9	36	32-127	7	0-30
100-51-6	MSD Benzyl alcohol	116	0.00 U	51.1	44	37-116	1	0-30
95-48-7	MSD o-Cresol	116	0.00 U	47.1	41	34-109	3	0-30
65794-96-9	MSD m,p-Cresols	116	0.00 U	56.1	48	36-120	1	0-30
621-64-7	MSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	116	0.00 U	49.9	43	42-118	7	0-30
67-72-1	MSD Hexachloroethane	116	0.00 U	32.5	28 *	29-94	9	0-30
98-95-3	MSD Nitrobenzene	116	0.00 U	48.8	42	38-123	9	0-30
78-59-1	MSD Isophorone	116	0.00 U	44.4	38 *	43-120	9	0-30
88-75-5	MSD 2-Nitrophenol	116	0.00 U	44.0	38 *	39-115	2	0-30
105-67-9	MSD 2,4-Dimethylphenol	116	0.00 U	42.4	36 *	39-107	7	0-30
111-91-1	MSD bis(2-Chloroethoxy)methane	116	0.00 U	45.4	39 *	42-118	8	0-30
120-83-2	MSD 2,4-Dichlorophenol	116	0.00 U	45.6	39 *	40-111	1	0-30
65-85-0	MSD Benzoic acid	233	0.00 U	62.4	27	17-95	6	0-30



Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 6 of 8

SDG Number: 2017-1649

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-134190MSD

Matrix: W

Lab Sample ID 1203805363

Instrument: MSD3.I

Analysis Date: 06/07/2017 22:05

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1671166

Inj. Vol: 1 uL

Batch ID: 1671167

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
106-47-8	MSD 4-Chloroaniline	116	0.00 U	86.4	74	44-138	14	0-30
87-68-3	MSD Hexachlorobutadiene	116	0.00 U	33.5	29	26-98	10	0-30
59-50-7	MSD Parachlorometa cresol 4-Chloro-3-methylphenol	116	0.00 U	47.8	41	41-122	4	0-30
91-57-6	MSD 2-Methylnaphthalene	116	0.00 U	38.2	33	29-109	9	0-30
91-20-3	MSD Naphthalene	116	0.00 U	42.5	37	31-108	10	0-30
90-12-0	MSD 1-Methylnaphthalene	116	0.00 U	39.5	34	33-112	9	0-30
77-47-4	MSD Hexachlorocyclopentadiene	116	0.00 U	24.0	21 *	26-79	12	0-30
88-06-2	MSD 2,4,6-Trichlorophenol	116	0.00 U	44.5	38 *	39-124	0	0-30
95-95-4	MSD 2,4,5-Trichlorophenol	116	0.00 U	41.2	35 *	42-120	3	0-30
91-58-7	MSD 2-Chloronaphthalene	116	0.00 U	38.4	33	29-113	9	0-30
88-74-4	MSD 2-Nitroaniline o-Nitroaniline	116	0.00 U	41.0	35 *	41-121	7	0-30
99-09-2	MSD 3-Nitroaniline m-Nitroaniline	116	0.00 U	70.7	61	42-144	6	0-30
131-11-3	MSD Dimethylphthalate	116	0.00 U	44.0	38 *	45-128	10	0-30
606-20-2	MSD 2,6-Dinitrotoluene	116	0.00 U	41.4	36 *	46-124	11	0-30
121-14-2	MSD 2,4-Dinitrotoluene	116	0.00 U	43.5	37 *	45-125	8	0-30
208-96-8	MSD Acenaphthylene	116	0.00 U	45.1	39	35-120	10	0-30
83-32-9	MSD Acenaphthene	116	0.00 U	48.4	42	35-117	8	0-30
51-28-5	MSD 2,4-Dinitrophenol	116	0.00 U	57.9	50	27-122	8	0-30
132-64-9	MSD Dibenzofuran	116	0.00 U	43.7	38	38-113	8	0-30
58-90-2	MSD 2,3,4,6-Tetrachlorophenol	116	0.00 U	43.7	38 *	40-128	3	0-30
84-66-2	MSD Diethylphthalate	116	0.00 U	44.7	38 *	43-127	9	0-30
100-02-7	MSD 4-Nitrophenol	116	0.00 U	31.1	27	17-85	19	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 7 of 8

SDG Number: 2017-1649

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-134190MSD

Matrix: W

Lab Sample ID 1203805363

Instrument: MSD3.I

Analysis Date: 06/07/2017 22:05

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1671166

Inj. Vol: 1 uL

Batch ID: 1671167

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
86-73-7	MSD Fluorene	116	0.00 U	49.3	42	39-117	10	0-30
7005-72-3	MSD 4-Chlorophenylphenylether	116	0.00 U	48.0	41	39-121	9	0-30
100-01-6	MSD 4-Nitroaniline <i>p-Nitroaniline</i>	116	0.00 U	49.3	42	30-133	3	0-30
534-52-1	MSD 2-Methyl-4,6-dinitrophenol	116	0.00 U	50.3	43	32-126	6	0-30
122-39-4	MSD Diphenylamine	116	0.00 U	43.0	37	37-118	11	0-30
122-66-7	MSD Azobenzene <i>1,2-Diphenylhydrazine</i>	116	0.00 U	39.6	34 *	38-120	12	0-30
101-55-3	MSD 4-Bromophenylphenylether	116	0.00 U	41.8	36 *	39-121	11	0-30
118-74-1	MSD Hexachlorobenzene	116	0.00 U	40.9	35 *	40-118	13	0-30
87-86-5	MSD Pentachlorophenol	116	0.00 U	46.5	40	35-121	3	0-30
85-01-8	MSD Phenanthrene	116	0.00 U	47.0	40	40-115	12	0-30
120-12-7	MSD Anthracene	116	0.00 U	46.8	40	38-120	11	0-30
84-74-2	MSD Di-n-butylphthalate	116	0.00 U	43.8	38 *	41-128	9	0-30
206-44-0	MSD Fluoranthene	116	0.00 U	48.2	41	41-119	8	0-30
129-00-0	MSD Pyrene	116	0.00 U	46.7	40	35-128	16	0-30
85-68-7	MSD Butylbenzylphthalate	116	0.00 U	39.8	34 *	40-129	13	0-30
117-81-7	MSD bis(2-Ethylhexyl)phthalate	116	0.00 U	38.5	33 *	38-131	8	0-30
56-55-3	MSD Benzo(a)anthracene	116	0.00 U	47.4	41	39-120	11	0-30
218-01-9	MSD Chrysene	116	0.00 U	49.4	42	41-124	12	0-30
117-84-0	MSD Di-n-octylphthalate	116	0.00 U	31.7	27 *	37-134	5	0-30
205-99-2	MSD Benzo(b)fluoranthene	116	0.00 U	46.4	40	31-122	12	0-30
207-08-9	MSD Benzo(k)fluoranthene	116	0.00 U	52.7	45	33-123	14	0-30
50-32-8	MSD Benzo(a)pyrene	116	0.00 U	46.0	40	32-118	11	0-30

Semi-Volatile  
Quality Control Summary  
Spike Recovery Report

Page 8 of 8

SDG Number: 2017-1649

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-17-134190MSD

Matrix: W

Lab Sample ID 1203805363

Instrument: MSD3.I

Analysis Date: 06/07/2017 22:05

Dilution: 1

Analyst: JLD1

Prep Batch ID: 1671166

Inj. Vol: 1 uL

Batch ID: 1671167

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
193-39-5	MSD Indeno(1,2,3-cd)pyrene	116	0.00	U 41.3	36	27-121	7	0-30
53-70-3	MSD Dibenzo(a,h)anthracene	116	0.00	U 44.1	38	30-125	8	0-30
191-24-2	MSD Benzo(ghi)perylene	116	0.00	U 44.4	38	24-126	8	0-30
123-91-1	MSD 1,4-Dioxane	116	0.00	U 50.2	43	24-110	5	0-30
930-55-2	MSD N-Nitrosopyrrolidine	116	0.00	U 56.3	48	47-119	2	0-30
95-94-3	MSD 1,2,4,5-Tetrachlorobenzene	116	0.00	U 37.3	32	32-101	9	0-30
1912-24-9	MSD Atrazine	116	0.00	U 26.2	23 *	42-129	14	0-30
92-87-5	MSD Benzidine	233	0.00	U 8.14	4 *	15-130	43 *	0-30
91-94-1	MSD 3,3'-Dichlorobenzidine	116	0.00	U 30.2	26 *	34-124	13	0-30
120-82-1	MSD 1,2,4-Trichlorobenzene	116	0.00	U 34.5	30	26-102	12	0-30

## Method Blank Summary

Page 1 of 1

SDG Number:	2017-1649	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1671166	Instrument ID:	MSD3.I	Data File:	s060717.B\s3f0708.D
Lab Sample ID:	1203804283	Prep Date:	06/07/2017 08:30	Analyzed:	06/07/17 15:18
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 1671166	1203804284	s060717.B\s3f0709.D	06/07/17	1547
02 CAWA-17-133394	424747002	s060717.B\s3f0719.D	06/07/17	2038
03 CAWA-17-134190	424747005	s060717.B\s3f0720.D	06/07/17	2107
04 CAWA-17-134190MS	1203805362	s060717.B\s3f0721.D	06/07/17	2136
05 CAWA-17-134190MSD	1203805363	s060717.B\s3f0722.D	06/07/17	2205

# Quality Control Data

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

Page 1 of 3

SDG Number: 2017-1649

Lab Sample ID: 1203804283

Client Sample: QC for batch 1671166

Client ID: MB for batch 1671166

Batch ID: 1671167

Run Date: 06/07/2017 15:18

Prep Date: 06/07/2017 08:30

Data File: s060717.B\s3f0708.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	10.0	ug/L	3.00	10.0
123-91-1	1,4-Dioxane	U	10.0	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	10.0	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	10.0	ug/L	3.00	10.0
930-55-2	N-Nitrosopyrrolidine	U	10.0	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	10.0	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene	U	10.0	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene	U	10.0	ug/L	3.00	10.0
122-66-7	Azobenzene	U	10.0	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	10.0	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene	U	10.0	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene	U	1.00	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol	U	10.0	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol	U	10.0	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol	U	10.0	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol	U	10.0	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol	U	10.0	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol	U	20.0	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene	U	10.0	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene	U	10.0	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene	U	1.00	ug/L	0.410	1.00
95-57-8	2-Chlorophenol	U	10.0	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol	U	10.0	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene	U	1.00	ug/L	0.300	1.00
88-75-5	2-Nitrophenol	U	10.0	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine	U	10.0	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether	U	10.0	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol	U	10.0	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	10.0	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether	U	10.0	ug/L	3.00	10.0
100-02-7	4-Nitrophenol	U	10.0	ug/L	3.00	10.0
83-32-9	Acenaphthene	U	1.00	ug/L	0.300	1.00
208-96-8	Acenaphthylene	U	1.00	ug/L	0.300	1.00
62-53-3	Aniline	U	10.0	ug/L	4.20	10.0
120-12-7	Anthracene	U	1.00	ug/L	0.300	1.00
1912-24-9	Atrazine	U	10.0	ug/L	3.00	10.0
92-87-5	Benzidine	U	10.0	ug/L	3.90	10.0

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

Page 2 of 3

SDG Number: 2017-1649

Lab Sample ID: 1203804283

Client Sample: QC for batch 1671166

Client ID: MB for batch 1671166

Batch ID: 1671167

Run Date: 06/07/2017 15:18

Prep Date: 06/07/2017 08:30

Data File: s060717.B\s3f0708.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
56-55-3	Benzo(a)anthracene	U	1.00	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene	U	1.00	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene	U	1.00	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene	U	1.00	ug/L	0.300	1.00
207-08-9	Benzo(k)fluoranthene	J	0.300	ug/L	0.300	1.00
65-85-0	Benzoic acid	U	20.0	ug/L	6.00	20.0
100-51-6	Benzyl alcohol	U	10.0	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate	U	10.0	ug/L	3.00	10.0
218-01-9	Chrysene	J	0.400	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate	U	10.0	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate	U	10.0	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene	U	1.00	ug/L	0.300	1.00
132-64-9	Dibenzofuran	U	10.0	ug/L	3.00	10.0
84-66-2	Diethylphthalate	U	10.0	ug/L	3.00	10.0
131-11-3	Dimethylphthalate	U	10.0	ug/L	3.00	10.0
88-85-7	Dinoseb	U	10.0	ug/L	3.00	10.0
122-39-4	Diphenylamine	U	10.0	ug/L	3.00	10.0
206-44-0	Fluoranthene	U	1.00	ug/L	0.300	1.00
86-73-7	Fluorene	U	1.00	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene	U	10.0	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene	U	10.0	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene	U	10.0	ug/L	3.00	10.0
67-72-1	Hexachloroethane	U	10.0	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene	U	1.00	ug/L	0.300	1.00
78-59-1	Isophorone	U	10.0	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine	U	10.0	ug/L	3.00	10.0
621-64-7	N-Nitrosodi--n-propylamine	U	10.0	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
91-20-3	Naphthalene	U	1.00	ug/L	0.300	1.00
98-95-3	Nitrobenzene	U	10.0	ug/L	3.00	10.0
87-86-5	Pentachlorophenol	U	10.0	ug/L	3.00	10.0
85-01-8	Phenanthrene	U	1.00	ug/L	0.300	1.00
108-95-2	Phenol	U	10.0	ug/L	3.00	10.0
129-00-0	Pyrene	U	1.00	ug/L	0.300	1.00
110-86-1	Pyridine	U	10.0	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	10.0	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane	U	10.0	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether	U	10.0	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate	U	10.0	ug/L	3.00	10.0

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

Page 3 of 3

SDG Number: 2017-1649

Lab Sample ID: 1203804283

Client Sample: QC for batch 1671166

Client ID: MB for batch 1671166

Batch ID: 1671167

Run Date: 06/07/2017 15:18

Prep Date: 06/07/2017 08:30

Data File: s060717.B\s3f0708.D

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-009

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 1 mL

Client: ARSL004

Method: SW846 3510C/8270D

Inst: MSD3.I

Analyst: JLD1

Aliquot: 1000 mL

Column: DB-5ms

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

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	82.4	100	ug/L	82 (32%-124%)
2-Fluorobiphenyl	40.4	50.0	ug/L	81 (32%-112%)
2-Fluorophenol	48.0	100	ug/L	48 (15%-88%)
Nitrobenzene-d5	45.2	50.0	ug/L	90 (36%-115%)
Phenol-d5	28.3	100	ug/L	28 (15%-91%)
p-Terphenyl-d14	43.8	50.0	ug/L	88 (36%-121%)

**Tentatively Identified Compound Summary**

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000067-66-3	Trichloromethane	2.189	36.1	ug/L	97	NJ
000109-99-9	Furan, tetrahydro-	2.232	4.77	ug/L	91	NJ
	unknown	2.296	5.36	ug/L	0	J
	unknown	2.414	6.9	ug/L	0	J



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

Page 1 of 3

SDG Number: 2017-1649

Lab Sample ID: 1203804284

Client Sample: QC for batch 1671166

Client ID: LCS for batch 1671166

Batch ID: 1671167

Run Date: 06/07/2017 15:47

Prep Date: 06/07/2017 08:30

Data File: s060717.B\s3f0709.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		30.0	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		22.7	ug/L	3.00	10.0
924-16-3	N-Nitrosodi-n-butylamine	U	10.0	ug/L	3.00	10.0
55-18-5	N-Nitrosodiethylamine	U	10.0	ug/L	3.00	10.0
930-55-2	N-Nitrosopyrrolidine		37.0	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	10.0	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		27.5	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		29.0	ug/L	3.00	10.0
122-66-7	Azobenzene		38.2	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		27.7	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		28.1	ug/L	3.00	10.0
90-12-0	1-Methylnaphthalene		30.3	ug/L	0.300	1.00
58-90-2	2,3,4,6-Tetrachlorophenol		38.5	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		35.1	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		38.5	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		34.6	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		31.1	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		38.6	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		36.6	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		35.2	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		30.8	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		34.3	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		38.3	ug/L	3.00	10.0
91-57-6	2-Methylnaphthalene		29.4	ug/L	0.300	1.00
88-75-5	2-Nitrophenol		34.1	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		37.4	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		34.9	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		34.7	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		43.2	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		38.9	ug/L	3.00	10.0
100-02-7	4-Nitrophenol		10.7	ug/L	3.00	10.0
83-32-9	Acenaphthene		39.7	ug/L	0.300	1.00
208-96-8	Acenaphthylene		36.6	ug/L	0.300	1.00
62-53-3	Aniline		36.4	ug/L	4.20	10.0
120-12-7	Anthracene		39.0	ug/L	0.300	1.00
1912-24-9	Atrazine		39.2	ug/L	3.00	10.0
92-87-5	Benzidine		58.7	ug/L	3.90	10.0

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

Page 2 of 3

SDG Number: 2017-1649

Lab Sample ID: 1203804284

Client Sample: QC for batch 1671166

Client ID: LCS for batch 1671166

Batch ID: 1671167

Run Date: 06/07/2017 15:47

Prep Date: 06/07/2017 08:30

Data File: s060717.B\s3f0709.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
56-55-3	Benzo(a)anthracene		39.7	ug/L	0.300	1.00
50-32-8	Benzo(a)pyrene		40.0	ug/L	0.300	1.00
205-99-2	Benzo(b)fluoranthene		40.9	ug/L	0.300	1.00
191-24-2	Benzo(ghi)perylene		35.5	ug/L	0.300	1.00
207-08-9	Benzo(k)fluoranthene	B	46.3	ug/L	0.300	1.00
65-85-0	Benzoic acid		24.3	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		30.1	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		35.9	ug/L	3.00	10.0
218-01-9	Chrysene	B	40.8	ug/L	0.300	1.00
84-74-2	Di-n-butylphthalate		37.3	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		28.6	ug/L	3.00	10.0
53-70-3	Dibenzo(a,h)anthracene		36.0	ug/L	0.300	1.00
132-64-9	Dibenzofuran		35.0	ug/L	3.00	10.0
84-66-2	Diethylphthalate		37.7	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		36.8	ug/L	3.00	10.0
88-85-7	Dinoseb	U	10.0	ug/L	3.00	10.0
122-39-4	Diphenylamine		36.9	ug/L	3.00	10.0
206-44-0	Fluoranthene		39.6	ug/L	0.300	1.00
86-73-7	Fluorene		40.0	ug/L	0.300	1.00
118-74-1	Hexachlorobenzene		34.9	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		26.0	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		19.1	ug/L	3.00	10.0
67-72-1	Hexachloroethane		26.1	ug/L	3.00	10.0
193-39-5	Indeno(1,2,3-cd)pyrene		33.2	ug/L	0.300	1.00
78-59-1	Isophorone		33.9	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		21.7	ug/L	3.00	10.0
621-64-7	N-Nitrosodi-n-propylamine		39.1	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
91-20-3	Naphthalene		33.0	ug/L	0.300	1.00
98-95-3	Nitrobenzene		34.3	ug/L	3.00	10.0
87-86-5	Pentachlorophenol		46.2	ug/L	3.00	10.0
85-01-8	Phenanthrene		39.5	ug/L	0.300	1.00
108-95-2	Phenol		13.5	ug/L	3.00	10.0
129-00-0	Pyrene		41.8	ug/L	0.300	1.00
110-86-1	Pyridine		22.2	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		34.0	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		34.8	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		35.3	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		35.2	ug/L	3.00	10.0

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

Page 3 of 3

<b>SDG Number:</b> 2017-1649	<b>Matrix:</b> WATER
<b>Lab Sample ID:</b> 1203804284	
<b>Client Sample:</b> QC for batch 1671166	<b>Client:</b> ARSL004
<b>Client ID:</b> LCS for batch 1671166	<b>Method:</b> SW846 3510C/8270D
<b>Batch ID:</b> 1671167	<b>Inst:</b> MSD3.I
<b>Run Date:</b> 06/07/2017 15:47	<b>Analyst:</b> JLD1
<b>Prep Date:</b> 06/07/2017 08:30	<b>Aliquot:</b> 1000 mL
<b>Data File:</b> s060717.B\s3f0709.D	<b>Column:</b> DB-5ms
	<b>Project:</b> QC
	<b>SOP Ref:</b> GL-OA-E-009
	<b>Dilution:</b> 1
	<b>Inj. Vol:</b> 1 uL
	<b>Final Volume:</b> 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		33.6	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		43.7	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		30.3	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		36.9	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		41.1	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	80.9	100	ug/L	81	(32%-124%)
2-Fluorobiphenyl	35.3	50.0	ug/L	71	(32%-112%)
2-Fluorophenol	42.5	100	ug/L	42	(15%-88%)
Nitrobenzene-d5	35.2	50.0	ug/L	70	(36%-115%)
Phenol-d5	26.3	100	ug/L	26	(15%-91%)
p-Terphenyl-d14	40.4	50.0	ug/L	81	(36%-121%)

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

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 06/02/2017 13:33	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203805362	<b>Date Received:</b> 06/06/2017 09:05	
<b>Client Sample:</b> QC for batch 1671166	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134190MS	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1671167	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/07/2017 21:36	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/07/2017 08:30	<b>Aliquot:</b> 430 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060717.B\s3f0721.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		40.8	ug/L	6.98	23.3
120-82-1	1,2,4-Trichlorobenzene		38.9	ug/L	6.98	23.3
95-50-1	1,2-Dichlorobenzene		40.1	ug/L	6.98	23.3
122-66-7	Azobenzene		44.7	ug/L	6.98	23.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		37.7	ug/L	6.98	23.3
106-46-7	1,4-Dichlorobenzene		38.4	ug/L	6.98	23.3
123-91-1	1,4-Dioxane		47.9	ug/L	6.98	23.3
90-12-0	1-Methylnaphthalene		43.4	ug/L	0.698	2.33
58-90-2	2,3,4,6-Tetrachlorophenol		42.3	ug/L	6.98	23.3
95-95-4	2,4,5-Trichlorophenol		40.2	ug/L	6.98	23.3
88-06-2	2,4,6-Trichlorophenol		44.4	ug/L	6.98	23.3
120-83-2	2,4-Dichlorophenol		44.9	ug/L	6.98	23.3
105-67-9	2,4-Dimethylphenol		45.4	ug/L	6.98	23.3
51-28-5	2,4-Dinitrophenol		53.3	ug/L	11.6	46.5
121-14-2	2,4-Dinitrotoluene		47.1	ug/L	6.98	23.3
606-20-2	2,6-Dinitrotoluene		46.4	ug/L	6.98	23.3
91-58-7	2-Chloronaphthalene		42.0	ug/L	0.953	2.33
95-57-8	2-Chlorophenol		45.4	ug/L	6.98	23.3
534-52-1	2-Methyl-4,6-dinitrophenol		47.5	ug/L	6.98	23.3
91-57-6	2-Methylnaphthalene		41.9	ug/L	0.698	2.33
88-75-5	2-Nitrophenol		43.3	ug/L	6.98	23.3
91-94-1	3,3'-Dichlorobenzidine		34.3	ug/L	6.98	23.3
101-55-3	4-Bromophenylphenylether		46.6	ug/L	6.98	23.3
59-50-7	Parachlorometa cresol		50.0	ug/L	6.98	23.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		75.0	ug/L	7.67	23.3
7005-72-3	4-Chlorophenylphenylether		52.7	ug/L	6.98	23.3
100-02-7	4-Nitrophenol		25.6	ug/L	6.98	23.3
83-32-9	Acenaphthene		52.7	ug/L	0.698	2.33
208-96-8	Acenaphthylene		49.8	ug/L	0.698	2.33
62-53-3	Aniline		66.4	ug/L	9.77	23.3
120-12-7	Anthracene		52.2	ug/L	0.698	2.33
1912-24-9	Atrazine		30.0	ug/L	6.98	23.3
92-87-5	Benzidine	J	12.6	ug/L	9.07	23.3
56-55-3	Benzo(a)anthracene		53.0	ug/L	0.698	2.33
50-32-8	Benzo(a)pyrene		51.5	ug/L	0.698	2.33
205-99-2	Benzo(b)fluoranthene		52.5	ug/L	0.698	2.33
191-24-2	Benzo(ghi)perylene		48.0	ug/L	0.698	2.33

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

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 06/02/2017 13:33	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203805362	<b>Date Received:</b> 06/06/2017 09:05	
<b>Client Sample:</b> QC for batch 1671166	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134190MS	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1671167	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/07/2017 21:36	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/07/2017 08:30	<b>Aliquot:</b> 430 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060717.B\s3f0721.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	B	60.6	ug/L	0.698	2.33
65-85-0	Benzoic acid		58.6	ug/L	14.0	46.5
100-51-6	Benzyl alcohol		50.7	ug/L	6.98	23.3
85-68-7	Butylbenzylphthalate		45.1	ug/L	6.98	23.3
218-01-9	Chrysene	B	55.7	ug/L	0.698	2.33
84-74-2	Di-n-butylphthalate		48.0	ug/L	6.98	23.3
117-84-0	Di-n-octylphthalate		33.2	ug/L	6.98	23.3
53-70-3	Dibenzo(a,h)anthracene		47.6	ug/L	0.698	2.33
132-64-9	Dibenzofuran		47.5	ug/L	6.98	23.3
84-66-2	Diethylphthalate		48.8	ug/L	6.98	23.3
131-11-3	Dimethylphthalate		48.9	ug/L	6.98	23.3
88-85-7	Dinoseb	U	23.3	ug/L	6.98	23.3
122-39-4	Diphenylamine		48.2	ug/L	6.98	23.3
206-44-0	Fluoranthene		52.5	ug/L	0.698	2.33
86-73-7	Fluorene		54.2	ug/L	0.698	2.33
118-74-1	Hexachlorobenzene		46.5	ug/L	6.98	23.3
87-68-3	Hexachlorobutadiene		36.9	ug/L	6.98	23.3
77-47-4	Hexachlorocyclopentadiene		26.9	ug/L	6.98	23.3
67-72-1	Hexachloroethane		35.6	ug/L	6.98	23.3
193-39-5	Indeno(1,2,3-cd)pyrene		44.5	ug/L	0.698	2.33
78-59-1	Isophorone		48.4	ug/L	8.14	23.3
62-75-9	N-Methyl-N-nitrosomethylamine		44.9	ug/L	6.98	23.3
924-16-3	N-Nitrosodi-n-butylamine	U	23.3	ug/L	6.98	23.3
55-18-5	N-Nitrosodiethylamine	U	23.3	ug/L	6.98	23.3
621-64-7	N-Nitrosodi--n-propylamine		53.3	ug/L	6.98	23.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		57.4	ug/L	6.98	23.3
91-20-3	Naphthalene		47.0	ug/L	0.698	2.33
98-95-3	Nitrobenzene		53.4	ug/L	6.98	23.3
608-93-5	Pentachlorobenzene	U	23.3	ug/L	6.98	23.3
87-86-5	Pentachlorophenol		45.0	ug/L	6.98	23.3
85-01-8	Phenanthrene		53.1	ug/L	0.698	2.33
108-95-2	Phenol		32.8	ug/L	6.98	23.3
129-00-0	Pyrene		55.0	ug/L	0.698	2.33
110-86-1	Pyridine	J	8.47	ug/L	6.98	23.3
108-60-1	bis(2-Chloro-1-methylethyl)ether		44.8	ug/L	6.98	23.3
111-91-1	bis(2-Chloroethoxy)methane		49.2	ug/L	6.98	23.3
111-44-4	bis(2-Chloroethyl) ether		47.8	ug/L	6.98	23.3
117-81-7	bis(2-Ethylhexyl)phthalate		41.6	ug/L	6.98	23.3

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

Page 3 of 3

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 06/02/2017 13:33	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203805362	<b>Date Received:</b> 06/06/2017 09:05	
<b>Client Sample:</b> QC for batch 1671166	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134190MS	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1671167	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/07/2017 21:36	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/07/2017 08:30	<b>Aliquot:</b> 430 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060717.B\s3f0721.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		56.9	ug/L	8.60	23.3
99-09-2	3-Nitroaniline		66.5	ug/L	6.98	23.3
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		48.4	ug/L	6.98	23.3
88-74-4	2-Nitroaniline		44.1	ug/L	6.98	23.3
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		51.0	ug/L	6.98	23.3
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	90.1	233	ug/L	39	(32%-124%)
2-Fluorobiphenyl	48.0	116	ug/L	41	(32%-112%)
2-Fluorophenol	75.3	233	ug/L	32	(15%-88%)
Nitrobenzene-d5	50.1	116	ug/L	43	(36%-115%)
Phenol-d5	64.7	233	ug/L	28	(15%-91%)
p-Terphenyl-d14	46.7	116	ug/L	40	(36%-121%)

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

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 06/02/2017 13:33	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203805363	<b>Date Received:</b> 06/06/2017 09:05	
<b>Client Sample:</b> QC for batch 1671166	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134190MSD	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1671167	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/07/2017 22:05	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/07/2017 08:30	<b>Aliquot:</b> 430 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060717.B\s3f0722.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		37.3	ug/L	6.98	23.3
120-82-1	1,2,4-Trichlorobenzene		34.5	ug/L	6.98	23.3
95-50-1	1,2-Dichlorobenzene		36.5	ug/L	6.98	23.3
122-66-7	Azobenzene		39.6	ug/L	6.98	23.3
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		34.1	ug/L	6.98	23.3
106-46-7	1,4-Dichlorobenzene		34.8	ug/L	6.98	23.3
123-91-1	1,4-Dioxane		50.2	ug/L	6.98	23.3
90-12-0	1-Methylnaphthalene		39.5	ug/L	0.698	2.33
58-90-2	2,3,4,6-Tetrachlorophenol		43.7	ug/L	6.98	23.3
95-95-4	2,4,5-Trichlorophenol		41.2	ug/L	6.98	23.3
88-06-2	2,4,6-Trichlorophenol		44.5	ug/L	6.98	23.3
120-83-2	2,4-Dichlorophenol		45.6	ug/L	6.98	23.3
105-67-9	2,4-Dimethylphenol		42.4	ug/L	6.98	23.3
51-28-5	2,4-Dinitrophenol		57.9	ug/L	11.6	46.5
121-14-2	2,4-Dinitrotoluene		43.5	ug/L	6.98	23.3
606-20-2	2,6-Dinitrotoluene		41.4	ug/L	6.98	23.3
91-58-7	2-Chloronaphthalene		38.4	ug/L	0.953	2.33
95-57-8	2-Chlorophenol		46.9	ug/L	6.98	23.3
534-52-1	2-Methyl-4,6-dinitrophenol		50.3	ug/L	6.98	23.3
91-57-6	2-Methylnaphthalene		38.2	ug/L	0.698	2.33
88-75-5	2-Nitrophenol		44.0	ug/L	6.98	23.3
91-94-1	3,3'-Dichlorobenzidine		30.2	ug/L	6.98	23.3
101-55-3	4-Bromophenylphenylether		41.8	ug/L	6.98	23.3
59-50-7	Parachlorometa cresol		47.8	ug/L	6.98	23.3
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		86.4	ug/L	7.67	23.3
7005-72-3	4-Chlorophenylphenylether		48.0	ug/L	6.98	23.3
100-02-7	4-Nitrophenol		31.1	ug/L	6.98	23.3
83-32-9	Acenaphthene		48.4	ug/L	0.698	2.33
208-96-8	Acenaphthylene		45.1	ug/L	0.698	2.33
62-53-3	Aniline		77.4	ug/L	9.77	23.3
120-12-7	Anthracene		46.8	ug/L	0.698	2.33
1912-24-9	Atrazine		26.2	ug/L	6.98	23.3
92-87-5	Benzidine	U	23.3	ug/L	9.07	23.3
56-55-3	Benzo(a)anthracene		47.4	ug/L	0.698	2.33
50-32-8	Benzo(a)pyrene		46.0	ug/L	0.698	2.33
205-99-2	Benzo(b)fluoranthene		46.4	ug/L	0.698	2.33
191-24-2	Benzo(ghi)perylene		44.4	ug/L	0.698	2.33

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

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 06/02/2017 13:33	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203805363	<b>Date Received:</b> 06/06/2017 09:05	
<b>Client Sample:</b> QC for batch 1671166	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134190MSD	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1671167	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/07/2017 22:05	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/07/2017 08:30	<b>Aliquot:</b> 430 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060717.B\s3f0722.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
207-08-9	Benzo(k)fluoranthene	B	52.7	ug/L	0.698	2.33
65-85-0	Benzoic acid		62.4	ug/L	14.0	46.5
100-51-6	Benzyl alcohol		51.1	ug/L	6.98	23.3
85-68-7	Butylbenzylphthalate		39.8	ug/L	6.98	23.3
218-01-9	Chrysene	B	49.4	ug/L	0.698	2.33
84-74-2	Di-n-butylphthalate		43.8	ug/L	6.98	23.3
117-84-0	Di-n-octylphthalate		31.7	ug/L	6.98	23.3
53-70-3	Dibenzo(a,h)anthracene		44.1	ug/L	0.698	2.33
132-64-9	Dibenzofuran		43.7	ug/L	6.98	23.3
84-66-2	Diethylphthalate		44.7	ug/L	6.98	23.3
131-11-3	Dimethylphthalate		44.0	ug/L	6.98	23.3
88-85-7	Dinoseb	U	23.3	ug/L	6.98	23.3
122-39-4	Diphenylamine		43.0	ug/L	6.98	23.3
206-44-0	Fluoranthene		48.2	ug/L	0.698	2.33
86-73-7	Fluorene		49.3	ug/L	0.698	2.33
118-74-1	Hexachlorobenzene		40.9	ug/L	6.98	23.3
87-68-3	Hexachlorobutadiene		33.5	ug/L	6.98	23.3
77-47-4	Hexachlorocyclopentadiene		24.0	ug/L	6.98	23.3
67-72-1	Hexachloroethane		32.5	ug/L	6.98	23.3
193-39-5	Indeno(1,2,3-cd)pyrene		41.3	ug/L	0.698	2.33
78-59-1	Isophorone		44.4	ug/L	8.14	23.3
62-75-9	N-Methyl-N-nitrosomethylamine		46.7	ug/L	6.98	23.3
924-16-3	N-Nitrosodi-n-butylamine	U	23.3	ug/L	6.98	23.3
55-18-5	N-Nitrosodiethylamine	U	23.3	ug/L	6.98	23.3
621-64-7	N-Nitrosodi--n-propylamine		49.9	ug/L	6.98	23.3
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		56.3	ug/L	6.98	23.3
91-20-3	Naphthalene		42.5	ug/L	0.698	2.33
98-95-3	Nitrobenzene		48.8	ug/L	6.98	23.3
608-93-5	Pentachlorobenzene	U	23.3	ug/L	6.98	23.3
87-86-5	Pentachlorophenol		46.5	ug/L	6.98	23.3
85-01-8	Phenanthrene		47.0	ug/L	0.698	2.33
108-95-2	Phenol		33.6	ug/L	6.98	23.3
129-00-0	Pyrene		46.7	ug/L	0.698	2.33
110-86-1	Pyridine	J	8.05	ug/L	6.98	23.3
108-60-1	bis(2-Chloro-1-methylethyl)ether		41.9	ug/L	6.98	23.3
111-91-1	bis(2-Chloroethoxy)methane		45.4	ug/L	6.98	23.3
111-44-4	bis(2-Chloroethyl) ether		44.8	ug/L	6.98	23.3
117-81-7	bis(2-Ethylhexyl)phthalate		38.5	ug/L	6.98	23.3



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

Page 3 of 3

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 06/02/2017 13:33	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203805363	<b>Date Received:</b> 06/06/2017 09:05	
<b>Client Sample:</b> QC for batch 1671166	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> CAWA-17-134190MSD	<b>Method:</b> SW846 3510C/8270D	<b>SOP Ref:</b> GL-OA-E-009
<b>Batch ID:</b> 1671167	<b>Inst:</b> MSD3.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/07/2017 22:05	<b>Analyst:</b> JLD1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/07/2017 08:30	<b>Aliquot:</b> 430 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> s060717.B\s3f0722.D	<b>Column:</b> DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
65794-96-9	m,p-Cresols		56.1	ug/L	8.60	23.3
99-09-2	3-Nitroaniline		70.7	ug/L	6.98	23.3
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		47.1	ug/L	6.98	23.3
88-74-4	2-Nitroaniline		41.0	ug/L	6.98	23.3
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		49.3	ug/L	6.98	23.3
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	89.7	233	ug/L	39	(32%-124%)
2-Fluorobiphenyl	44.0	116	ug/L	38	(32%-112%)
2-Fluorophenol	81.9	233	ug/L	35	(15%-88%)
Nitrobenzene-d5	46.0	116	ug/L	40	(36%-115%)
Phenol-d5	65.7	233	ug/L	28	(15%-91%)
p-Terphenyl-d14	42.6	116	ug/L	37	(36%-121%)

# Miscellaneous

### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 08-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> SEMIVOA GC/MS	<b>Test / Method:</b> SW846 3510C/8270D	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL, LANL, UCOR, WVNS
<b>Batch ID:</b> 1671167	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 424747(2017-1649),424753(2017-1646)</b> <b>Application Issues:</b> Failed Recovery for MS/MSD, or PS/PSD Failed RPD for MS/MSD, or PS/PSD Failed Yield for Surrogates			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
1. Failed RPD for MS/MSD: QC 1203805361MSD 1203805363MSD  2. Failed Recovery for MS/MSD: QC 1203805362MS, 1203805363MSD  3. Failed Yield for Surrogates: 424747 005 424753 005		1. The relative percent differences (RPD) for the MS and MSD, (See Below), were not within the acceptance limits. The failures were attributed to matrix interference. The data were reported. 1203805360MS and 1203805361MSD (2017-03444 WNWMP-01) Benzidine [82* (0%-30%)]. 1203805362MS and 1203805363MSD (CAWA-17-134190) Benzidine [43* (0%-30%)].  2. The MS or MSD (See Below) recovered spiked analytes outside of the established acceptance limits. As similar recoveries were displayed in the MS and MSD, the failures were attributed to sample matrix interference and the data were reported. 1203805362 (CAWA-17-134190MS) Several [See applicable report]. 1203805363 (CAWA-17-134190MSD) Several [See applicable report].  3. Sample (See Below) did not meet surrogate recovery acceptance criteria. The sample was analyzed at a dilution. As a result, one or more surrogates were diluted out of the acceptance limits. 424753005 (WSTMO-17-136858) 2,4,6-Tribromophenol [0* (32%-124%)], 2-Fluorophenol [0* (15%-88%)], Phenol-d5 [2* (15%-91%)] and p-Terphenyl-d14 [22* (36%-121%)].  Sample (See Below) did not meet surrogate recovery acceptance criteria. Since there is insufficient sample remaining to perform a re-extraction, the results from this extraction are reported. 424747005 (CAWA-17-134190) 2,4,6-Tribromophenol [7* (32%-124%)], 2-Fluorobiphenyl [10* (32%-112%)], 2-Fluorophenol [5* (15%-88%)], Nitrobenzene-d5 [10* (36%-115%)], Phenol-d5 [3* (15%-91%)] and p-Terphenyl-d14 [9* (36%-121%)].	

**Originator's Name:**

Jennifer Dunagan Jones13-JUN-17

**Data Validator/Group Leader:**

Barbara Bailey 14-JUN-17

# **Perchlorates by LCMSMS Analysis**

# Case Narrative

**Perchlorates by LCMSMS  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1649  
Work Order #: 424747**

**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: 1671834

Prep Batch Number: 1671833

**Sample Analysis**

<b>Sample ID</b>	<b>Client ID</b>
424747001	424747001 (CAWA-17-133332)
1203805879	Interference Check Sample (ICS)
1203805875	Method Blank (MB)
1203805876	Laboratory Control Sample (LCS)
1203805877	424741001(CAPA-17-133353) Matrix Spike (MS)
1203805878	424741001(CAPA-17-133353) Matrix Spike Duplicate (MSD)

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

**Preparation/Analytical Method Verification**

**SOP Reference**

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

**Calibration Information**

**Initial Calibration**

All initial calibration requirements have been met for this SDG. Due to software constraints, all Initial

Calibration Blanks must be designated as IPB001.

#### **ICV Requirements**

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

#### **CCB Requirements**

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

#### **CCV Requirements**

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

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

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

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

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

The MB analyzed with this SDG met the acceptance criteria.

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

The ICS spike recoveries met the acceptance criteria.

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

The LCS spike recoveries met the acceptance limits.

##### **QC Sample Designation**

Client sample 424741001 (CAPA-17-133353) was chosen for matrix spike and matrix spike duplicate analysis.

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

The MS recoveries were within the established acceptance limits.

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

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

##### **Internal Standard Area Acceptance**

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

##### **Retention Time**

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

#### **Technical Information**

##### **Holding Time Specifications**

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

**Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

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

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

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

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

**Manual Integrations**

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

**Method Comments**

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

**Additional Comments**

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

**Perchlorate Isotope Ratio**

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

**System Configuration**

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

**Electronic Packaging Comment**

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

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



### **Chromatographic Columns**

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

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

Dionex: IonPac AG-16 2 x 50 mm.

### **Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1649 GEL Work Order: 424747

#### 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: 14 JUN 2017

Title: Group Leader

# **Sample Data Summary**

## Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-17-133332Date Received: 06-JUN-17GEL Job No (SDG): 2017-1649GEL Sample ID: 424747001Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:         

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.275	ug/L		1	07-JUN-17 20:20	per0607029a
	Perchlorate Isotope Ratio			2.99			1	07-JUN-17 20:20	per0607029a
14797-73-0	Perchlorate-101	.05	.2	0.260	ug/L		1	07-JUN-17 20:20	per0607029a
	Perchlorate-O(18)			0.428	ug/L		1	07-JUN-17 20:20	per0607029a

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

\*Concentration =

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

# **Quality Control Summary**

**Perchlorate Laboratory Control Sample**

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No. (SDG):** 2017-1649

**Extract Batch Code:** 1671833

**Date Filtered:** 07-JUN-17

**Matrix:** WATER

**Sample ID:** 1203805876

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.209	ug/L	104		85 - 115
Perchlorate Isotope Ratio		2.99				-
Perchlorate-101	0.200	.197	ug/L	99		85 - 115
Perchlorate-O(18)		.47	ug/L			-

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

### Perchlorate Spike/Spike Duplicate Summary

**Lab Name:** General Engineering Laboratories

**Lab Code:** GEL

**GEL Job No (SDG):** 2017-1649

**Extract Batch Code:** 1671833

**Date Extracted:** 07-JUN-17

**GEL MS/PS ID:** 1203805877

**Client ID:** CAPA-17-133353

**GEL MSD/PSD ID:** 1203805878

**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	0.634	ug/L	0.874	120	.806	86	8	30	75 - 125
Perchlorate Isotope Ratio	0	3.00		3.08		2.97		3		-
Perchlorate-101	0.200	0.597	ug/L	0.801	102	.766	85	5	30	75 - 125
Perchlorate-O(18)	0	0.453	ug/L	0.435		.446		3		-

^ 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: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 07-JUN-17GEL Job No (SDG): 2017-1649GEL Sample ID: 1203805875Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:     

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	07-JUN-17 17:56	per0607013a
	Perchlorate Isotope Ratio						1	07-JUN-17 17:56	per0607013a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	07-JUN-17 17:56	per0607013a
	Perchlorate-O(18)			0.465	ug/L		1	07-JUN-17 17:56	per0607013a

^ 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: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 07-JUN-17GEL Job No (SDG): 2017-1649GEL Sample ID: 1203805876Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:         

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.209	ug/L		1	07-JUN-17 18:05	per0607014a
	Perchlorate Isotope Ratio			2.99			1	07-JUN-17 18:05	per0607014a
14797-73-0	Perchlorate-101	.05	.2	0.197	ug/L	J	1	07-JUN-17 18:05	per0607014a
	Perchlorate-O(18)			0.470	ug/L		1	07-JUN-17 18:05	per0607014a

^ 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: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2017-1649GEL Sample ID: 1203805879Date Filtered: 07-JUN-17Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.199	ug/L	J	1	07-JUN-17 18:14	per0607015a
	Perchlorate Isotope Ratio			2.89			1	07-JUN-17 18:14	per0607015a
14797-73-0	Perchlorate-101	.05	.2	0.194	ug/L	J	1	07-JUN-17 18:14	per0607015a
	Perchlorate-O(18)			0.504	ug/L		1	07-JUN-17 18:14	per0607015a

^ 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: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-133353MSDate Received: 06-JUN-17GEL Job No (SDG): 2017-1649GEL Sample ID: 1203805877Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:     

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.874	ug/L		1	07-JUN-17 18:59	per0607020a
	Perchlorate Isotope Ratio			3.08			1	07-JUN-17 18:59	per0607020a
14797-73-0	Perchlorate-101	.05	.2	0.801	ug/L		1	07-JUN-17 18:59	per0607020a
	Perchlorate-O(18)			0.435	ug/L		1	07-JUN-17 18:59	per0607020a

^ 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: 1671833Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-17-133353MSDDate Received: 06-JUN-17GEL Job No (SDG): 2017-1649GEL Sample ID: 1203805878Date Filtered: 07-JUN-17Injection Volume (uL): 20%Solids:     

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.806	ug/L		1	07-JUN-17 19:08	per0607021a
	Perchlorate Isotope Ratio			2.97			1	07-JUN-17 19:08	per0607021a
14797-73-0	Perchlorate-101	.05	.2	0.766	ug/L		1	07-JUN-17 19:08	per0607021a
	Perchlorate-O(18)			0.446	ug/L		1	07-JUN-17 19:08	per0607021a

^ 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 =

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

# PCB Analysis

# Case Narrative

**GC Semivolatile PCB  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1649  
Work Order #: 424747**

**Method/Analysis Information**

**Procedure:** Analysis of Polychlorinated Biphenyls by ECD

Analytical Method: SW846 3535A/8082

Prep Method: SW846 3535A

Analytical Batch Number: 1672047

Prep Batch Number: 1672046

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW846 3535A/8082:

<b>Sample ID</b>	<b>Client ID</b>
424747004	CAWA-17-134190
1203806423	Method Blank (MB)
1203806424	Laboratory Control Sample (LCS)
1203806429	Laboratory Control Sample Duplicate (LCSD)
1203806425	423945001(WST35-17-135775) Matrix Spike (MS)

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-040 REV# 24.

Raw data reports are processed and reviewed by the analyst using the Chemstation 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.

**Initial Calibration**

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

**Continuing Calibration Verification (CCV) Requirements**

All associated calibration verification standards (ICV or CCV) met the acceptance criteria. All analytes were



within the established retention time windows for this method.

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

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

The MB analyzed with this SDG met the acceptance criteria.

#### **Surrogate Recoveries**

Samples (See Below) failed to meet surrogate recovery acceptance criteria and were re-extracted. The re-extracted samples failed surrogate recovery in the same manner; therefore, the failures were attributed to sample matrix interference.

Sample	Analyte	Value
424747004 (CAWA-17-134190)	4cmx	17* (33%-122%)
	4cmx	20* (33%-122%)
	Decachlorobiphenyl	23* (35%-138%)
	Decachlorobiphenyl	24* (35%-138%)

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

An LCSD analysis was performed for this batch of the samples.

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

The LCS/LCSD spike recoveries met the acceptance limits.

#### **LCS/LCSD Relative Percent Difference (RPD) Statement**

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

#### **QC Sample Designation**

Sample 423945001 (WST35-17-135775) was selected for the matrix spike analysis.

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

The MS/MSD recoveries were within the established acceptance limits.

### **Technical Information**

#### **Holding Time Specifications**

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 samples and QC in this batch were cleaned using alumina in order to remove oil and other high molecular weight interferences. All samples and QC in this batch were cleaned with activated copper in order to remove sulfur. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported analyte concentrations were confirmed on dissimilar columns.

#### **Sample Dilutions**

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

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

Sample 424747004 (CAWA-17-134190) was re-extracted due to low surrogate recovery. The raw data of the re-extracted sample were included in the Miscellaneous Data section for confirmation.

### **Miscellaneous Information**

#### **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. 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.

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

Data exception report (DER) 1640705 was generated for sample 424747004 (CAWA-17-134190).

#### **Manual integrations**

Manual integrations were not required for samples and QC samples associated with this SDG in this batch.

#### **Additional Comments**

The column 1 has been chosen as the primary column. The data are reported from the column 1 for all samples in this batch.

### **System Configuration**

The Semi-Volatiles-PCB analysis was performed on the following instrument configuration:

<b>Instrument ID</b>	<b>Instrument</b>	<b>System Configuration</b>	<b>Column ID</b>	<b>Column Description</b>
ECD9A.I_1	Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler	7890A GC/ECD	Restek Rtx-CLPest 1	30m x 0.25mm, 0.25um
ECD9A.I_2	Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler	7890A GC/ECD	Restek Rtx-CLPest 2	30m x 0.25mm, 0.20um

### **Certification Statement**

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

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1649 GEL Work Order: 424747

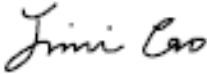
#### The Qualifiers in this report are defined as follows:

- \* 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: Jimin Cao

Date: 16 JUN 2017

Title: Data Validator

# **Sample Data Summary**

**PCB**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 06/02/2017 13:33	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 424747004	<b>Date Received:</b> 06/06/2017 09:05	
<b>Client Sample:</b> PCB	<b>Client:</b> ARSL004	<b>Project:</b> ESHL00114
<b>Client ID:</b> CAWA-17-134190	<b>Method:</b> SW846 3535A/8082	<b>SOP Ref:</b> GL-OA-E-040
<b>Batch ID:</b> 1672047	<b>Inst:</b> ECD9A.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 11:57	<b>Analyst:</b> YS1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/08/2017 09:15	<b>Aliquot:</b> 930 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> 060917.S\E9f0931.D	<b>Column:</b> 1 RTX-CLPEST 1	
060917.S\E9f0931.D	2 RTX-CLPEST 2	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016	U	0.108	ug/L	0.0358	0.108	1
11104-28-2	Aroclor-1221	U	0.108	ug/L	0.0358	0.108	1
11141-16-5	Aroclor-1232	U	0.108	ug/L	0.0358	0.108	1
53469-21-9	Aroclor-1242	U	0.108	ug/L	0.0358	0.108	1
12672-29-6	Aroclor-1248	U	0.108	ug/L	0.0358	0.108	1
11097-69-1	Aroclor-1254	U	0.108	ug/L	0.0358	0.108	1
11096-82-5	Aroclor-1260	U	0.108	ug/L	0.0358	0.108	1
37324-23-5	Aroclor-1262	U	0.108	ug/L	0.0358	0.108	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.0364	0.215	17 *	(33%-122%)
Decachlorobiphenyl	0.0485	0.215	23 *	(35%-138%)

# **Quality Control Summary**

---

**PCB**  
**Surrogate Recovery Report**

Page 1 of 1

**SDG Number: 2017-1649****Matrix Type: LIQUID**

---

Sample ID	Client ID	4CMX 1 %REC #	4CMX 2 %REC #	DCB 1 %REC #	DCB 2 %REC #
1203806423	MB for batch 1672046	55	60	81	88
1203806424	LCS for batch 1672046	61	67	87	94
1203806429	LCSD for batch 1672046	65	71	91	98
1203806425	WST35-17-135775MS	60	64	88	95
424747004	CAWA-17-134190	17 *	20 *	23 *	24 *

---

**Surrogate****Acceptance Limits**

4CMX    = 4cmx                   (33%-122%)

DCB       = Decachlorobiphenyl   (35%-138%)

\* Recovery outside Acceptance Limits

# Column to be used to flag recovery values

D Sample Diluted

**PCB**  
**Quality Control Summary**  
**Spike Recovery Report**

Page 1 of 2

SDG Number: 2017-1649

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1672046

Matrix: WATER

Lab Sample ID 1203806424

Instrument: ECD9A.I

Analysis Date: 06/09/2017 08:22

Dilution: 1

Analyst: YS1

Prep Batch ID: 1672046

Inj. Vol: 1 uL

Batch ID: 1672047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
12674-11-2	LCS Aroclor-1016	1.00	0.0	0.668	67	45-101
11096-82-5	LCS Aroclor-1260	1.00	0.0	0.647	65	52-113



**PCB**  
**Quality Control Summary**  
**Spike Recovery Report**

Page 2 of 2

SDG Number: 2017-1649

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1672046

Matrix: WATER

Lab Sample ID 1203806429

Instrument: ECD9A.I

Analysis Date: 06/09/2017 08:34

Dilution: 1

Analyst: YS1

Prep Batch ID: 1672046

Inj. Vol: 1 uL

Batch ID: 1672047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
12674-11-2	LCSD Aroclor-1016	1.00	0.0	0.715	72	45-101	7	0-26
11096-82-5	LCSD Aroclor-1260	1.00	0.0	0.719	72	52-113	11	0-26

**PCB**  
**Quality Control Summary**  
**Spike Recovery Report**

Page 1 of 1

SDG Number: 2017-1649

Sample Type: Matrix Spike

Client ID: WST35-17-135775MS

Matrix: W

Lab Sample ID 1203806425

Instrument: ECD9A.I

Analysis Date: 06/09/2017 09:13

Dilution: 1

Analyst: YS1

Prep Batch ID: 1672046

Inj. Vol: 1 uL

Batch ID: 1672047

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
12674-11-2	MS Aroclor-1016	1.28	0.00 U	0.882	69	26-110
11096-82-5	MS Aroclor-1260	1.28	0.00 U	0.866	68	30-127

## Method Blank Summary

Page 1 of 1

SDG Number:	2017-1649	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1672046	Instrument ID:	ECD9A.I_1	Data File:	060917.S\E9f0914.D
Lab Sample ID:	1203806423		ECD9A.I_2		060917.S\E9f0914.D
Column:	RTX-CLPEST 1	Prep Date:	06/08/2017 09:15	Analyzed:	06/09/17 08:10
	RTX-CLPEST 2				

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 1672046	1203806424	060917.S\E9f0915.D	06/09/17	0822
02 LCSD for batch 1672046	1203806429	060917.S\E9f0916.D	06/09/17	0834
03 WST35-17-135775MS	1203806425	060917.S\E9f0919.D	06/09/17	0913
04 CAWA-17-134190	424747004	060917.S\E9f0931.D	06/09/17	1157

# Quality Control Data

**PCB**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2017-1649  
**Lab Sample ID:** 1203806423  
**Client Sample:** QC for batch 1672046  
**Client ID:** MB for batch 1672046  
**Batch ID:** 1672047  
**Run Date:** 06/09/2017 08:10  
**Prep Date:** 06/08/2017 09:15  
**Data File:** 060917.S\E9f0914.D  
 060917.S\E9f0914.D

**Client:** ARSL004  
**Method:** SW846 3535A/8082  
**Inst:** ECD9A.I  
**Analyst:** YS1  
**Aliquot:** 1000 mL  
**Column:** 1 RTX-CLPEST 1  
 2 RTX-CLPEST 2

**Matrix:** WATER  
**Project:** QC  
**SOP Ref:** GL-OA-E-040  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016	U	0.100	ug/L	0.0333	0.100	1
11104-28-2	Aroclor-1221	U	0.100	ug/L	0.0333	0.100	1
11141-16-5	Aroclor-1232	U	0.100	ug/L	0.0333	0.100	1
53469-21-9	Aroclor-1242	U	0.100	ug/L	0.0333	0.100	1
12672-29-6	Aroclor-1248	U	0.100	ug/L	0.0333	0.100	1
11097-69-1	Aroclor-1254	U	0.100	ug/L	0.0333	0.100	1
11096-82-5	Aroclor-1260	U	0.100	ug/L	0.0333	0.100	1
37324-23-5	Aroclor-1262	U	0.100	ug/L	0.0333	0.100	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.109	0.200	55	(33%-122%)
Decachlorobiphenyl	0.162	0.200	81	(35%-138%)

**PCB**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2017-1649  
**Lab Sample ID:** 1203806424  
**Client Sample:** QC for batch 1672046  
**Client ID:** LCS for batch 1672046  
**Batch ID:** 1672047  
**Run Date:** 06/09/2017 08:22  
**Prep Date:** 06/08/2017 09:15  
**Data File:** 060917.S\E9f0915.D  
 060917.S\E9f0915.D

**Client:** ARSL004  
**Method:** SW846 3535A/8082  
**Inst:** ECD9A.I  
**Analyst:** YS1  
**Aliquot:** 1000 mL  
**Column:** 1 RTX-CLPEST 1  
 2 RTX-CLPEST 2

**Matrix:** WATER  
**Project:** QC  
**SOP Ref:** GL-OA-E-040  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016		0.668	ug/L	0.0333	0.100	1
11104-28-2	Aroclor-1221	U	0.100	ug/L	0.0333	0.100	1
11141-16-5	Aroclor-1232	U	0.100	ug/L	0.0333	0.100	1
53469-21-9	Aroclor-1242	U	0.100	ug/L	0.0333	0.100	1
12672-29-6	Aroclor-1248	U	0.100	ug/L	0.0333	0.100	1
11097-69-1	Aroclor-1254	U	0.100	ug/L	0.0333	0.100	1
11096-82-5	Aroclor-1260		0.647	ug/L	0.0333	0.100	1
37324-23-5	Aroclor-1262	U	0.100	ug/L	0.0333	0.100	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.122	0.200	61	(33%-122%)
Decachlorobiphenyl	0.175	0.200	87	(35%-138%)

**PCB**  
**Certificate of Analysis**  
**Sample Summary**

Page 1 of 1

<b>SDG Number:</b> 2017-1649	<b>Date Collected:</b> 05/22/2017 09:47	<b>Matrix:</b> W
<b>Lab Sample ID:</b> 1203806425	<b>Date Received:</b> 05/24/2017 09:10	
<b>Client Sample:</b> QC for batch 1672046	<b>Client:</b> ARSL004	<b>Project:</b> QC
<b>Client ID:</b> WST35-17-135775MS	<b>Method:</b> SW846 3535A/8082	<b>SOP Ref:</b> GL-OA-E-040
<b>Batch ID:</b> 1672047	<b>Inst:</b> ECD9A.I	<b>Dilution:</b> 1
<b>Run Date:</b> 06/09/2017 09:13	<b>Analyst:</b> YS1	<b>Inj. Vol:</b> 1 uL
<b>Prep Date:</b> 06/08/2017 09:15	<b>Aliquot:</b> 780 mL	<b>Final Volume:</b> 1 mL
<b>Data File:</b> 060917.S\E9f0919.D	<b>Column:</b> 1 RTX-CLPEST 1	
060917.S\E9f0919.D	2 RTX-CLPEST 2	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016		0.882	ug/L	0.0427	0.128	1
11104-28-2	Aroclor-1221	U	0.128	ug/L	0.0427	0.128	1
11141-16-5	Aroclor-1232	U	0.128	ug/L	0.0427	0.128	1
53469-21-9	Aroclor-1242	U	0.128	ug/L	0.0427	0.128	1
12672-29-6	Aroclor-1248	U	0.128	ug/L	0.0427	0.128	1
11097-69-1	Aroclor-1254	U	0.128	ug/L	0.0427	0.128	1
11096-82-5	Aroclor-1260		0.866	ug/L	0.0427	0.128	1
37324-23-5	Aroclor-1262	U	0.128	ug/L	0.0427	0.128	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.153	0.256	ug/L	60 (33%-122%)
Decachlorobiphenyl	0.225	0.256	ug/L	88 (35%-138%)

**PCB**  
**Certificate of Analysis**  
**Sample Summary**

**SDG Number:** 2017-1649  
**Lab Sample ID:** 1203806429  
**Client Sample:** QC for batch 1672046  
**Client ID:** LCSD for batch 1672046  
**Batch ID:** 1672047  
**Run Date:** 06/09/2017 08:34  
**Prep Date:** 06/08/2017 09:15  
**Data File:** 060917.S\E9f0916.D  
 060917.S\E9f0916.D

**Client:** ARSL004  
**Method:** SW846 3535A/8082  
**Inst:** ECD9A.I  
**Analyst:** YS1  
**Aliquot:** 1000 mL  
**Column:** 1 RTX-CLPEST 1  
 2 RTX-CLPEST 2

**Matrix:** WATER  
**Project:** QC  
**SOP Ref:** GL-OA-E-040  
**Dilution:** 1  
**Inj. Vol:** 1 uL  
**Final Volume:** 1 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
12674-11-2	Aroclor-1016		0.715	ug/L	0.0333	0.100	1
11104-28-2	Aroclor-1221	U	0.100	ug/L	0.0333	0.100	1
11141-16-5	Aroclor-1232	U	0.100	ug/L	0.0333	0.100	1
53469-21-9	Aroclor-1242	U	0.100	ug/L	0.0333	0.100	1
12672-29-6	Aroclor-1248	U	0.100	ug/L	0.0333	0.100	1
11097-69-1	Aroclor-1254	U	0.100	ug/L	0.0333	0.100	1
11096-82-5	Aroclor-1260		0.719	ug/L	0.0333	0.100	1
37324-23-5	Aroclor-1262	U	0.100	ug/L	0.0333	0.100	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
4cmx	0.130	0.200	65	(33%-122%)
Decachlorobiphenyl	0.182	0.200	91	(35%-138%)



# Miscellaneous

### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 09-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> GC/ECD	<b>Test / Method:</b> SW846 3535A/8082, SW846 3535A/8082A	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL, GEEL
<b>Batch ID:</b> 1672047	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 424080,424218(2017-1613),424228,424572,424632,424747(2017-1649)</b>			
<b>Application Issues:</b> Failed RPD for MS/MSD, or PS/PSD Failed Yield for Surrogates			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
1. The relative percent difference (RPD) between the MS and MSD was not within the required acceptance limits. As the spike recoveries.  2. Samples (See Below) did not meet the surrogate recovery acceptance criteria.  424218 001  424228 002  424747 004		1. The relative percent difference (RPD) between the MS and MSD (See Below) was not within the required acceptance limits. As the spike recoveries were within the acceptance limits in the MS/MSD, the data results were not adversely impacted. 1203806427MS and 1203806428MSD (LF03009-01) Aroclor-1016 [30* (0.0%-27.0%)], Aroclor-1016 [34* (0.0%-27.0%)], Aroclor-1260 [31* (0.0%-29.0%)], Aroclor-1260 [35* (0.0%-29.0%)] and Decachlorobiphenyl [31* (0%-30%)].  2. Samples (See Below) failed to meet surrogate recovery acceptance criteria and were re-extracted. The re-extracted samples failed surrogate recovery in the same manner; therefore, the failures were attributed to sample matrix interference. 424218001 (WST15-17-136956) 4cmx [27* (33%-122%)], 4cmx [30* (33%-122%)], Decachlorobiphenyl [31* (35%-138%)], Decachlorobiphenyl [34* (35%-138%)]. 424747004 (CAWA-17-134190) 4cmx [17* (33%-122%)], 4cmx [20* (33%-122%)], Decachlorobiphenyl [23* (35%-138%)] and Decachlorobiphenyl [24* (35%-138%)].  Sample (See Below) did not meet the surrogate recovery acceptance criteria due to dilution and sample matrix interference. Sample 424228002 was very viscous and very dark. 424228002 (W359358BOT) 4cmx [0* (33%-122%)] and Decachlorobiphenyl [0* (35%-138%)].	

**Originator's Name:**

Yiping Shi 09-JUN-17

**Data Validator/Group Leader:**

Jimin Cao 16-JUN-17

# Metals Analysis

# Case Narrative

**Metals**  
**Technical Case Narrative**  
**ARS International, LLC (ARSL)**  
**SDG #: 2017-1649**  
**Work Order #: 424747**

<b>Sample ID</b>	<b>Client ID</b>
424747001	CAWA-17-133332
424747005	CAWA-17-134190
1203805071	Method Blank (MB)ICP
1203805072	Laboratory Control Sample (LCS)
1203805075	424741001(CAPA-17-133353L) Serial Dilution (SD)
1203805073	424741001(CAPA-17-133353D) Sample Duplicate (DUP)
1203805074	424741001(CAPA-17-133353S) Matrix Spike (MS)
1203805126	Method Blank (MB)ICP-MS
1203805127	Laboratory Control Sample (LCS)
1203805130	424741001(CAPA-17-133353L) Serial Dilution (SD)
1203805128	424741001(CAPA-17-133353D) Sample Duplicate (DUP)
1203805129	424741001(CAPA-17-133353S) Matrix Spike (MS)
1203805738	Method Blank (MB)CVAA
1203805739	Laboratory Control Sample (LCS)
1203805744	423833001(CAMO-17-132523L) Serial Dilution (SD)
1203805740	423833001(CAMO-17-132523D) Sample Duplicate (DUP)
1203805742	423833001(CAMO-17-132523S) Matrix Spike (MS)

**Sample Analysis**

Samples 424747001 and 005 in this SDG were analyzed for metals and mercury on an "as received" basis.

**Method/Analysis Information**

<b>Analytical Batch:</b>	1671565, 1671589, 1671798 and 1674389
<b>Prep Batch :</b>	1671563, 1671587 and 1671792
<b>Standard Operating Procedures:</b>	GL-MA-E-013 REV# 28, GL-MA-E-006 REV# 13, GL-MA-E-014 REV# 29, GL-MA-E-010 REV# 34 and GL-GC-E-107 REV# 10
<b>Analytical Method:</b>	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.2 1974 and SM:A2340B
<b>Prep Method :</b>	SW846 3005A and EPA 245.1/245.2 Prep

**Preparation/Analytical Method Verification**

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

**System Configuration**

The Hardness as CaCO<sub>3</sub> is calculated from Calcium and Magnesium results.

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

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

The Metals analysis - ICPMS was performed on a PerkinElmer NexION 300X 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, sodium and zinc. Client sample concentrations were less than the MDL or greater than two times the PQL; therefore the data were not adversely affected. 424747001 (CAWA-17-133332)-ICP.

#### **ICSA/ICSAB Statement**

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

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

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

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

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

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

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

The MBs analyzed with this SDG met the acceptance criteria.

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recoveries met the acceptance limits.

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

The following samples were selected as the quality control (QC) samples for this SDG: 424741001 (CAPA-17-133353)-ICP and ICP-MS and 423833001 (CAMO-17-132523)-CVAA.

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

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

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

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

#### **Serial Dilution % Difference Statement**

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

#### **Technical Information**

##### **Holding Time Specifications**

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

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

All procedures were performed as stated in the SOP.

##### **Sample Dilutions**

The samples in this SDG did not require dilutions.

##### **Preparation Information**

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

#### **Miscellaneous Information**

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

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

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

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

A data exception report was not required for this SDG.

##### **Additional Comments**

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

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

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

#### **Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the

requirements of the NELAC standard unless otherwise noted in the analytical case narrative.



## **GEL LABORATORIES LLC**

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

### **Qualifier Definition Report for**

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

Client SDG: 2017-1649 GEL Work Order: 424747

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

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

#### **Review/Validation**

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

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

**Signature:**



**Name: Nik-Cole Elmore**

**Date: 15 JUN 2017**

**Title: Data Validator**

# **Sample Data Summary**

---

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

**SDG No:** 2017-1649**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424747001**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-133332**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/08/17 11:41	060817W2-7	1671798

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

SDG No: 2017-1649

CONTRACT: ESHL00114

METHOD TYPE: SW846

SAMPLE ID: 424747001

BASIS: As Received

DATE COLLECTED 02-JUN-17

CLIENT ID: CAWA-17-13332

LEVEL: Low

DATE RECEIVED 06-JUN-17

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	97.6	ug/L	J	68	200	200	1	P	HSC	06/14/17 18:30	061417A-1	1671565
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	PRB	06/08/17 19:35	170608-2	1671589
7440-38-2	Arsenic	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 18:21	170609-6	1671589
7440-39-3	Barium	8.76	ug/L		1	5	5	1	P	HSC	06/14/17 18:30	061417A-1	1671565
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 18:30	061417A-1	1671565
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	06/14/17 18:30	061417A-1	1671565
7440-43-9	Cadmium	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 19:35	170608-2	1671589
7440-70-2	Calcium	8250	ug/L		50	200	200	1	P	HSC	06/14/17 18:30	061417A-1	1671565
7440-47-3	Chromium	10	ug/L	U	3	10	10	1	MS	PRB	06/09/17 18:21	170609-6	1671589
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/14/17 18:30	061417A-1	1671565
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/14/17 18:30	061417A-1	1671565
7439-89-6	Iron	47	ug/L	J	30	100	100	1	P	HSC	06/14/17 18:30	061417A-1	1671565
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	PRB	06/09/17 01:45	170608-5	1671589
7439-95-4	Magnesium	2170	ug/L		110	300	300	1	P	HSC	06/14/17 18:30	061417A-1	1671565
7439-96-5	Manganese	33	ug/L		2	10	10	1	P	HSC	06/14/17 18:30	061417A-1	1671565
7439-98-7	Molybdenum	1.41	ug/L		0.2	0.5	0.5	1	MS	PRB	06/08/17 19:35	170608-2	1671589
7440-02-0	Nickel	2	ug/L	U	0.6	2	2	1	MS	PRB	06/09/17 18:21	170609-6	1671589
7440-09-7	Potassium	372	ug/L		50	150	150	1	P	HSC	06/14/17 18:30	061417A-1	1671565
7782-49-2	Selenium	5	ug/L	U	2	5	5	1	MS	PRB	06/09/17 18:21	170609-6	1671589
7631-86-9	Silica	57400	ug/L		53	213	213	1	P	HSC	06/14/17 18:30	061417A-1	1671565
7440-22-4	Silver	1	ug/L	U	0.3	1	1	1	MS	PRB	06/08/17 19:35	170608-2	1671589
7440-23-5	Sodium	18500	ug/L		100	300	300	1	P	HSC	06/14/17 18:30	061417A-1	1671565
7440-24-6	Strontium	49.9	ug/L		1	5	5	1	P	HSC	06/14/17 18:30	061417A-1	1671565
7440-28-0	Thallium	2	ug/L	U	0.6	2	2	1	MS	PRB	06/09/17 01:45	170608-5	1671589
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/14/17 18:30	061417A-1	1671565
7440-61-1	Uranium	0.692	ug/L		0.067	0.2	0.2	1	MS	PRB	06/09/17 01:45	170608-5	1671589
7440-62-2	Vanadium	1.91	ug/L	J	1	5	5	1	P	HSC	06/14/17 18:30	061417A-1	1671565
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	06/14/17 18:30	061417A-1	1671565

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

**SDG No:** 2017-1649**CONTRACT:** ESHL00114**METHOD TYPE:****SAMPLE ID:** 424747001**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-133332**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	29.5	mg/L		0.453	1.24	1.24	1		JJ2	06/15/17 11:55		1674389

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1671565	1671563	SW846 3005A	50	mL	50	mL	06/06/17	CXW4
1671589	1671587	SW846 3005A	50	mL	50	mL	06/06/17	CXW4
1671798	1671792	EPA 245.1/245.2 Prep	20	mL	20	mL	06/07/17	AXS5

**\*Analytical Methods:**

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

---

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

**SDG No:** 2017-1649**CONTRACT:** ESHL00114**METHOD TYPE:** EPA**SAMPLE ID:** 424747005**BASIS:** As Received**DATE COLLECTED** 02-JUN-17**CLIENT ID:** CAWA-17-134190**LEVEL:** Low**DATE RECEIVED** 06-JUN-17**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	MTM1	06/08/17 11:42	060817W2-7	1671798

**Prep Information:**

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1671798	1671792	EPA 245.1/245.2 Prep	20	mL	20	mL	06/07/17	AXS5

**\*Analytical Methods:**

AV EPA 245.2 1974

# **Quality Control Summary**

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

SDG NO. 2017-1649

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>
1203805071	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	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
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Iron	30	ug/L	+/-100	U	P	30	100
	Manganese	2	ug/L	+/-10	U	P	2	10
	Silica	53	ug/L	+/-213	U	P	53	213
	Zinc	-4.22	ug/L	+/-10	J	P	3.3	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Strontium	1	ug/L	+/-5	U	P	1	5
	Sodium	100	ug/L	+/-300	U	P	100	300
	Potassium	50	ug/L	+/-150	U	P	50	150
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Copper	3	ug/L	+/-10	U	P	3	10
1203805126	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
1203805738	Mercury	0.067	ug/L	+/-0.2	U	AV	0.067	0.2

## \*Analytical Methods:

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



## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2017-1649

Client ID: CAPA-17-133353S

Contract: ESHL00114

Level: Low

Matrix: WATER

% Solids:

Sample ID: 424741001

Spike ID: 1203805074

<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	5750		664		5000	102		P
Barium	ug/L	75-125	548		56.6		500	98.3		P
Beryllium	ug/L	75-125	498		1	U	500	99.6		P
Boron	ug/L	75-125	531		17.3	J	500	103		P
Calcium	ug/L	75-125	20700		15700		5000	99.5		P
Cobalt	ug/L	75-125	491		1	U	500	98.3		P
Copper	ug/L	75-125	520		3	U	500	104		P
Iron	ug/L	75-125	5370		325		5000	101		P
Magnesium	ug/L	75-125	9090		4110		5000	99.4		P
Manganese	ug/L	75-125	493		2	U	500	98.3		P
Potassium	ug/L	75-125	8010		2930		5000	102		P
Silica	ug/L	75-125	51700		40500		10700	105		P
Sodium	ug/L	75-125	25600		19600		5000	119		P
Strontium	ug/L	75-125	601		95.7		500	101		P
Tin	ug/L	75-125	496		2.5	U	500	98.8		P
Vanadium	ug/L	75-125	511		3.28	J	500	101		P
Zinc	ug/L	75-125	469		3.3	U	500	93.8		P

\*Analytical Methods:

P SW846 3005A/6010C

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2017-1649 Client ID: CAPA-17-133353S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 424741001 Spike ID: 1203805129

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Antimony	ug/L	75-125	50.1		1	U	50	99.8		MS
Arsenic	ug/L	75-125	52		2	U	50	100		MS
Cadmium	ug/L	75-125	49.9		0.3	U	50	99.9		MS
Chromium	ug/L	75-125	49.6		3	U	50	97.4		MS
Lead	ug/L	75-125	47.4		0.5	U	50	94.5		MS
Molybdenum	ug/L	75-125	51.9		0.948		50	102		MS
Nickel	ug/L	75-125	49.1		0.812	J	50	96.5		MS
Selenium	ug/L	75-125	47		2	U	50	92		MS
Silver	ug/L	75-125	50.2		0.3	U	50	100		MS
Thallium	ug/L	75-125	43.9		0.6	U	50	87.8		MS
Uranium	ug/L	75-125	46.6		0.184	J	50	92.8		MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-5a-

## Matrix Spike Summary

SDG NO. 2017-1649 Client ID CAMO-17-132523S

Contract: ESHL00114 Level: Low

Matrix: WATER % Solids:

Sample ID: 423833001 Spike ID: 1203805742

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	2.04		0.067	U	2	102		AV

## \*Analytical Methods:

AV EPA 245.1/245.2

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

SDG No.: 2017–1649

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA–17–133353D

Matrix: WATER

Level: Low

Sample ID: 424741001

Duplicate ID: 1203805073

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L	+/-200	664		647		2.55		P
Barium	ug/L	+/-20%	56.6		56		1.16		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	17.3 J		16.2 J		6.54		P
Calcium	ug/L	+/-20%	15700		15500		1.48		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L	+/-100	325		324		.401		P
Magnesium	ug/L	+/-20%	4110		4050		1.64		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	2930		2870		2.21		P
Silica	ug/L	+/-20%	40500		39700		2.01		P
Sodium	ug/L	+/-20%	19600		20000		1.78		P
Strontium	ug/L	+/-20%	95.7		94.9		.858		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	3.28 J		2.3 J		34.9		P
Zinc	ug/L		3.3 U		3.3 U				P

\*Analytical Methods:

P SW846 3005A/6010C

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

SDG No.: 2017-1649

Lab Code: GEL

Contract: ESHL00114

Client ID: CAPA-17-133353D

Matrix: WATER

Level: Low

Sample ID: 424741001

Duplicate ID: 1203805128

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Antimony	ug/L		1 U		1 U				MS
Arsenic	ug/L		2 U		2 U				MS
Cadmium	ug/L		0.3 U		0.3 U				MS
Chromium	ug/L		3 U		3 U				MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	0.948		0.933		1.59		MS
Nickel	ug/L		0.812 J		0.6 U		200		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	0.184 J		0.177 J		3.88		MS

\*Analytical Methods:

MS SW846 3005A/6020A

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

**SDG No.:** 2017–1649**Lab Code:** GEL**Contract:** ESHL00114**Client ID:** CAMO–17–132523D**Matrix:** WATER**Level:** Low**Sample ID:** 423833001**Duplicate ID:** 1203805740**Percent Solids for Dup:** N/A

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

\*Analytical Methods:

AV EPA 245.1/245.2

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2017-1649

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>
1203805072								
	Aluminum	ug/L	5000	5130		103	80-120	P
	Barium	ug/L	500	505		101	80-120	P
	Beryllium	ug/L	500	503		101	80-120	P
	Boron	ug/L	500	514		103	80-120	P
	Calcium	ug/L	5000	5070		101	80-120	P
	Cobalt	ug/L	500	511		102	80-120	P
	Copper	ug/L	500	520		104	80-120	P
	Iron	ug/L	5000	5120		102	80-120	P
	Magnesium	ug/L	5000	5170		103	80-120	P
	Manganese	ug/L	500	510		102	80-120	P
	Potassium	ug/L	5000	5150		103	80-120	P
	Silica	ug/L	10700	10600		99.1	80-120	P
	Sodium	ug/L	5000	5490		110	80-120	P
	Strontium	ug/L	500	515		103	80-120	P
	Tin	ug/L	500	499		99.9	80-120	P
	Vanadium	ug/L	500	512		102	80-120	P
	Zinc	ug/L	500	479		95.8	80-120	P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2017-1649

Contract: ESHL00114

Aqueous LCS Source:O2Si

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1203805127								
	Antimony	ug/L	50	50.4		101	80-120	MS
	Arsenic	ug/L	50	53.3		107	80-120	MS
	Cadmium	ug/L	50	50.5		101	80-120	MS
	Chromium	ug/L	50	51.8		104	80-120	MS
	Lead	ug/L	50	49.5		99	80-120	MS
	Molybdenum	ug/L	50	49.8		99.6	80-120	MS
	Nickel	ug/L	50	51.9		104	80-120	MS
	Selenium	ug/L	50	51.2		102	80-120	MS
	Silver	ug/L	50	50.7		101	80-120	MS
	Thallium	ug/L	50	45.1		90.3	80-120	MS
	Uranium	ug/L	50	47.2		94.5	80-120	MS

## \*Analytical Methods:

MS SW846 3005A/6020A



## METALS

-7-

## Laboratory Control Sample Summary

SDG NO. 2017-1649

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>
1203805739	Mercury	ug/L	2	2.02		101	85-115	AV

## \*Analytical Methods:

AV EPA 245.1/245.2

## METALS

-9-

## Serial Dilution Sample Summary

SDG NO. 2017-1649

Client ID: CAPA-17-133353L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 424741001

Serial Dilution ID: 1203805075

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	664		679	J	2.358			P
Barium	56.6		57.7		1.911		10	P
Beryllium	1	U	5	U				P
Boron	17.3	J	75	U	52.718			P
Calcium	15700		16100		2.573		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	325		339	J	4.313			P
Magnesium	4110		4070		1.058			P
Manganese	2	U	10	U				P
Potassium	2930		3030		3.494		10	P
Silica	40500		40100		.913		10	P
Sodium	19600		20700		5.351		10	P
Strontium	95.7		98.4		2.825		10	P
Tin	2.5	U	12.5	U				P
Vanadium	3.28	J	5	U	135.167			P
Zinc	3.3	U	16.5	U				P

## \*Analytical Methods:

P SW846 3005A/6010C

## METALS

-9-

## Serial Dilution Sample Summary

SDG NO. 2017-1649

Client ID: CAPA-17-133353L

Contract: ESHL00114

Matrix: LIQUID

Level: Low

Sample ID: 424741001

Serial Dilution ID: 1203805130

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Antimony	1	U	5	U				MS
Arsenic	2	U	10	U				MS
Cadmium	.3	U	1.5	U				MS
Chromium	3	U	15	U				MS
Lead	.5	U	2.5	U				MS
Molybdenum	.948		1.15	J	20.781			MS
Nickel	.812	J	5.81	J	614.901			MS
Selenium	2	U	10	U				MS
Silver	.3	U	1.5	U				MS
Thallium	.6	U	3	U				MS
Uranium	.184	J	.335	U	2.174			MS

## \*Analytical Methods:

MS SW846 3005A/6020A

## METALS

-9-

## Serial Dilution Sample Summary

**SDG NO.** 2017-1649 **Client ID:** CAMO-17-132523L**Contract:** ESHL00114**Matrix:** LIQUID **Level:** Low**Sample ID:** 423833001 **Serial Dilution ID:** 1203805744

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

## \*Analytical Methods:

AV EPA 245.1/245.2

# **General Chem Analysis**

# Case Narrative

**General Chemistry  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1649  
Work Order #: 424747**

**Method/Analysis Information**

**Product:** Carbon and Total Organic

**Analytical Batch:** 1671529

**Method:** SW 9060 Total Organic Carbon

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424747005	CAWA-17-134190
1203805981	Method Blank (MB)
1203805982	Laboratory Control Sample (LCS)
1203805983	Laboratory Control Sample Duplicate (LCSD)
1203805984	424739002(CAPA-17133356) Sample Duplicate (DUP)
1203805986	424739002(CAPA-17133356) Post Spike (PS)

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

**SOP Reference**

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

**Preparation/Analytical Method Verification**

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

**Calibration Information**

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

**Initial Calibration**

All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**

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

**Calibration Verification Information (CCV)**

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

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

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

The MB analyzed with this SDG met the acceptance criteria.

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

##### **LCS/LCSD Relative Percent Difference (RPD) Statement**

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

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

Sample 424739002 (CAPA-17133356) 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 following sample was diluted in the first analytical run, and a dilution was not required, therefore the sample was reanalyzed neat. 424747005 (CAWA-17-134190).

#### **Miscellaneous Information**

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

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

##### **Additional Comments**



Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Cyanide and Total</b>		
<b>Analytical Batch:</b>	1671534	<b>Method:</b>	WSP-CN(T)
<b>Prep Batch :</b>	1671533	<b>Method:</b>	EPA 335.4

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424747005	CAWA-17-134190
1203805008	Method Blank (MB)
1203805009	Laboratory Control Sample (LCS)
1203805010	424739002(CAPA-17133356) Sample Duplicate (DUP)
1203805012	424739002(CAPA-17133356) Matrix Spike (MS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Continuing Calibration Blanks**

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

### **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 424739002 (CAPA-17133356) 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****Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will

always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

### **Method/Analysis Information**

**Product:** Ion Chromatography  
**Analytical Batch:** 1671680 **Method:** WSP-ANIONS

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424747001	CAWA-17-133332
1203805353	Method Blank (MB)
1203805354	Laboratory Control Sample (LCS)
1203805355	424735002(CAWA-17-134176) Sample Duplicate (DUP)
1203805356	424735002(CAWA-17-134176) Post Spike (PS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

#### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

#### **Continuing Calibration Blanks**

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

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

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

#### **Y Intercept Rule**

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

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

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

The MB analyzed with this SDG met the acceptance criteria.

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

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

Sample 424735002 (CAWA-17-134176) 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 1203805355 (CAWA-17-134176DUP) and 1203805356 (CAWA-17-134176PS) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

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

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

### **Miscellaneous Information**

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

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

#### **Manual Integrations**

Samples 1203805355 (CAWA-17-134176DUP), 1203805356 (CAWA-17-134176PS) and 424747001 (CAWA-17-133332) 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**

<b>Product:</b>	<b>Ammonia Nitrogen</b>		
<b>Analytical Batch:</b>	1671935	<b>Method:</b>	NH3
<b>Prep Batch :</b>	1671933	<b>Method:</b>	EPA 350.1 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424747001	CAWA-17-133332
1203806101	Method Blank (MB)
1203806102	Laboratory Control Sample (LCS)
1203806103	424741001(CAPA-17-133353) Sample Duplicate (DUP)
1203806104	424741001(CAPA-17-133353) Matrix Spike (MS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Calibration Verification Information**

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

### **Continuing Calibration Blanks**

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

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

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



acceptance limits.

**Y Intercept Rule**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample 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 424741001 (CAPA-17-133353) was selected for QC analysis.

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

<b>Product:</b>	<b>Total Kjeldahl Nitrogen</b>		
<b>Analytical Batch:</b>	1671942	<b>Method:</b>	TKN
<b>Prep Batch :</b>	1671941	<b>Method:</b>	EPA 351.2 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424747005	CAWA-17-134190
1203806126	Method Blank (MB)
1203806127	Laboratory Control Sample (LCS)
1203806128	424741002(CAPA-17-133355) Sample Duplicate (DUP)
1203806129	424741002(CAPA-17-133355) Matrix Spike (MS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Calibration Verification Information**

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

### **Continuing Calibration Blanks**

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

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

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

acceptance limits.

**Y Intercept Rule**

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

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

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Sample 424741002 (CAPA-17-133355) was selected for QC analysis.

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

Samples 1203806126 (MB) and 1203806127 (LCS) were re-analyzed due to instrument failure. The results from the reanalysis are reported.

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** Nitrate Nitrite by Cadmium Reduction

**Analytical Batch:** 1671832

**Method:** NO3NO2

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424747001	CAWA-17-133332
1203805863	Method Blank (MB)
1203805864	Laboratory Control Sample (LCS)
1203805866	424735002(CAWA-17-134176) Sample Duplicate (DUP)
1203805867	424853003(NonSDG) Sample Duplicate (DUP)
1203805871	424735002(CAWA-17-134176) Post Spike (PS)
1203805872	424853003(NonSDG) Post Spike (PS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

#### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

#### **Calibration Verification Information**

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

#### **Continuing Calibration Blanks**

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

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

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

acceptance limits.

**Y Intercept Rule**

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

**Quality Control (QC) Information**

**Method Blank (MB) Statement**

The MB analyzed with this SDG met the acceptance criteria.

**Laboratory Control Sample Duplicate (LCSD)**

An LCSD was not used in place of matrix QC.

**Laboratory Control Sample (LCS) Recovery**

The LCS spike recovery met the acceptance limits.

**Quality Control (QC) Designation**

Samples 424735002 (CAWA-17-134176) and 424853003 (NonSDG) were selected for QC analysis.

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Preservation/Integrity**

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

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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



### **Method/Analysis Information**

<b>Product:</b>	<b>Total Phosphorus</b>		
<b>Analytical Batch:</b>	1671937	<b>Method:</b>	PO4
<b>Prep Batch :</b>	1671936	<b>Method:</b>	EPA 365.4 Prep

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424747001	CAWA-17-133332
1203806112	Method Blank (MB)
1203806113	Laboratory Control Sample (LCS)
1203806120	424735002(CAWA-17-134176) Sample Duplicate (DUP)
1203806121	424735002(CAWA-17-134176) Matrix Spike (MS)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Continuing Calibration Blanks**

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

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

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

### **Y Intercept Rule**

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

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

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

The MB analyzed with this SDG met the acceptance criteria.

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

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

Sample 424735002 (CAWA-17-134176) 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**

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

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

##### **Additional Comments**

Additional comments were not required for this SDG.

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

This data package was generated using an electronic data processing program referred to as virtual packaging. In an

effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

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

### **Method/Analysis Information**

**Product:** Solids and Total Dissolved

**Analytical Batch:** 1672860

**Method:** TDS

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424747001	CAWA-17-133332
1203808586	Method Blank (MB)
1203808587	Laboratory Control Sample (LCS)
1203808588	424735002(CAWA-17-134176) 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 424735002 (CAWA-17-134176) was selected for QC analysis.

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** Specific Conductivity

**Analytical Batch:** 1671823

**Method:** EPA120.1 Specific Conductivity

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424747001	CAWA-17-133332
1203805834	Laboratory Control Sample (LCS)
1203805835	424596002(CAWA-17-133306) Sample Duplicate (DUP)
1203805836	424747001(CAWA-17-133332) Sample Duplicate (DUP)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Initial Standardization**

The titrant was properly standardized

### **Calibration Verification Information**

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

### **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 424596002 (CAWA-17-133306) and 424747001 (CAWA-17-133332) 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****Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** pH

**Analytical Batch:** 1671988 **Method:** PH

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424747001	CAWA-17-133332
1203806295	Laboratory Control Sample (LCS)
1203806297	424747001(CAWA-17-133332) Sample Duplicate (DUP)

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

### **SOP Reference**

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

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

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

### **Calibration Information**

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

### **Initial Calibration**

All initial calibration requirements have been met for this SDG.

### **Initial Standardization**

The titrant was properly standardized

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

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

An LCSD was not used in place of matrix QC.

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

The LCS spike recovery met the acceptance limits.

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

Sample 424747001 (CAWA-17-133332) 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
1203806297 (CAWA-17-133332DUP)	pH	Received 06-JUN-17, out of holding 02-JUN-17
424747001 (CAWA-17-133332)	pH	Received 06-JUN-17, out of holding 02-JUN-17

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

A data exception report (DER) 1640886 was generated for samples 424747001 (CAWA-17-133332) and 1203806297 (CAWA-17-133332DUP) in this SDG/batch.

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

### **Method/Analysis Information**

**Product:** Alkalinity

**Analytical Batch:** 1671987      **Method:** EPA 310.1 Total Alkalinity

### **Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
424747001	CAWA-17-133332
1203806283	Laboratory Control Sample (LCS)
1203806285	424747001(CAWA-17-133332) Sample Duplicate (DUP)
1203806287	424747001(CAWA-17-133332) 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 424747001 (CAWA-17-133332) was selected for QC analysis.

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

**Certification Statement**

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

## **GEL LABORATORIES LLC**

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

### **Qualifier Definition Report for**

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

Client SDG: 2017-1649 GEL Work Order: 424747


#### **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:** 14 JUN 2017

**Title:** Analyst I

# Sample Data Summary

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: June 14, 2017

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

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

Client SDG: 2017-1649

Client Sample ID: CAWA-17-133332  
Sample ID: 424747001  
Matrix: W  
Collect Date: 02-JUN-17 13:33  
Receive Date: 06-JUN-17  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	U	ND	0.067	0.200	mg/L		1	MXL2	06/07/17	0201	1671680	1
Chloride		1.38	0.067	0.200	mg/L		1					
Fluoride	J	0.0867	0.033	0.100	mg/L		1					
Sulfate		5.39	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia		0.0951	0.017	0.050	mg/L	1.00	1	KLP1	06/09/17	1018	1671935	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.736	0.017	0.050	mg/L		1	AXH3	06/09/17	1016	1671832	3
PO4 "As Received"												
Phosphorus, Total as P		0.057	0.020	0.050	mg/L	1.00	1	KLP1	06/09/17	1334	1671937	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		136	3.40	14.3	mg/L			KLP1	06/09/17	1546	1672860	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity "As Received"												
Alkalinity, Total as CaCO3		58.6	1.45	4.00	mg/L			RXB5	06/09/17	1358	1671987	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		157	1.00	1.00	umhos/cm		1	VH1	06/08/17	1104	1671823	7
PH "As Received"												
pH at Temp 12.4C	H	8.04	0.010	0.100	SU		1	RXB5	06/09/17	1356	1671988	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	06/08/17	1545	1671933
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	06/08/17	1700	1671936

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: June 14, 2017

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

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

Client SDG: 2017-1649

Client Sample ID: CAWA-17-133332  
Sample ID: 424747001

Project: ESHL00114  
Client ID: ARSL004

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

### Notes:

#### Column headers are defined as follows:

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

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: June 14, 2017

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

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

Client SDG: 2017-1649

Client Sample ID: CAWA-17-134190  
Sample ID: 424747005  
Matrix: W  
Collect Date: 02-JUN-17 13:33  
Receive Date: 06-JUN-17  
Collector: Client

Project: ESHL00114  
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis												
SW 9060 Total Organic Carbon "As Received"												
Total Organic Carbon Average	J	0.673	0.330	1.00	mg/L		1	TSM	06/12/17	1305	1671529	1
Flow Injection Analysis												
WSP-CN(T) "As Received"												
Cyanide, Total	U	ND	1.67	5.00	ug/L	1.00	1	AXH3	06/07/17	1013	1671534	2
Nutrient Analysis												
TKN "As Received"												
Nitrogen, Total Kjeldahl		0.403	0.033	0.100	mg/L	1.00	1	KLP1	06/09/17	1517	1671942	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	06/07/17	0842	1671533
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	06/08/17	1700	1671941

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

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

## QC Summary

Report Date: June 14, 2017

Page 1 of 6

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

Contact: Mr. Keith Greene

Workorder: 424747

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Carbon Analysis</b>											
Batch	1671529										
QC1203805984	424739002	DUP									
Total Organic Carbon Average		J	0.455	J	0.416	mg/L	8.96	^	(+/-1.00)	TSM	06/09/17 03:57
QC1203805982	LCS										
Total Organic Carbon Average	10.0				10.6	mg/L			106	(80%-120%)	06/09/17 00:26
QC1203805983	LCSD										
Total Organic Carbon Average	10.0				10.6	mg/L	0.595		106	(0%-20%)	06/09/17 00:38
QC1203805981	MB										
Total Organic Carbon Average				U	ND	mg/L					06/09/17 00:15
QC1203805986	424739002	PS									
Total Organic Carbon Average	10.0	J	0.455		11.6	mg/L			111	(75%-125%)	06/09/17 04:44
<b>Flow Injection Analysis</b>											
Batch	1671534										
QC1203805010	424739002	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A			AXH3	06/07/17 10:01
QC1203805009	LCS										
Cyanide, Total	50.0				51.6	ug/L			103	(90%-110%)	06/07/17 09:48
QC1203805008	MB										
Cyanide, Total				U	ND	ug/L					06/07/17 09:47
QC1203805012	424739002	MS									
Cyanide, Total	100	U	ND		106	ug/L			106	(90%-110%)	06/07/17 10:02

# GEL LABORATORIES LLC

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

## QC Summary

Workorder: 424747

Page 2 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1671680										
QC1203805355	424735002	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MXL2	06/06/17	20:43
Chloride			15.2		15.2	mg/L	0.0289	(0%-20%)		06/08/17	04:23
Fluoride			0.161		0.160	mg/L	1.06 ^	(+/-0.100)		06/06/17	20:43
Sulfate			7.13		6.96	mg/L	2.31	(0%-20%)			
QC1203805354	LCS										
Bromide	1.25				1.23	mg/L		98.5 (80%-120%)		06/06/17	19:45
Chloride	5.00				4.61	mg/L		92.3 (80%-120%)			
Fluoride	2.50				2.37	mg/L		94.9 (80%-120%)			
Sulfate	10.0				9.58	mg/L		95.8 (80%-120%)			
QC1203805353	MB										
Bromide			U		ND	mg/L				06/06/17	19:17
Chloride			U		ND	mg/L					
Fluoride			U		ND	mg/L					
Sulfate			U		ND	mg/L					
QC1203805356	424735002	PS									
Bromide	1.25	U	ND		1.23	mg/L		98.8 (75%-125%)		06/06/17	21:12
Chloride	5.00		7.60		13.1	mg/L		111 (75%-125%)		06/08/17	04:52

# GEL LABORATORIES LLC

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

## QC Summary

Workorder: 424747

Page 3 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch	1671680										
Fluoride	2.50	0.161		2.50	mg/L		93.4	(75%-125%)	MXL2	06/06/17	21:12
Sulfate	10.0	7.13		17.2	mg/L		101	(75%-125%)			

### Nutrient Analysis

Batch	1671832										
QC1203805866	424735002	DUP									
Nitrogen, Nitrate/Nitrite		J	0.0222	J	0.0219	mg/L	1.36	^	(+/-0.050)	AXH3	06/09/17 10:00
QC1203805867	424853003	DUP									
Nitrogen, Nitrate/Nitrite			1.12		1.11	mg/L	0.897		(0%-20%)		06/09/17 10:28
QC1203805864	LCS										
Nitrogen, Nitrate/Nitrite			1.00		0.997	mg/L			99.7	(90%-110%)	06/09/17 09:52
QC1203805863	MB										
Nitrogen, Nitrate/Nitrite				U	ND	mg/L					06/09/17 09:51
QC1203805871	424735002	PS									
Nitrogen, Nitrate/Nitrite			1.00	J	0.0222	mg/L			99.8	(90%-110%)	06/09/17 10:01
QC1203805872	424853003	PS									
Nitrogen, Nitrate/Nitrite			1.00		1.12	mg/L			92	(90%-110%)	06/09/17 10:29
Batch	1671935										
QC1203806103	424741001	DUP									
Nitrogen, Ammonia			0.0858		0.0733	mg/L	15.7	^	(+/-0.050)	KLP1	06/09/17 10:13
QC1203806102	LCS										
Nitrogen, Ammonia			1.00		1.01	mg/L			101	(90%-110%)	06/09/17 10:02
QC1203806101	MB										
Nitrogen, Ammonia				J	0.0385	mg/L					06/09/17 10:01

# GEL LABORATORIES LLC

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

## QC Summary

Workorder: 424747

Page 4 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Nutrient Analysis</b>											
Batch	1671935										
QC1203806104	424741001	MS									
Nitrogen, Ammonia	1.00	0.0858		1.03	mg/L		94.4	(90%-110%)	KLP1	06/09/17	10:14
Batch	1671937										
QC1203806120	424735002	DUP									
Phosphorus, Total as P		0.0744		0.0757	mg/L	1.73	^	(+/-0.050)	KLP1	06/09/17	13:20
QC1203806113	LCS										
Phosphorus, Total as P	1.00			0.848	mg/L			(80%-124%)		06/09/17	13:07
QC1203806112	MB										
Phosphorus, Total as P			U	ND	mg/L					06/09/17	13:06
QC1203806121	424735002	MS									
Phosphorus, Total as P	1.00	0.0744		1.03	mg/L			(63%-139%)		06/09/17	13:21
Batch	1671942										
QC1203806128	424741002	DUP									
Nitrogen, Total Kjeldahl		0.336		0.308	mg/L	8.7	^	(+/-0.100)	KLP1	06/09/17	15:06
QC1203806127	LCS										
Nitrogen, Total Kjeldahl	1.00			0.953	mg/L			(90%-110%)		06/09/17	15:14
QC1203806126	MB										
Nitrogen, Total Kjeldahl			J	0.0715	mg/L					06/09/17	15:13
QC1203806129	424741002	MS									
Nitrogen, Total Kjeldahl	1.00	0.336		1.35	mg/L			(90%-110%)		06/09/17	15:07
<b>Solids Analysis</b>											
Batch	1672860										
QC1203808588	424735002	DUP									
Total Dissolved Solids		141		139	mg/L	2.04		(0%-5%)	KLP1	06/09/17	15:46

# GEL LABORATORIES LLC

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

## QC Summary

Workorder: 424747

Page 5 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Solids Analysis</b>											
Batch	1672860										
QC1203808587	LCS										
Total Dissolved Solids	300			287	mg/L		95.7	(95%-105%)	KLP1	06/09/17	15:46
QC1203808586	MB										
Total Dissolved Solids			U	ND	mg/L					06/09/17	15:46
<b>Titration and Ion Analysis</b>											
Batch	1671823										
QC1203805835	424596002	DUP									
Conductivity			236	233	umhos/cm	1.28		(0%-10%)	VH1	06/08/17	10:57
QC1203805836	424747001	DUP									
Conductivity			157	156	umhos/cm	0.639		(0%-10%)		06/08/17	11:04
QC1203805834	LCS										
Conductivity	1410			1400	umhos/cm		99.2	(95%-105%)		06/08/17	10:45
Batch	1671987										
QC1203806285	424747001	DUP									
Alkalinity, Total as CaCO3			58.6	59.0	mg/L	0.68		(0%-20%)	RXB5	06/09/17	13:58
Carbonate alkalinity (CaCO3)		U	ND	U	ND	mg/L	N/A				
QC1203806283	LCS										
Alkalinity, Total as CaCO3	100			108	mg/L		108	(90%-110%)		06/09/17	13:09
QC1203806287	424747001	MS									
Alkalinity, Total as CaCO3	100		58.6	165	mg/L		107	(80%-120%)		06/09/17	13:59
Batch	1671988										
QC1203806297	424747001	DUP									
pH		H	8.04	H	8.04	SU	0	(0%-5%)	RXB5	06/09/17	13:59

# GEL LABORATORIES LLC

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

## QC Summary

Workorder: 424747

Page 6 of 6

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration and Ion Analysis											
Batch	1671988										
QC1203806295	LCS										
pH	7.00			7.01	SU		100	(99%-101%)	RXB5	06/09/17	13:08

### 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
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- R Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes.
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- d 5-day BOD--The 2:1 depletion requirement was not met for this sample
- e 5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes
- h Preparation or preservation holding time was exceeded

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

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

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

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

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

# Miscellaneous



### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 10-JUN-17	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> ELECTRODE	<b>Test / Method:</b> EPA 150.1, SW846 9040C	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL, GELC
<b>Batch ID:</b> 1671988	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG):</b> 424296,424297,424596(2017-1633),424735(2017-1647),424739(2017-1645),424741(2017-1644),424747(2017-1649) <b>Application Issues:</b> Sample received out of holding Sample Logged out of Holding			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
1. Sample Logged out of Holding: 424296 001  2. Sample received out of holding: 424297 001 424596 002,003,007,010 424735 002,004 424739 001 424741 001,003,006,008,009 424747 001 QC 1203806296DUP,1203806297DUP		1. Sample (See Below) was logged in for this analysis outside of the method specified holding time. The data is qualified. 424296001 (Rad Pyridine 7647) [Logged 30-MAY-17, out of holding 30-MAY-17].  2. Samples (See Below) were received by the laboratory outside of the method specified holding time. The data is qualified. 1203806296 (CAWA-17-133306DUP) [Received 02-JUN-17, out of holding 31-MAY-17]. 1203806297 (CAWA-17-133332DUP) [Received 06-JUN-17, out of holding 02-JUN-17]. 424297001 (Non-Rad Pyridine 7856) [Received 30-MAY-17, out of holding 30-MAY-17]. 424596002 (CAWA-17-133306) [Received 02-JUN-17, out of holding 31-MAY-17]. 424596003 (CAWA-17-133334) [Received 02-JUN-17, out of holding 31-MAY-17]. 424596007 (CAWA-17-134191) [Received 02-JUN-17, out of holding 31-MAY-17]. 424596010 (CAWA-17-133316) [Received 02-JUN-17, out of holding 31-MAY-17]. 424735002 (CAWA-17-134176) [Received 06-JUN-17, out of holding 02-JUN-17]. 424735004 (CAWA-17-133309) [Received 06-JUN-17, out of holding 02-JUN-17]. 424739001 (CAPA-17133354) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741001 (CAPA-17-133353) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741003 (CAPA-17-133360) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741006 (CAWA-17-133318) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741008 (CAPA-17-133358) [Received 06-JUN-17, out of holding 01-JUN-17]. 424741009 (CAPA-17-133359) [Received 06-JUN-17, out of holding 01-JUN-17]. 424747001 (CAWA-17-133332) [Received 06-JUN-17, out of holding 02-JUN-17].	

**Originator's Name:**

Rachael Bell 10-JUN-17

**Data Validator/Group Leader:**

Elzbieta Szulc 12-JUN-17

**Originator's Name:**

Rachael Bell 10-JUN-17

**Data Validator/Group Leader:**

Elzbieta Szulc 12-JUN-17

# **Radiological Analysis**

# Case Narrative

**Radiochemistry  
Technical Case Narrative  
ARS International, LLC (ARSL)  
SDG #: 2017-1649  
Work Order #: 424747**

**Method/Analysis Information**

**Product:** Alphaspec Am241 Liquid

Analytical Method: HASL-300:AM-241

Analytical Batch Number: 1672176

<b>Sample ID</b>	<b>Client ID</b>
424747005	CAWA-17-134190
1203806727	Method Blank (MB)
1203806729	Laboratory Control Sample (LCS)
1203806728	424747005(CAWA-17-134190) 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 June 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 1203806727 (MB) and 1203806729 (LCS) were changed to 1.0 per client request.

**QC Information**

All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Miscellaneous Information section.

**Designated QC**

The following sample was used for QC: 424747005 (CAWA-17-134190). The QC was from ARSL work order 424747.

**CSU**

The blank result is less than 1.65 times the CSU.

**Tracers Met**

The tracer yield requirement of 15-125%, or the client's contract acceptance criteria, were met.

**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.

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

A data exception report (DER) 1641818 was generated for samples 1203806728 (CAWA-17-134190DUP) and 424747005 (CAWA-17-134190) in this SDG/batch. DER 1641818 was generated due to RDL less than MDA. 1. Samples 424747005 and 1203806728 did not meet the Am-241 detection limit due to the small sample aliquots used. 1. The sample aliquots were reduced due to the matrix of the sample. The samples contained sediment and are cloudy. The samples were counted the maximum count time of 1000 minutes in order to achieve the lowest possible MDAs. Reporting results.

**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**

The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**

The blank result is greater than the decision level but less than the MDC.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** ISOPU  
**Analytical Method:** HASL-300:ISOPU  
**Analytical Batch Number:** 1672177

<b>Sample ID</b>	<b>Client ID</b>
424747005	CAWA-17-134190
1203806730	Method Blank (MB)
1203806732	Laboratory Control Sample (LCS)
1203806731	424747005(CAWA-17-134190) 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 June 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 1203806730 (MB) and 1203806732 (LCS) were changed to 1.0 per client request.

##### **QC Information**

All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Miscellaneous Information section.

##### **Designated QC**

The following sample was used for QC: 424747005 (CAWA-17-134190). The QC was from ARSL work order 424747.

##### **CSU**

The blank result is less than 1.65 times the CSU.

##### **Tracers Met**

The tracer yield requirement of 15-125%, or the client's contract acceptance criteria, were met.

##### **RDL Met**

Refer to Miscellaneous Information section.

**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.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**

A data exception report (DER) 1641809 was generated for samples 1203806731 (CAWA-17-134190DUP) and 424747005 (CAWA-17-134190) in this SDG/batch. DER 1641809 was generated due to RDL less than MDA and Other. 1. Samples 424747005 and 1203806731 did not meet the Pu-238 and Pu-239/240 detection limits due to the small sample aliquots used. 2. Sample 424747005 does not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer. 1. The sample aliquots were reduced due to the matrix of the sample. The samples contained sediment and was cloudy. The samples were counted the maximum count time of 1000 minutes in order to achieve the lowest possible MDAs. Reporting results. 2. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.

**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**

The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

<b>Product:</b>	<b>IsoU</b>
Analytical Method:	HASL-300:ISOU
Analytical Batch Number:	1672178

<b>Sample ID</b>	<b>Client ID</b>
------------------	------------------



424747005	CAWA-17-134190
1203806733	Method Blank (MB)
1203806735	Laboratory Control Sample (LCS)
1203806734	424747005(CAWA-17-134190) 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 June 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 1203806733 (MB) and 1203806735 (LCS) were changed to 1.0 per client request.

##### **QC Information**

All of the QC samples met the required acceptance limits.

##### **Designated QC**

The following sample was used for QC: 424747005 (CAWA-17-134190). The QC was from ARSL work order 424747.

##### **CSU**

The blank 1203806733 (MB) result for U-233/234, U-235/236, and U-238 are greater than 1.65 times the CSU but less than the MDC.

##### **Tracers Met**

The tracer yield requirement of 15-125%, or the client's contract acceptance criteria, were met.

##### **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.

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

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

**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**

The MDCs (and Lc if requested) are calculated using a blank population.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** Gammaspec

Analytical Method: EPA:901.1

Analytical Batch Number: 1671920

<b>Sample ID</b>	<b>Client ID</b>
424747005	CAWA-17-134190
1203806065	Method Blank (MB)
1203806067	Laboratory Control Sample (LCS)
1203806066	424747005(CAWA-17-134190) 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 2016, March 2017 and October 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**

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

**QC Information**

All of the QC samples met the required acceptance limits.

**Designated QC**

The following sample was used for QC: 424747005 (CAWA-17-134190). The QC was from ARSL work order 424747.

**CSU**

The blank result is less than 1.65 times the CSU.

**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.

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

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

**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.

**Blank Decision Level**

The blank result is less than the decision level.

### Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
UI	Results are considered a false positive due to high counting uncertainty.	Cesium-137	424747005	CAWA-17-134190

### Method/Analysis Information

**Product:** GFPC, Sr90, liquid

Analytical Method: EPA:905.0

Analytical Batch Number: 1671753

Sample ID	Client ID
424747005	CAWA-17-134190
1203805583	Method Blank (MB)
1203805586	Laboratory Control Sample (LCS)
1203805584	424596007(CAWA-17-134191) Sample Duplicate (DUP)
1203805585	424596007(CAWA-17-134191) 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-RAD-A-004 REV# 18.

### 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 1203805583 (MB) and 1203805586 (LCS) were changed to 1.0 per client request.

**QC Information**

All of the QC samples met the required acceptance limits.

**Designated QC**

The following sample was used for QC: 424596007 (CAWA-17-134191). The QC was from ARSL work order 424596.

**CSU**

The blank result is less than 1.65 times the CSU.

**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.

**Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

**Recounts**

Sample 1203805583 (MB) was recounted due to a suspected blank false positive. The recount is reported.

Sample 1203805584 (CAWA-17-134191DUP) was recounted due to a suspected false positive. The recount is reported.

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

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

**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.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier Information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:**

**WSP-GrossA/B**

Analytical Method:

EPA 900.0/SW846 9310

Analytical Batch Number: 1671754

<b>Sample ID</b>	<b>Client ID</b>
424747005	CAWA-17-134190
1203805587	Method Blank (MB)
1203805591	Laboratory Control Sample (LCS)
1203805588	424596007(CAWA-17-134191) Sample Duplicate (DUP)
1203805589	424596007(CAWA-17-134191) Matrix Spike (MS)
1203805590	424596007(CAWA-17-134191) 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 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 1203805587 (MB) and 1203805591 (LCS) were changed to 1.0 per client request.

##### **QC Information**

All of the QC samples met the required acceptance limits.

##### **Designated QC**

The following sample was used for QC: 424596007 (CAWA-17-134191). The QC was from ARSL work order 424596.

##### **CSU**

The blank result is less than 1.65 times the CSU.

#### **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.

**Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

**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 1203805591 (LCS) was recounted due to high recovery. The recount is reported.

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

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

**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, 1203805589 (CAWA-17-134191MS) and 1203805590 (CAWA-17-134191MSD), aliquots were reduced to conserve sample volume.

**Blank Decision Level**

The blank result is less than the decision level.

**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.

## GEL LABORATORIES LLC

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

### Qualifier Definition Report for

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

Client SDG: 2017-1649 GEL Work Order: 424747

#### 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.
- UI Gamma Spectroscopy--Uncertain identification

#### 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: Heather McCarty

Date: 14 JUN 2017

Title: Analyst II



### DATA EXCEPTION REPORT

<b>Mo.Day Yr.</b> 14-JUN-17	<b>Division:</b> Radiochemistry	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> ALPHA SPECTROMETER	<b>Test / Method:</b> DOE EML HASL-300, Pu-11-RC Modified	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1672177	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 424747(2017-1649)</b> <b>Application Issues:</b> RDL less than MDA Other			
<b>Specification and Requirements</b> <b>Exception Description:</b>		<b>DER Disposition:</b>	
1. Samples 424747005 and 1203806731 did not meet the Pu-238 and Pu-239/240 detection limits due to the small sample aliquots used.  2. Sample 424747005 does not meet the resolution requirement of having a full width half maximum of 100 keV or less for the Pu-242 tracer.		1. The sample aliquots were reduced due to the matrix of the sample. The samples contained sediment and was cloudy. The samples were counted the maximum count time of 1000 minutes in order to achieve the lowest possible MDAs. Reporting results.  2. The sample does meet the tracer yield requirement, the detection limits, and its tracer peak is within the Pu-242 region of interest. Reporting results.	

**Originator's Name:**

Melanie Aycock 14-JUN-17

**Data Validator/Group Leader:**

Jessica Downey 14-JUN-17

DATA EXCEPTION REPORT			
<b>Mo.Day Yr.</b> 14-JUN-17	<b>Division:</b> Radiochemistry	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> ALPHA SPECTROMETER	<b>Test / Method:</b> DOE EML HASL-300, Am-05-RC Modified	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> ESHL
<b>Batch ID:</b> 1672176	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 424747(2017-1649)</b> <b>Application Issues:</b> RDL less than MDA			
<b>Specification and Requirements</b>		<b>DER Disposition:</b>	
<b>Exception Description:</b>			
1. Samples 424747005 and 1203806728 did not meet the Am-241 detection limit due to the small sample aliquots used.		1. The sample aliquots were reduced due to the matrix of the sample. The samples contained sediment and are cloudy. The samples were counted the maximum count time of 1000 minutes in order to achieve the lowest possible MDAs. Reporting results.	

**Originator's Name:**  
Melanie Aycock 14-JUN-17

**Data Validator/Group Leader:**  
Jessica Downey 14-JUN-17

# **Sample Data Summary**

# 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-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Contact: Mr. Keith Greene

Project: LANL- WQH Water Samples

Report Date: June 14, 2017

Client Sample ID: CAWA-17-134190  
Sample ID: 424747005  
Matrix: W  
Collect Date: 02-JUN-17  
Receive Date: 06-JUN-17  
Collector: Client

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

*Alphaspec Am241 Liquid "As Received"*

Americium-241	U	0.0485	+/-0.0182	0.0809	0.0339	+/-0.0183	0.050	pCi/L			HAKB	06/13/17	1435	1672176	1
<i>ISOPU "As Received"</i>															
Plutonium-238	U	0.0256	+/-0.0135	0.073	0.0307	+/-0.0135	0.050	pCi/L			HAKB	06/13/17	1435	1672177	2
Plutonium-239/240	U	-0.00427	+/-0.0128	0.0774	0.0329	+/-0.0128	0.050	pCi/L							
<i>IsoU "As Received"</i>															
Uranium-234		1.53	+/-0.0955	0.139	0.0617	+/-0.122	1.00	pCi/L			HAKB	06/13/17	1407	1672178	3
Uranium-235/236	U	0.0924	+/-0.0275	0.136	0.0581	+/-0.0279	1.00	pCi/L							
Uranium-238		1.35	+/-0.0907	0.144	0.0641	+/-0.113	0.500	pCi/L							

### Rad Gamma Spec Analysis

*Gammasespec "As Received"*

Cesium-137	UI	8.23	+/-3.35	4.84	2.16	+/-3.35	8.00	pCi/L			MJH1	06/12/17	0707	1671920	4
Cobalt-60	U	-1.04	+/-1.42	5.12	2.18	+/-1.44	8.00	pCi/L							
Neptunium-237	U	1.79	+/-2.63	9.85	4.61	+/-2.66		pCi/L							
Potassium-40	U	-29.1	+/-20.7	81.5	36.9	+/-21.8		pCi/L							
Sodium-22	U	1.37	+/-1.23	5.28	2.27	+/-1.27		pCi/L							

### Rad Gas Flow Proportional Counting

*GFPC, Sr90, liquid "As Received"*

Strontium-90	U	0.138	+/-0.102	0.339	0.164	+/-0.103	0.500	pCi/L			KSD1	06/10/17	1149	1671753	5
<i>WSP-GrossA/B "As Received"</i>															
Beta		6.65	+/-0.581	1.54	0.740	+/-0.841	3.00	pCi/L			LXB3	06/10/17	1122	1671754	6
Alpha		10.1	+/-1.87	2.89	0.973	+/-2.06	3.00	pCi/L			LXB3	06/12/17	1241	1671754	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"	1672176	75.9	(50%-105%)
Plutonium-242 Tracer	ISOPU "As Received"	1672177	88.7	(50%-105%)
Uranium-232 Tracer	IsoU "As Received"	1672178	78	(50%-105%)

# 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-03, SM271, Drop Pt. 02U, Rm111

Los Alamos, New Mexico 87545

Report Date: June 14, 2017

Contact: Mr. Keith Greene

Project: LANL- WQH Water Samples

Client Sample ID: CAWA-17-134190

Sample ID: 424747005

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				
Strontium Carrier		GFPC, Sr90, liquid "As Received"						1671753	86.5	(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

# **Quality Control Summary**

# GEL LABORATORIES LLC

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

## QC Summary

Report Date: June 14, 2017

Page 1 of 6

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

Los Alamos, New Mexico

Contact: Mr. Keith Greene

Workorder: 424747

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	1672176										
QC1203806728	424747005	DUP									
Americium-241	U	0.0485	U	0.00451	pCi/L	0.597		(0-1)	HAKB	06/13/17	14:35
	Uncert:	+/-0.0182		+/-0.0186							
	TPU:	+/-0.0183		+/-0.0186							
**Americium-243 Tracer	5.24	3.98		3.78	pCi/L		72.1	(50%-105%)			
	Uncert:	+/-0.159		+/-0.153							
	TPU:	+/-0.285		+/-0.279							
QC1203806729	LCS										
Americium-241	1.97			1.82	pCi/L		92.6	(80%-120%)	HAKB	06/13/17	14:35
	Uncert:			+/-0.0498							
	TPU:			+/-0.0913							
**Americium-243 Tracer	2.10			2.13	pCi/L		101	(50%-105%)			
	Uncert:			+/-0.0531							
	TPU:			+/-0.103							
QC1203806727	MB										
Americium-241			U	0.0113	pCi/L				HAKB	06/13/17	14:35
	Uncert:			+/-0.00742							
	TPU:			+/-0.00744							
**Americium-243 Tracer	2.10			1.82	pCi/L		86.8	(50%-105%)			
	Uncert:			+/-0.0583							
	TPU:			+/-0.108							
Batch	1672177										
QC1203806731	424747005	DUP									
Plutonium-238	U	0.0256	U	-0.0396	pCi/L	0.841		(0-1)	HAKB	06/13/17	14:35
	Uncert:	+/-0.0135		+/-0.0252							
	TPU:	+/-0.0135		+/-0.0253							
Plutonium-239/240	U	-0.00427	U	0.0248	pCi/L	0.386		(0-1)			
	Uncert:	+/-0.0128		+/-0.0248							
	TPU:	+/-0.0128		+/-0.0248							
**Plutonium-242 Tracer	4.92	4.37		4.04	pCi/L		82	(50%-105%)			
	Uncert:	+/-0.146		+/-0.156							
	TPU:	+/-0.249		+/-0.261							
QC1203806732	LCS										
Plutonium-238			U	0.0205	pCi/L			(80%-120%)	HAKB	06/13/17	14:35
	Uncert:			+/-0.00724							
	TPU:			+/-0.00728							
Plutonium-239/240	1.98			1.74	pCi/L		88.3	(80%-120%)			
	Uncert:			+/-0.0531							
	TPU:			+/-0.0878							
**Plutonium-242 Tracer	1.97			1.72	pCi/L		87.6	(50%-105%)			
	Uncert:			+/-0.0562							
	TPU:			+/-0.0968							

# GEL LABORATORIES LLC

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

## QC Summary

Workorder: 424747

Page 2 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	1672177										
QC1203806730	MB										
Plutonium-238			U	0.00149	pCi/L				HAKB	06/13/17	14:35
				Uncert:							
				TPU:							
Plutonium-239/240			U	0.00446	pCi/L						
				Uncert:							
				TPU:							
**Plutonium-242 Tracer	1.97			1.65	pCi/L		83.8	(50%-105%)			
				Uncert:							
				TPU:							
Batch	1672178										
QC1203806734	424747005	DUP									
Uranium-234		1.53		1.44	pCi/L	0.18		(0-1)	HAKB	06/13/17	14:07
		Uncert:		+/-0.0955							
		TPU:		+/-0.122							
Uranium-235/236		U	0.0924	0.165	pCi/L	0.524		(0-1)			
		Uncert:		+/-0.0275							
		TPU:		+/-0.0279							
Uranium-238		1.35		1.37	pCi/L	0.0484		(0-1)			
		Uncert:		+/-0.0907							
		TPU:		+/-0.113							
**Uranium-232 Tracer	5.22	4.07		4.00	pCi/L		76.6	(50%-105%)			
		Uncert:		+/-0.174							
		TPU:		+/-0.314							
QC1203806735	LCS										
Uranium-234				2.39	pCi/L				HAKB	06/13/17	14:07
		Uncert:		+/-0.0714							
		TPU:		+/-0.137							
Uranium-235/236				0.158	pCi/L						
		Uncert:		+/-0.0209							
		TPU:		+/-0.0223							
Uranium-238	2.70			2.61	pCi/L		96.7	(80%-120%)			
		Uncert:		+/-0.0742							
		TPU:		+/-0.148							
**Uranium-232 Tracer	2.09			2.07	pCi/L		99.3	(50%-105%)			
		Uncert:		+/-0.0663							
		TPU:		+/-0.122							
QC1203806733	MB										
Uranium-234			U	0.0206	pCi/L				HAKB	06/13/17	14:07
		Uncert:		+/-0.00823							
		TPU:		+/-0.00829							
Uranium-235/236			U	0.0153	pCi/L						
		Uncert:		+/-0.00804							
		TPU:		+/-0.00808							
Uranium-238			U	0.0185	pCi/L						
		Uncert:		+/-0.00682							
		TPU:		+/-0.00688							



# GEL LABORATORIES LLC

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

## QC Summary

Workorder: 424747

Page 3 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	1672178										
**Uranium-232 Tracer	2.09			1.85	pCi/L		88.6	(50%-105%)			
	Uncert:			+/-0.0662							
	TPU:			+/-0.122							
<b>Rad Gamma Spec</b>											
Batch	1671920										
QC1203806066	424747005	DUP									
Cesium-137	UI	8.23	U	1.25	pCi/L	0.709		(0-1)	MJH1	06/12/17	14:56
	Uncert:	+/-3.35		+/-1.55							
	TPU:	+/-3.35		+/-1.57							
Cobalt-60	U	-1.04	U	-1.06	pCi/L	0.00362		(0-1)			
	Uncert:	+/-1.42		+/-1.71							
	TPU:	+/-1.44		+/-1.73							
Neptunium-237	U	1.79	U	-1.22	pCi/L	0.274		(0-1)			
	Uncert:	+/-2.63		+/-2.83							
	TPU:	+/-2.66		+/-2.84							
Potassium-40	U	-29.1	U	-56.4	pCi/L	0.263		(0-1)			
	Uncert:	+/-20.7		+/-26.9							
	TPU:	+/-21.8		+/-30.0							
Sodium-22	U	1.37	U	1.07	pCi/L	0.0464		(0-1)			
	Uncert:	+/-1.23		+/-1.92							
	TPU:	+/-1.27		+/-1.93							
QC1203806067	LCS										
Americium-241	1.10E+05			1.15E+05	pCi/L		104	(80%-120%)	MJH1	06/12/17	14:58
	Uncert:			+/-1280							
	TPU:			+/-4660							
Cesium-137	42100			45000	pCi/L		107	(80%-120%)			
	Uncert:			+/-420							
	TPU:			+/-1160							
Cobalt-60	38200			38300	pCi/L		100	(80%-120%)			
	Uncert:			+/-454							
	TPU:			+/-933							
Neptunium-237			U	-59	pCi/L						
	Uncert:			+/-117							
	TPU:			+/-118							
Potassium-40			U	-26.8	pCi/L						
	Uncert:			+/-345							
	TPU:			+/-345							
Sodium-22			U	-24.8	pCi/L						
	Uncert:			+/-45.4							
	TPU:			+/-45.8							
QC1203806065	MB										
Cesium-137			U	-4.06	pCi/L				MJH1	06/12/17	07:07
	Uncert:			+/-2.58							
	TPU:			+/-2.74							
Cobalt-60			U	-0.327	pCi/L						
	Uncert:			+/-1.37							

# GEL LABORATORIES LLC

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

## QC Summary

Workorder: 424747

Page 4 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
<b>Rad Gamma Spec</b>											
Batch	1671920										
Neptunium-237	TPU:			+/-1.37							
			U	-0.76	pCi/L						
	Uncert:			+/-2.41							
Potassium-40	TPU:			+/-2.42							
			U	16.6	pCi/L						
	Uncert:			+/-33.9							
Sodium-22	TPU:			+/-33.9							
			U	0.669	pCi/L						
	Uncert:			+/-1.26							
	TPU:			+/-1.27							
<b>Rad Gas Flow</b>											
Batch	1671753										
QC1203805584	424596007	DUP									
Strontium-90	U	0.126	U	0.361	pCi/L	0.564		(0-1)	KSD1	06/12/17	12:27
	Uncert:	+/-0.0615		+/-0.143							
	TPU:	+/-0.0624		+/-0.146							
**Strontium Carrier	7.75	6.10		6.50	mg		83.9	(50%-105%)			
QC1203805586	LCS										
Strontium-90	21.9			24.5	pCi/L		112	(80%-120%)	KSD1	06/12/17	09:09
	Uncert:			+/-0.615							
	TPU:			+/-2.10							
**Strontium Carrier	7.75			5.30	mg		68.4	(50%-105%)			
QC1203805583	MB										
Strontium-90			U	0.101	pCi/L				KSD1	06/12/17	14:18
	Uncert:			+/-0.0861							
	TPU:			+/-0.0864							
**Strontium Carrier	7.75			7.10	mg		91.6	(50%-105%)			
QC1203805585	424596007	MS									
Strontium-90	438	U	0.126	428	pCi/L		97.8	(75%-125%)	KSD1	06/12/17	09:09
	Uncert:		+/-0.0615	+/-9.65							
	TPU:		+/-0.0624	+/-35.8							
**Strontium Carrier	7.75	6.10		7.50	mg		96.8	(50%-105%)			
Batch	1671754										
QC1203805588	424596007	DUP									
Alpha	U	-0.172	U	0.311	pCi/L	0.385		(0-1)	LXB3	06/12/17	12:41
	Uncert:	+/-0.325		+/-0.300							
	TPU:	+/-0.325		+/-0.302							
Beta	U	0.035	U	0.295	pCi/L	0.0822		(0-1)		06/09/17	11:59
	Uncert:	+/-0.788		+/-0.795							
	TPU:	+/-0.788		+/-0.795							
QC1203805591	LCS										
Alpha	12.1			11.1	pCi/L		91.8	(80%-120%)	LXB3	06/13/17	07:42
	Uncert:			+/-0.582							
	TPU:			+/-1.17							
Beta	43.8			47.8	pCi/L		109	(80%-120%)		06/09/17	11:59

# GEL LABORATORIES LLC

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

## QC Summary

Workorder: 424747

Page 5 of 6

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gas Flow											
Batch	1671754										
				Uncert:							
				TPU:							
QC1203805587	MB										
Alpha			U	0.102	pCi/L				LXB3	06/12/17	12:41
				Uncert:							
				TPU:							
Beta			U	-0.00971	pCi/L					06/09/17	11:59
				Uncert:							
				TPU:							
QC1203805589	424596007	MS									
Alpha	242	U	-0.172	251	pCi/L		104	(75%-125%)	LXB3	06/12/17	12:42
			Uncert:	+/-0.325							
			TPU:	+/-0.325							
Beta	875	U	0.035	1050	pCi/L		120	(75%-125%)		06/09/17	11:59
			Uncert:	+/-0.788							
			TPU:	+/-0.788							
QC1203805590	424596007	MSD									
Alpha	242	U	-0.172	237	pCi/L	0.153	97.9	(0-1)	LXB3	06/12/17	12:42
			Uncert:	+/-0.325							
			TPU:	+/-0.325							
Beta	875	U	0.035	973	pCi/L	0.22	111	(0-1)		06/09/17	11:59
			Uncert:	+/-0.788							
			TPU:	+/-0.788							

### 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.

# GEL LABORATORIES LLC

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

## QC Summary

Workorder: 424747

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.