

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4563 EVENT NAME: Ancho (MDA AB Monitoring)
Q2 MY2014 Sampling Event

SAMPLE ID: CAAN-14-54786 WORK ORDER:

	<u>AS</u> <u>PLANNED</u>	<u>AS</u> <u>COLLECTED</u>		<u>AS</u> <u>PLANNED</u>	<u>AS</u> <u>COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		03/12/2014	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):		1015	MEDIA:	UA	ok
PRS ID:		ok	SAMPLE TECH CODE:	UA	DC
LOCATION ID: R-29			FIELD PREP:	UF	ok
LOCATION TYPE:			FIELD QC TYPE:	FTB	
PORT: SINGLE COMPLETION			SAMPLE USAGE:	QC	

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
MB	WSP-8011-EDB_DBCP	40 ML SEPTUM AMBER GLASS	1	HCL MS 3/12/14	Y	MS
MS	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	1	HCL MS 3/12/14	Y	MS
	WSP-LL-8260B	40 ML SEPTUM AMBER GLASS	2	HCL MS 3/12/14		

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV

pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C

Turbidity _____ NTU

COLLECTED BY (PRINT)

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 3/12/14 1325	RECEIVED BY (Printed Name) (Signature)	Date/Time 3/12/14 1325
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 02/27/2014

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4563 EVENT NAME: Ancho (MDA AB Monitoring)
 Q2 MY2014 Sampling Event
 SAMPLE ID: CAAN-14-54788 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		03/12/2014	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):		1015	MEDIA:	UA	
PRS ID:		ok	SAMPLE TECH CODE:	UA	GSP
LOCATION ID: R-29			FIELD PREP:	UF	ok
LOCATION TYPE: MON			FIELD QC TYPE: REG		
PORT: SINGLE COMPLETION			SAMPLE USAGE: INV		

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
ms	MSGP-Hg	1 LITER POLY	1	HNO3	Y	ms
	WSP-8011-EDB_DBCP	40 ML SEPTUM AMBER GLASS	2	HCL 3/2/28/14 Vas2C3		
	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE ms 3/12/14		
	WSP-8310-PAH	1 LITER AMBER GLASS	2	ICE		
	WSP-8321A-NMED HEXP	1 LITER AMBER GLASS	2	ICE ms 3/12/14		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-GrossA/B	1 LITER POLY	1	HNO3		
	WSP-LL-8081A-HCB	1 LITER AMBER GLASS	2	ICE		
	WSP-LL-8151A-PCP	1 LITER AMBER GLASS	2	ICE		

Analyses continued on next page

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4563

EVENT NAME:

Ancho (MDA AB Monitoring)

Q2 MY2014 Sampling Event

SAMPLE ID: CAAN-14-54788

WORK ORDER: NA

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

NA

LOCATION COMMENTS:

diesel generator running 40' down road

FIELD PARAMETERS:

Dissolved Oxygen 8.17 mg/L Flow (in gpm) 7.3 GPM Oxidation-Reduction Potential 133.5 mV
 pH 8.10 SU Specific Conductance 129 uS/cm Temperature 18.21 deg C
 Turbidity 7.2 NTU

COLLECTED BY (PRINT)

M. Shabo, P. Feller

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 3/2/14 1325	RECEIVED BY (Printed Name) (Signature)	Date/Time 3/2/14 1325
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 02/27/2014

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4563 EVENT NAME: Ancho (MDA AB Monitoring)
 Q2 MY2014 Sampling Event
 SAMPLE ID: CAAN-14-54790 WORK ORDER: NA

	<u>AS</u> <u>PLANNED</u>	<u>AS COLLECTED</u>		<u>AS</u> <u>PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		03/12/2014	FIELD MATRIX:	WG	<i>sk</i>
TIME COLLECTED (HH:MM):		1015	MEDIA:	UA	
PRS ID:		<i>ok</i>	SAMPLE TECH CODE:	UA	<i>GSP</i>
LOCATION ID: R-29			FIELD PREP:	F	<i>sk</i>
LOCATION TYPE: MON			FIELD QC TYPE:	REG	
PORT: SINGLE COMPLETION			SAMPLE USAGE:	INV	

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
<i>WA</i>	WSP-All Metals	1 LITER POLY	1	HNO3 ICE	<i>Y</i>	<i>ms</i>
<i>1</i>	WSP-GENINORG+PerChlorate	1 LITER POLY	1	ICE	<i>Y</i>	<i>Y</i>
<i>1</i>	WSP-NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4	<i>Y</i>	<i>Y</i>

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Dissolved Oxygen _____ mg/L Flow (in gpm) _____ GPM Oxidation-Reduction Potential _____ mV
 pH _____ SU Specific Conductance _____ uS/cm Temperature _____ deg C
 Turbidity _____ NTU

COLLECTED BY (PRINT)

RELINQUISHED BY (Printed Name) <i>Michael + D. Feller</i> (Signature) <i>[Signature]</i>	Date/Time 3/12/14 1325	RECEIVED BY (Printed Name) <i>M. Martin</i> (Signature) <i>[Signature]</i>	Date/Time 3/12/14 1325
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 02/27/2014

DATA VALIDATION REPORT

Chain Of Custody No. 2014-2989

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
344588	EPA:120.1	1				
344588	EPA:150.1	1				
344588	EPA:160.1	1				
344588	EPA:245.2	2				
344588	EPA:300.0	1				
344588	EPA:310.1	1				
344588	EPA:335.4	1				
344588	EPA:350.1	1				
344588	EPA:351.2	1				
344588	EPA:353.2	1				
344588	EPA:365.4	1				
344588	EPA:900	1				
344588	EPA:901.1	1				
344588	EPA:905.0	1				
344588	HASL-300:AM-241	1				
344588	HASL-300:ISOPU	1				
344588	HASL-300:ISOU	1				
344588	SM:A2340B	1				
344588	SW-846:6010B	1				
344588	SW-846:6020	1				
344588	SW-846:6850	1				
344588	SW-846:8011	1		1		
344588	SW-846:8081A	1				
344588	SW-846:8151A	1				
344588	SW-846:8260B	1		1		
344588	SW-846:8270C	1				
344588	SW-846:8310	1				
344588	SW-846:8321A_MOD	1				
344588	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
344588	EPA:120.1	1375626	1375626	1										1			1				
344588	EPA:150.1	1376069	1376069	1										1			1				
344588	EPA:160.1	1373214	1373214	1					1					1			1				
344588	EPA:245.2	1376039	1376037	2					1	1				1			1				
344588	EPA:300.0	1371922	1371922	1					1					1			2				
344588	EPA:310.1	1373531	1373531	1					2	1				2			1				
344588	EPA:335.4	1372104	1372103	1					1	1				1			1				
344588	EPA:350.1	1373240	1373238	1					1	1				1			1				
344588	EPA:351.2	1373249	1373248	1					1	1				1			1				
344588	EPA:353.2	1373256	1373256	1					1					1			1				
344588	EPA:365.4	1373244	1373241	1					1	1				1			1				
344588	EPA:900	1374043	1374043	1					1	1	1			1			1				
344588	EPA:901.1	1372823	1372823	1					1					1			1				
344588	EPA:905.0	1374041	1374041	1					1	1				1			1				
344588	HASL-300:AM-241	1373330	1373330	1					1					1			1				
344588	HASL-300:ISOPU	1373331	1373331	1					1					1			1				
344588	HASL-300:ISOU	1373332	1373332	1					1					1			1				
344588	SM:A2340B	1379093	1379093	1																	
344588	SW-846:6010B	1372903	1372902	1					1	1				1			1				
344588	SW-846:6020	1372901	1372900	1					1	1				1			1				
344588	SW-846:6850	1372838	1372837	1					1	1	1			1							
344588	SW-846:8011	1372704	1372703	1		1			1					1	1						
344588	SW-846:8081A	1372943	1372942	1					1	1				1	1						
344588	SW-846:8151A	1372945	1372944	1					1	1				1	1						
344588	SW-846:8260B	1375561	1375561	1		1			2					4							
344588	SW-846:8270C	1372454	1372453	1					1	1	1			1							
344588	SW-846:8310	1373320	1373319	1					1	1				1	1						
344588	SW-846:8321A_MOD	1373604	1373603	1					1	1	1			1							
344588	SW-846:9060	1373397	1373397	1					1					1			1				

DATA VALIDATION REPORT

2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:120.1	GENERAL CHEMISTRY	CAAN-14-54790	344588007	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAWA-14-54768	1203057549	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1203057547	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAAN-14-54790	344588007	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAWA-14-54760	1203058583	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1203058582	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAAN-14-54790	344588007	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAWA-14-54761	1203051684	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1203051685	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1203051683	MB	1	0	0	0
EPA:245.2	INORGANIC	CAAN-14-54788	344588004	REG	1	0	0	0
EPA:245.2	INORGANIC	CAAN-14-54790	344588007	REG	1	0	0	0
EPA:245.2	INORGANIC	CAWA-14-54740	1203058502	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAWA-14-54740	1203058503	MS	0	0	1	0
EPA:245.2	INORGANIC	LCS	1203058501	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1203058500	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAAN-14-54790	344588007	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-14-54761	1203052102	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAWA-14-54785	1203048736	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1203048738	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1203048735	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAAN-14-54790	344588007	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-14-54756	1203052472	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAWA-14-54756	1203052473	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203052469	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1203053475	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	MB	1203052468	MB	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	MB	1203053474	MB	2	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAAN-14-54788	344588004	REG	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-14-54733	1203049221	DUP	1	0	0	0
EPA:335.4	GENERAL CHEMISTRY	CAWA-14-54733	1203049223	MS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	LCS	1203049225	LCS	0	0	1	0
EPA:335.4	GENERAL CHEMISTRY	MB	1203049220	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAAN-14-54790	344588007	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-14-54761	1203051756	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAWA-14-54761	1203051757	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1203051755	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1203051754	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	CAAN-14-54788	344588004	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-14-54740	1203051779	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAWA-14-54740	1203051780	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1203051778	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1203051777	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAAN-14-54790	344588007	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAWA-14-54770	1203051808	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1203051813	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1203051806	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAAN-14-54790	1203051762	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAAN-14-54790	1203051763	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAAN-14-54790	344588007	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1203051761	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1203051760	MB	1	0	0	0
EPA:900	RAD	CAAN-14-54788	344588004	REG	2	0	0	0
EPA:900	RAD	CAWA-14-54704	1203053745	DUP	2	0	0	0
EPA:900	RAD	CAWA-14-54704	1203053746	MS	0	0	2	0
EPA:900	RAD	CAWA-14-54704	1203053747	MSD	0	0	2	0
EPA:900	RAD	LCS	1203053748	LCS	0	0	2	0
EPA:900	RAD	MB	1203053744	MB	2	0	0	0
EPA:901.1	RAD	CAAN-14-54788	1203051018	DUP	5	0	0	0
EPA:901.1	RAD	CAAN-14-54788	344588004	REG	5	0	0	0
EPA:901.1	RAD	LCS	1203051019	LCS	0	0	3	0
EPA:901.1	RAD	MB	1203051017	MB	5	0	0	0
EPA:905.0	RAD	CAAN-14-54788	344588004	REG	1	0	0	0
EPA:905.0	RAD	CAPA-14-54777	1203053725	DUP	1	0	0	0
EPA:905.0	RAD	CAPA-14-54777	1203053726	MS	0	0	1	0
EPA:905.0	RAD	LCS	1203053727	LCS	0	0	1	0
EPA:905.0	RAD	MB	1203053724	MB	1	0	0	0
HASL-300:AM-241	RAD	CAAN-14-54788	344588004	REG	1	0	0	0
HASL-300:AM-241	RAD	CAWA-14-54740	1203051955	DUP	1	0	0	0
HASL-300:AM-241	RAD	LCS	1203051956	LCS	0	0	1	0
HASL-300:AM-241	RAD	MB	1203051954	MB	1	0	0	0
HASL-300:ISOPU	RAD	CAAN-14-54788	344588004	REG	2	0	0	0
HASL-300:ISOPU	RAD	CAWA-14-54740	1203051958	DUP	2	0	0	0
HASL-300:ISOPU	RAD	LCS	1203051959	LCS	0	0	1	0
HASL-300:ISOPU	RAD	MB	1203051957	MB	2	0	0	0
HASL-300:ISOU	RAD	CAAN-14-54788	344588004	REG	3	0	0	0
HASL-300:ISOU	RAD	CAWA-14-54740	1203051961	DUP	3	0	0	0
HASL-300:ISOU	RAD	LCS	1203051962	LCS	0	0	1	0

DATA VALIDATION REPORT

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
HASL-300:ISOU	RAD	MB	1203051960	MB	3	0	0	0
SM:A2340B	INORGANIC	CAAN-14-54790	344588007	REG	1	0	0	0
SW-846:6010B	INORGANIC	CAAN-14-54790	1203051201	DUP	17	0	0	0
SW-846:6010B	INORGANIC	CAAN-14-54790	1203051202	MS	0	0	17	0
SW-846:6010B	INORGANIC	CAAN-14-54790	344588007	REG	17	0	0	0
SW-846:6010B	INORGANIC	LCS	1203051200	LCS	0	0	17	0
SW-846:6010B	INORGANIC	MB	1203051199	MB	17	0	0	0
SW-846:6020	INORGANIC	CAAN-14-54790	1203051196	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAAN-14-54790	1203051197	MS	0	0	11	0
SW-846:6020	INORGANIC	CAAN-14-54790	344588007	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1203051195	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1203051194	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAAN-14-54790	344588007	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-14-54762	1203051048	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAWA-14-54762	1203051049	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1203051047	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1203051046	MB	1	0	0	0
SW-846:8011	VOC	CAAN-14-54786	344588008	FTB	2	1	0	0
SW-846:8011	VOC	CAAN-14-54788	344588001	REG	2	1	0	0
SW-846:8011	VOC	LCS	1203050726	LCS	0	1	2	0
SW-846:8011	VOC	LCSD	1203050727	LCSD	0	1	2	0
SW-846:8011	VOC	MB	1203050725	MB	2	1	0	0
SW-846:8081A	PESTPCB	CAAN-14-54788	1203051299	MS	0	2	1	0
SW-846:8081A	PESTPCB	CAAN-14-54788	344588005	REG	1	2	0	0
SW-846:8081A	PESTPCB	LCS	1203051298	LCS	0	2	1	0
SW-846:8081A	PESTPCB	LCSD	1203051301	LCSD	0	2	1	0
SW-846:8081A	PESTPCB	MB	1203051297	MB	1	2	0	0
SW-846:8151A	HERB	CAAN-14-54788	1203051304	MS	0	1	1	0
SW-846:8151A	HERB	CAAN-14-54788	344588006	REG	1	1	0	0
SW-846:8151A	HERB	LCS	1203051303	LCS	0	1	1	0
SW-846:8151A	HERB	LCSD	1203051308	LCSD	0	1	1	0
SW-846:8151A	HERB	MB	1203051302	MB	1	1	0	0
SW-846:8260B	VOC	CAAN-14-54786	344588009	FTB	78	3	0	0
SW-846:8260B	VOC	CAAN-14-54788	344588004	REG	78	3	0	0
SW-846:8260B	VOC	LCS	1203057407	LCS	0	3	68	0
SW-846:8260B	VOC	LCS	1203057408	LCS	0	3	10	0
SW-846:8260B	VOC	LCS	1203064498	LCS	0	3	68	0
SW-846:8260B	VOC	LCS	1203064499	LCS	0	3	10	0
SW-846:8260B	VOC	MB	1203057404	MB	78	3	0	0
SW-846:8260B	VOC	MB	1203064497	MB	78	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-846:8270C	SVOC	CAAN-14-54788	344588004	REG	60	6	0	0
SW-846:8270C	SVOC	CAWA-14-54749	1203050103	MS	0	6	56	0
SW-846:8270C	SVOC	CAWA-14-54749	1203050104	MSD	0	6	56	0
SW-846:8270C	SVOC	LCS	1203050102	LCS	0	6	56	0
SW-846:8270C	SVOC	MB	1203050101	MB	60	6	0	0
SW-846:8310	SVOC	CAAN-14-54788	344588002	REG	18	1	0	0
SW-846:8310	SVOC	CAWA-14-54740	1203051936	MS	0	1	18	0
SW-846:8310	SVOC	LCS	1203051935	LCS	0	1	18	0
SW-846:8310	SVOC	LCSD	1203053862	LCSD	0	1	18	0
SW-846:8310	SVOC	MB	1203051934	MB	18	1	0	0
SW-846:8321A_MOD	LCMS/MS HIGH	CAAN-14-54788	344588003	REG	20	2	0	0
SW-846:8321A_MOD	LCMS/MS HIGH	CAWA-14-54750	1203052666	MS	0	2	20	0
SW-846:8321A_MOD	LCMS/MS HIGH	CAWA-14-54750	1203052667	MSD	0	2	20	0
SW-846:8321A_MOD	LCMS/MS HIGH	LCS	1203052665	LCS	0	2	20	0
SW-846:8321A_MOD	LCMS/MS HIGH	MB	1203052664	MB	20	2	0	0
SW-846:9060	GENERAL CHEMISTRY	CAAN-14-54788	344588004	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAWA-14-54733	1203052109	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1203052113	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1203052108	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	1203051199	METHOD BLANK	SW-846:6010B	W	Cobalt	-1.03	J	ug/L	5.00

DATA VALIDATION REPORT

Blank FS ID	Blank Lab Sample	Blank Type	Analytical Method	Sample	Parameter Name	Blank Lab Result	Lab Qualifier	Blank Lab Units	Blank Lab Detection Limit
MB	1203051199	METHOD BLANK	SW-846:6010B	W	Iron	95.3	J	ug/L	100
MB	1203051199	METHOD BLANK	SW-846:6010B	W	Manganese	2.98	J	ug/L	10.0
MB	1203052468	METHOD BLANK	EPA:310.1	W	Alkalinity-CO3	1.00		mg/L	1.00
MB	1203052468	METHOD BLANK	EPA:310.1	W	Alkalinity-CO3+HCO3	1.00		mg/L	1.00

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
CAAN-14-54790	1203051199	METHOD BLANK	SW-846:6010B	Cobalt	-1.03	ug/L	5.00	U	5.00	N	5		Y
CAAN-14-54790	1203051199	METHOD BLANK	SW-846:6010B	Iron	95.3	ug/L	43	J	100	Y	5		Y

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
CAAN-14-54788	1203051304	SW-846:8151A	2,4-Dichlorophenylacetic acid	1372945	03-18-2014	144	137	43	10

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-14-54740	1203051780		EPA:351.2	Total Kjeldahl Nitrogen	1373248	03-26-2014	W	78		110	90	10		

DATA VALIDATION REPORT

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

LCS Lab Sample	LCSD Lab	Analytical Method	Parameter Name	Lab Lot ID	Analysis	Sample Matrix	LCS Spike Recovery	LCSD Spike Recovery	Upper Limit	Lower Limit	Upper Rejection Limit	Lower Rejection Limit	RPD	RPD Limit
1203057407		SW-846:8260B	Dichlorodifluoromethane	1375561	03-26-2014	W	131		129	58		10		
1203057408		SW-846:8260B	Acrolein	1375561	03-26-2014	W	143		126	65		10		
1203064499		SW-846:8260B	Acrolein	1375561	03-27-2014	W	136		126	65		10		
1203050102		SW-846:8270C	Nitrophenol[4-]	1372453	03-18-2014	W	14		77	16		10		
1203051935	1203053862	SW-846:8310	Dibenz(a,h)anthracene	1373319	03-21-2014	W	72	58	118	30		10	21	20

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
-------------	------------	-----------------	----------------	--------------------	------------------	-------------------	----------------	---------------	----------------------	-------------------------	-------------	------------	-----------	---------------	--------------	------------	--------------------	------------	-------------	---------	-----------------	------------------------	----------

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-29	2014-2989	CAAN-14-54788	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N	.00312	pCi/L	.00312	pCi/L	0.0625	0.0054	W	03/12/2014		1373330	VAL	Y
R-29	2014-2989	CAAN-14-54788	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N	-2.25	pCi/L	-2.25	pCi/L	6.39	1.95	W	03/12/2014		1372823	VAL	Y
R-29	2014-2989	CAAN-14-54788	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N	-2.47	pCi/L	-2.47	pCi/L	5.03	2.01	W	03/12/2014		1372823	VAL	Y
R-29	2014-2989	CAAN-14-54788	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N	-.49	pCi/L	-.49	pCi/L	2.43	0.530	W	03/12/2014		1374043	VAL	Y
R-29	2014-2989	CAAN-14-54788	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N	4.53	pCi/L	4.53	pCi/L	11.8	3.01	W	03/12/2014		1372823	VAL	Y
R-29	2014-2989	CAAN-14-54788	REG	INIT	SVOC	SW-846:8270C	Nitrophenol[4-]	U	UJ	SV12a	N	10.2	ug/L	10.2	ug/L			W	03/12/2014		1372454	VAL	Y
R-29	2014-2989	CAAN-14-54788	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N	0	pCi/L	0	pCi/L	0.0455	0.00999	W	03/12/2014		1373331	VAL	Y
R-29	2014-2989	CAAN-14-54788	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N	.00706	pCi/L	.00706	pCi/L	0.104	0.00999	W	03/12/2014		1373331	VAL	Y
R-29	2014-2989	CAAN-14-54788	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N	22.7	pCi/L	22.7	pCi/L	89.8	21.2	W	03/12/2014		1372823	VAL	Y
R-29	2014-2989	CAAN-14-54788	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N	-1.91	pCi/L	-1.91	pCi/L	4.80	1.48	W	03/12/2014		1372823	VAL	Y
R-29	2014-2989	CAAN-14-54788	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N	-.000552	pCi/L	-.000552	pCi/L	0.475	0.126	W	03/12/2014		1374041	VAL	Y
R-29	2014-2989	CAAN-14-54788	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N	.00486	pCi/L	.00486	pCi/L	0.0622	0.00842	W	03/12/2014		1373332	VAL	Y
R-29	2014-2989	CAAN-14-54790	REG	INIT	INORGANIC	SW-846:6010B	Iron	U	U	I4	N	43	ug/L	43	ug/L			W	03/12/2014		1372903	VAL	Y

Reason Code

Description

I4	the sample result is =<5x the concentration of related analyte in the method blank.
J_LAB	The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL
NQ	The analytical laboratory did not qualify the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample.
R5	Analyte is not detected because the amount reported is less than the MDC.
SV12a	The LCS percent recovery was < the LAL but >10%. 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
CAAN-14-54786	R-29	FTB	SW-846:8011	0	2
CAAN-14-54786	R-29	FTB	SW-846:8260B	0	78
CAAN-14-54788	R-29	REG	EPA:245.2	0	1
CAAN-14-54788	R-29	REG	EPA:335.4	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAAN-14-54788	R-29	REG	EPA:351.2	0	1
CAAN-14-54788	R-29	REG	EPA:900	0	2
CAAN-14-54788	R-29	REG	EPA:901.1	0	5
CAAN-14-54788	R-29	REG	EPA:905.0	0	1
CAAN-14-54788	R-29	REG	HASL-300:AM-241	0	1
CAAN-14-54788	R-29	REG	HASL-300:ISOPU	0	2
CAAN-14-54788	R-29	REG	HASL-300:ISOU	0	3
CAAN-14-54788	R-29	REG	SW-846:8011	0	2
CAAN-14-54788	R-29	REG	SW-846:8081A	0	1
CAAN-14-54788	R-29	REG	SW-846:8151A	0	1
CAAN-14-54788	R-29	REG	SW-846:8260B	0	78
CAAN-14-54788	R-29	REG	SW-846:8270C	0	60
CAAN-14-54788	R-29	REG	SW-846:8310	0	18
CAAN-14-54788	R-29	REG	SW-846:8321A_MOD	0	20
CAAN-14-54788	R-29	REG	SW-846:9060	0	1
CAAN-14-54790	R-29	REG	EPA:120.1	0	1
CAAN-14-54790	R-29	REG	EPA:150.1	0	1
CAAN-14-54790	R-29	REG	EPA:160.1	0	1
CAAN-14-54790	R-29	REG	EPA:245.2	0	1
CAAN-14-54790	R-29	REG	EPA:300.0	0	4
CAAN-14-54790	R-29	REG	EPA:310.1	0	2
CAAN-14-54790	R-29	REG	EPA:350.1	0	1
CAAN-14-54790	R-29	REG	EPA:353.2	0	1
CAAN-14-54790	R-29	REG	EPA:365.4	0	1
CAAN-14-54790	R-29	REG	SM:A2340B	0	1
CAAN-14-54790	R-29	REG	SW-846:6010B	0	17
CAAN-14-54790	R-29	REG	SW-846:6020	0	11
CAAN-14-54790	R-29	REG	SW-846:6850	0	1



April 10, 2014

www.gel.com

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

Re: LANL-WQH Groundwater Samples
Work Order: 344588
SDG: 2014-2989

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on March 14, 2014, and analyzed for Explosives by LCMSMS, GC Semivolatile Herbicide, GC Semivolatile Pesticide, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, HPLC Polynuclear Aromatic Hydrocarbon, 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,

Hope Taylor for
Valerie Davis
Project Manager

Purchase Order: 63641-10
Chain of Custody: 2014-2989
Enclosures



ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL-WQH Groundwater Samples
Work Order #: 344588
SDG: 2014-2989

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Case Narrative

**Case Narrative for
ARS International, LLC (ARS-LANS-MTOA6-25093-GEL)
LANL-WQH Groundwater Samples
Workorder #: 344588
SDG # : 2014-2989**

April 10, 2014

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 March 14, 2014 for analysis. Please see attached email for discrepancies. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
344588001	CAAN-14-54788
344588002	CAAN-14-54788
344588003	CAAN-14-54788
344588004	CAAN-14-54788
344588005	CAAN-14-54788
344588006	CAAN-14-54788
344588007	CAAN-14-54790
344588008	CAAN-14-54786
344588009	CAAN-14-54786

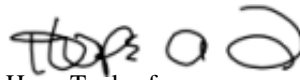
Case Narrative

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

Data Package

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Explosives by LCMSMS, GC Semivolatile Herbicide, GC Semivolatile Pesticide, GC/MS Semivolatile, GC/MS Volatile, General Chemistry, HPLC Polynuclear Aromatic Hydrocarbon, 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.

A handwritten signature in black ink, appearing to read 'Hope Taylor'.

Hope Taylor for
Valerie Davis
Project Manager

List of current GEL Certifications as of 10 April 2014

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA130005
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122014-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
South Carolina Chemistry	10120001
South Carolina GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-14-9
Utah NELAP	SC000122013-11
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12
Wisconsin	999887790

Chain of Custody and Supporting Documentation

Client Contact:

Lab Agreement #: 126310011

Project Number:

Analysis Turnaround Time:
24 Hour - ☐ 7 Day - ☐ 14 Day - ☐ 21 Day - ☐ 28 Day - ☒ Other - ☐

Field Sample ID

Sample Date

Sample Time

Sample Matrix

MSGP-Hg

WSP-8011-EDB_DBCP

WSP-8260B-VOA

WSP-8270C-SVOA

WSP-8310-PAH

WSP-8321A-NMED HEXP

WSP-All Metals

WSP-CN(T)

WSP-GENINORGP+Perchlorate

WSP-GrossA/B

WSP-LL-8081A-HCB

WSP-LL-8151A-PCP

WSP-LL-8260B

WSP-LL-8270C

WSP-NH3+NO3/NO2+PO4

WSP-RAD

WSP-TKN+TOC

Rad Screening Info:

Yes, Below Background

Lab Reporting Limit Type:

Sample Quantitation Limit

Special Instructions:

Special Instructions:

Relinquished by:

Relinquished by:

Relinquished by:

Print Name:

Print Name:

Print Name:

Received by:

Received by:

Received by:

Date/Time:

Date/Time:

Date/Time:

Print Name:

Print Name:

Print Name:

Date/Time:

Date/Time:

Date/Time:

SAMPLE RECEIPT & REVIEW FORM

Client: <u>LANK</u>			SDG/AR/COC/Work Order: <u>344588</u>
Received By: <u>P. Huent</u>			Date Received: <u>3/14/14</u>
Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0CPM</u>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe) <u>3,4c</u>
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: Ice bags <u>Blue ice</u> Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): <u>130462966</u>
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
7 Are Encore containers present?			<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles Laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11 Number of containers received match number indicated on COC?			<input checked="" type="checkbox"/>	Sample ID's affected: <u>Lab rec'd (1) 801 EDB (1) 8260b FD-CRAN-14-54786 chain indicates (2) 2966</u> <u>Lab rec'd (2) 8321A containers chain indicates (3) CRAN-14-54788</u>
12 Are sample containers identifiable as GEL provided?			<input checked="" type="checkbox"/>	<u>Clients</u>
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
14 Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>5908 1776 7877</u> <u>5908 1776 7866</u> <u>5908 1776 7888</u> <u>5908 1776 7925</u> } <u>3,4c</u>

Comments (Use Continuation Form if needed):

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SHIP DATE: 13MAR14
ACTGHT: 42.0 LB MAN
CAD: 0014176/CAFE2704

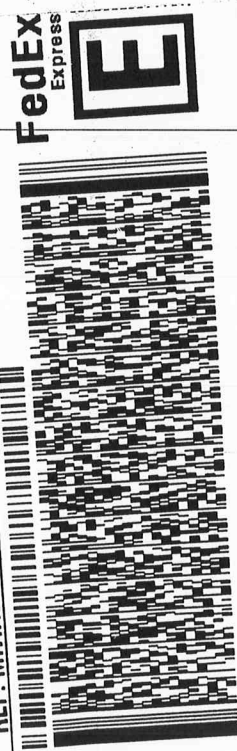
BILL SENDER

LOS ALAMOS, NM 87545
UNITED STATES US

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171
REF: MR1A015AGWJO



FRI - 14 MAR 10:30A
PRIORITY OVERNIGHT

1 of 2
TRK# 5908 1776 7877
MASTER

29407
SC-US CHS

XX CHSA



Part # 156148-434 RIT2 10/11 80

ORIGIN ID:SAFE (505) 665-9966
SHIP DATE: 13MAR14
ACTGHT: 47.0 LB MAN
CAD: 0014176/CAFE2704

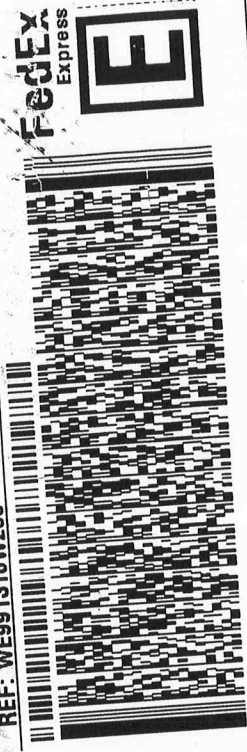
BILL SENDER

LOS ALAMOS, NM 87545
UNITED STATES US

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171
REF: WE991316W200



FRI - 14 MAR 10:30A
PRIORITY OVERNIGHT

TRK# 5908 1776 7866
0201

29407
SC-US CHS

XX CHSA



Part # 156148-434 RIT2 10/11 80

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

SHIP DATE: 13MAR14
ACTWGT: 21.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

LOS ALAMOS, NM 87545
UNITED STATES US

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

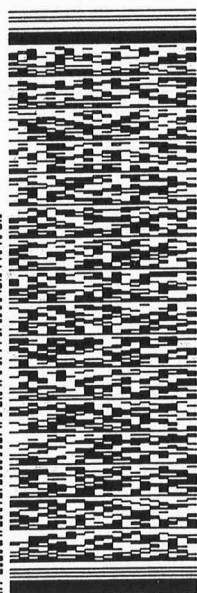
(843) 566-8171

REF: WE6L11551000

4c



FedEx
Express



FRI - 14 MAR 10:30A
PRIORITY OVERNIGHT

TRK# 5908 1776 7925

0201

XX CHSA

29407
SC-US CHS



Part # 156148-434 R1T2 10/11

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

SHIP DATE: 13MAR14
ACTWGT: 48.0 LB MAN
CAD: 0014176/CAFE2704

BILL SENDER

LOS ALAMOS, NM 87545
UNITED STATES US

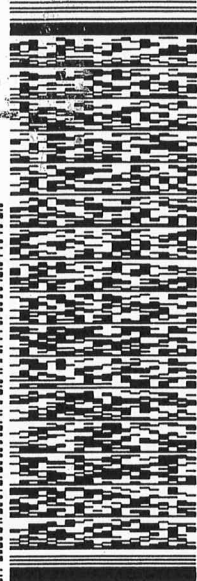
TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 566-8171

REF: MR1A015AGWJQ

3c



FedEx
Express



FRI - 14 MAR 10:30A
PRIORITY OVERNIGHT

2 of 2
MPS# 5908 1776 7888

0263

Mstr# 5908 1776 7877

0201

XX CHSA

29407
SC-US CHS



Part # 156148-434 R1T2 10/11

ample issue from today

Subject: Sample issue from today

From: Pat Dent <Pat.Dent@gel.com>

Date: 3/14/2014 4:12 PM

To: "Keith R. Greene" <kgreene@lanl.gov>

CC: "team.davis" <team.davis@gel.com>, LANL@amrad.com, npatel@lanl.gov

RN#2014-2989

The lab received 1-8011 EBD, 1-8260b container sample ID-CAAN-14-54786, chain indicates 2-each.

The lab received 2-8321A containers sample ID-CAAN-14-54788, chain indicates 3.

Thanks!!

--

Patricia Dent
Project Manager Assistant
GEL Laboratories, LLC
2040 Savage Rd.
Charleston, S.C. 29407
Main: 843-556-8171 Ext 4264
Fax: 843-766-1178
Email: pad@gel.com
Web: www.gel.com

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

**ChemStation Case Narrative
ARS International, LLC (ARSL)
SDG 2014-2989**

Method/Analysis Information

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

Analytical Method: SW846 8260B DOE-AL

Analytical Batch Number: 1375561

Sample Analysis

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

Sample ID	Client ID
344588004	CAAN-14-54788
344588009	CAAN-14-54786
1203057404	Method Blank (MB)
1203057405	344384004(CAWA-14-54734) Post Spike (PS)
1203057406	344384004(CAWA-14-54734) Post Spike Duplicate (PSD)
1203057407	Laboratory Control Sample (LCS)
1203057408	Laboratory Control Sample (LCS)
1203057409	344384004(CAWA-14-54734) Post Spike (PS)
1203057410	344384004(CAWA-14-54734) 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 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-038 REV# 21.

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) section 19.1.2. False positive analytes are designated on the quantitation report with a 'd' qualifier.

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 1203057404 (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 1203057407 (LCS) and 1203057408 (LCS) recoveries were not all within the acceptance limits. The unacceptable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported. See the Data Exception Report in the miscellaneous section of the data package.

QC Sample Designation

Sample 344384004 (CAWA-14-54734) was designated for spike analysis.

Matrix Spike (PS) Recovery Statement

The spike 1203057405 (CAWA-14-54734) recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

Matrix Spike Duplicate (PSD) Recovery Statement

The spike duplicate 1203057406 (CAWA-14-54734) recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

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

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. Samples 344588004 (CAAN-14-54788) and 344588009 (CAAN-14-54786) were not analyzed within the recommended holding. However, the samples were analyzed within two times the holding period. This satisfies the client criteria.

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**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

The following DER was generated for this SDG: 1281556.

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) were requested for this sample delivery group/work order. Please note that non-requested target analytes that are reported on the quantitation reports will be present on the Form I. These detected analytes are included in the calibrated method and as a result will be reported on the Sample Data Summary (Form I) or Certificate of Analysis (C of A). TIC data are included on the Sample Data Summary (Form I).

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.

System Configuration

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

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

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all 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: 2014-2989 GEL Work Order: 344588

The Qualifiers in this report are defined as follows:

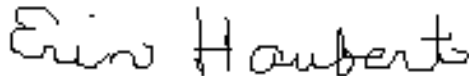
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- B The target analyte was detected in the associated blank.
- E Concentration of the target analyte exceeds the instrument calibration range
- H Analytical holding time was exceeded
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature:



Name: Erin Haubert

Date: 09 APR 2014

Title: Data Validator

Sample Data Summary

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2014-2989

Lab Sample ID: 344588004

Date Collected: 03/12/2014 10:15

Date Received: 03/14/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAAN-14-54788

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1375561

Inst: VOA9.I

Dilution: 1

Run Date: 03/26/2014 21:03

Analyst: GRB2

Purge Vol: 5 mL

Prep Date: 03/26/2014 21:03

Data File: 032614V9\9F324.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
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	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.200	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	2.20	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	3.00	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	1.00	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
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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2014-2989

Lab Sample ID: 344588004

Date Collected: 03/12/2014 10:15

Date Received: 03/14/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAAN-14-54788

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1375561

Inst: VOA9.I

Dilution: 1

Run Date: 03/26/2014 21:03

Analyst: GRB2

Purge Vol: 5 mL

Prep Date: 03/26/2014 21:03

Data File: 032614V9\9F324.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
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	1.00	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	3.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.400	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	1.50	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
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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2014-2989
Lab Sample ID: 344588004

Client ID: CAAN-14-54788
Batch ID: 1375561
Run Date: 03/26/2014 21:03
Prep Date: 03/26/2014 21:03
Data File: 032614V9\9F324.D

Date Collected: 03/12/2014 10:15
Date Received: 03/14/2014 09:00
Client: ARSL004
Method: SW846 8260B DOE-AL
Inst: VOA9.I
Analyst: GRB2

Matrix: W
Project: ESHL00714
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
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	60.8	50.0	ug/L	122 (78%-124%)
Bromofluorobenzene	53.5	50.0	ug/L	107 (80%-120%)
Toluene-d8	54.0	50.0	ug/L	108 (80%-120%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	4.226	10.7	ug/L	0	J
	unknown	4.286	9.57	ug/L	0	J
	unknown siloxane	12.291	5.9	ug/L	0	J
	unknown siloxane	14.663	17.9	ug/L	0	J
	unknown siloxane	16.62	10.4	ug/L	0	J

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2014-2989

Lab Sample ID: 344588009

Date Collected: 03/12/2014 10:15

Date Received: 03/14/2014 09:00

Matrix: W

Client ID: CAAN-14-54786

Batch ID: 1375561

Run Date: 03/26/2014 21:30

Prep Date: 03/26/2014 21:30

Data File: 032614V9\9F325.D

Client: ARSL004

Method: SW846 8260B DOE-AL

Inst: VOA9.I

Analyst: GRB2

Column: DB-624

Project: ESHL00714

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
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	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.200	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	2.20	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	3.00	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	1.00	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
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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2014-2989

Lab Sample ID: 344588009

Date Collected: 03/12/2014 10:15

Date Received: 03/14/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAAN-14-54786

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1375561

Inst: VOA9.I

Dilution: 1

Run Date: 03/26/2014 21:30

Analyst: GRB2

Purge Vol: 5 mL

Prep Date: 03/26/2014 21:30

Data File: 032614V9\9F325.D

Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
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	1.00	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	3.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.400	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	1.50	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
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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2014-2989

Lab Sample ID: 344588009

Date Collected: 03/12/2014 10:15

Date Received: 03/14/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Client ID: CAAN-14-54786

Method: SW846 8260B DOE-AL

SOP Ref: GL-OA-E-038

Batch ID: 1375561

Inst: VOA9.I

Dilution: 1

Run Date: 03/26/2014 21:30

Analyst: GRB2

Purge Vol: 5 mL

Prep Date: 03/26/2014 21:30

Column: DB-624

Data File: 032614V9\9F325.D

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
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	59.7	50.0	ug/L 119	(78%-124%)
Bromofluorobenzene	57.3	50.0	ug/L 115	(80%-120%)
Toluene-d8	52.4	50.0	ug/L 105	(80%-120%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	4.256	12.6	ug/L	0	J
	unknown siloxane	14.663	12.7	ug/L	0	J
	unknown siloxane	16.62	20.4	ug/L	0	J

Quality Control Summary

Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2014-2989**Matrix Type: LIQUID**

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203057407	LCS for batch 1375561	102	108	109
1203057408	LCS for batch 1375561	109	112	108
1203057404	MB for batch 1375561	104	107	107
344588004	CAAN-14-54788	122	108	107
344588009	CAAN-14-54786	119	105	115
1203057405	CAWA-14-54734PS	120	106	106
1203057406	CAWA-14-54734PSD	114	106	108
1203057409	CAWA-14-54734PS	114	112	103
1203057410	CAWA-14-54734PSD	108	105	108

Surrogate**Acceptance Limits**

DCED4 = 1,2-Dichloroethane-d4

(78%-124%)

TOL = Toluene-d8

(80%-120%)

BFB = Bromofluorobenzene

(80%-120%)

* 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: 2014-2989

Sample Type: Post Spike

Client ID: CAWA-14-54734PS

Matrix: W

Lab Sample ID 1203057405

Instrument: VOA9.I

Analysis Date: 03/26/2014 22:50

Dilution: 1

Analyst: GRB2

Purge Vol: 5 mL

Batch ID: 1375561

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	HU	87.1	87 72-120
75-05-8	PS Acetonitrile	1250	0.00	HU	1070	86 61-135
67-64-1	PS Acetone	250	4.04	BHJ	188	74 29-144
74-88-4	PS Iodomethane	250	0.00	HU	261	104 73-120
75-15-0	PS Carbon disulfide	250	0.00	HU	233	93 79-138
108-05-4	PS Vinyl acetate	250	0.00	HU	204	81 60-136
78-93-3	PS 2-Butanone	250	0.00	HU	234	94 38-136
108-10-1	PS 4-Methyl-2-pentanone	250	0.00	HU	234	93 70-132
591-78-6	PS 2-Hexanone	250	0.00	HU	220	88 48-137
75-71-8	PS Dichlorodifluoromethane	50.0	0.00	HU	73.6	147 * 51-133
74-87-3	PS Chloromethane	50.0	0.00	HU	46.4	93 54-135
75-01-4	PS Vinyl chloride	50.0	0.00	HU	52.4	105 52-129
74-83-9	PS Bromomethane	50.0	0.00	HU	57.7	115 67-128
75-00-3	PS Chloroethane	50.0	0.00	HU	51.9	104 69-120
75-69-4	PS Trichlorofluoromethane	50.0	0.00	HU	66.9	134 * 66-126
60-29-7	PS Ethyl ether	50.0	0.00	HU	52.1	104 69-120
75-35-4	PS 1,1-Dichloroethylene	50.0	0.00	HU	44.9	90 74-130
75-09-2	PS Methylene chloride	50.0	0.00	HU	42.9	86 73-120
1634-04-4	PS tert-Butyl methyl ether	50.0	0.00	HU	51.2	102 71-124
156-60-5	PS trans-1,2-Dichloroethylene	50.0	0.00	HU	45.4	91 75-124
75-34-3	PS 1,1-Dichloroethane	50.0	0.00	HU	46.3	93 76-122
156-59-2	PS cis-1,2-Dichloroethylene	50.0	0.00	HU	47.6	95 77-121

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 8

SDG Number: 2014-2989

Sample Type: Post Spike

Client ID: CAWA-14-54734PS

Matrix: W

Lab Sample ID 1203057405

Instrument: VOA9.I

Analysis Date: 03/26/2014 22:50

Dilution: 1

Analyst: GRB2

Purge Vol: 5 mL

Batch ID: 1375561

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	HU 53.5	107	72-129
74-97-5	PS Bromochloromethane	50.0	0.00	HU 50.4	101	78-122
67-66-3	PS Chloroform	50.0	0.00	HU 50.3	101	75-123
71-55-6	PS 1,1,1-Trichloroethane	50.0	0.00	HU 53.7	107	76-129
563-58-6	PS 1,1-Dichloropropene	50.0	0.00	HU 45.5	91	76-125
56-23-5	PS Carbon tetrachloride	50.0	0.00	HU 58.4	117	76-132
107-06-2	PS 1,2-Dichloroethane	50.0	0.00	HU 50.3	101	68-128
71-43-2	PS Benzene	50.0	0.00	HU 44.4	89	75-120
79-01-6	PS Trichloroethylene	50.0	0.00	HU 48.4	97	75-125
78-87-5	PS 1,2-Dichloropropane	50.0	0.00	HU 43.0	86	75-120
74-95-3	PS Dibromomethane	50.0	0.00	HU 52.2	104	77-122
75-27-4	PS Bromodichloromethane	50.0	0.00	HU 54.1	108	76-129
10061-01-5	PS cis-1,3-Dichloropropylene	50.0	0.00	HU 49.0	98	75-127
108-88-3	PS Toluene	50.0	0.00	HU 42.6	85	72-120
10061-02-6	PS trans-1,3-Dichloropropylene	50.0	0.00	HU 50.6	101	73-123
79-00-5	PS 1,1,2-Trichloroethane	50.0	0.00	HU 44.9	90	77-120
142-28-9	PS 1,3-Dichloropropane	50.0	0.00	HU 43.9	88	73-120
127-18-4	PS Tetrachloroethylene	50.0	0.00	HU 49.7	99	67-124
124-48-1	PS Dibromochloromethane	50.0	0.00	HU 58.3	117	70-130
108-90-7	PS Chlorobenzene	50.0	0.00	HU 44.2	88	74-120
100-41-4	PS Ethylbenzene	50.0	0.00	HU 43.3	87	72-120
95-47-6	PS o-Xylene	50.0	0.00	HU 47.0	94	72-120

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 8

SDG Number: 2014-2989

Sample Type: Post Spike

Client ID: CAWA-14-54734PS

Matrix: W

Lab Sample ID 1203057405

Instrument: VOA9.I

Analysis Date: 03/26/2014 22:50

Dilution: 1

Analyst: GRB2

Purge Vol: 5 mL

Batch ID: 1375561

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
100-42-5	PS Styrene	50.0	0.00	HU 47.1	94	74-124
75-25-2	PS Bromoform	50.0	0.00	HU 62.7	125	61-135
98-82-8	PS Isopropylbenzene	50.0	0.00	HU 44.2	88	71-124
79-34-5	PS 1,1,2,2-Tetrachloroethane	50.0	0.00	HU 44.4	89	74-124
96-18-4	PS 1,2,3-Trichloropropane	50.0	0.00	HU 49.3	99	71-125
108-86-1	PS Bromobenzene	50.0	0.00	HU 45.1	90	72-120
103-65-1	PS n-Propylbenzene	50.0	0.00	HU 41.9	84	69-121
108-67-8	PS 1,3,5-Trimethylbenzene	50.0	0.00	HU 42.8	86	71-123
95-49-8	PS 2-Chlorotoluene	50.0	0.00	HU 41.1	82	71-120
106-43-4	PS 4-Chlorotoluene	50.0	0.00	HU 41.2	82	70-120
98-06-6	PS tert-Butylbenzene	50.0	0.00	HU 41.5	83	72-124
95-63-6	PS 1,2,4-Trimethylbenzene	50.0	0.00	HU 41.5	83	71-122
135-98-8	PS sec-Butylbenzene	50.0	0.00	HU 43.1	86	71-124
99-87-6	PS 4-Isopropyltoluene	50.0	0.00	HU 43.9	88	70-124
541-73-1	PS 1,3-Dichlorobenzene	50.0	0.00	HU 43.7	87	70-120
106-46-7	PS 1,4-Dichlorobenzene	50.0	0.00	HU 42.0	84	70-120
104-51-8	PS n-Butylbenzene	50.0	0.00	HU 39.8	80	69-125
87-68-3	PS Hexachlorobutadiene	50.0	0.00	HU 49.4	99	60-129
91-20-3	PS Naphthalene	50.0	0.00	HU 42.7	85	58-134
87-61-6	PS 1,2,3-Trichlorobenzene	50.0	0.00	HU 44.1	88	52-132
120-82-1	PS 1,2,4-Trichlorobenzene	50.0	0.00	HU 44.4	89	59-126
630-20-6	PS 1,1,1,2-Tetrachloroethane	50.0	0.00	HU 53.3	107	78-128

Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 8

SDG Number: 2014-2989

Sample Type: Post Spike

Client ID: CAWA-14-54734PS

Matrix: W

Lab Sample ID 1203057405

Instrument: VOA9.I

Analysis Date: 03/26/2014 22:50

Dilution: 1

Analyst: GRB2

Purge Vol: 5 mL

Batch ID: 1375561

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
95-50-1	PS	1,2-Dichlorobenzene	50.0	0.00	HU	44.3	89	72-120
71-36-3	PS	n-Butyl alcohol	5000	0.00	HU	5120	102	64-138

Volatile
Quality Control Summary
Spike Recovery Report

Page 5 of 8

SDG Number: 2014-2989

Sample Type: Post Spike Duplicate

Client ID: CAWA-14-54734PSD

Matrix: W

Lab Sample ID 1203057406

Instrument: VOA9.I

Analysis Date: 03/26/2014 23:17

Dilution: 1

Analyst: GRB2

Purge Vol: 5 mL

Batch ID: 1375561

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	HU	91.7	92	72-120	5 0-20
75-05-8	PSD Acetonitrile	1250	0.00	HU	1010	81	61-135	6 0-20
67-64-1	PSD Acetone	250	4.04	BHJ	177	69	29-144	6 0-20
74-88-4	PSD Iodomethane	250	0.00	HU	252	101	73-120	3 0-20
75-15-0	PSD Carbon disulfide	250	0.00	HU	217	87	79-138	7 0-20
108-05-4	PSD Vinyl acetate	250	0.00	HU	206	82	60-136	1 0-20
78-93-3	PSD 2-Butanone	250	0.00	HU	233	93	38-136	0 0-20
108-10-1	PSD 4-Methyl-2-pentanone	250	0.00	HU	236	94	70-132	1 0-20
591-78-6	PSD 2-Hexanone	250	0.00	HU	210	84	48-137	4 0-20
75-71-8	PSD Dichlorodifluoromethane	50.0	0.00	HU	69.6	139 *	51-133	5 0-20
74-87-3	PSD Chloromethane	50.0	0.00	HU	45.0	90	54-135	3 0-20
75-01-4	PSD Vinyl chloride	50.0	0.00	HU	50.4	101	52-129	4 0-20
74-83-9	PSD Bromomethane	50.0	0.00	HU	55.9	112	67-128	3 0-20
75-00-3	PSD Chloroethane	50.0	0.00	HU	50.6	101	69-120	3 0-20
75-69-4	PSD Trichlorofluoromethane	50.0	0.00	HU	62.6	125	66-126	7 0-20
60-29-7	PSD Ethyl ether	50.0	0.00	HU	49.7	99	69-120	5 0-20
75-35-4	PSD 1,1-Dichloroethylene	50.0	0.00	HU	43.6	87	74-130	3 0-20
75-09-2	PSD Methylene chloride	50.0	0.00	HU	44.6	89	73-120	4 0-20
1634-04-4	PSD tert-Butyl methyl ether	50.0	0.00	HU	51.9	104	71-124	1 0-20
156-60-5	PSD trans-1,2-Dichloroethylene	50.0	0.00	HU	45.1	90	75-124	1 0-20
75-34-3	PSD 1,1-Dichloroethane	50.0	0.00	HU	43.7	87	76-122	6 0-20
156-59-2	PSD cis-1,2-Dichloroethylene	50.0	0.00	HU	47.6	95	77-121	0 0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 6 of 8

SDG Number: 2014-2989

Sample Type: Post Spike Duplicate

Client ID: CAWA-14-54734PSD

Matrix: W

Lab Sample ID 1203057406

Instrument: VOA9.I

Analysis Date: 03/26/2014 23:17

Dilution: 1

Analyst: GRB2

Purge Vol: 5 mL

Batch ID: 1375561

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	HU 52.7	105	72-129	2	0-20
74-97-5	PSD Bromochloromethane	50.0	0.00	HU 51.0	102	78-122	1	0-20
67-66-3	PSD Chloroform	50.0	0.00	HU 51.2	102	75-123	2	0-20
71-55-6	PSD 1,1,1-Trichloroethane	50.0	0.00	HU 52.7	105	76-129	2	0-20
563-58-6	PSD 1,1-Dichloropropene	50.0	0.00	HU 45.3	91	76-125	1	0-20
56-23-5	PSD Carbon tetrachloride	50.0	0.00	HU 56.2	112	76-132	4	0-20
107-06-2	PSD 1,2-Dichloroethane	50.0	0.00	HU 48.2	96	68-128	4	0-20
71-43-2	PSD Benzene	50.0	0.00	HU 44.6	89	75-120	1	0-20
79-01-6	PSD Trichloroethylene	50.0	0.00	HU 49.9	100	75-125	3	0-20
78-87-5	PSD 1,2-Dichloropropane	50.0	0.00	HU 46.2	92	75-120	7	0-20
74-95-3	PSD Dibromomethane	50.0	0.00	HU 52.0	104	77-122	0	0-20
75-27-4	PSD Bromodichloromethane	50.0	0.00	HU 55.6	111	76-129	3	0-20
10061-01-5	PSD cis-1,3-Dichloropropylene	50.0	0.00	HU 51.8	104	75-127	5	0-20
108-88-3	PSD Toluene	50.0	0.00	HU 41.5	83	72-120	3	0-20
10061-02-6	PSD trans-1,3-Dichloropropylene	50.0	0.00	HU 54.4	109	73-123	7	0-20
79-00-5	PSD 1,1,2-Trichloroethane	50.0	0.00	HU 47.5	95	77-120	6	0-20
142-28-9	PSD 1,3-Dichloropropane	50.0	0.00	HU 42.8	86	73-120	3	0-20
127-18-4	PSD Tetrachloroethylene	50.0	0.00	HU 47.9	96	67-124	4	0-20
124-48-1	PSD Dibromochloromethane	50.0	0.00	HU 57.8	116	70-130	1	0-20
108-90-7	PSD Chlorobenzene	50.0	0.00	HU 45.3	91	74-120	2	0-20
100-41-4	PSD Ethylbenzene	50.0	0.00	HU 43.3	87	72-120	0	0-20
95-47-6	PSD o-Xylene	50.0	0.00	HU 45.4	91	72-120	3	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 7 of 8

SDG Number: 2014-2989

Sample Type: Post Spike Duplicate

Client ID: CAWA-14-54734PSD

Matrix: W

Lab Sample ID 1203057406

Instrument: VOA9.I

Analysis Date: 03/26/2014 23:17

Dilution: 1

Analyst: GRB2

Purge Vol: 5 mL

Batch ID: 1375561

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
100-42-5	PSD Styrene	50.0	0.00	HU 47.2	94	74-124	0	0-20
75-25-2	PSD Bromoform	50.0	0.00	HU 67.9	136 *	61-135	8	0-20
98-82-8	PSD Isopropylbenzene	50.0	0.00	HU 45.2	90	71-124	2	0-20
79-34-5	PSD 1,1,2,2-Tetrachloroethane	50.0	0.00	HU 47.1	94	74-124	6	0-20
96-18-4	PSD 1,2,3-Trichloropropane	50.0	0.00	HU 49.9	100	71-125	1	0-20
108-86-1	PSD Bromobenzene	50.0	0.00	HU 48.2	96	72-120	7	0-20
103-65-1	PSD n-Propylbenzene	50.0	0.00	HU 42.5	85	69-121	1	0-20
108-67-8	PSD 1,3,5-Trimethylbenzene	50.0	0.00	HU 44.3	89	71-123	3	0-20
95-49-8	PSD 2-Chlorotoluene	50.0	0.00	HU 43.2	86	71-120	5	0-20
106-43-4	PSD 4-Chlorotoluene	50.0	0.00	HU 44.6	89	70-120	8	0-20
98-06-6	PSD tert-Butylbenzene	50.0	0.00	HU 44.9	90	72-124	8	0-20
95-63-6	PSD 1,2,4-Trimethylbenzene	50.0	0.00	HU 43.0	86	71-122	4	0-20
135-98-8	PSD sec-Butylbenzene	50.0	0.00	HU 42.2	84	71-124	2	0-20
99-87-6	PSD 4-Isopropyltoluene	50.0	0.00	HU 44.1	88	70-124	1	0-20
541-73-1	PSD 1,3-Dichlorobenzene	50.0	0.00	HU 44.5	89	70-120	2	0-20
106-46-7	PSD 1,4-Dichlorobenzene	50.0	0.00	HU 43.4	87	70-120	3	0-20
104-51-8	PSD n-Butylbenzene	50.0	0.00	HU 41.4	83	69-125	4	0-20
87-68-3	PSD Hexachlorobutadiene	50.0	0.00	HU 50.7	101	60-129	2	0-20
91-20-3	PSD Naphthalene	50.0	0.00	HU 49.1	98	58-134	14	0-20
87-61-6	PSD 1,2,3-Trichlorobenzene	50.0	0.00	HU 47.1	94	52-132	7	0-20
120-82-1	PSD 1,2,4-Trichlorobenzene	50.0	0.00	HU 45.0	90	59-126	1	0-20
630-20-6	PSD 1,1,1,2-Tetrachloroethane	50.0	0.00	HU 53.2	106	78-128	0	0-20

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2014-2989

Sample Type: Post Spike Duplicate

Client ID: CAWA-14-54734PSD

Matrix: W

Lab Sample ID 1203057406

Instrument: VOA9.I

Analysis Date: 03/26/2014 23:17

Dilution: 1

Analyst: GRB2

Purge Vol: 5 mL

Batch ID: 1375561

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
95-50-1	PSD 1,2-Dichlorobenzene	50.0	0.00	HU	46.5	93	72-120	5	0-20
71-36-3	PSD n-Butyl alcohol	5000	0.00	HU	5110	102	64-138	0	0-20

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 4

SDG Number: 2014-2989

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1375561

Matrix: WATER

Lab Sample ID 1203057407

Instrument: VOA9.I

Analysis Date: 03/26/2014 14:09

Dilution: 1

Analyst: GRB2

Purge Vol: 5 mL

Batch ID: 1375561

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	98.0	98	80-120
75-05-8	LCS Acetonitrile	1250	0.0	1020	82	63-131
67-64-1	LCS Acetone	250	0.0	240	96	50-149
74-88-4	LCS Iodomethane	250	0.0	243	97	75-120
75-15-0	LCS Carbon disulfide	250	0.0	218	87	80-136
108-05-4	LCS Vinyl acetate	250	0.0	221	88	78-130
78-93-3	LCS 2-Butanone	250	0.0	216	86	57-148
108-10-1	LCS 4-Methyl-2-pentanone	250	0.0	258	103	75-130
591-78-6	LCS 2-Hexanone	250	0.0	225	90	64-149
75-71-8	LCS Dichlorodifluoromethane	50.0	0.0	65.6	131 *	58-129
74-87-3	LCS Chloromethane	50.0	0.0	42.5	85	59-131
75-01-4	LCS Vinyl chloride	50.0	0.0	48.9	98	59-127
74-83-9	LCS Bromomethane	50.0	0.0	51.7	103	70-125
75-00-3	LCS Chloroethane	50.0	0.0	52.8	106	73-120
75-69-4	LCS Trichlorofluoromethane	50.0	0.0	58.1	116	73-123
60-29-7	LCS Ethyl ether	50.0	0.0	54.3	109	73-120
75-35-4	LCS 1,1-Dichloroethylene	50.0	0.0	43.1	86	80-128
75-09-2	LCS Methylene chloride	50.0	0.0	44.4	89	75-120
1634-04-4	LCS tert-Butyl methyl ether	50.0	0.0	53.0	106	74-122
156-60-5	LCS trans-1,2-Dichloroethylene	50.0	0.0	44.0	88	80-121
75-34-3	LCS 1,1-Dichloroethane	50.0	0.0	44.7	89	79-120
156-59-2	LCS cis-1,2-Dichloroethylene	50.0	0.0	46.5	93	79-120

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 4

SDG Number: 2014-2989

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1375561

Matrix: WATER

Lab Sample ID 1203057407

Instrument: VOA9.I

Analysis Date: 03/26/2014 14:09

Dilution: 1

Analyst: GRB2

Purge Vol: 5 mL

Batch ID: 1375561

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	52.3	105	79-130
74-97-5	LCS Bromochloromethane	50.0	0.0	49.3	99	80-121
67-66-3	LCS Chloroform	50.0	0.0	48.0	96	79-120
71-55-6	LCS 1,1,1-Trichloroethane	50.0	0.0	50.5	101	80-128
563-58-6	LCS 1,1-Dichloropropene	50.0	0.0	45.2	90	80-123
56-23-5	LCS Carbon tetrachloride	50.0	0.0	52.4	105	80-131
107-06-2	LCS 1,2-Dichloroethane	50.0	0.0	45.4	91	73-120
71-43-2	LCS Benzene	50.0	0.0	44.8	90	78-120
79-01-6	LCS Trichloroethylene	50.0	0.0	48.9	98	80-121
78-87-5	LCS 1,2-Dichloropropane	50.0	0.0	44.9	90	79-120
74-95-3	LCS Dibromomethane	50.0	0.0	48.4	97	80-120
75-27-4	LCS Bromodichloromethane	50.0	0.0	52.1	104	80-126
10061-01-5	LCS cis-1,3-Dichloropropylene	50.0	0.0	53.1	106	80-125
108-88-3	LCS Toluene	50.0	0.0	45.1	90	78-120
10061-02-6	LCS trans-1,3-Dichloropropylene	50.0	0.0	53.7	107	79-121
79-00-5	LCS 1,1,2-Trichloroethane	50.0	0.0	47.8	96	78-120
142-28-9	LCS 1,3-Dichloropropane	50.0	0.0	45.6	91	75-120
127-18-4	LCS Tetrachloroethylene	50.0	0.0	51.9	104	74-123
124-48-1	LCS Dibromochloromethane	50.0	0.0	56.1	112	73-129
108-90-7	LCS Chlorobenzene	50.0	0.0	47.5	95	79-120
100-41-4	LCS Ethylbenzene	50.0	0.0	46.6	93	79-120
95-47-6	LCS o-Xylene	50.0	0.0	49.4	99	80-123

Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 4

SDG Number: 2014-2989

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1375561

Matrix: WATER

Lab Sample ID 1203057407

Instrument: VOA9.I

Analysis Date: 03/26/2014 14:09

Dilution: 1

Analyst: GRB2

Purge Vol: 5 mL

Batch ID: 1375561

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
100-42-5	LCS Styrene	50.0	0.0	51.0	102	80-121
75-25-2	LCS Bromoform	50.0	0.0	66.2	132	65-135
98-82-8	LCS Isopropylbenzene	50.0	0.0	48.8	98	79-121
79-34-5	LCS 1,1,2,2-Tetrachloroethane	50.0	0.0	47.5	95	76-123
96-18-4	LCS 1,2,3-Trichloropropane	50.0	0.0	53.3	107	76-120
108-86-1	LCS Bromobenzene	50.0	0.0	49.0	98	79-120
103-65-1	LCS n-Propylbenzene	50.0	0.0	46.3	93	80-123
108-67-8	LCS 1,3,5-Trimethylbenzene	50.0	0.0	48.3	97	80-120
95-49-8	LCS 2-Chlorotoluene	50.0	0.0	46.6	93	79-120
106-43-4	LCS 4-Chlorotoluene	50.0	0.0	47.5	95	79-120
98-06-6	LCS tert-Butylbenzene	50.0	0.0	51.1	102	79-122
95-63-6	LCS 1,2,4-Trimethylbenzene	50.0	0.0	47.4	95	80-120
135-98-8	LCS sec-Butylbenzene	50.0	0.0	47.2	94	80-121
99-87-6	LCS 4-Isopropyltoluene	50.0	0.0	49.6	99	80-121
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	49.1	98	76-120
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	47.8	96	78-120
104-51-8	LCS n-Butylbenzene	50.0	0.0	46.7	93	80-123
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	57.6	115	71-128
91-20-3	LCS Naphthalene	50.0	0.0	53.9	108	64-132
87-61-6	LCS 1,2,3-Trichlorobenzene	50.0	0.0	54.8	110	61-132
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	54.8	110	66-130
630-20-6	LCS 1,1,1,2-Tetrachloroethane	50.0	0.0	55.6	111	80-125

Volatile
Quality Control Summary
Spike Recovery Report

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SDG Number: 2014-2989

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1375561

Matrix: WATER

Lab Sample ID 1203057407

Instrument: VOA9.I

Analysis Date: 03/26/2014 14:09

Dilution: 1

Analyst: GRB2

Purge Vol: 5 mL

Batch ID: 1375561

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	50.4	101	78-120
71-36-3	LCS n-Butyl alcohol	5000	0.0	4990	100	67-137

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2014-2989

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1375561

Matrix: WATER

Lab Sample ID 1203057408

Instrument: VOA9.I

Analysis Date: 03/26/2014 14:37

Dilution: 1

Analyst: GRB2

Purge Vol: 5 mL

Batch ID: 1375561

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	357	143 *	65-126
76-13-1	LCS Trichlorotrifluoroethane	250	0.0	235	94	73-132
107-05-1	LCS Allyl chloride	250	0.0	211	84	67-127
107-13-1	LCS Acrylonitrile	250	0.0	268	107	74-122
107-12-0	LCS Propionitrile	250	0.0	282	113	73-124
126-98-7	LCS Methacrylonitrile	250	0.0	253	101	68-123
80-62-6	LCS Methyl methacrylate	250	0.0	278	111	79-120
97-63-2	LCS Ethyl methacrylate	250	0.0	270	108	77-120
78-83-1	LCS Isobutyl alcohol	2500	0.0	2620	105	72-133
126-99-8	LCS 2-Chloro-1,3-butadiene	50.0	0.0	55.9	112	57-142

Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 2

SDG Number: 2014-2989

Sample Type: Post Spike

Client ID: CAWA-14-54734PS

Matrix: W

Lab Sample ID 1203057409

Instrument: VOA9.I

Analysis Date: 03/26/2014 23:44

Dilution: 1

Analyst: GRB2

Purge Vol: 5 mL

Batch ID: 1375561

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	HU 311	125	57-131
76-13-1	PS Trichlorotrifluoroethane	250	0.00	HU 252	101	76-133
107-05-1	PS Allyl chloride	250	0.00	HU 216	87	65-130
107-13-1	PS Acrylonitrile	250	0.00	HU 255	102	70-128
107-12-0	PS Propionitrile	250	0.00	HU 265	106	68-131
126-98-7	PS Methacrylonitrile	250	0.00	HU 251	101	64-129
80-62-6	PS Methyl methacrylate	250	0.00	HU 272	109	76-120
97-63-2	PS Ethyl methacrylate	250	0.00	HU 246	98	72-122
78-83-1	PS Isobutyl alcohol	2500	0.00	HU 2500	100	72-134
126-99-8	PS 2-Chloro-1,3-butadiene	50.0	0.00	HU 56.5	113	46-140

Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 2

SDG Number: 2014-2989

Sample Type: Post Spike Duplicate

Client ID: CAWA-14-54734PSD

Matrix: W

Lab Sample ID 1203057410

Instrument: VOA9.I

Analysis Date: 03/27/2014 00:10

Dilution: 1

Analyst: GRB2

Purge Vol: 5 mL

Batch ID: 1375561

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	HU 288	115	57-131	8	0-20
76-13-1	PSD Trichlorotrifluoroethane	250	0.00	HU 236	94	76-133	7	0-20
107-05-1	PSD Allyl chloride	250	0.00	HU 198	79	65-130	9	0-20
107-13-1	PSD Acrylonitrile	250	0.00	HU 229	92	70-128	11	0-20
107-12-0	PSD Propionitrile	250	0.00	HU 239	96	68-131	11	0-20
126-98-7	PSD Methacrylonitrile	250	0.00	HU 235	94	64-129	7	0-20
80-62-6	PSD Methyl methacrylate	250	0.00	HU 250	100	76-120	8	0-20
97-63-2	PSD Ethyl methacrylate	250	0.00	HU 224	90	72-122	9	0-20
78-83-1	PSD Isobutyl alcohol	2500	0.00	HU 2240	89	72-134	11	0-20
126-99-8	PSD 2-Chloro-1,3-butadiene	50.0	0.00	HU 51.1	102	46-140	10	0-20

Method Blank Summary

Page 1 of 1

SDG Number:	2014-2989	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1375561	Instrument ID:	VOA9.I	Data File:	032614V9\9F312BAR.D
Lab Sample ID:	1203057404	Prep Date:	03/26/2014 15:33	Analyzed:	03/26/14 15:33
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 1375561	1203057407	032614V9\9F309LAR.D	03/26/14	1409
02 LCS for batch 1375561	1203057408	032614V9\9F310SHAR.D	03/26/14	1437
03 CAAN-14-54788	344588004	032614V9\9F324.D	03/26/14	2103
04 CAAN-14-54786	344588009	032614V9\9F325.D	03/26/14	2130
05 CAWA-14-54734PS	1203057405	032614V9\9F328.D	03/26/14	2250
06 CAWA-14-54734PSD	1203057406	032614V9\9F329.D	03/26/14	2317
07 CAWA-14-54734PS	1203057409	032614V9\9F330.D	03/26/14	2344
08 CAWA-14-54734PSD	1203057410	032614V9\9F331.D	03/27/14	0010

Quality Control Data

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2014-2989	Matrix: WATER
Lab Sample ID: 1203057404	
Client Sample: QC for batch 1375561	Client: ARSL004
Client ID: MB for batch 1375561	Method: SW846 8260B DOE-AL
Batch ID: 1375561	Inst: VOA9.I
Run Date: 03/26/2014 15:33	Analyst: GRB2
Prep Date: 03/26/2014 15:33	Purge Vol: 5 mL
Data File: 032614V9\9F312BAR.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
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	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.200	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	2.20	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	J	4.01	ug/L	3.00	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	1.00	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
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

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2014-2989	Matrix: WATER
Lab Sample ID: 1203057404	
Client Sample: QC for batch 1375561	Client: ARSL004
Client ID: MB for batch 1375561	Method: SW846 8260B DOE-AL
Batch ID: 1375561	Project: QC
Run Date: 03/26/2014 15:33	SOP Ref: GL-OA-E-038
Prep Date: 03/26/2014 15:33	Dilution: 1
Data File: 032614V9\9F312BAR.D	Purge Vol: 5 mL
	Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
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	1.00	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	3.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.400	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	1.50	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
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

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2014-2989	Matrix:	WATER
Lab Sample ID:	1203057404		
Client Sample:	QC for batch 1375561	Client:	ARSL004
Client ID:	MB for batch 1375561	Method:	SW846 8260B DOE-AL
Batch ID:	1375561	Inst:	VOA9.I
Run Date:	03/26/2014 15:33	Analyst:	GRB2
Prep Date:	03/26/2014 15:33	Purge Vol:	5 mL
Data File:	032614V9\9F312BAR.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
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	52.0	50.0	ug/L 104	(78%-124%)
Bromofluorobenzene	53.5	50.0	ug/L 107	(80%-120%)
Toluene-d8	53.5	50.0	ug/L 107	(80%-120%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	4.197	5.51	ug/L	0	J
	unknown siloxane	16.62	6.76	ug/L	0	J

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2014-2989	Date Collected:	03/10/2014 13:35	Matrix:	W
Lab Sample ID:	1203057405	Date Received:	03/12/2014 09:05		
Client Sample:	QC for batch 1375561	Client:	ARSL004	Project:	QC
Client ID:	CAWA-14-54734PS	Method:	SW846 8260B DOE-AL	SOP Ref:	GL-OA-E-038
Batch ID:	1375561	Inst:	VOA9.I	Dilution:	1
Run Date:	03/26/2014 22:50	Analyst:	GRB2	Purge Vol:	5 mL
Prep Date:	03/26/2014 22:50				
Data File:	032614V9\9F328.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	H	53.3	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	H	53.7	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	H	44.4	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	H	44.9	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	H	46.3	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	H	44.9	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	H	45.5	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	H	44.1	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	H	49.3	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	H	44.4	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	H	41.5	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	H	44.3	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	H	50.3	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	H	43.0	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	H	42.8	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	H	43.7	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	H	43.9	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	H	42.0	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	H	53.5	ug/L	0.300	1.00
78-93-3	2-Butanone	H	234	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	HU	1.00	ug/L	0.200	1.00
95-49-8	2-Chlorotoluene	H	41.1	ug/L	0.300	1.00
591-78-6	2-Hexanone	H	220	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	H	41.2	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	H	43.9	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	H	234	ug/L	1.50	5.00
67-64-1	Acetone	BH	188	ug/L	3.00	10.0
75-05-8	Acetonitrile	H	1070	ug/L	8.00	25.0
107-02-8	Acrolein	HU	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	HU	5.00	ug/L	1.00	5.00
107-05-1	Allyl chloride	HU	5.00	ug/L	1.50	5.00
71-43-2	Benzene	H	44.4	ug/L	0.300	1.00
108-86-1	Bromobenzene	H	45.1	ug/L	0.300	1.00
74-97-5	Bromochloromethane	H	50.4	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	H	54.1	ug/L	0.300	1.00
75-25-2	Bromoform	H	62.7	ug/L	0.300	1.00
74-83-9	Bromomethane	H	57.7	ug/L	0.300	1.00
75-15-0	Carbon disulfide	H	233	ug/L	1.50	5.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2014-2989	Date Collected:	03/10/2014 13:35	Matrix:	W
Lab Sample ID:	1203057405	Date Received:	03/12/2014 09:05		
Client Sample:	QC for batch 1375561	Client:	ARSL004	Project:	QC
Client ID:	CAWA-14-54734PS	Method:	SW846 8260B DOE-AL	SOP Ref:	GL-OA-E-038
Batch ID:	1375561	Inst:	VOA9.I	Dilution:	1
Run Date:	03/26/2014 22:50	Analyst:	GRB2	Purge Vol:	5 mL
Prep Date:	03/26/2014 22:50				
Data File:	032614V9\9F328.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	H	58.4	ug/L	0.300	1.00
108-90-7	Chlorobenzene	H	44.2	ug/L	0.300	1.00
75-00-3	Chloroethane	H	51.9	ug/L	0.300	1.00
67-66-3	Chloroform	H	50.3	ug/L	0.300	1.00
74-87-3	Chloromethane	H	46.4	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	H	58.3	ug/L	0.300	1.00
74-95-3	Dibromomethane	H	52.2	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	H	73.6	ug/L	0.300	1.00
60-29-7	Ethyl ether	H	52.1	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	HU	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	H	43.3	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	H	49.4	ug/L	0.300	1.00
74-88-4	Iodomethane	H	261	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	HU	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	H	44.2	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	HU	5.00	ug/L	1.00	5.00
80-62-6	Methyl methacrylate	HU	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	H	42.9	ug/L	3.00	10.0
91-20-3	Naphthalene	H	42.7	ug/L	0.400	1.00
107-12-0	Propionitrile	HU	5.00	ug/L	1.50	5.00
100-42-5	Styrene	H	47.1	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	H	49.7	ug/L	0.300	1.00
108-88-3	Toluene	H	42.6	ug/L	0.300	1.00
79-01-6	Trichloroethylene	H	48.4	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	H	66.9	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	HU	5.00	ug/L	1.50	5.00
108-05-4	Vinyl acetate	H	204	ug/L	1.50	5.00
75-01-4	Vinyl chloride	H	52.4	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	H	47.6	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	H	49.0	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	H	87.1	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	H	5120	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	H	39.8	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	H	41.9	ug/L	0.300	1.00
95-47-6	o-Xylene	H	47.0	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	H	43.1	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	H	51.2	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	H	41.5	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	2014-2989	Date Collected:	03/10/2014 13:35	Matrix:	W
Lab Sample ID:	1203057405	Date Received:	03/12/2014 09:05		
Client Sample:	QC for batch 1375561	Client:	ARSL004	Project:	QC
Client ID:	CAWA-14-54734PS	Method:	SW846 8260B DOE-AL	SOP Ref:	GL-OA-E-038
Batch ID:	1375561	Inst:	VOA9.I	Dilution:	1
Run Date:	03/26/2014 22:50	Analyst:	GRB2	Purge Vol:	5 mL
Prep Date:	03/26/2014 22:50				
Data File:	032614V9\9F328.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
156-60-5	trans-1,2-Dichloroethylene	H	45.4	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	H	50.6	ug/L	0.300	1.00
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4		60.0	50.0	ug/L	120	(78%-124%)
Bromofluorobenzene		53.2	50.0	ug/L	106	(80%-120%)
Toluene-d8		52.9	50.0	ug/L	106	(80%-120%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2014-2989	Date Collected: 03/10/2014 13:35	Matrix: W
Lab Sample ID: 1203057406	Date Received: 03/12/2014 09:05	
Client Sample: QC for batch 1375561	Client: ARSL004	Project: QC
Client ID: CAWA-14-54734PSD	Method: SW846 8260B DOE-AL	SOP Ref: GL-OA-E-038
Batch ID: 1375561	Inst: VOA9.I	Dilution: 1
Run Date: 03/26/2014 23:17	Analyst: GRB2	Purge Vol: 5 mL
Prep Date: 03/26/2014 23:17		
Data File: 032614V9\9F329.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	H	53.2	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	H	52.7	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	H	47.1	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	H	47.5	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	H	43.7	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	H	43.6	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	H	45.3	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	H	47.1	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	H	49.9	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	H	45.0	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	H	43.0	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	H	46.5	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	H	48.2	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	H	46.2	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	H	44.3	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	H	44.5	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	H	42.8	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	H	43.4	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	H	52.7	ug/L	0.300	1.00
78-93-3	2-Butanone	H	233	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	HU	1.00	ug/L	0.200	1.00
95-49-8	2-Chlorotoluene	H	43.2	ug/L	0.300	1.00
591-78-6	2-Hexanone	H	210	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	H	44.6	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	H	44.1	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	H	236	ug/L	1.50	5.00
67-64-1	Acetone	BH	177	ug/L	3.00	10.0
75-05-8	Acetonitrile	H	1010	ug/L	8.00	25.0
107-02-8	Acrolein	HU	5.00	ug/L	1.50	5.00
107-13-1	Acrylonitrile	HU	5.00	ug/L	1.00	5.00
107-05-1	Allyl chloride	HU	5.00	ug/L	1.50	5.00
71-43-2	Benzene	H	44.6	ug/L	0.300	1.00
108-86-1	Bromobenzene	H	48.2	ug/L	0.300	1.00
74-97-5	Bromochloromethane	H	51.0	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	H	55.6	ug/L	0.300	1.00
75-25-2	Bromoform	H	67.9	ug/L	0.300	1.00
74-83-9	Bromomethane	H	55.9	ug/L	0.300	1.00
75-15-0	Carbon disulfide	H	217	ug/L	1.50	5.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2014-2989	Date Collected:	03/10/2014 13:35	Matrix:	W
Lab Sample ID:	1203057406	Date Received:	03/12/2014 09:05		
Client Sample:	QC for batch 1375561	Client:	ARSL004	Project:	QC
Client ID:	CAWA-14-54734PSD	Method:	SW846 8260B DOE-AL	SOP Ref:	GL-OA-E-038
Batch ID:	1375561	Inst:	VOA9.I	Dilution:	1
Run Date:	03/26/2014 23:17	Analyst:	GRB2	Purge Vol:	5 mL
Prep Date:	03/26/2014 23:17				
Data File:	032614V9\9F329.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	H	56.2	ug/L	0.300	1.00
108-90-7	Chlorobenzene	H	45.3	ug/L	0.300	1.00
75-00-3	Chloroethane	H	50.6	ug/L	0.300	1.00
67-66-3	Chloroform	H	51.2	ug/L	0.300	1.00
74-87-3	Chloromethane	H	45.0	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	H	57.8	ug/L	0.300	1.00
74-95-3	Dibromomethane	H	52.0	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	H	69.6	ug/L	0.300	1.00
60-29-7	Ethyl ether	H	49.7	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	HU	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene	H	43.3	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	H	50.7	ug/L	0.300	1.00
74-88-4	Iodomethane	H	252	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	HU	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	H	45.2	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	HU	5.00	ug/L	1.00	5.00
80-62-6	Methyl methacrylate	HU	5.00	ug/L	1.50	5.00
75-09-2	Methylene chloride	H	44.6	ug/L	3.00	10.0
91-20-3	Naphthalene	H	49.1	ug/L	0.400	1.00
107-12-0	Propionitrile	HU	5.00	ug/L	1.50	5.00
100-42-5	Styrene	H	47.2	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	H	47.9	ug/L	0.300	1.00
108-88-3	Toluene	H	41.5	ug/L	0.300	1.00
79-01-6	Trichloroethylene	H	49.9	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	H	62.6	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	HU	5.00	ug/L	1.50	5.00
108-05-4	Vinyl acetate	H	206	ug/L	1.50	5.00
75-01-4	Vinyl chloride	H	50.4	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	H	47.6	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	H	51.8	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	H	91.7	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	H	5110	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	H	41.4	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	H	42.5	ug/L	0.300	1.00
95-47-6	o-Xylene	H	45.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	H	42.2	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	H	51.9	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	H	44.9	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	2014-2989	Date Collected:	03/10/2014 13:35	Matrix:	W
Lab Sample ID:	1203057406	Date Received:	03/12/2014 09:05		
Client Sample:	QC for batch 1375561	Client:	ARSL004	Project:	QC
Client ID:	CAWA-14-54734PSD	Method:	SW846 8260B DOE-AL	SOP Ref:	GL-OA-E-038
Batch ID:	1375561	Inst:	VOA9.I	Dilution:	1
Run Date:	03/26/2014 23:17	Analyst:	GRB2	Purge Vol:	5 mL
Prep Date:	03/26/2014 23:17				
Data File:	032614V9\9F329.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
156-60-5	trans-1,2-Dichloroethylene	H	45.1	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	H	54.4	ug/L	0.300	1.00
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits
1,2-Dichloroethane-d4		56.9	50.0	ug/L	114	(78%-124%)
Bromofluorobenzene		53.9	50.0	ug/L	108	(80%-120%)
Toluene-d8		53.0	50.0	ug/L	106	(80%-120%)

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2014-2989	Matrix:	WATER
Lab Sample ID:	1203057407		
Client Sample:	QC for batch 1375561	Client:	ARSL004
Client ID:	LCS for batch 1375561	Method:	SW846 8260B DOE-AL
Batch ID:	1375561	Inst:	VOA9.I
Run Date:	03/26/2014 14:09	Analyst:	GRB2
Prep Date:	03/26/2014 14:09	Purge Vol:	5 mL
Data File:	032614V9\9F309LAR.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane		55.6	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane		50.5	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane		47.5	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane		47.8	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane		44.7	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene		43.1	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene		45.2	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene		54.8	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane		53.3	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene		54.8	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene		47.4	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene		50.4	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane		45.4	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane		44.9	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene		48.3	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene		49.1	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane		45.6	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene		47.8	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane		52.3	ug/L	0.300	1.00
78-93-3	2-Butanone		216	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	U	1.00	ug/L	0.200	1.00
95-49-8	2-Chlorotoluene		46.6	ug/L	0.300	1.00
591-78-6	2-Hexanone		225	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene		47.5	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene		49.6	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone		258	ug/L	1.50	5.00
67-64-1	Acetone	B	240	ug/L	3.00	10.0
75-05-8	Acetonitrile		1020	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	1.00	5.00
107-05-1	Allyl chloride	U	5.00	ug/L	1.50	5.00
71-43-2	Benzene		44.8	ug/L	0.300	1.00
108-86-1	Bromobenzene		49.0	ug/L	0.300	1.00
74-97-5	Bromochloromethane		49.3	ug/L	0.300	1.00
75-27-4	Bromodichloromethane		52.1	ug/L	0.300	1.00
75-25-2	Bromoform		66.2	ug/L	0.300	1.00
74-83-9	Bromomethane		51.7	ug/L	0.300	1.00
75-15-0	Carbon disulfide		218	ug/L	1.50	5.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number: 2014-2989

Lab Sample ID: 1203057407

Client Sample: QC for batch 1375561

Client ID: LCS for batch 1375561

Batch ID: 1375561

Run Date: 03/26/2014 14:09

Prep Date: 03/26/2014 14:09

Data File: 032614V9\9F309LAR.D

Matrix: WATER

Client: ARSL004

Method: SW846 8260B DOE-AL

Inst: VOA9.I

Analyst: GRB2

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
56-23-5	Carbon tetrachloride		52.4	ug/L	0.300	1.00
108-90-7	Chlorobenzene		47.5	ug/L	0.300	1.00
75-00-3	Chloroethane		52.8	ug/L	0.300	1.00
67-66-3	Chloroform		48.0	ug/L	0.300	1.00
74-87-3	Chloromethane		42.5	ug/L	0.300	1.00
124-48-1	Dibromochloromethane		56.1	ug/L	0.300	1.00
74-95-3	Dibromomethane		48.4	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane		65.6	ug/L	0.300	1.00
60-29-7	Ethyl ether		54.3	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	U	5.00	ug/L	1.50	5.00
100-41-4	Ethylbenzene		46.6	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene		57.6	ug/L	0.300	1.00
74-88-4	Iodomethane		243	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	U	50.0	ug/L	15.0	50.0
98-82-8	Isopropylbenzene		48.8	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	U	5.00	ug/L	1.00	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	3.00	10.0
91-20-3	Naphthalene		53.9	ug/L	0.400	1.00
107-12-0	Propionitrile	U	5.00	ug/L	1.50	5.00
100-42-5	Styrene		51.0	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene		51.9	ug/L	0.300	1.00
108-88-3	Toluene		45.1	ug/L	0.300	1.00
79-01-6	Trichloroethylene		48.9	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane		58.1	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	U	5.00	ug/L	1.50	5.00
108-05-4	Vinyl acetate		221	ug/L	1.50	5.00
75-01-4	Vinyl chloride		48.9	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene		46.5	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene		53.1	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes		98.0	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol		4990	ug/L	15.0	50.0
104-51-8	n-Butylbenzene		46.7	ug/L	0.300	1.00
103-65-1	n-Propylbenzene		46.3	ug/L	0.300	1.00
95-47-6	o-Xylene		49.4	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene		47.2	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether		53.0	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene		51.1	ug/L	0.300	1.00

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	2014-2989	Matrix:	WATER
Lab Sample ID:	1203057407		
Client Sample:	QC for batch 1375561	Client:	ARSL004
Client ID:	LCS for batch 1375561	Method:	SW846 8260B DOE-AL
Batch ID:	1375561	Inst:	VOA9.I
Run Date:	03/26/2014 14:09	Analyst:	GRB2
Prep Date:	03/26/2014 14:09	Purge Vol:	5 mL
Data File:	032614V9\9F309LAR.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
156-60-5	trans-1,2-Dichloroethylene		44.0	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	51.1	50.0	ug/L	102	(78%-124%)
Bromofluorobenzene	54.6	50.0	ug/L	109	(80%-120%)
Toluene-d8	54.0	50.0	ug/L	108	(80%-120%)

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2014-2989	Matrix:	WATER
Lab Sample ID:	1203057408		
Client Sample:	QC for batch 1375561	Client:	ARSL004
Client ID:	LCS for batch 1375561	Method:	SW846 8260B DOE-AL
Batch ID:	1375561	Inst:	VOA9.I
Run Date:	03/26/2014 14:37	Analyst:	GRB2
Prep Date:	03/26/2014 14:37	Purge Vol:	5 mL
Data File:	032614V9\9F310SHAR.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
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	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene		55.9	ug/L	0.200	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	2.20	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	3.00	10.0
75-05-8	Acetonitrile	U	25.0	ug/L	8.00	25.0
107-02-8	Acrolein		357	ug/L	1.50	5.00
107-13-1	Acrylonitrile		268	ug/L	1.00	5.00
107-05-1	Allyl chloride		211	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
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

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2014-2989	Matrix: WATER
Lab Sample ID: 1203057408	
Client Sample: QC for batch 1375561	Client: ARSL004
Client ID: LCS for batch 1375561	Method: SW846 8260B DOE-AL
Batch ID: 1375561	Inst: VOA9.I
Run Date: 03/26/2014 14:37	Analyst: GRB2
Prep Date: 03/26/2014 14:37	Purge Vol: 5 mL
Data File: 032614V9\9F310SHAR.D	Column: DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
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		2620	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	U	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile		253	ug/L	1.00	5.00
80-62-6	Methyl methacrylate		278	ug/L	1.50	5.00
75-09-2	Methylene chloride	U	10.0	ug/L	3.00	10.0
91-20-3	Naphthalene	U	1.00	ug/L	0.400	1.00
107-12-0	Propionitrile		282	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		235	ug/L	1.50	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
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

Volatile
Certificate of Analysis
Sample Summary

SDG Number:	2014-2989	Matrix:	WATER
Lab Sample ID:	1203057408		
Client Sample:	QC for batch 1375561	Client:	ARSL004
Client ID:	LCS for batch 1375561	Method:	SW846 8260B DOE-AL
Batch ID:	1375561	Inst:	VOA9.I
Run Date:	03/26/2014 14:37	Analyst:	GRB2
Prep Date:	03/26/2014 14:37	Purge Vol:	5 mL
Data File:	032614V9\9F310SHAR.D	Column:	DB-624

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
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		54.6	50.0	ug/L	109	(78%-124%)
Bromofluorobenzene		54.1	50.0	ug/L	108	(80%-120%)
Toluene-d8		56.0	50.0	ug/L	112	(80%-120%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2014-2989	Date Collected: 03/10/2014 13:35	Matrix: W
Lab Sample ID: 1203057409	Date Received: 03/12/2014 09:05	
Client Sample: QC for batch 1375561	Client: ARSL004	Project: QC
Client ID: CAWA-14-54734PS	Method: SW846 8260B DOE-AL	SOP Ref: GL-OA-E-038
Batch ID: 1375561	Inst: VOA9.I	Dilution: 1
Run Date: 03/26/2014 23:44	Analyst: GRB2	Purge Vol: 5 mL
Prep Date: 03/26/2014 23:44		
Data File: 032614V9\9F330.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	HU	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	HU	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	HU	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	HU	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	HU	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	HU	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	HU	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	HU	5.00	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	H	56.5	ug/L	0.200	1.00
95-49-8	2-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	HU	5.00	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	HU	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	HU	5.00	ug/L	1.50	5.00
67-64-1	Acetone	HU	10.0	ug/L	3.00	10.0
75-05-8	Acetonitrile	HU	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	H	311	ug/L	1.50	5.00
107-13-1	Acrylonitrile	H	255	ug/L	1.00	5.00
107-05-1	Allyl chloride	H	216	ug/L	1.50	5.00
71-43-2	Benzene	HU	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	HU	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	HU	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	HU	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	HU	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	HU	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	HU	5.00	ug/L	1.50	5.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2014-2989	Date Collected:	03/10/2014 13:35	Matrix:	W
Lab Sample ID:	1203057409	Date Received:	03/12/2014 09:05		
Client Sample:	QC for batch 1375561	Client:	ARSL004	Project:	QC
Client ID:	CAWA-14-54734PS	Method:	SW846 8260B DOE-AL	SOP Ref:	GL-OA-E-038
Batch ID:	1375561	Inst:	VOA9.I	Dilution:	1
Run Date:	03/26/2014 23:44	Analyst:	GRB2	Purge Vol:	5 mL
Prep Date:	03/26/2014 23:44				
Data File:	032614V9\9F330.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	HU	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	HU	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	HU	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	HU	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	HU	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	HU	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	HU	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	HU	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	HU	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	H	246	ug/L	1.50	5.00
100-41-4	Ethylbenzene	HU	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	HU	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	HU	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	H	2500	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	HU	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	H	251	ug/L	1.00	5.00
80-62-6	Methyl methacrylate	H	272	ug/L	1.50	5.00
75-09-2	Methylene chloride	HU	10.0	ug/L	3.00	10.0
91-20-3	Naphthalene	HU	1.00	ug/L	0.400	1.00
107-12-0	Propionitrile	H	265	ug/L	1.50	5.00
100-42-5	Styrene	HU	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	HU	1.00	ug/L	0.300	1.00
108-88-3	Toluene	HU	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	HU	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	HU	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	H	252	ug/L	1.50	5.00
108-05-4	Vinyl acetate	HU	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	HU	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	HU	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	HU	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	HU	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	HU	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	HU	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	HU	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	HU	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	HU	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

Page 3 of 3

SDG Number:	2014-2989	Date Collected:	03/10/2014 13:35	Matrix:	W
Lab Sample ID:	1203057409	Date Received:	03/12/2014 09:05		
Client Sample:	QC for batch 1375561	Client:	ARSL004	Project:	QC
Client ID:	CAWA-14-54734PS	Method:	SW846 8260B DOE-AL	SOP Ref:	GL-OA-E-038
Batch ID:	1375561	Inst:	VOA9.I	Dilution:	1
Run Date:	03/26/2014 23:44	Analyst:	GRB2	Purge Vol:	5 mL
Prep Date:	03/26/2014 23:44				
Data File:	032614V9\9F330.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
156-60-5	trans-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits	
1,2-Dichloroethane-d4	56.8	50.0	ug/L	114	(78%-124%)
Bromofluorobenzene	51.5	50.0	ug/L	103	(80%-120%)
Toluene-d8	55.9	50.0	ug/L	112	(80%-120%)

Volatile
Certificate of Analysis
Sample Summary

SDG Number: 2014-2989	Date Collected: 03/10/2014 13:35	Matrix: W
Lab Sample ID: 1203057410	Date Received: 03/12/2014 09:05	
Client Sample: QC for batch 1375561	Client: ARSL004	Project: QC
Client ID: CAWA-14-54734PSD	Method: SW846 8260B DOE-AL	SOP Ref: GL-OA-E-038
Batch ID: 1375561	Inst: VOA9.I	Dilution: 1
Run Date: 03/27/2014 00:10	Analyst: GRB2	Purge Vol: 5 mL
Prep Date: 03/27/2014 00:10		
Data File: 032614V9\9F331.D	Column: DB-624	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
630-20-6	1,1,1,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
71-55-6	1,1,1-Trichloroethane	HU	1.00	ug/L	0.300	1.00
79-34-5	1,1,2,2-Tetrachloroethane	HU	1.00	ug/L	0.300	1.00
79-00-5	1,1,2-Trichloroethane	HU	1.00	ug/L	0.300	1.00
75-34-3	1,1-Dichloroethane	HU	1.00	ug/L	0.300	1.00
75-35-4	1,1-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
563-58-6	1,1-Dichloropropene	HU	1.00	ug/L	0.300	1.00
87-61-6	1,2,3-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
96-18-4	1,2,3-Trichloropropane	HU	1.00	ug/L	0.300	1.00
120-82-1	1,2,4-Trichlorobenzene	HU	1.00	ug/L	0.300	1.00
95-63-6	1,2,4-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
95-50-1	1,2-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
107-06-2	1,2-Dichloroethane	HU	1.00	ug/L	0.300	1.00
78-87-5	1,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
108-67-8	1,3,5-Trimethylbenzene	HU	1.00	ug/L	0.300	1.00
541-73-1	1,3-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
142-28-9	1,3-Dichloropropane	HU	1.00	ug/L	0.300	1.00
106-46-7	1,4-Dichlorobenzene	HU	1.00	ug/L	0.300	1.00
594-20-7	2,2-Dichloropropane	HU	1.00	ug/L	0.300	1.00
78-93-3	2-Butanone	HU	5.00	ug/L	2.00	5.00
126-99-8	2-Chloro-1,3-butadiene	H	51.1	ug/L	0.200	1.00
95-49-8	2-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
591-78-6	2-Hexanone	HU	5.00	ug/L	2.20	5.00
106-43-4	4-Chlorotoluene	HU	1.00	ug/L	0.300	1.00
99-87-6	4-Isopropyltoluene	HU	1.00	ug/L	0.300	1.00
108-10-1	4-Methyl-2-pentanone	HU	5.00	ug/L	1.50	5.00
67-64-1	Acetone	HU	10.0	ug/L	3.00	10.0
75-05-8	Acetonitrile	HU	25.0	ug/L	8.00	25.0
107-02-8	Acrolein	H	288	ug/L	1.50	5.00
107-13-1	Acrylonitrile	H	229	ug/L	1.00	5.00
107-05-1	Allyl chloride	H	198	ug/L	1.50	5.00
71-43-2	Benzene	HU	1.00	ug/L	0.300	1.00
108-86-1	Bromobenzene	HU	1.00	ug/L	0.300	1.00
74-97-5	Bromochloromethane	HU	1.00	ug/L	0.300	1.00
75-27-4	Bromodichloromethane	HU	1.00	ug/L	0.300	1.00
75-25-2	Bromoform	HU	1.00	ug/L	0.300	1.00
74-83-9	Bromomethane	HU	1.00	ug/L	0.300	1.00
75-15-0	Carbon disulfide	HU	5.00	ug/L	1.50	5.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2014-2989	Date Collected:	03/10/2014 13:35	Matrix:	W
Lab Sample ID:	1203057410	Date Received:	03/12/2014 09:05		
Client Sample:	QC for batch 1375561	Client:	ARSL004	Project:	QC
Client ID:	CAWA-14-54734PSD	Method:	SW846 8260B DOE-AL	SOP Ref:	GL-OA-E-038
Batch ID:	1375561	Inst:	VOA9.I	Dilution:	1
Run Date:	03/27/2014 00:10	Analyst:	GRB2	Purge Vol:	5 mL
Prep Date:	03/27/2014 00:10				
Data File:	032614V9\9F331.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
56-23-5	Carbon tetrachloride	HU	1.00	ug/L	0.300	1.00
108-90-7	Chlorobenzene	HU	1.00	ug/L	0.300	1.00
75-00-3	Chloroethane	HU	1.00	ug/L	0.300	1.00
67-66-3	Chloroform	HU	1.00	ug/L	0.300	1.00
74-87-3	Chloromethane	HU	1.00	ug/L	0.300	1.00
124-48-1	Dibromochloromethane	HU	1.00	ug/L	0.300	1.00
74-95-3	Dibromomethane	HU	1.00	ug/L	0.300	1.00
75-71-8	Dichlorodifluoromethane	HU	1.00	ug/L	0.300	1.00
60-29-7	Ethyl ether	HU	1.00	ug/L	0.300	1.00
97-63-2	Ethyl methacrylate	H	224	ug/L	1.50	5.00
100-41-4	Ethylbenzene	HU	1.00	ug/L	0.300	1.00
87-68-3	Hexachlorobutadiene	HU	1.00	ug/L	0.300	1.00
74-88-4	Iodomethane	HU	5.00	ug/L	1.50	5.00
78-83-1	Isobutyl alcohol	H	2240	ug/L	15.0	50.0
98-82-8	Isopropylbenzene	HU	1.00	ug/L	0.300	1.00
126-98-7	Methacrylonitrile	H	235	ug/L	1.00	5.00
80-62-6	Methyl methacrylate	H	250	ug/L	1.50	5.00
75-09-2	Methylene chloride	HU	10.0	ug/L	3.00	10.0
91-20-3	Naphthalene	HU	1.00	ug/L	0.400	1.00
107-12-0	Propionitrile	H	239	ug/L	1.50	5.00
100-42-5	Styrene	HU	1.00	ug/L	0.300	1.00
127-18-4	Tetrachloroethylene	HU	1.00	ug/L	0.300	1.00
108-88-3	Toluene	HU	1.00	ug/L	0.300	1.00
79-01-6	Trichloroethylene	HU	1.00	ug/L	0.300	1.00
75-69-4	Trichlorofluoromethane	HU	1.00	ug/L	0.300	1.00
76-13-1	Trichlorotrifluoroethane	H	236	ug/L	1.50	5.00
108-05-4	Vinyl acetate	HU	5.00	ug/L	1.50	5.00
75-01-4	Vinyl chloride	HU	1.00	ug/L	0.300	1.00
156-59-2	cis-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-01-5	cis-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00
179601-23-1	m,p-Xylenes	HU	2.00	ug/L	0.300	2.00
71-36-3	n-Butyl alcohol	HU	50.0	ug/L	15.0	50.0
104-51-8	n-Butylbenzene	HU	1.00	ug/L	0.300	1.00
103-65-1	n-Propylbenzene	HU	1.00	ug/L	0.300	1.00
95-47-6	o-Xylene	HU	1.00	ug/L	0.300	1.00
135-98-8	sec-Butylbenzene	HU	1.00	ug/L	0.300	1.00
1634-04-4	tert-Butyl methyl ether	HU	1.00	ug/L	0.300	1.00
98-06-6	tert-Butylbenzene	HU	1.00	ug/L	0.300	1.00

**Volatile
Certificate of Analysis
Sample Summary**

SDG Number:	2014-2989	Date Collected:	03/10/2014 13:35	Matrix:	W
Lab Sample ID:	1203057410	Date Received:	03/12/2014 09:05		
Client Sample:	QC for batch 1375561	Client:	ARSL004	Project:	QC
Client ID:	CAWA-14-54734PSD	Method:	SW846 8260B DOE-AL	SOP Ref:	GL-OA-E-038
Batch ID:	1375561	Inst:	VOA9.I	Dilution:	1
Run Date:	03/27/2014 00:10	Analyst:	GRB2	Purge Vol:	5 mL
Prep Date:	03/27/2014 00:10				
Data File:	032614V9\9F331.D	Column:	DB-624		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
156-60-5	trans-1,2-Dichloroethylene	HU	1.00	ug/L	0.300	1.00
10061-02-6	trans-1,3-Dichloropropylene	HU	1.00	ug/L	0.300	1.00

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits	
1,2-Dichloroethane-d4	54.1	50.0	ug/L	108	(78%-124%)
Bromofluorobenzene	54.2	50.0	ug/L	108	(80%-120%)
Toluene-d8	52.6	50.0	ug/L	105	(80%-120%)

Miscellaneous

DATA EXCEPTION REPORT

Mo.Day Yr. 08-APR-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: VOA GC/MS	Test / Method: SW846 8260B DOE-AL	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1375561	Sample Numbers: See Below		
<p>Potentially affected work order(s)(SDG): 344383(2014-2971),344384(2014-2970),344473(2014-2974),344474(2014-2973),344588(2014-2989),344674(2014-2999)</p> <p>Application Issues:</p> <p>Failed Recovery for MS/PS Sample Analyzed out of Holding Failed Recovery for LCS/LCSD Failed Recovery for MSD/PSD</p>			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. QC sample 1203057405MS recovered outside the limits for Dichlorodifluoromethane at 147% (51.00%-133.00%) and Trichlorofluoromethane at 134% (66.00%-126.00%). QC sample 1203057406MSD recovered outside the limits for Dichlorodifluoromethane at 139% (51.00%-133.00%) and Bromoform at 136% (61.00%-135.00%).</p> <p>2. The following samples were analyzed out of holding: 344383 004,009 344384 004,009,013,018 344473 004,009 344474 002,004,006 QC 1203057405MS, 1203057406MSD,1203057409MS and 1203057410MSD</p> <p>3. The following LCS recoveries were not all within the acceptance limits: 1203057407LCS recovered Dichlorodifluoromethane at 131% (58.00%-129.00%); 1203057408LCS recovered Acrolein at 143% (65.00%-126.00%); and 1203064499LCS recovered Acrolein at 136% (65.00%-126.00%).</p>		<p>1. The MS/MSD pair recovered in a similar manner. The results are reported.</p> <p>2. The samples were analyzed within the two times the holding time criteria. The results are reported.</p> <p>3. The unacceptable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported.</p>	

Originator's Name:
Gelester Baskett 08-APR-14

Data Validator/Group Leader:
Erin Haubert 09-APR-14

Semi-Volatile Analysis

Case Narrative

**Semi-Volatile Case Narrative
ARS International, LLC (ARSL)
SDG 2014-2989**

Method/Analysis Information

Procedure:	Analysis of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry
Analytical Method:	SW846 3510C/8270D
Prep Method:	SW846 3510C
Analytical Batch Number:	1372454
Prep Batch Number:	1372453

Sample Analysis

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

Sample ID	Client ID
344588004	CAAN-14-54788
1203050101	Method Blank (MB)
1203050102	Laboratory Control Sample (LCS)
1203050103	344473004(CAWA-14-54749) Matrix Spike (MS)
1203050104	344473004(CAWA-14-54749) 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# 32.

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

Calibration Information

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

Diphenylamine has now superseded N-Nitroso-diphenylamine on Quantitation Reports, Initial Calibration Reports, Calibration Check Standard Reports, etc. Previous versions of EPA Methodologies referenced N-Nitroso-diphenylamine. However, as stated in EPA Methodology, "N-Nitroso-diphenylamine decomposes in the gas chromatographic inlet and cannot be separated from Diphenylamine." Studies of these two compounds at

GEL, both independent of each other and together, showed that they not only co-elute, but also have similar mass spectra. N-Nitroso-diphenylamine and Diphenylamine will be reported as Diphenylamine on all reports and forms.

Initial Calibration

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

CCV Requirements

All Calibration Verification Standards (CCV) did not meet the acceptance criteria as outlined in Method 8270D for sample 344588004 (CAAN-14-54788). However, the method allows for a designated number of outliers dependent on the requested analyte list. This SDG satisfied the 8270D outlier acceptance criteria. Detected concentrations of these analytes should be considered as estimated.

Quality Control (QC) Information

Method Blank (MB) Statement

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

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS(1203050102) recovered 4-Nitrophenol at 14%. The limits are 16%-77%. The LCS failure represents less than 5% of the total requested spike analyte list. That satisfied the acceptance criteria for the client and the data results have been reported for sample 344588004 (CAAN-14-54788).

QC Sample Designation

Sample 344473004 (CAWA-14-54749) was selected for analysis as the matrix spike and matrix spike duplicate.

Matrix Spike (MS) Recovery Statement

The MS recoveries were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The MS(1203050103)/MSD(1203050104) RPD value for Benzidine was 95% (limit: 30%) and for Pyridine was 33% (limit: 30%). Since Benzidine and Pyridine were individually within the acceptance criteria in the MS and MSD, the non-conformance had no adverse impact on the data and the results have been reported for sample 344588004 (CAAN-14-54788).

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**

Data exception report 1275606 was generated for sample 344588004 (CAAN-14-54788) in this batch for this SDG.

Manual Integrations

Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations. Manual integrations, if any, are included with the raw data.

TIC Comment

Tentatively identified compounds (TIC) may be requested for samples 1203050101(MB) and 344588004 (CAAN-14-54788) 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, are included on the Sample Data Summary (Form 1) and are also included with the sample raw data.

Additional Comments

The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

Due to rounding differences in the calculation, the data reported in the Surrogate Recovery Report may differ slightly from the raw data. Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

Electronic Package Comment

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

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

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description
MSD5.I	Agilent 6890/5973 GC/MS w/ 7683 Autosampler	HP6890/HP5973	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: 2014-2989 GEL Work Order: 344588

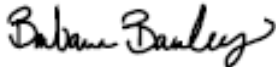
The Qualifiers in this report are defined as follows:

- * 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, 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: 08 APR 2014

Title: Data Validator

Sample Data Summary

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

SDG Number: 2014-2989

Lab Sample ID: 344588004

Date Collected: 03/12/2014 10:15

Date Received: 03/14/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Batch ID: 1372454

Inst: MSD5.I

Dilution: 1

Run Date: 03/18/2014 16:08

Analyst: RMB

Inj. Vol: 1 uL

Prep Date: 03/17/2014 07:00

Aliquot: 980 mL

Final Volume: 1 mL

Data File: s031814.b\s5C1815.D

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene	U	10.2	ug/L	3.06	10.2
120-82-1	1,2,4-Trichlorobenzene	U	10.2	ug/L	3.06	10.2
95-50-1	1,2-Dichlorobenzene	U	10.2	ug/L	3.06	10.2
122-66-7	Azobenzene	U	10.2	ug/L	3.06	10.2
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene	U	10.2	ug/L	3.06	10.2
106-46-7	1,4-Dichlorobenzene	U	10.2	ug/L	3.06	10.2
123-91-1	1,4-Dioxane	U	10.2	ug/L	3.06	10.2
58-90-2	2,3,4,6-Tetrachlorophenol	U	10.2	ug/L	3.06	10.2
95-95-4	2,4,5-Trichlorophenol	U	10.2	ug/L	3.06	10.2
88-06-2	2,4,6-Trichlorophenol	U	10.2	ug/L	3.06	10.2
120-83-2	2,4-Dichlorophenol	U	10.2	ug/L	3.06	10.2
105-67-9	2,4-Dimethylphenol	U	10.2	ug/L	3.06	10.2
51-28-5	2,4-Dinitrophenol	U	20.4	ug/L	5.10	20.4
121-14-2	2,4-Dinitrotoluene	U	10.2	ug/L	3.06	10.2
606-20-2	2,6-Dinitrotoluene	U	10.2	ug/L	3.06	10.2
91-58-7	2-Chloronaphthalene	U	1.02	ug/L	0.418	1.02
95-57-8	2-Chlorophenol	U	10.2	ug/L	3.06	10.2
534-52-1	2-Methyl-4,6-dinitrophenol	U	10.2	ug/L	3.06	10.2
88-75-5	2-Nitrophenol	U	10.2	ug/L	3.06	10.2
91-94-1	3,3'-Dichlorobenzidine	U	10.2	ug/L	3.06	10.2
101-55-3	4-Bromophenylphenylether	U	10.2	ug/L	3.06	10.2
59-50-7	Parachlorometa cresol	U	10.2	ug/L	3.06	10.2
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline	U	10.2	ug/L	3.37	10.2
7005-72-3	4-Chlorophenylphenylether	U	10.2	ug/L	3.06	10.2
100-02-7	4-Nitrophenol	U	10.2	ug/L	3.06	10.2
62-53-3	Aniline	U	10.2	ug/L	4.29	10.2
1912-24-9	Atrazine	U	10.2	ug/L	3.06	10.2
92-87-5	Benzidine	U	10.2	ug/L	3.98	10.2
65-85-0	Benzoic acid	U	20.4	ug/L	6.12	20.4
100-51-6	Benzyl alcohol	U	10.2	ug/L	3.06	10.2
85-68-7	Butylbenzylphthalate	U	10.2	ug/L	3.06	10.2
84-74-2	Di-n-butylphthalate	U	10.2	ug/L	3.06	10.2
117-84-0	Di-n-octylphthalate	U	10.2	ug/L	3.06	10.2
132-64-9	Dibenzofuran	U	10.2	ug/L	3.06	10.2
84-66-2	Diethylphthalate	U	10.2	ug/L	3.06	10.2
131-11-3	Dimethylphthalate	U	10.2	ug/L	3.06	10.2
88-85-7	Dinoseb	U	10.2	ug/L	3.06	10.2

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

Page 2 of 3

SDG Number: 2014-2989

Lab Sample ID: 344588004

Date Collected: 03/12/2014 10:15

Date Received: 03/14/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Method: SW846 3510C/8270D

SOP Ref: GL-OA-E-009

Inst: MSD5.I

Dilution: 1

Batch ID: 1372454

Analyst: RMB

Inj. Vol: 1 uL

Run Date: 03/18/2014 16:08

Aliquot: 980 mL

Final Volume: 1 mL

Prep Date: 03/17/2014 07:00

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
122-39-4	Diphenylamine	U	10.2	ug/L	3.06	10.2
87-68-3	Hexachlorobutadiene	U	10.2	ug/L	3.06	10.2
77-47-4	Hexachlorocyclopentadiene	U	10.2	ug/L	3.06	10.2
67-72-1	Hexachloroethane	U	10.2	ug/L	3.06	10.2
78-59-1	Isophorone	U	10.2	ug/L	3.57	10.2
62-75-9	N-Methyl-N-nitrosomethylamine	U	10.2	ug/L	3.06	10.2
924-16-3	N-Nitrosodi-n-butylamine	U	10.2	ug/L	3.06	10.2
55-18-5	N-Nitrosodiethylamine	U	10.2	ug/L	3.06	10.2
621-64-7	N-Nitrosodi--n-propylamine	U	10.2	ug/L	3.06	10.2
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine	U	10.2	ug/L	3.06	10.2
98-95-3	Nitrobenzene	U	10.2	ug/L	3.06	10.2
608-93-5	Pentachlorobenzene	U	10.2	ug/L	3.06	10.2
108-95-2	Phenol	U	10.2	ug/L	3.06	10.2
110-86-1	Pyridine	U	10.2	ug/L	3.06	10.2
108-60-1	bis(2-Chloro-1-methylethyl)ether	U	10.2	ug/L	3.06	10.2
111-91-1	bis(2-Chloroethoxy)methane	U	10.2	ug/L	3.06	10.2
111-44-4	bis(2-Chloroethyl) ether	U	10.2	ug/L	3.06	10.2
117-81-7	bis(2-Ethylhexyl)phthalate	U	10.2	ug/L	3.06	10.2
65794-96-9	m,p-Cresols	U	10.2	ug/L	3.78	10.2
99-09-2	3-Nitroaniline	U	10.2	ug/L	3.06	10.2
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol	U	10.2	ug/L	3.06	10.2
88-74-4	2-Nitroaniline	U	10.2	ug/L	3.06	10.2
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline	U	10.2	ug/L	3.06	10.2
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	79.1	102	ug/L	77.5	(26%-129%)
2-Fluorobiphenyl	34.8	51.0	ug/L	68.1	(32%-102%)
2-Fluorophenol	38.3	102	ug/L	37.5	(10%-78%)
Nitrobenzene-d5	37.9	51.0	ug/L	74.2	(36%-125%)
Phenol-d5	22.0	102	ug/L	21.6	(10%-104%)
p-Terphenyl-d14	42.7	51.0	ug/L	83.6	(34%-135%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	1.963	4.33	ug/L	0	J
	unknown	2.073	29	ug/L	0	J

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

SDG Number: 2014-2989
Lab Sample ID: 344588004

Client ID: CAAN-14-54788
Batch ID: 1372454
Run Date: 03/18/2014 16:08
Prep Date: 03/17/2014 07:00
Data File: s031814.b\s5C1815.D

Date Collected: 03/12/2014 10:15
Date Received: 03/14/2014 09:00
Client: ARSL004
Method: SW846 3510C/8270D
Inst: MSD5.I
Analyst: RMB
Aliquot: 980 mL
Column: DB-5ms

Matrix: W

Project: ESHL00714
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
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Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	2.301	35.8	ug/L	0	J
	unknown	2.415	20.5	ug/L	0	J
	unknown	2.473	8.6	ug/L	0	J
	unknown	22.492	16.6	ug/L	0	J

Quality Control Summary

Semi-Volatile
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2014-2989

Matrix Type: LIQUID

Sample ID	Client ID	2FP %REC	PHL %REC	NBZ %REC	FBP %REC	TBP %REC	TPH %REC
1203050101	MB for batch 1372453	40	24	66	44	68	80
1203050102	LCS for batch 1372453	35	24	75	62	81	72
1203050103	CAWA-14-54749MS	56	44	84	70	90	79
1203050104	CAWA-14-54749MSD	50	41	77	68	86	79
344588004	CAAN-14-54788	38	22	74	68	78	84

Surrogate

Acceptance Limits

2FP	= 2-Fluorophenol	(10%-78%)
PHL	= Phenol-d5	(10%-104%)
NBZ	= Nitrobenzene-d5	(36%-125%)
FBP	= 2-Fluorobiphenyl	(32%-102%)
TBP	= 2,4,6-Tribromophenol	(26%-129%)
TPH	= p-Terphenyl-d14	(34%-135%)

* 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 3

SDG Number: 2014-2989

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1372453

Matrix: WATER

Lab Sample ID 1203050102

Instrument: MSD5.I

Analysis Date: 03/18/2014 10:55

Dilution: 1

Analyst: RMB

Prep Batch ID: 1372453

Inj. Vol: 1 uL

Batch ID: 1372454

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	20.7	41	18-75
110-86-1	LCS Pyridine	50.0	0.0	22.5	45	11-88
62-53-3	LCS Aniline	50.0	0.0	33.7	67	35-107
108-95-2	LCS Phenol	50.0	0.0	12.2	24	13-77
111-44-4	LCS bis(2-Chloroethyl) ether	50.0	0.0	33.1	66	35-111
95-57-8	LCS 2-Chlorophenol	50.0	0.0	28.4	57	39-99
541-73-1	LCS 1,3-Dichlorobenzene	50.0	0.0	23.8	48	25-100
106-46-7	LCS 1,4-Dichlorobenzene	50.0	0.0	23.1	46	24-88
95-50-1	LCS 1,2-Dichlorobenzene	50.0	0.0	24.8	50	27-87
108-60-1	LCS bis(2-Chloro-1-methylethyl)et	50.0	0.0	29.5	59	23-120
100-51-6	LCS Benzyl alcohol	50.0	0.0	28.6	57	33-90
95-48-7	LCS o-Cresol	50.0	0.0	25.5	51	32-90
65794-96-9	LCS m,p-Cresols	50.0	0.0	27.5	55	28-100
621-64-7	LCS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	50.0	0.0	37.4	75	39-113
67-72-1	LCS Hexachloroethane	50.0	0.0	24.7	49	20-85
98-95-3	LCS Nitrobenzene	50.0	0.0	37.0	74	41-119
78-59-1	LCS Isophorone	50.0	0.0	41.3	83	49-133
88-75-5	LCS 2-Nitrophenol	50.0	0.0	36.6	73	42-111
105-67-9	LCS 2,4-Dimethylphenol	50.0	0.0	32.2	64	43-99
111-91-1	LCS bis(2-Chloroethoxy)methane	50.0	0.0	39.4	79	44-109
120-83-2	LCS 2,4-Dichlorophenol	50.0	0.0	34.9	70	45-106
65-85-0	LCS Benzoic acid	100	0.0	24.4	24	10-81

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 3

SDG Number: 2014-2989

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1372453

Matrix: WATER

Lab Sample ID 1203050102

Instrument: MSD5.I

Analysis Date: 03/18/2014 10:55

Dilution: 1

Analyst: RMB

Prep Batch ID: 1372453

Inj. Vol: 1 uL

Batch ID: 1372454

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	38.8	78	50-122
87-68-3	LCS Hexachlorobutadiene	50.0	0.0	25.6	51	19-92
59-50-7	LCS Parachlorometa cresol 4-Chloro-3-methylphenol	50.0	0.0	34.5	69	46-111
77-47-4	LCS Hexachlorocyclopentadiene	50.0	0.0	17.2	34	15-72
88-06-2	LCS 2,4,6-Trichlorophenol	50.0	0.0	37.7	75	41-109
95-95-4	LCS 2,4,5-Trichlorophenol	50.0	0.0	37.7	75	41-111
91-58-7	LCS 2-Chloronaphthalene	50.0	0.0	28.2	56	36-98
88-74-4	LCS 2-Nitroaniline o-Nitroaniline	50.0	0.0	42.0	84	44-117
99-09-2	LCS 3-Nitroaniline m-Nitroaniline	50.0	0.0	42.4	85	45-124
131-11-3	LCS Dimethylphthalate	50.0	0.0	39.8	80	53-112
606-20-2	LCS 2,6-Dinitrotoluene	50.0	0.0	39.2	78	52-117
121-14-2	LCS 2,4-Dinitrotoluene	50.0	0.0	43.5	87	45-124
51-28-5	LCS 2,4-Dinitrophenol	50.0	0.0	37.8	76	19-110
132-64-9	LCS Dibenzofuran	50.0	0.0	32.5	65	45-107
58-90-2	LCS 2,3,4,6-Tetrachlorophenol	50.0	0.0	36.3	73	45-120
84-66-2	LCS Diethylphthalate	50.0	0.0	41.6	83	51-116
100-02-7	LCS 4-Nitrophenol	50.0	0.0	7.05	14 *	16-77
7005-72-3	LCS 4-Chlorophenylphenylether	50.0	0.0	33.3	67	40-114
100-01-6	LCS 4-Nitroaniline p-Nitroaniline	50.0	0.0	46.7	93	38-133
534-52-1	LCS 2-Methyl-4,6-dinitrophenol	50.0	0.0	41.4	83	34-114
122-39-4	LCS Diphenylamine	50.0	0.0	38.5	77	47-111
122-66-7	LCS Azobenzene 1,2-Diphenylhydrazine	50.0	0.0	36.2	72	40-112

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 3

SDG Number: 2014-2989

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1372453

Matrix: WATER

Lab Sample ID 1203050102

Instrument: MSD5.I

Analysis Date: 03/18/2014 10:55

Dilution: 1

Analyst: RMB

Prep Batch ID:1372453

Inj. Vol: 1 uL

Batch ID: 1372454

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
101-55-3	LCS 4-Bromophenylphenylether	50.0	0.0	34.9	70	41-113
84-74-2	LCS Di-n-butylphthalate	50.0	0.0	39.8	80	49-116
85-68-7	LCS Butylbenzylphthalate	50.0	0.0	40.6	81	40-122
117-81-7	LCS bis(2-Ethylhexyl)phthalate	50.0	0.0	37.2	74	37-124
117-84-0	LCS Di-n-octylphthalate	50.0	0.0	33.0	66	33-122
123-91-1	LCS 1,4-Dioxane	50.0	0.0	19.6	39	26-73
930-55-2	LCS N-Nitrosopyrrolidine	50.0	0.0	35.0	70	42-106
95-94-3	LCS 1,2,4,5-Tetrachlorobenzene	50.0	0.0	25.2	50	36-95
1912-24-9	LCS Atrazine	50.0	0.0	35.7	71	47-115
92-87-5	LCS Benzidine	100	0.0	48.2	48	10-124
91-94-1	LCS 3,3'-Dichlorobenzidine	50.0	0.0	27.6	55	31-113
120-82-1	LCS 1,2,4-Trichlorobenzene	50.0	0.0	26.4	53	26-92

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 1 of 6

SDG Number: 2014-2989

Sample Type: Matrix Spike

Client ID: CAWA-14-54749MS

Matrix: W

Lab Sample ID 1203050103

Instrument: MSD5.I

Analysis Date: 03/18/2014 14:34

Dilution: 1

Analyst: RMB

Prep Batch ID: 1372453

Inj. Vol: 1 uL

Batch ID: 1372454

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	108	0.00 U	63.5	59	21-88
110-86-1	MS Pyridine	108	0.00 U	70.8	66	14-94
62-53-3	MS Aniline	108	0.00 U	87.2	81	24-109
108-95-2	MS Phenol	108	0.00 U	48.3	45	10-88
111-44-4	MS bis(2-Chloroethyl) ether	108	0.00 U	80.3	75	25-114
95-57-8	MS 2-Chlorophenol	108	0.00 U	75.7	70	31-103
541-73-1	MS 1,3-Dichlorobenzene	108	0.00 U	57.9	54	18-83
106-46-7	MS 1,4-Dichlorobenzene	108	0.00 U	58.3	54	20-86
95-50-1	MS 1,2-Dichlorobenzene	108	0.00 U	61.8	58	21-85
108-60-1	MS bis(2-Chloro-1-methylethyl)et	108	0.00 U	73.4	68	16-121
100-51-6	MS Benzyl alcohol	108	0.00 U	78.4	73	31-100
95-48-7	MS o-Cresol	108	0.00 U	74.6	69	26-97
65794-96-9	MS m,p-Cresols	108	0.00 U	83.3	77	24-110
621-64-7	MS N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	108	0.00 U	91.8	85	29-116
67-72-1	MS Hexachloroethane	108	0.00 U	61.7	57	17-82
98-95-3	MS Nitrobenzene	108	0.00 U	90.2	84	32-126
78-59-1	MS Isophorone	108	0.00 U	96.3	90	36-139
88-75-5	MS 2-Nitrophenol	108	0.00 U	87.7	82	29-117
105-67-9	MS 2,4-Dimethylphenol	108	0.00 U	80.9	75	28-107
111-91-1	MS bis(2-Chloroethoxy)methane	108	0.00 U	91.9	85	34-112
120-83-2	MS 2,4-Dichlorophenol	108	0.00 U	85.5	80	34-111
65-85-0	MS Benzoic acid	215	0.00 U	90.4	42	10-105

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 2 of 6

SDG Number: 2014-2989

Sample Type: Matrix Spike

Client ID: CAWA-14-54749MS

Matrix: W

Lab Sample ID 1203050103

Instrument: MSD5.I

Analysis Date: 03/18/2014 14:34

Dilution: 1

Analyst: RMB

Prep Batch ID: 1372453

Inj. Vol: 1 uL

Batch ID: 1372454

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
106-47-8	MS	4-Chloroaniline	108	0.00	U	91.5	85	28-123
87-68-3	MS	Hexachlorobutadiene	108	0.00	U	56.9	53	11-97
59-50-7	MS	Parachlorometa cresol 4-Chloro-3-methylphenol	108	0.00	U	89.7	83	31-119
77-47-4	MS	Hexachlorocyclopentadiene	108	0.00	U	40.8	38	14-73
88-06-2	MS	2,4,6-Trichlorophenol	108	0.00	U	88.4	82	31-113
95-95-4	MS	2,4,5-Trichlorophenol	108	0.00	U	80.9	75	30-117
91-58-7	MS	2-Chloronaphthalene	108	0.00	U	65.5	61	30-97
88-74-4	MS	2-Nitroaniline o-Nitroaniline	108	0.00	U	95.4	89	28-122
99-09-2	MS	3-Nitroaniline m-Nitroaniline	108	0.00	U	101	94	29-125
131-11-3	MS	Dimethylphthalate	108	0.00	U	92.1	86	41-116
606-20-2	MS	2,6-Dinitrotoluene	108	0.00	U	91.7	85	40-123
121-14-2	MS	2,4-Dinitrotoluene	108	0.00	U	99.7	93	34-126
51-28-5	MS	2,4-Dinitrophenol	108	0.00	U	100	93	17-110
132-64-9	MS	Dibenzofuran	108	0.00	U	76.2	71	36-107
58-90-2	MS	2,3,4,6-Tetrachlorophenol	108	0.00	U	88.5	82	29-126
84-66-2	MS	Diethylphthalate	108	0.00	U	95.2	89	41-117
100-02-7	MS	4-Nitrophenol	108	0.00	U	37.4	35	16-71
7005-72-3	MS	4-Chlorophenylphenylether	108	0.00	U	76.9	72	30-112
100-01-6	MS	4-Nitroaniline p-Nitroaniline	108	0.00	U	114	106	25-133
534-52-1	MS	2-Methyl-4,6-dinitrophenol	108	0.00	U	103	96	22-118
122-39-4	MS	Diphenylamine	108	0.00	U	86.0	80	34-111
122-66-7	MS	Azobenzene 1,2-Diphenylhydrazine	108	0.00	U	82.0	76	30-112

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 3 of 6

SDG Number: 2014-2989

Sample Type: Matrix Spike

Client ID: CAWA-14-54749MS

Matrix: W

Lab Sample ID 1203050103

Instrument: MSD5.I

Analysis Date: 03/18/2014 14:34

Dilution: 1

Analyst: RMB

Prep Batch ID:1372453

Inj. Vol: 1 uL

Batch ID: 1372454

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
101-55-3	MS 4-Bromophenylphenylether	108	0.00 U	77.9	72	32-111
84-74-2	MS Di-n-butylphthalate	108	0.00 U	85.8	80	35-118
85-68-7	MS Butylbenzylphthalate	108	0.00 U	81.4	76	29-121
117-81-7	MS bis(2-Ethylhexyl)phthalate	108	0.00 U	81.1	75	29-120
117-84-0	MS Di-n-octylphthalate	108	0.00 U	78.1	73	25-118
123-91-1	MS 1,4-Dioxane	108	0.00 U	65.5	61	26-88
930-55-2	MS N-Nitrosopyrrolidine	108	0.00 U	88.7	82	42-110
95-94-3	MS 1,2,4,5-Tetrachlorobenzene	108	0.00 U	55.6	52	29-96
1912-24-9	MS Atrazine	108	0.00 U	81.2	76	33-121
92-87-5	MS Benzidine	215	0.00 U	190	89	10-117
91-94-1	MS 3,3'-Dichlorobenzidine	108	0.00 U	73.7	69	22-111
120-82-1	MS 1,2,4-Trichlorobenzene	108	0.00 U	62.1	58	20-90

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 4 of 6

SDG Number: 2014-2989

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-14-54749MSD

Matrix: W

Lab Sample ID 1203050104

Instrument: MSD5.I

Analysis Date: 03/18/2014 15:05

Dilution: 1

Analyst: RMB

Prep Batch ID: 1372453

Inj. Vol: 1 uL

Batch ID: 1372454

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	108	0.00 U	61.0	57	21-88	4	0-30
110-86-1	MSD Pyridine	108	0.00 U	50.6	47	14-94	33 *	0-30
62-53-3	MSD Aniline	108	0.00 U	80.0	74	24-109	9	0-30
108-95-2	MSD Phenol	108	0.00 U	45.2	42	10-88	7	0-30
111-44-4	MSD bis(2-Chloroethyl) ether	108	0.00 U	73.1	68	25-114	9	0-30
95-57-8	MSD 2-Chlorophenol	108	0.00 U	68.8	64	31-103	9	0-30
541-73-1	MSD 1,3-Dichlorobenzene	108	0.00 U	50.8	47	18-83	13	0-30
106-46-7	MSD 1,4-Dichlorobenzene	108	0.00 U	51.0	47	20-86	14	0-30
95-50-1	MSD 1,2-Dichlorobenzene	108	0.00 U	54.7	51	21-85	12	0-30
108-60-1	MSD bis(2-Chloro-1-methylethyl)et	108	0.00 U	66.1	61	16-121	11	0-30
100-51-6	MSD Benzyl alcohol	108	0.00 U	76.9	72	31-100	2	0-30
95-48-7	MSD o-Cresol	108	0.00 U	69.4	65	26-97	7	0-30
65794-96-9	MSD m,p-Cresols	108	0.00 U	77.7	72	24-110	7	0-30
621-64-7	MSD N-Nitrosodi--n-propylamine <i>N-Nitrosodipropylamine</i>	108	0.00 U	85.7	80	29-116	7	0-30
67-72-1	MSD Hexachloroethane	108	0.00 U	53.9	50	17-82	14	0-30
98-95-3	MSD Nitrobenzene	108	0.00 U	83.1	77	32-126	8	0-30
78-59-1	MSD Isophorone	108	0.00 U	91.8	85	36-139	5	0-30
88-75-5	MSD 2-Nitrophenol	108	0.00 U	84.4	79	29-117	4	0-30
105-67-9	MSD 2,4-Dimethylphenol	108	0.00 U	72.9	68	28-107	10	0-30
111-91-1	MSD bis(2-Chloroethoxy)methane	108	0.00 U	87.2	81	34-112	5	0-30
120-83-2	MSD 2,4-Dichlorophenol	108	0.00 U	80.2	75	34-111	6	0-30
65-85-0	MSD Benzoic acid	215	0.00 U	94.8	44	10-105	5	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 5 of 6

SDG Number: 2014-2989

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-14-54749MSD

Matrix: W

Lab Sample ID 1203050104

Instrument: MSD5.I

Analysis Date: 03/18/2014 15:05

Dilution: 1

Analyst: RMB

Prep Batch ID: 1372453

Inj. Vol: 1 uL

Batch ID: 1372454

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	108	0.00 U	86.1	80	28-123	6	0-30
87-68-3	MSD Hexachlorobutadiene	108	0.00 U	52.5	49	11-97	8	0-30
59-50-7	MSD Parachlorometa cresol 4-Chloro-3-methylphenol	108	0.00 U	86.0	80	31-119	4	0-30
77-47-4	MSD Hexachlorocyclopentadiene	108	0.00 U	41.4	38	14-73	1	0-30
88-06-2	MSD 2,4,6-Trichlorophenol	108	0.00 U	88.8	83	31-113	0	0-30
95-95-4	MSD 2,4,5-Trichlorophenol	108	0.00 U	84.1	78	30-117	4	0-30
91-58-7	MSD 2-Chloronaphthalene	108	0.00 U	63.0	59	30-97	4	0-30
88-74-4	MSD 2-Nitroaniline o-Nitroaniline	108	0.00 U	95.3	89	28-122	0	0-30
99-09-2	MSD 3-Nitroaniline m-Nitroaniline	108	0.00 U	95.8	89	29-125	5	0-30
131-11-3	MSD Dimethylphthalate	108	0.00 U	89.5	83	41-116	3	0-30
606-20-2	MSD 2,6-Dinitrotoluene	108	0.00 U	87.9	82	40-123	4	0-30
121-14-2	MSD 2,4-Dinitrotoluene	108	0.00 U	94.4	88	34-126	5	0-30
51-28-5	MSD 2,4-Dinitrophenol	108	0.00 U	99.8	93	17-110	0	0-30
132-64-9	MSD Dibenzofuran	108	0.00 U	73.9	69	36-107	3	0-30
58-90-2	MSD 2,3,4,6-Tetrachlorophenol	108	0.00 U	85.7	80	29-126	3	0-30
84-66-2	MSD Diethylphthalate	108	0.00 U	92.8	86	41-117	3	0-30
100-02-7	MSD 4-Nitrophenol	108	0.00 U	35.1	33	16-71	6	0-30
7005-72-3	MSD 4-Chlorophenylphenylether	108	0.00 U	74.8	70	30-112	3	0-30
100-01-6	MSD 4-Nitroaniline p-Nitroaniline	108	0.00 U	113	105	25-133	1	0-30
534-52-1	MSD 2-Methyl-4,6-dinitrophenol	108	0.00 U	103	95	22-118	0	0-30
122-39-4	MSD Diphenylamine	108	0.00 U	83.0	77	34-111	4	0-30
122-66-7	MSD Azobenzene 1,2-Diphenylhydrazine	108	0.00 U	78.2	73	30-112	5	0-30

Semi-Volatile
Quality Control Summary
Spike Recovery Report

Page 6 of 6

SDG Number: 2014-2989

Sample Type: Matrix Spike Duplicate

Client ID: CAWA-14-54749MSD

Matrix: W

Lab Sample ID 1203050104

Instrument: MSD5.I

Analysis Date: 03/18/2014 15:05

Dilution: 1

Analyst: RMB

Prep Batch ID: 1372453

Inj. Vol: 1 uL

Batch ID: 1372454

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
101-55-3	MSD 4-Bromophenylphenylether	108	0.00 U	74.7	70	32-111	4	0-30
84-74-2	MSD Di-n-butylphthalate	108	0.00 U	83.0	77	35-118	3	0-30
85-68-7	MSD Butylbenzylphthalate	108	0.00 U	83.5	78	29-121	3	0-30
117-81-7	MSD bis(2-Ethylhexyl)phthalate	108	0.00 U	82.7	77	29-120	2	0-30
117-84-0	MSD Di-n-octylphthalate	108	0.00 U	80.0	74	25-118	2	0-30
123-91-1	MSD 1,4-Dioxane	108	0.00 U	62.9	58	26-88	4	0-30
930-55-2	MSD N-Nitrosopyrrolidine	108	0.00 U	87.7	82	42-110	1	0-30
95-94-3	MSD 1,2,4,5-Tetrachlorobenzene	108	0.00 U	53.9	50	29-96	3	0-30
1912-24-9	MSD Atrazine	108	0.00 U	80.3	75	33-121	1	0-30
92-87-5	MSD Benzidine	215	0.00 U	67.8	32	10-117	95 *	0-30
91-94-1	MSD 3,3'-Dichlorobenzidine	108	0.00 U	67.4	63	22-111	9	0-30
120-82-1	MSD 1,2,4-Trichlorobenzene	108	0.00 U	54.9	51	20-90	12	0-30

Method Blank Summary

Page 1 of 1

SDG Number: 2014-2989

Client: ARSL004

Matrix: WATER

Client ID: MB for batch 1372453

Instrument ID: MSD5.I

Data File: s031814.b\s5C1804.D

Lab Sample ID: 1203050101

Prep Date: 03/17/2014 07:00

Analyzed: 03/18/14 10:24

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 1372453	1203050102	s031814.b\s5C1805.D	03/18/14	1055
02 CAWA-14-54749MS	1203050103	s031814.b\s5C1812.D	03/18/14	1434
03 CAWA-14-54749MSD	1203050104	s031814.b\s5C1813.D	03/18/14	1505
04 CAAN-14-54788	344588004	s031814.b\s5C1815.D	03/18/14	1608

Quality Control Data

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

SDG Number: 2014-2989

Lab Sample ID: 1203050101

Client Sample: QC for batch 1372453

Client ID: MB for batch 1372453

Batch ID: 1372454

Run Date: 03/18/2014 10:24

Prep Date: 03/17/2014 07:00

Data File: s031814.b\s5C1804.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: MSD5.I
Analyst: RMB
Aliquot: 1000 mL
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
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
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
62-53-3	Aniline	U	10.0	ug/L	4.20	10.0
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
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
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
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

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

Page 2 of 3

SDG Number: 2014-2989

Lab Sample ID: 1203050101

Client Sample: QC for batch 1372453

Client ID: MB for batch 1372453

Batch ID: 1372454

Run Date: 03/18/2014 10:24

Prep Date: 03/17/2014 07:00

Data File: s031814.b\s5C1804.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: MSD5.I

Analyst: RMB

Aliquot: 1000 mL

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
122-39-4	Diphenylamine	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
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
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
108-95-2	Phenol	U	10.0	ug/L	3.00	10.0
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
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	68.0	100	ug/L	68.0	(26%-129%)
2-Fluorobiphenyl	22.2	50.0	ug/L	44.3	(32%-102%)
2-Fluorophenol	40.0	100	ug/L	40.0	(10%-78%)
Nitrobenzene-d5	33.2	50.0	ug/L	66.5	(36%-125%)
Phenol-d5	23.9	100	ug/L	23.9	(10%-104%)
p-Terphenyl-d14	39.8	50.0	ug/L	79.6	(34%-135%)

Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
000067-66-3	Trichloromethane	2.092	33.3	ug/L	94	NJ
	unknown	2.311	39.6	ug/L	0	J

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

Page 3 of 3

SDG Number: 2014-2989

Lab Sample ID: 1203050101

Client Sample: QC for batch 1372453

Client ID: MB for batch 1372453

Batch ID: 1372454

Run Date: 03/18/2014 10:24

Prep Date: 03/17/2014 07:00

Data File: s031814.b\s5C1804.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: MSD5.I

Analyst: RMB

Aliquot: 1000 mL

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
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Tentatively Identified Compound Summary

CAS No.	Tentatively Identified Compound (TIC)	RT	Estimated	Units	Fit	Qual
	unknown	2.425	24.4	ug/L	0	J
	unknown	2.487	6.3	ug/L	0	J
	unknown	22.944	14.8	ug/L	0	J

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

SDG Number: 2014-2989

Lab Sample ID: 1203050102

Client Sample: QC for batch 1372453

Client ID: LCS for batch 1372453

Batch ID: 1372454

Run Date: 03/18/2014 10:55

Prep Date: 03/17/2014 07:00

Data File: s031814.b\s5C1805.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: MSD5.I
Analyst: RMB
Aliquot: 1000 mL
Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		25.2	ug/L	3.00	10.0
120-82-1	1,2,4-Trichlorobenzene		26.4	ug/L	3.00	10.0
95-50-1	1,2-Dichlorobenzene		24.8	ug/L	3.00	10.0
122-66-7	Azobenzene		36.2	ug/L	3.00	10.0
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		23.8	ug/L	3.00	10.0
106-46-7	1,4-Dichlorobenzene		23.1	ug/L	3.00	10.0
123-91-1	1,4-Dioxane		19.6	ug/L	3.00	10.0
58-90-2	2,3,4,6-Tetrachlorophenol		36.3	ug/L	3.00	10.0
95-95-4	2,4,5-Trichlorophenol		37.7	ug/L	3.00	10.0
88-06-2	2,4,6-Trichlorophenol		37.7	ug/L	3.00	10.0
120-83-2	2,4-Dichlorophenol		34.9	ug/L	3.00	10.0
105-67-9	2,4-Dimethylphenol		32.2	ug/L	3.00	10.0
51-28-5	2,4-Dinitrophenol		37.8	ug/L	5.00	20.0
121-14-2	2,4-Dinitrotoluene		43.5	ug/L	3.00	10.0
606-20-2	2,6-Dinitrotoluene		39.2	ug/L	3.00	10.0
91-58-7	2-Chloronaphthalene		28.2	ug/L	0.410	1.00
95-57-8	2-Chlorophenol		28.4	ug/L	3.00	10.0
534-52-1	2-Methyl-4,6-dinitrophenol		41.4	ug/L	3.00	10.0
88-75-5	2-Nitrophenol		36.6	ug/L	3.00	10.0
91-94-1	3,3'-Dichlorobenzidine		27.6	ug/L	3.00	10.0
101-55-3	4-Bromophenylphenylether		34.9	ug/L	3.00	10.0
59-50-7	Parachlorometa cresol		34.5	ug/L	3.00	10.0
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		38.8	ug/L	3.30	10.0
7005-72-3	4-Chlorophenylphenylether		33.3	ug/L	3.00	10.0
100-02-7	4-Nitrophenol	J	7.05	ug/L	3.00	10.0
62-53-3	Aniline		33.7	ug/L	4.20	10.0
1912-24-9	Atrazine		35.7	ug/L	3.00	10.0
92-87-5	Benzidine		48.2	ug/L	3.90	10.0
65-85-0	Benzoic acid		24.4	ug/L	6.00	20.0
100-51-6	Benzyl alcohol		28.6	ug/L	3.00	10.0
85-68-7	Butylbenzylphthalate		40.6	ug/L	3.00	10.0
84-74-2	Di-n-butylphthalate		39.8	ug/L	3.00	10.0
117-84-0	Di-n-octylphthalate		33.0	ug/L	3.00	10.0
132-64-9	Dibenzofuran		32.5	ug/L	3.00	10.0
84-66-2	Diethylphthalate		41.6	ug/L	3.00	10.0
131-11-3	Dimethylphthalate		39.8	ug/L	3.00	10.0
88-85-7	Dinoseb	U	10.0	ug/L	3.00	10.0

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

SDG Number: 2014-2989

Lab Sample ID: 1203050102

Client Sample: QC for batch 1372453

Client ID: LCS for batch 1372453

Batch ID: 1372454

Run Date: 03/18/2014 10:55

Prep Date: 03/17/2014 07:00

Data File: s031814.b\s5C1805.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: MSD5.I

Analyst: RMB

Aliquot: 1000 mL

Column: DB-5ms

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
122-39-4	Diphenylamine		38.5	ug/L	3.00	10.0
87-68-3	Hexachlorobutadiene		25.6	ug/L	3.00	10.0
77-47-4	Hexachlorocyclopentadiene		17.2	ug/L	3.00	10.0
67-72-1	Hexachloroethane		24.7	ug/L	3.00	10.0
78-59-1	Isophorone		41.3	ug/L	3.50	10.0
62-75-9	N-Methyl-N-nitrosomethylamine		20.7	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
621-64-7	N-Nitrosodi--n-propylamine		37.4	ug/L	3.00	10.0
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		35.0	ug/L	3.00	10.0
98-95-3	Nitrobenzene		37.0	ug/L	3.00	10.0
608-93-5	Pentachlorobenzene	U	10.0	ug/L	3.00	10.0
108-95-2	Phenol		12.2	ug/L	3.00	10.0
110-86-1	Pyridine		22.5	ug/L	3.00	10.0
108-60-1	bis(2-Chloro-1-methylethyl)ether		29.5	ug/L	3.00	10.0
111-91-1	bis(2-Chloroethoxy)methane		39.4	ug/L	3.00	10.0
111-44-4	bis(2-Chloroethyl) ether		33.1	ug/L	3.00	10.0
117-81-7	bis(2-Ethylhexyl)phthalate		37.2	ug/L	3.00	10.0
65794-96-9	m,p-Cresols		27.5	ug/L	3.70	10.0
99-09-2	3-Nitroaniline		42.4	ug/L	3.00	10.0
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		25.5	ug/L	3.00	10.0
88-74-4	2-Nitroaniline		42.0	ug/L	3.00	10.0
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		46.7	ug/L	3.00	10.0
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	81.4	100	ug/L	81.4	(26%-129%)
2-Fluorobiphenyl	31.0	50.0	ug/L	62.0	(32%-102%)
2-Fluorophenol	34.6	100	ug/L	34.6	(10%-78%)
Nitrobenzene-d5	37.5	50.0	ug/L	74.9	(36%-125%)
Phenol-d5	23.8	100	ug/L	23.8	(10%-104%)
p-Terphenyl-d14	36.1	50.0	ug/L	72.2	(34%-135%)

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

SDG Number: 2014-2989	Date Collected: 03/11/2014 10:55	Matrix: W
Lab Sample ID: 1203050103	Date Received: 03/13/2014 09:00	
Client Sample: QC for batch 1372453	Client: ARSL004	Project: QC
Client ID: CAWA-14-54749MS	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1372454	Inst: MSD5.I	Dilution: 1
Run Date: 03/18/2014 14:34	Analyst: RMB	Inj. Vol: 1 uL
Prep Date: 03/17/2014 07:00	Aliquot: 465 mL	Final Volume: 1 mL
Data File: s031814.b\s5C1812.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		55.6	ug/L	6.45	21.5
120-82-1	1,2,4-Trichlorobenzene		62.1	ug/L	6.45	21.5
95-50-1	1,2-Dichlorobenzene		61.8	ug/L	6.45	21.5
122-66-7	Azobenzene		82.0	ug/L	6.45	21.5
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		57.9	ug/L	6.45	21.5
106-46-7	1,4-Dichlorobenzene		58.3	ug/L	6.45	21.5
123-91-1	1,4-Dioxane		65.5	ug/L	6.45	21.5
58-90-2	2,3,4,6-Tetrachlorophenol		88.5	ug/L	6.45	21.5
95-95-4	2,4,5-Trichlorophenol		80.9	ug/L	6.45	21.5
88-06-2	2,4,6-Trichlorophenol		88.4	ug/L	6.45	21.5
120-83-2	2,4-Dichlorophenol		85.5	ug/L	6.45	21.5
105-67-9	2,4-Dimethylphenol		80.9	ug/L	6.45	21.5
51-28-5	2,4-Dinitrophenol		100	ug/L	10.8	43.0
121-14-2	2,4-Dinitrotoluene		99.7	ug/L	6.45	21.5
606-20-2	2,6-Dinitrotoluene		91.7	ug/L	6.45	21.5
91-58-7	2-Chloronaphthalene		65.5	ug/L	0.882	2.15
95-57-8	2-Chlorophenol		75.7	ug/L	6.45	21.5
534-52-1	2-Methyl-4,6-dinitrophenol		103	ug/L	6.45	21.5
88-75-5	2-Nitrophenol		87.7	ug/L	6.45	21.5
91-94-1	3,3'-Dichlorobenzidine		73.7	ug/L	6.45	21.5
101-55-3	4-Bromophenylphenylether		77.9	ug/L	6.45	21.5
59-50-7	Parachlorometa cresol		89.7	ug/L	6.45	21.5
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		91.5	ug/L	7.10	21.5
7005-72-3	4-Chlorophenylphenylether		76.9	ug/L	6.45	21.5
100-02-7	4-Nitrophenol		37.4	ug/L	6.45	21.5
62-53-3	Aniline		87.2	ug/L	9.03	21.5
1912-24-9	Atrazine		81.2	ug/L	6.45	21.5
92-87-5	Benzidine		190	ug/L	8.39	21.5
65-85-0	Benzoic acid		90.4	ug/L	12.9	43.0
100-51-6	Benzyl alcohol		78.4	ug/L	6.45	21.5
85-68-7	Butylbenzylphthalate		81.4	ug/L	6.45	21.5
84-74-2	Di-n-butylphthalate		85.8	ug/L	6.45	21.5
117-84-0	Di-n-octylphthalate		78.1	ug/L	6.45	21.5
132-64-9	Dibenzofuran		76.2	ug/L	6.45	21.5
84-66-2	Diethylphthalate		95.2	ug/L	6.45	21.5
131-11-3	Dimethylphthalate		92.1	ug/L	6.45	21.5
88-85-7	Dinoseb	U	21.5	ug/L	6.45	21.5

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

SDG Number:	2014-2989	Date Collected:	03/11/2014 10:55	Matrix:	W
Lab Sample ID:	1203050103	Date Received:	03/13/2014 09:00		
Client Sample:	QC for batch 1372453	Client:	ARSL004	Project:	QC
Client ID:	CAWA-14-54749MS	Method:	SW846 3510C/8270D	SOP Ref:	GL-OA-E-009
Batch ID:	1372454	Inst:	MSD5.I	Dilution:	1
Run Date:	03/18/2014 14:34	Analyst:	RMB	Inj. Vol:	1 uL
Prep Date:	03/17/2014 07:00	Aliquot:	465 mL	Final Volume:	1 mL
Data File:	s031814.b\s5C1812.D	Column:	DB-5ms		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
122-39-4	Diphenylamine		86.0	ug/L	6.45	21.5
87-68-3	Hexachlorobutadiene		56.9	ug/L	6.45	21.5
77-47-4	Hexachlorocyclopentadiene		40.8	ug/L	6.45	21.5
67-72-1	Hexachloroethane		61.7	ug/L	6.45	21.5
78-59-1	Isophorone		96.3	ug/L	7.53	21.5
62-75-9	N-Methyl-N-nitrosomethylamine		63.5	ug/L	6.45	21.5
924-16-3	N-Nitrosodi-n-butylamine	U	21.5	ug/L	6.45	21.5
55-18-5	N-Nitrosodiethylamine	U	21.5	ug/L	6.45	21.5
621-64-7	N-Nitrosodi--n-propylamine		91.8	ug/L	6.45	21.5
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		88.7	ug/L	6.45	21.5
98-95-3	Nitrobenzene		90.2	ug/L	6.45	21.5
608-93-5	Pentachlorobenzene	U	21.5	ug/L	6.45	21.5
108-95-2	Phenol		48.3	ug/L	6.45	21.5
110-86-1	Pyridine		70.8	ug/L	6.45	21.5
108-60-1	bis(2-Chloro-1-methylethyl)ether		73.4	ug/L	6.45	21.5
111-91-1	bis(2-Chloroethoxy)methane		91.9	ug/L	6.45	21.5
111-44-4	bis(2-Chloroethyl) ether		80.3	ug/L	6.45	21.5
117-81-7	bis(2-Ethylhexyl)phthalate		81.1	ug/L	6.45	21.5
65794-96-9	m,p-Cresols		83.3	ug/L	7.96	21.5
99-09-2	3-Nitroaniline		101	ug/L	6.45	21.5
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		74.6	ug/L	6.45	21.5
88-74-4	2-Nitroaniline		95.4	ug/L	6.45	21.5
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		114	ug/L	6.45	21.5
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
2,4,6-Tribromophenol	194	215	ug/L	90.0	(26%-129%)
2-Fluorobiphenyl	75.7	108	ug/L	70.4	(32%-102%)
2-Fluorophenol	120	215	ug/L	56.0	(10%-78%)
Nitrobenzene-d5	90.2	108	ug/L	83.8	(36%-125%)
Phenol-d5	93.9	215	ug/L	43.7	(10%-104%)
p-Terphenyl-d14	84.4	108	ug/L	78.5	(34%-135%)

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

SDG Number:	2014-2989	Date Collected:	03/11/2014 10:55	Matrix:	W
Lab Sample ID:	1203050104	Date Received:	03/13/2014 09:00		
Client Sample:	QC for batch 1372453	Client:	ARSL004	Project:	QC
Client ID:	CAWA-14-54749MSD	Method:	SW846 3510C/8270D	SOP Ref:	GL-OA-E-009
Batch ID:	1372454	Inst:	MSD5.I	Dilution:	1
Run Date:	03/18/2014 15:05	Analyst:	RMB	Inj. Vol:	1 uL
Prep Date:	03/17/2014 07:00	Aliquot:	465 mL	Final Volume:	1 mL
Data File:	s031814.b\s5C1813.D	Column:	DB-5ms		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
95-94-3	1,2,4,5-Tetrachlorobenzene		53.9	ug/L	6.45	21.5
120-82-1	1,2,4-Trichlorobenzene		54.9	ug/L	6.45	21.5
95-50-1	1,2-Dichlorobenzene		54.7	ug/L	6.45	21.5
122-66-7	Azobenzene		78.2	ug/L	6.45	21.5
	<i>1,2-Diphenylhydrazine</i>					
541-73-1	1,3-Dichlorobenzene		50.8	ug/L	6.45	21.5
106-46-7	1,4-Dichlorobenzene		51.0	ug/L	6.45	21.5
123-91-1	1,4-Dioxane		62.9	ug/L	6.45	21.5
58-90-2	2,3,4,6-Tetrachlorophenol		85.7	ug/L	6.45	21.5
95-95-4	2,4,5-Trichlorophenol		84.1	ug/L	6.45	21.5
88-06-2	2,4,6-Trichlorophenol		88.8	ug/L	6.45	21.5
120-83-2	2,4-Dichlorophenol		80.2	ug/L	6.45	21.5
105-67-9	2,4-Dimethylphenol		72.9	ug/L	6.45	21.5
51-28-5	2,4-Dinitrophenol		99.8	ug/L	10.8	43.0
121-14-2	2,4-Dinitrotoluene		94.4	ug/L	6.45	21.5
606-20-2	2,6-Dinitrotoluene		87.9	ug/L	6.45	21.5
91-58-7	2-Chloronaphthalene		63.0	ug/L	0.882	2.15
95-57-8	2-Chlorophenol		68.8	ug/L	6.45	21.5
534-52-1	2-Methyl-4,6-dinitrophenol		103	ug/L	6.45	21.5
88-75-5	2-Nitrophenol		84.4	ug/L	6.45	21.5
91-94-1	3,3'-Dichlorobenzidine		67.4	ug/L	6.45	21.5
101-55-3	4-Bromophenylphenylether		74.7	ug/L	6.45	21.5
59-50-7	Parachlorometa cresol		86.0	ug/L	6.45	21.5
	<i>4-Chloro-3-methylphenol</i>					
106-47-8	4-Chloroaniline		86.1	ug/L	7.10	21.5
7005-72-3	4-Chlorophenylphenylether		74.8	ug/L	6.45	21.5
100-02-7	4-Nitrophenol		35.1	ug/L	6.45	21.5
62-53-3	Aniline		80.0	ug/L	9.03	21.5
1912-24-9	Atrazine		80.3	ug/L	6.45	21.5
92-87-5	Benzidine		67.8	ug/L	8.39	21.5
65-85-0	Benzoic acid		94.8	ug/L	12.9	43.0
100-51-6	Benzyl alcohol		76.9	ug/L	6.45	21.5
85-68-7	Butylbenzylphthalate		83.5	ug/L	6.45	21.5
84-74-2	Di-n-butylphthalate		83.0	ug/L	6.45	21.5
117-84-0	Di-n-octylphthalate		80.0	ug/L	6.45	21.5
132-64-9	Dibenzofuran		73.9	ug/L	6.45	21.5
84-66-2	Diethylphthalate		92.8	ug/L	6.45	21.5
131-11-3	Dimethylphthalate		89.5	ug/L	6.45	21.5
88-85-7	Dinoseb	U	21.5	ug/L	6.45	21.5

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

Page 2 of 2

SDG Number: 2014-2989	Date Collected: 03/11/2014 10:55	Matrix: W
Lab Sample ID: 1203050104	Date Received: 03/13/2014 09:00	
Client Sample: QC for batch 1372453	Client: ARSL004	Project: QC
Client ID: CAWA-14-54749MSD	Method: SW846 3510C/8270D	SOP Ref: GL-OA-E-009
Batch ID: 1372454	Inst: MSD5.I	Dilution: 1
Run Date: 03/18/2014 15:05	Analyst: RMB	Inj. Vol: 1 uL
Prep Date: 03/17/2014 07:00	Aliquot: 465 mL	Final Volume: 1 mL
Data File: s031814.b\s5C1813.D	Column: DB-5ms	

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
122-39-4	Diphenylamine		83.0	ug/L	6.45	21.5
87-68-3	Hexachlorobutadiene		52.5	ug/L	6.45	21.5
77-47-4	Hexachlorocyclopentadiene		41.4	ug/L	6.45	21.5
67-72-1	Hexachloroethane		53.9	ug/L	6.45	21.5
78-59-1	Isophorone		91.8	ug/L	7.53	21.5
62-75-9	N-Methyl-N-nitrosomethylamine		61.0	ug/L	6.45	21.5
924-16-3	N-Nitrosodi-n-butylamine	U	21.5	ug/L	6.45	21.5
55-18-5	N-Nitrosodiethylamine	U	21.5	ug/L	6.45	21.5
621-64-7	N-Nitrosodi--n-propylamine		85.7	ug/L	6.45	21.5
	<i>N-Nitrosodipropylamine</i>					
930-55-2	N-Nitrosopyrrolidine		87.7	ug/L	6.45	21.5
98-95-3	Nitrobenzene		83.1	ug/L	6.45	21.5
608-93-5	Pentachlorobenzene	U	21.5	ug/L	6.45	21.5
108-95-2	Phenol		45.2	ug/L	6.45	21.5
110-86-1	Pyridine		50.6	ug/L	6.45	21.5
108-60-1	bis(2-Chloro-1-methylethyl)ether		66.1	ug/L	6.45	21.5
111-91-1	bis(2-Chloroethoxy)methane		87.2	ug/L	6.45	21.5
111-44-4	bis(2-Chloroethyl) ether		73.1	ug/L	6.45	21.5
117-81-7	bis(2-Ethylhexyl)phthalate		82.7	ug/L	6.45	21.5
65794-96-9	m,p-Cresols		77.7	ug/L	7.96	21.5
99-09-2	3-Nitroaniline		95.8	ug/L	6.45	21.5
	<i>m-Nitroaniline</i>					
95-48-7	o-Cresol		69.4	ug/L	6.45	21.5
88-74-4	2-Nitroaniline		95.3	ug/L	6.45	21.5
	<i>o-Nitroaniline</i>					
100-01-6	4-Nitroaniline		113	ug/L	6.45	21.5
	<i>p-Nitroaniline</i>					

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4,6-Tribromophenol	186	215	ug/L 86.4	(26%-129%)
2-Fluorobiphenyl	73.4	108	ug/L 68.3	(32%-102%)
2-Fluorophenol	108	215	ug/L 50.2	(10%-78%)
Nitrobenzene-d5	82.8	108	ug/L 77.0	(36%-125%)
Phenol-d5	87.2	215	ug/L 40.6	(10%-104%)
p-Terphenyl-d14	85.2	108	ug/L 79.3	(34%-135%)

Miscellaneous

DATA EXCEPTION REPORT

Mo.Day Yr. 19-MAR-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: SEMIOVA GC/MS	Test / Method: SW846 3510C/8270D	Matrix Type: Liquid	Client Code: ARSL (ESHL)
Batch ID: 1372454	Sample Numbers: 344383004, 344384004, 344384013, 344473004, 344588004		
Potentially affected work order(s)(SDG): 344383(2014-2971),344384(2014-2970),344473(2014-2974),344481,344588(2014-2989) Application Issues: Failed RPD for MS/MSD, or PS/PSD Failed Recovery for LCS/LCSD			
Specification and Requirements Exception Description:		DER Disposition:	
1. The LCS(1203050102) recovered 4-Nitrophenol at 14%. The limits are 16%-77%. 2. The MS(1203050103)/MSD(1203050104) RPD value for Benzidine was 95% (limit: 30%) and for Pyridine was 33% (limit: 30%).		1. The LCS failure represents less than 5% of the total requested spike analyte list. That satisfied the acceptance criteria for the client and the data results have been reported. 2. Since Benzidine and Pyridine were individually within the acceptance criteria in the MS and MSD, the non-conformance had no adverse impact on the data and the results have been reported.	

Originator's Name:

Richard Bomar 19-MAR-14

Data Validator/Group Leader:

Barbara Bailey 08-APR-14

HPLC Polynuclear Aromatic Hydrocarbon Analysis

HPLC-PAH
ARS International, LLC (ARSL)
SDG 2014-2989

Method/Analysis Information

Procedure: Polynuclear Aromatic Hydrocarbons
Analytical Method: SW846 8310
Prep Method: SW846 3510C
Analytical Batch Number: 1373320
Prep Batch Number: 1373319

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8310:

Sample ID	Client ID
344588002	CAAN-14-54788
1203051934	Method Blank (MB)
1203051935	Laboratory Control Sample (LCS)
1203051936	344674002(CAWA-14-54740) Matrix Spike (MS)
1203053862	Laboratory Control Sample Duplicate (LCSD)

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-030 REV# 15.

Raw data reports are processed and reviewed by the analyst using the Target software package. False positives have been removed from the Target quantitation reports per standard operating procedures (SOP) section 18.0.

Calibration Information

Due to software limitations, the files displayed at the beginning of the Form 6 are only the last files uploaded for each individual level. A complete listing of all files used in the current ICAL are shown on the Calibration History that is included with each Level 4 or higher package. The last file by date in each level is the one currently uploaded for that level.

The linear equation used in Target and indicated on the initial calibration summary form is not a conventional linear equation (slope intercept formula) and does not match the equation found in SW-846 method 8000B. The x and y axes are inversed in Target, so that the instrument response is treated as the independent variable (x) and the concentration ratio is treated as the dependent variable (y). The equation used in Target to calculate sample results is adjusted to account for the linear equation inversion and reciprocal slope. The adjusted calculation has been independently verified to produce valid results.

Initial Calibration

All initial calibration requirements have been met for this SDG.

CCV Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Laboratory Control Sample Duplicate (LCSD) Recovery

The LCSD spike recoveries met the acceptance limits.

LCS/LCSD Relative Percent Difference (RPD) Statement

Dibenzo(a,h)anthracene did not meet the RPD acceptance range of 0-20% in the LCS/LCSD pair (1203051935/1203053862) at 21%. The high RPD value was the result of a lower recovery in the LCSD due to vagaries in the extraction process. All other target analyte recoveries were similar, resulting in smaller RPD values. The data are reported with the appropriate DER.

QC Sample Designation

Client sample 344674002 (CAWA-14-54740) from SDG 2014-2999 was chosen for matrix spike analysis.

Matrix Spike (MS) Recovery Statement

The MS recoveries were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement

There was only enough sample provided for one matrix spike.

MS/MSD Relative Percent Difference (RPD) Statement

There was only enough sample provided for one matrix spike.

Technical Information:

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

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

Data Exception Report 1277499 was generated for this SDG.

Dibenzo(a,h)anthracene did not meet the RPD acceptance range of 0-20% in the LCS/LCSD pair (1203051935/1203053862) at 21%. The high RPD value was the result of a lower recovery in the LCSD due to vagaries in the extraction process. All other target analyte recoveries were similar, resulting in smaller RPD values. The data are reported with the appropriate DER.

Manual Integrations

Some initial calibration standards, continuing calibration standards, and/or samples required manual integrations due to software limitations.

Please see the raw data in the Miscellaneous Section.

Additional Comments

The Form 8 is used only as a sequence of the analysis.

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 analyst, reviewer, and report specialist names 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 laboratory utilizes a high performance liquid chromatography (HPLC) instrument configuration for Polynuclear Aromatic Hydrocarbons analyses.

The chromatographic hardware system consists of a HP Model 1100 HPLC with programmable gradient pumping and a 100uL loop injector.

The HPLC 1100 is coupled to a HP Model G1315A Diode Array UV detector which monitors absorbance at the following five wavelengths: 1) 224 nm; 2) 250 nm; 3) 270 nm; 4) 234 nm; 5) 300 nm.

The HPLC 1100 is also coupled to a HP Model G1321A Fluorescence Detector in series which monitors the following varying excitations and emissions 1) EX 230 nm EM 330 nm; 2) EX 210 nm EM 314 nm; 3) EX 250 nm EM 368 nm; 4) EX 237 nm EM 440 nm; 5) EX 277 nm EM 376 nm; 6) EX 255 nm EM 420 nm; 7) EX 230 nm EM 453 nm.

The Diode Array UV detector is used as the primary detector and the Fluorescence Detector is used as the confirmation detector. All results are reported from the primary Diode Array UV detector.

The HPLC system is identified with a designation of HPLC E in the raw data printouts.

Chromatographic Columns

Chromatographic separation of Polynuclear Aromatic Hydrocarbons is accomplished through analysis on the following reversed phase column:

Phenomenex: Luna C18 (2), 100 A, 250 mm x 4.6 mm containing 5 um size particle.

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: 2014-2989 GEL Work Order: 344588

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, 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: 01 APR 2014

Title: Group Leader

Roadmap for ARSL 2014-2989 HPLC_PAH

This roadmap was analyzed by cww on 03-26-2014, 12:45.

This roadmap was reviewed by map on 03-27-2014, 09:59.

This roadmap was packaged by map on 04-01-2014, 08:54.

Sample

exclude	manual	datafile	smpid	injdate	injtime	sublist	clientid	dilution	batchid	comment
<input type="checkbox"/>	N	/chem/hplce.i/p032114.b/ph5c2108.d	344588002	21-MAR-2014	14:12	2014-2989.sub	CAAN-14-54788	1	1373320	<input type="text"/>

QC Sample

exclude	manual	datafile	smpid	sampletype	injdate	injtime	sublist	clientid	dilution	batchid	comment
<input type="checkbox"/>	N	/chem/hplce.i/p032114.b/ph5c2104A.d	1203051934	mb	21-MAR-2014	11:23	2014-2989.sub	PAHBLK01	1	1373320	<input type="text"/>
<input type="checkbox"/>	N	/chem/hplce.i/p032114.b/ph5c2105A.d	1203051935	lcs	21-MAR-2014	12:05	2014-2989.sub	PAHBLK01LCS	1	1373320	<input type="text" value="Pass"/>
<input type="checkbox"/>	N	/chem/hplce.i/p032114.b/ph5c2106A.d	1203053862	lcsd	21-MAR-2014	12:47	2014-2989.sub	PAHBLK01LCSD	1	1373320	<input type="text" value="Pass"/>

Sample Data Summary

PAH by HPLC
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: 2014-2989

Lab Sample ID: 344588002

Date Collected: 03/12/2014 10:15

Date Received: 03/14/2014 09:00

Matrix: W

Client: ARSL004

Project: ESHL00714

Method: SW846 8310

SOP Ref: GL-OA-E-030

Batch ID: 1373320

Inst: HPLCE.I

Dilution: 1

Run Date: 03/21/2014 14:12

Analyst: CWW

Inj. Vol: 20 uL

Prep Date: 03/19/2014 17:15

Aliquot: 990 mL

Final Volume: 1 mL

Data File: ph5c2108.d

Column: C-18, DAD/FLD

Level: LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene	U	0.505	ug/L	0.220	0.505
91-57-6	2-Methylnaphthalene	U	0.505	ug/L	0.152	0.505
83-32-9	Acenaphthene	U	0.505	ug/L	0.152	0.505
208-96-8	Acenaphthylene	U	0.505	ug/L	0.152	0.505
120-12-7	Anthracene	U	0.505	ug/L	0.152	0.505
56-55-3	Benzo(a)anthracene	U	0.0505	ug/L	0.0162	0.0505
50-32-8	Benzo(a)pyrene	U	0.0505	ug/L	0.0162	0.0505
205-99-2	Benzo(b)fluoranthene	U	0.0505	ug/L	0.0162	0.0505
191-24-2	Benzo(ghi)perylene	U	0.0505	ug/L	0.0162	0.0505
207-08-9	Benzo(k)fluoranthene	U	0.0253	ug/L	0.00808	0.0253
218-01-9	Chrysene	U	0.0505	ug/L	0.0162	0.0505
53-70-3	Dibenzo(a,h)anthracene	U	0.0505	ug/L	0.0162	0.0505
206-44-0	Fluoranthene	U	0.0505	ug/L	0.0162	0.0505
86-73-7	Fluorene	U	0.505	ug/L	0.152	0.505
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.0505	ug/L	0.0162	0.0505
91-20-3	Naphthalene	U	0.505	ug/L	0.152	0.505
85-01-8	Phenanthrene	U	0.505	ug/L	0.184	0.505
129-00-0	Pyrene	U	0.0505	ug/L	0.0162	0.0505

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	111	253	43.8	(21%-96%)

QC Summary

PAH by HPLC
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2014-2989

Matrix Type: LIQUID

PACK Column (1) : C-18, DAD/FLD

Sample ID	Client ID	DFBF %REC
1203051934	MB for batch 1373319	66
1203051935	LCS for batch 1373319	64
1203053862	LCSD for batch 1373319	66
344588002	CAAN-14-54788	44
1203051936	CAWA-14-54740MS	68

Surrogate

Acceptance Limits

DFBF = Decafluorobiphenyl

(21%-96%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

PAH by HPLC

Page 1 of 2

Quality Control Summary
Spike Recovery Report

SDG Number: 2014-2989

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1373319

Matrix: WATER

Lab Sample ID 1203051935

Instrument: HPLCE.I

Analysis Date: 03/21/2014 12:05

Dilution: 1

Analyst: CWW

Prep Batch ID:1373319

Inj. Vol: 20 uL

Batch ID: 1373320

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
91-20-3	LCS Naphthalene	50.0	0.0	36.9	74	54-108
91-57-6	LCS 2-Methylnaphthalene	50.0	0.0	43.1	86	50-91
90-12-0	LCS 1-Methylnaphthalene	50.0	0.0	40.0	80	55-96
208-96-8	LCS Acenaphthylene	50.0	0.0	40.4	81	52-100
83-32-9	LCS Acenaphthene	50.0	0.0	43.8	88	53-107
86-73-7	LCS Fluorene	50.0	0.0	43.3	87	62-130
85-01-8	LCS Phenanthrene	50.0	0.0	43.6	87	69-130
120-12-7	LCS Anthracene	50.0	0.0	45.8	92	70-130
206-44-0	LCS Fluoranthene	5.00	0.0	4.28	86	70-130
129-00-0	LCS Pyrene	5.00	0.0	4.51	90	70-130
56-55-3	LCS Benzo(a)anthracene	5.00	0.0	4.52	90	70-130
218-01-9	LCS Chrysene	5.00	0.0	4.77	95	70-130
205-99-2	LCS Benzo(b)fluoranthene	5.00	0.0	4.47	89	70-130
207-08-9	LCS Benzo(k)fluoranthene	2.50	0.0	2.39	96	70-130
50-32-8	LCS Benzo(a)pyrene	5.00	0.0	4.59	92	70-130
193-39-5	LCS Indeno(1,2,3-cd)pyrene	5.00	0.0	4.67	93	57-114
53-70-3	LCS Dibenzo(a,h)anthracene	5.00	0.0	3.59	72	30-118
191-24-2	LCS Benzo(ghi)perylene	5.00	0.0	3.45	69	42-115

PAH by HPLC

Page 2 of 2

Quality Control Summary
Spike Recovery Report

SDG Number: 2014-2989

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1373319

Matrix: WATER

Lab Sample ID 1203053862

Instrument: HPLCE.I

Analysis Date: 03/21/2014 12:47

Dilution: 1

Analyst: CWW

Prep Batch ID:1373319

Inj. Vol: 20 uL

Batch ID: 1373320

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
91-20-3	LCSD Naphthalene	50.0	0.0	37.4	75	54-108	1	0-26
91-57-6	LCSD 2-Methylnaphthalene	50.0	0.0	43.3	87	50-91	0	0-20
90-12-0	LCSD 1-Methylnaphthalene	50.0	0.0	40.4	81	55-96	1	0-20
208-96-8	LCSD Acenaphthylene	50.0	0.0	40.6	81	52-100	0	0-20
83-32-9	LCSD Acenaphthene	50.0	0.0	44.0	88	53-107	0	0-20
86-73-7	LCSD Fluorene	50.0	0.0	43.3	87	62-130	0	0-20
85-01-8	LCSD Phenanthrene	50.0	0.0	43.6	87	69-130	0	0-20
120-12-7	LCSD Anthracene	50.0	0.0	45.2	90	70-130	1	0-20
206-44-0	LCSD Fluoranthene	5.00	0.0	4.26	85	70-130	0	0-20
129-00-0	LCSD Pyrene	5.00	0.0	4.49	90	70-130	0	0-20
56-55-3	LCSD Benzo(a)anthracene	5.00	0.0	4.47	89	70-130	1	0-20
218-01-9	LCSD Chrysene	5.00	0.0	4.78	96	70-130	0	0-20
205-99-2	LCSD Benzo(b)fluoranthene	5.00	0.0	4.42	88	70-130	1	0-20
207-08-9	LCSD Benzo(k)fluoranthene	2.50	0.0	2.35	94	70-130	2	0-20
50-32-8	LCSD Benzo(a)pyrene	5.00	0.0	4.54	91	70-130	1	0-20
193-39-5	LCSD Indeno(1,2,3-cd)pyrene	5.00	0.0	4.47	89	57-114	4	0-20
53-70-3	LCSD Dibenzo(a,h)anthracene	5.00	0.0	2.92	58	30-118	21 *	0-20
191-24-2	LCSD Benzo(ghi)perylene	5.00	0.0	3.49	70	42-115	1	0-20

PAH by HPLC
Quality Control Summary
Spike Recovery Report

Page 1 of 1

SDG Number: 2014-2989

Sample Type: Matrix Spike

Client ID: CAWA-14-54740MS

Matrix: W

Lab Sample ID 1203051936

Instrument: HPLCE.I

Analysis Date: 03/21/2014 15:36

Dilution: 1

Analyst: CWW

Prep Batch ID:1373319

Inj. Vol: 20 uL

Batch ID: 1373320

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
91-20-3	MS Naphthalene	52.1	0.00 U	39.3	75	32-104
91-57-6	MS 2-Methylnaphthalene	52.1	0.00 U	45.5	87	56-130
90-12-0	MS 1-Methylnaphthalene	52.1	0.00 U	42.1	81	46-130
208-96-8	MS Acenaphthylene	52.1	0.00 U	41.9	80	26-121
83-32-9	MS Acenaphthene	52.1	0.00 U	45.3	87	27-118
86-73-7	MS Fluorene	52.1	0.00 U	44.2	85	29-123
85-01-8	MS Phenanthrene	52.1	0.00 U	44.3	85	35-126
120-12-7	MS Anthracene	52.1	0.00 U	46.3	89	36-122
206-44-0	MS Fluoranthene	5.21	0.00 U	4.30	83	32-134
129-00-0	MS Pyrene	5.21	0.00 U	4.54	87	32-134
56-55-3	MS Benzo(a)anthracene	5.21	0.00 U	4.53	87	35-129
218-01-9	MS Chrysene	5.21	0.00 U	4.77	92	25-141
205-99-2	MS Benzo(b)fluoranthene	5.21	0.00 U	4.45	86	29-133
207-08-9	MS Benzo(k)fluoranthene	2.60	0.00 U	2.38	91	28-134
50-32-8	MS Benzo(a)pyrene	5.21	0.00 U	4.58	88	25-135
193-39-5	MS Indeno(1,2,3-cd)pyrene	5.21	0.00 U	4.64	89	25-135
53-70-3	MS Dibenzo(a,h)anthracene	5.21	0.00 U	4.06	78	25-133
191-24-2	MS Benzo(ghi)perylene	5.21	0.00 U	3.81	73	27-140

Method Blank Summary

Page 1 of 1

SDG Number:	2014-2989	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1373319	Instrument ID:	HPLCE.I	Data File:	ph5c2104.d
Lab Sample ID:	1203051934	Prep Date:	03/19/2014 17:15	Analyzed:	03/21/14 11:23
Column:	C-18, DAD/FLD	Level:	LOW		

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 1373319	1203051935	ph5c2105.d	03/21/14	1205
02 LCSD for batch 1373319	1203053862	ph5c2106.d	03/21/14	1247
03 CAAN-14-54788	344588002	ph5c2108.d	03/21/14	1412
04 CAWA-14-54740MS	1203051936	ph5c2110.d	03/21/14	1536

QC Data

PAH by HPLC
Certificate of Analysis
Sample Summary

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SDG Number: 2014-2989

Lab Sample ID: 1203051934

Client Sample: QC for batch 1373319

Client ID: MB for batch 1373319

Batch ID: 1373320

Run Date: 03/21/2014 11:23

Prep Date: 03/19/2014 17:15

Data File: ph5c2104.d

Client: ARSL004

Method: SW846 8310

Inst: HPLCE.I

Analyst: CWW

Aliquot: 1000 mL

Column: C-18, DAD/FLD

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-030

Dilution: 1

Inj. Vol: 20 uL

Final Volume: 1 mL

Level: LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene	U	0.500	ug/L	0.218	0.500
91-57-6	2-Methylnaphthalene	U	0.500	ug/L	0.150	0.500
83-32-9	Acenaphthene	U	0.500	ug/L	0.150	0.500
208-96-8	Acenaphthylene	U	0.500	ug/L	0.150	0.500
120-12-7	Anthracene	U	0.500	ug/L	0.150	0.500
56-55-3	Benzo(a)anthracene	U	0.050	ug/L	0.016	0.050
50-32-8	Benzo(a)pyrene	U	0.050	ug/L	0.016	0.050
205-99-2	Benzo(b)fluoranthene	U	0.050	ug/L	0.016	0.050
191-24-2	Benzo(ghi)perylene	U	0.050	ug/L	0.016	0.050
207-08-9	Benzo(k)fluoranthene	U	0.025	ug/L	0.008	0.025
218-01-9	Chrysene	U	0.050	ug/L	0.016	0.050
53-70-3	Dibenzo(a,h)anthracene	U	0.050	ug/L	0.016	0.050
206-44-0	Fluoranthene	U	0.050	ug/L	0.016	0.050
86-73-7	Fluorene	U	0.500	ug/L	0.150	0.500
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.050	ug/L	0.016	0.050
91-20-3	Naphthalene	U	0.500	ug/L	0.150	0.500
85-01-8	Phenanthrene	U	0.500	ug/L	0.182	0.500
129-00-0	Pyrene	U	0.050	ug/L	0.016	0.050

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	165	250	66.1	(21%-96%)

PAH by HPLC
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: 2014-2989

Lab Sample ID: 1203051935

Client Sample: QC for batch 1373319

Client ID: LCS for batch 1373319

Batch ID: 1373320

Run Date: 03/21/2014 12:05

Prep Date: 03/19/2014 17:15

Data File: ph5c2105.d

Client: ARSL004

Method: SW846 8310

Inst: HPLCE.I

Analyst: CWW

Aliquot: 1000 mL

Column: C-18, DAD/FLD

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-030

Dilution: 1

Inj. Vol: 20 uL

Final Volume: 1 mL

Level: LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene		40.0	ug/L	0.218	0.500
91-57-6	2-Methylnaphthalene		43.1	ug/L	0.150	0.500
83-32-9	Acenaphthene		43.8	ug/L	0.150	0.500
208-96-8	Acenaphthylene		40.4	ug/L	0.150	0.500
120-12-7	Anthracene		45.8	ug/L	0.150	0.500
56-55-3	Benzo(a)anthracene		4.52	ug/L	0.016	0.050
50-32-8	Benzo(a)pyrene		4.59	ug/L	0.016	0.050
205-99-2	Benzo(b)fluoranthene		4.47	ug/L	0.016	0.050
191-24-2	Benzo(ghi)perylene		3.45	ug/L	0.016	0.050
207-08-9	Benzo(k)fluoranthene		2.39	ug/L	0.008	0.025
218-01-9	Chrysene		4.77	ug/L	0.016	0.050
53-70-3	Dibenzo(a,h)anthracene		3.59	ug/L	0.016	0.050
206-44-0	Fluoranthene		4.28	ug/L	0.016	0.050
86-73-7	Fluorene		43.3	ug/L	0.150	0.500
193-39-5	Indeno(1,2,3-cd)pyrene		4.67	ug/L	0.016	0.050
91-20-3	Naphthalene		36.9	ug/L	0.150	0.500
85-01-8	Phenanthrene		43.6	ug/L	0.182	0.500
129-00-0	Pyrene		4.51	ug/L	0.016	0.050

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	160	250	64.1	(21%-96%)

PAH by HPLC
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: 2014-2989

Lab Sample ID: 1203053862

Client Sample: QC for batch 1373319

Client ID: LCSD for batch 1373319

Batch ID: 1373320

Run Date: 03/21/2014 12:47

Prep Date: 03/19/2014 17:15

Data File: ph5c2106.d

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-030

Dilution: 1

Inj. Vol: 20 uL

Final Volume: 1 mL

Level: LOW

Client: ARSL004

Method: SW846 8310

Inst: HPLCE.I

Analyst: CWW

Aliquot: 1000 mL

Column: C-18, DAD/FLD

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene		40.4	ug/L	0.218	0.500
91-57-6	2-Methylnaphthalene		43.3	ug/L	0.150	0.500
83-32-9	Acenaphthene		44.0	ug/L	0.150	0.500
208-96-8	Acenaphthylene		40.6	ug/L	0.150	0.500
120-12-7	Anthracene		45.2	ug/L	0.150	0.500
56-55-3	Benzo(a)anthracene		4.47	ug/L	0.016	0.050
50-32-8	Benzo(a)pyrene		4.54	ug/L	0.016	0.050
205-99-2	Benzo(b)fluoranthene		4.42	ug/L	0.016	0.050
191-24-2	Benzo(ghi)perylene		3.49	ug/L	0.016	0.050
207-08-9	Benzo(k)fluoranthene		2.35	ug/L	0.008	0.025
218-01-9	Chrysene		4.78	ug/L	0.016	0.050
53-70-3	Dibenzo(a,h)anthracene		2.92	ug/L	0.016	0.050
206-44-0	Fluoranthene		4.26	ug/L	0.016	0.050
86-73-7	Fluorene		43.3	ug/L	0.150	0.500
193-39-5	Indeno(1,2,3-cd)pyrene		4.47	ug/L	0.016	0.050
91-20-3	Naphthalene		37.4	ug/L	0.150	0.500
85-01-8	Phenanthrene		43.6	ug/L	0.182	0.500
129-00-0	Pyrene		4.49	ug/L	0.016	0.050

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	165	250	66.2	(21%-96%)

PAH by HPLC
Certificate of Analysis
Sample Summary

Page 1 of 1

SDG Number: 2014-2989	Date Collected: 03/13/2014 10:50	Matrix: W
Lab Sample ID: 1203051936	Date Received: 03/15/2014 09:00	
Client Sample: QC for batch 1373319	Client: ARSL004	Project: QC
Client ID: CAWA-14-54740MS	Method: SW846 8310	SOP Ref: GL-OA-E-030
Batch ID: 1373320	Inst: HPLCE.I	Dilution: 1
Run Date: 03/21/2014 15:36	Analyst: CWW	Inj. Vol: 20 uL
Prep Date: 03/19/2014 17:15	Aliquot: 960 mL	Final Volume: 1 mL
Data File: ph5c2110.d	Column: C-18, DAD/FLD	Level: LOW

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ
90-12-0	1-Methylnaphthalene		42.1	ug/L	0.227	0.521
91-57-6	2-Methylnaphthalene		45.5	ug/L	0.156	0.521
83-32-9	Acenaphthene		45.3	ug/L	0.156	0.521
208-96-8	Acenaphthylene		41.9	ug/L	0.156	0.521
120-12-7	Anthracene		46.3	ug/L	0.156	0.521
56-55-3	Benzo(a)anthracene		4.53	ug/L	0.0167	0.0521
50-32-8	Benzo(a)pyrene		4.58	ug/L	0.0167	0.0521
205-99-2	Benzo(b)fluoranthene		4.45	ug/L	0.0167	0.0521
191-24-2	Benzo(ghi)perylene		3.81	ug/L	0.0167	0.0521
207-08-9	Benzo(k)fluoranthene		2.38	ug/L	0.00833	0.026
218-01-9	Chrysene		4.77	ug/L	0.0167	0.0521
53-70-3	Dibenzo(a,h)anthracene		4.06	ug/L	0.0167	0.0521
206-44-0	Fluoranthene		4.30	ug/L	0.0167	0.0521
86-73-7	Fluorene		44.2	ug/L	0.156	0.521
193-39-5	Indeno(1,2,3-cd)pyrene		4.64	ug/L	0.0167	0.0521
91-20-3	Naphthalene		39.3	ug/L	0.156	0.521
85-01-8	Phenanthrene		44.3	ug/L	0.190	0.521
129-00-0	Pyrene		4.54	ug/L	0.0167	0.0521

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	177	260	ug/L 68.1	(21%-96%)

Miscellaneous Data

DATA EXCEPTION REPORT			
Mo.Day Yr. 25-MAR-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: HPLC	Test / Method: SW846 8310	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1373320	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 344473(2014-2974),344588(2014-2989),344674(2014-2999),344737(2014-3009) Application Issues: Failed RPD for MS/MSD, or PS/PSD Sample Prepped out of Holding			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Sample 344473002 (CAWA-14-54749) was extracted past the seven day hold time. 2. Dibenzo(a,h)anthracene did not meet the RPD acceptance range of 0-20% in the LCS/LCSD pair (1203051935/1203053862) at 21%.		1. The extraction group leader notified the project manager that the hold time for the sample was missed. Since the sample was still within twice the hold, permission was given to extract the sample. The data are 'h' qualified and reported with the appropriate DER. 2. The high RPD value was the result of a lower recovery in the LCSD due to vagaries in the extraction process. All other target analyte recoveries were similar, resulting in smaller RPD values. The data are reported with the appropriate DER.	

Originator's Name:

Charles Wilson 25-MAR-14

Data Validator/Group Leader:

Michael Penny 27-MAR-14

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorate by LC-MS/MS
ARS International, LLC (ARSL)
SDG 2014-2989**

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: SW846 6850 Modified

Prep Method: SW846 6850 Modified

Analytical Batch Number: 1372838

Prep Batch Number: 1372837

Sample Analysis

Sample ID	Client ID
344588007	CAAN-14-54790
1203051050	Interference Check Sample (ICS)
1203051046	Method Blank (MB)
1203051047	Laboratory Control Sample (LCS)
1203051048	344296007(CAWA-14-54762) Matrix Spike (MS)
1203051049	344296007(CAWA-14-54762) 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# 11.

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

The initial calibration verification standard (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 344296007 (CAWA-14-54762) from SDG 2014-2959 was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recoveries were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD 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.

Retention Time Standard Area Acceptance

The retention time 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 Method 332.0, 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

Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations.

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 not internally corrected for using Perchlorate-O (18). They are external calibrations.

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 either a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LCMSMS #1 and LCMSMS #2, respectively. 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

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: 2014-2989 GEL Work Order: 344588

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, 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: 25 MAR 2014

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1372837Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAAN-14-54790Date Received: 14-MAR-14GEL Job No (SDG): 2014-2989GEL Sample ID: 344588007Date Filtered: 18-MAR-14Injection 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	0.227	ug/L		1	18-MAR-14 19:24	per0318031a
	Perchlorate Isotope Ratio			3.12			1	18-MAR-14 19:24	per0318031a
14797-73-0	Perchlorate-101	.05	.2	0.218	ug/L		1	18-MAR-14 19:24	per0318031a
	Perchlorate-O(18)			0.499	ug/L		1	18-MAR-14 19:24	per0318031a

^ 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): 2014-2989

Extract Batch Code: 1372837

Date Filtered: 18-MAR-14

Matrix: WATER

Sample ID: 1203051047

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.19	ug/L	95.2		85 - 115
Perchlorate Isotope Ratio		2.88				-
Perchlorate-101	0.200	.198	ug/L	98.8		85 - 115
Perchlorate-O(18)		.484	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): 2014-2989

Extract Batch Code: 1372837

Date Extracted: 18-MAR-14

GEL MS/PS ID: 1203051048

Client ID: CAWA-14-54762

GEL MSD/PSD ID: 1203051049

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	0.128	ug/L	0.309	90.3	.312	92	1.09	30	75 - 125
Perchlorate Isotope Ratio	0	3.08		2.95		2.98		.869		-
Perchlorate-101	0.200	0.124	ug/L	0.313	94.3	.313	94.6	.224	30	75 - 125
Perchlorate-O(18)	0	0.496	ug/L	0.500		.504		.794		-

^ 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: 1372837Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 18-MAR-14GEL Job No (SDG): 2014-2989GEL Sample ID: 1203051046Date Filtered: 18-MAR-14Injection 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	18-MAR-14 16:53	per0318012a
	Perchlorate Isotope Ratio						1	18-MAR-14 16:53	per0318012a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	18-MAR-14 16:53	per0318012a
	Perchlorate-O(18)			0.511	ug/L		1	18-MAR-14 16:53	per0318012a

^ 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: 1372837Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 18-MAR-14GEL Job No (SDG): 2014-2989GEL Sample ID: 1203051047Date Filtered: 18-MAR-14Injection 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	0.190	ug/L	J	1	18-MAR-14 17:01	per0318013a
	Perchlorate Isotope Ratio			2.88			1	18-MAR-14 17:01	per0318013a
14797-73-0	Perchlorate-101	.05	.2	0.198	ug/L	J	1	18-MAR-14 17:01	per0318013a
	Perchlorate-O(18)			0.484	ug/L		1	18-MAR-14 17:01	per0318013a

^ 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: 1372837Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2014-2989GEL Sample ID: 1203051050Date Filtered: 18-MAR-14Injection 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	0.193	ug/L	J	1	18-MAR-14 17:09	per0318014a
	Perchlorate Isotope Ratio			2.9			1	18-MAR-14 17:09	per0318014a
14797-73-0	Perchlorate-101	.05	.2	0.199	ug/L	J	1	18-MAR-14 17:09	per0318014a
	Perchlorate-O(18)			0.509	ug/L		1	18-MAR-14 17:09	per0318014a

^ 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: 1372837Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-14-54762MSDate Received: 11-MAR-14GEL Job No (SDG): 2014-2989GEL Sample ID: 1203051048Date Filtered: 18-MAR-14Injection 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	0.309	ug/L		1	18-MAR-14 17:48	per0318019a
	Perchlorate Isotope Ratio			2.95			1	18-MAR-14 17:48	per0318019a
14797-73-0	Perchlorate-101	.05	.2	0.313	ug/L		1	18-MAR-14 17:48	per0318019a
	Perchlorate-O(18)			0.500	ug/L		1	18-MAR-14 17:48	per0318019a

^ 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: 1372837Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAWA-14-54762MSDDate Received: 11-MAR-14GEL Job No (SDG): 2014-2989GEL Sample ID: 1203051049Date Filtered: 18-MAR-14Injection 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	0.312	ug/L		1	18-MAR-14 17:56	per0318020a
	Perchlorate Isotope Ratio			2.98			1	18-MAR-14 17:56	per0318020a
14797-73-0	Perchlorate-101	.05	.2	0.313	ug/L		1	18-MAR-14 17:56	per0318020a
	Perchlorate-O(18)			0.504	ug/L		1	18-MAR-14 17:56	per0318020a

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

*Concentration =

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

Explosives by LCMSMS Analysis

Case Narrative

**LC-MS/MS Case Narrative
ARS International, LLC (ARSL)
SDG 2014-2989**

Method/Analysis Information

Procedure: **Definitive Low Level Analysis of Nitroaromatic Explosives Utilizing Liquid Chromatography-Mass Spectrometry/Mass Spectrometry (LC-MS/MS) by SW-846 Method 8321 Modified (8321M)**

Analytical Method: SW846 3535/8321A Modified

Prep Method: SW846 Method 3535

Analytical Batch Number: 1373604

Prep Batch Number: 1373603

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3535/8321A Modified:

Sample ID	Client ID
344588003	CAAN-14-54788
1203052664	Method Blank (MB)
1203052665	Laboratory Control Sample (LCS)
1203052666	344737012(CAWA-14-54750) Matrix Spike (MS)
1203052667	344737012(CAWA-14-54750) Matrix Spike Duplicate (MSD)

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP).

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-056 REV# 17.

Primary Analyte Analysis

Calibration Information

Initial Calibration

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

Calibration Verification Standard Requirements

All associated verification standards have not met requirements of 80-120% for the Primary analyte analysis. Calibration verification standard EXP0327034 recovered RDX at 122%. The data were Q qualified and were reported as stated in the SOP.

All other associated calibration verification standards (ICV and CCV) for this analysis met the acceptance criteria.

Calibration Blank Requirements

All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria.

Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

CRI Requirements

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

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

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

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries were within the established acceptance limits.

QC Sample Designation

Client sample 344737012 (CAWA-14-54750) from SDG 2014-3009 was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS spike recoveries were within the established acceptance limits for this analysis.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD spike recoveries were within the established acceptance limits for this analysis.

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

A final internal standard concentration of 100ug/L is employed in order to meet the minimum response factor requirement of 0.01 per EPA Method 8000C for the analysis of explosives on the API 4000.

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

Technical Information**Holding Time Specifications**

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water.

The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

Sample Re-extraction/Re-analysis

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

Secondary Analyte Analysis**Calibration Information****Initial Calibration**

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

Calibration Verification Standard Requirements

All associated calibration verification standards (ICV and CCV) for this analysis met the acceptance criteria.

Calibration Blank Requirements

All initial and continuing calibration blanks (ICB and CCB) bracketing the analyses associated with this batch for this analysis were within acceptance criteria.

Due to software limitations, the CCBs and/or the ICBs may have a concentration for target analytes in the Found column. These values should be zero.

CRI Requirements

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

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

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

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries were within the established acceptance limits.

QC Sample Designation

Client sample 344737012 (CAWA-14-54750) from SDG 2014-3009 was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS (1203052666) did not meet acceptance criteria for the recovery of TATB at 137%. The limits are 39-112%. Since similar recoveries were observed between the MS and MSD, the noted exceptions are attributed to sample matrix interference. The LCS (1203052665) met spike recovery limits for for all target analytes. Since the TATB recoveries in the MS and MSD were biased high and TATB was not detected in the parent sample, 334737012 (CAWA-14-54750), the data are considered unaffected and are reported with the appropriate DER.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD (1203052667) did not meet acceptance criteria for the recovery of TATB at 138%. The limits are 39-112%. Since similar recoveries were observed between the MS and MSD, the noted exceptions are attributed to sample matrix interference. The LCS (1203052665) met spike recovery limits for for all target analytes. Since the TATB recoveries in the MS and MSD were biased high and TATB was not detected in the parent sample, 334737012 (CAWA-14-54750), the data are considered unaffected and are reported with the appropriate DER.

MS/MSD Relative Percent Difference (RPD) Statement

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

Internal Standard (ISTD) Acceptance

The internal standard was not added to the Secondary analyte extracts.

Technical Information**Holding Time Specifications**

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

In accordance with GEL SOP GL-OA-056, all sample and QC extracts are diluted 1:1 v/v with LC reagent grade Water.

The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

Sample Re-extraction/Re-analysis

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

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

Data Exception Report 1280204 was generated for this SDG.

The MS (1203052666) did not meet acceptance criteria for the recovery of TATB at 137%. The limits are 39-112%. Since similar recoveries were observed between the MS and MSD, the noted exceptions are attributed to sample matrix interference. The LCS (1203052665) met spike recovery limits for for all target analytes. Since the TATB recoveries in the MS and MSD were biased high and TATB was not detected in the parent sample, 334737012 (CAWA-14-54750), the data are considered unaffected and are reported with the appropriate DER.

The MSD (1203052667) did not meet acceptance criteria for the recovery of TATB at 138%. The limits are 39-112%. Since similar recoveries were observed between the MS and MSD, the noted exceptions are attributed to sample matrix interference. The LCS (1203052665) met spike recovery limits for for all target analytes. Since the TATB recoveries in the MS and MSD were biased high and TATB was not detected in the parent sample, 334737012 (CAWA-14-54750), the data are considered unaffected and are reported with the appropriate DER.

Manual Integrations

Some initial calibration standards, continuing calibration standards, and/or samples may require manual integrations due to software limitations.

Additional Comments

Due to software limitations, all initial calibration blanks must be designated as XIB001 in order for the forms to be correct.

Due to software limitations, file extensions such as DL, RE, etc. may not appear on the generated forms and/or raw data.

System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Primary analyte analysis. It is coupled with a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LCMSMS #1, and LCMSMS #2, respectively. It is fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for the Primary analyte analysis.

The laboratory also utilizes an Agilent 1100 liquid chromatography instrument for either Primary or Secondary analyte analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as either LCMSMS #3 or LCMSMS #4. It is fitted with an APCI (Atmospheric Pressure Chemical Ionization) probe that is operated in the negative ionization mode for both the Primary and Secondary analyte analysis.

Electronic Packaging Comment

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

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

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

Chromatographic Columns

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

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

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

YMC: J'sphere ODS-H80, 150 x 4.6mm I.D.

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: 2014-2989 GEL Work Order: 344588

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
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- U Analyte was analyzed for, but not detected above the MDL, MDA, 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: 07 APR 2014

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAAN-14-54788

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Matrix: WATER

GEL Sample ID: 344588003

Sample Amount 990 mL

Date Received: 14-MAR-14

Moisture: .

Extraction Batch ID: 1373603

Extraction Type Sol Exchange

Date Extracted: 19-MAR-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0327027.wiff

Date Analyzed: 28-MAR-14 04:40

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	0.253	U	0.0808	0.253
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	0.253	U	0.0808	0.253
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	0.253	QU	0.0808	0.253
<i>121-82-4</i>	<i>RDX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	0.253	U	0.0808	0.253
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	0.253	U	0.0808	0.253
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	0.253	U	0.0808	0.253
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	0.253	U	0.0808	0.253
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	0.253	U	0.0828	0.253
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	0.253	U	0.0808	0.253
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	0.253	U	0.0808	0.253
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	0.253	U	0.0808	0.253
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	0.253	U	0.0808	0.253
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	0.505	U	0.0808	0.505
<i>479-45-8</i>	<i>Tetryl</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAAN-14-54788

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Matrix: WATER

GEL Sample ID: 344588003

Sample Amount 990 mL

Date Received: 14-MAR-14

Moisture: .

Extraction Batch ID: 1373603

Extraction Type Sol Exchange

Date Extracted: 19-MAR-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	0.505	U	0.101	0.505
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	0.505	U	0.152	0.505
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAAN-14-54788

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Matrix: WATER

GEL Sample ID: 344588003

Sample Amount 990 mL

Date Received: 14-MAR-14

Moisture: .

Extraction Batch ID: 1373603

Extraction Type Sol Exchange

Date Extracted: 19-MAR-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXS04020042.wiff

Date Analyzed: 03-APR-14 00:53

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	1.01	U	0.303	1.01
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.01	U	0.303	1.01
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.01	U	0.303	1.01
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.53	U	0.505	2.53
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.53	U	0.505	2.53
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

Quality Control Summary

High Explosives Surrogate Recovery Summary

Lab Name: GEL Laboratories LLCGEL Job No (SDG): 2014-2989Lab Code: GEL

HPLC Column: Ultracarb Phenomenex 5u ODS (20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
344588003	CAAN-14-54788	87.2	69 - 120	
1203052664	MB for batch 1373603	87.2	69 - 120	
1203052665	LCS for batch 1373603	85.2	69 - 120	
1203052666	CAWA-14-54750MS	88.4	69 - 120	
1203052667	CAWA-14-54750MSD	82.4	69 - 120	

DNT = 3,4-Dinitrotoluene

Lab Code: GEL

HPLC Column: YMC J'sphere ODS-H80

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
344588003	CAAN-14-54788	102	69 - 120	
1203052664	MB for batch 1373603	105	69 - 120	
1203052665	LCS for batch 1373603	104	69 - 120	
1203052666	CAWA-14-54750MS	106	69 - 120	
1203052667	CAWA-14-54750MSD	111	69 - 120	

DNT = 3,4-Dinitrotoluene

3B
High Explosives LCS/LCS Duplicate Summary

Lab Name: GEL Laboratories LLC

Client ID: LCS

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Extract Batch Code: 1373603

Date Extracted: 19-MAR-14

GEL LCS ID: 1203052665

GEL LCSDUP ID: .

Analysis Date/Time: 28-MAR-14 04:05

DUP Analysis Date/Time:

Reporting Units: ug/L

QC Type: LCS/LCSD

Compound	Spike Added	LCS Conc	LCS Rec #	LCSD Conc	LCSD Rec #	RPD #	RPD	Recovery Limits
1,3,5-Trinitrobenzene	5	4.07	81.4					70 - 117
2,4,6-Trinitrotoluene	5	4.4	88					70 - 121
2,4-Dinitrotoluene	5	4.38	87.6					70 - 115
2,6-Dinitrotoluene	5	4.19	83.8					70 - 109
2-Amino-4,6-dinitrotoluene	5	4.26	85.2					70 - 121
4-Amino-2,6-dinitrotoluene	5	4.85	97					70 - 119
HMX	5	3.68	73.6					66 - 115
Nitrobenzene	5	4.09	81.8					69 - 113
PETN	5	3.67	73.4					67 - 121
RDX	5	3.83	76.6					70 - 125
Tetryl	5	3.77	75.4					65 - 120
m-Dinitrobenzene	5	4.22	84.4					70 - 115
m-Nitrotoluene	5	4.44	88.8					69 - 113
o-Nitrotoluene	5	4.46	89.2					66 - 111
p-Nitrotoluene	5	4.08	81.6					67 - 113

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

* Values outside of QC limits

3B
High Explosives LCS/LCS Duplicate Summary

Lab Name: GEL Laboratories LLC

Client ID: LCS

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Extract Batch Code: 1373603

Date Extracted: 19-MAR-14

GEL LCS ID: 1203052665

GEL LCSDUP ID: .

Analysis Date/Time: 03-APR-14 00:36

DUP Analysis Date/Time:

Reporting Units: ug/L

QC Type: LCS/LCSD

Compound	Spike Added	LCS Conc	LCS Rec #	LCSD Conc	LCSD Rec #	RPD #	RPD	Recovery Limits
2,4-Diamino-6-nitrotoluene	5	3.55	71					70 - 109
2,6-Diamino-4-nitrotoluene	5	4.04	80.8					61 - 117
3,5-Dinitroaniline	5	4.59	91.8					70 - 117
TATB	5	6.38	128					32 - 169
tris(o-cresyl) phosphate	5	2.81	56.2					51 - 87

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

* Values outside of QC limits

3
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAWA-14-54750

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Extract Batch Code: 1373603

Date Extracted: 19-MAR-14

GEL Spike ID: 1203052666

GEL SpikeDup ID: 1203052667

Analysis Date/Time: 28-MAR-14 07:00

MSD Analysis Date/Time: 28-MAR-14 07:35

Reporting Units: ug/L

QC Type: MS/MSD

Compound	Spike Added	Sample Conc	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Rec Limits
m-Nitrotoluene	5.10204	0	4.28	83.8	4.09	80.2	4.39	20	61 - 110
o-Nitrotoluene	5.10204	0	3.89	76.2	4.05	79.4	4.11	20	57 - 112
p-Nitrotoluene	5.10204	0	4.03	79	4.29	84	6.14	20	63 - 111
2,4-Dinitrotoluene	5.10204	0	4.46	87.4	4.24	83.2	4.92	20	60 - 119
2,4,6-Trinitrotoluene	5.10204	0	4.43	86.8	4.15	81.4	6.42	20	60 - 123
1,3,5-Trinitrobenzene	5.10204	0	3.98	78	4.41	86.4	10.2	20	60 - 120
2,6-Dinitrotoluene	5.10204	0	4.27	83.6	4.17	81.8	2.18	20	60 - 113
4-Amino-2,6-dinitrotoluene	5.10204	0	4.81	94.2	4.7	92.2	2.15	20	63 - 133
Nitrobenzene	5.10204	0	3.76	73.6	3.77	73.8	.271	20	63 - 112
m-Dinitrobenzene	5.10204	0	4.14	81.2	4.4	86.2	5.97	20	60 - 117
Tetryl	5.10204	0	3.49	68.4	3.39	66.4	2.97	20	44 - 109
RDX	5.10204	0	3.94	77.2	4.42	86.6	11.5	20	67 - 131
PETN	5.10204	0	3.88	76	4.03	79	3.87	20	65 - 118
HMX	5.10204	0	4.08	80	4.38	85.8	7	20	59 - 117
2-Amino-4,6-dinitrotoluene	5.10204	0	4.2	82.4	4.03	79	4.21	20	60 - 124

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

3
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAWA-14-54750

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Extract Batch Code: 1373603

Date Extracted: 19-MAR-14

GEL Spike ID: 1203052666

GEL SpikeDup ID: 1203052667

Analysis Date/Time: 03-APR-14 02:00

MSD Analysis Date/Time: 03-APR-14 02:16

Reporting Units: ug/L

QC Type: MS/MSD

Compound	Spike Added	Sample Conc	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Rec Limits
2,4-Diamino-6-nitrotoluene	5.10204	0	3.86	75.6	4.04	79.2	4.65	20	68 - 116
2,6-Diamino-4-nitrotoluene	5.10204	0	3.97	77.8	4.18	82	5.26	20	53 - 124
3,5-Dinitroaniline	5.10204	0	4.68	91.8	4.77	93.4	1.73	20	67 - 123
TATB	5.10204	0	6.97	137 *	7.04	138 *	1.02	20	39 - 112
tris(o-cresyl) phosphate	5.10204	0	3.63	71.2	3.58	70.2	1.41	20	49 - 86

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

Quality Control Data

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1373603

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Matrix: WATER

GEL Sample ID: 1203052664

Sample Amount 1000 mL

Date Received: 14-MAR-14

Moisture: .

Extraction Batch ID: 1373603

Extraction Type Sol Exchange

Date Extracted: 19-MAR-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0327025.wiff

Date Analyzed: 28-MAR-14 03:30

Dilution Factor: 2

Concentration Units: ug/L

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1373603

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Matrix: WATER

GEL Sample ID: 1203052664

Sample Amount 1000 mL

Date Received: 14-MAR-14

Moisture: .

Extraction Batch ID: 1373603

Extraction Type Sol Exchange

Date Extracted: 19-MAR-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	0.500	U	0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	0.500	U	0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1373603

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Matrix: WATER

GEL Sample ID: 1203052664

Sample Amount 1000 mL

Date Received: 14-MAR-14

Moisture: .

Extraction Batch ID: 1373603

Extraction Type Sol Exchange

Date Extracted: 19-MAR-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXS04020040.wiff

Date Analyzed: 03-APR-14 00:19

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	1.00	U	0.300	1.00
3058-38-6	TATB				
618-87-1	3,5-Dinitroaniline	1.00	U	0.300	1.00
618-87-1	3,5-Dinitroaniline				
78-30-8	tris(o-cresyl) phosphate	1.00	U	0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.50	U	0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.50	U	0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1373603

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Matrix: WATER

GEL Sample ID: 1203052665

Sample Amount 1000 mL

Date Received: 14-MAR-14

Moisture: .

Extraction Batch ID: 1373603

Extraction Type Sol Exchange

Date Extracted: 19-MAR-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0327026.wiff

Date Analyzed: 28-MAR-14 04:05

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	3.67		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
2691-41-0	HMX	3.68		0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
479-45-8	Tetryl	3.77		0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				
121-82-4	RDX	3.83	Q	0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
99-35-4	1,3,5-Trinitrobenzene	4.07		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-99-0	p-Nitrotoluene	4.08		0.150	0.500
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
98-95-3	Nitrobenzene	4.09		0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
606-20-2	2,6-Dinitrotoluene	4.19		0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
99-65-0	m-Dinitrobenzene	4.22		0.080	0.250
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.26		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	4.38		0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.4		0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
99-08-1	m-Nitrotoluene	4.44		0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1373603

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Matrix: WATER

GEL Sample ID: 1203052665

Sample Amount 1000 mL

Date Received: 14-MAR-14

Moisture: .

Extraction Batch ID: 1373603

Extraction Type Sol Exchange

Date Extracted: 19-MAR-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
88-72-2	<i>o</i> -Nitrotoluene	4.46		0.082	0.250
<i>88-72-2</i>	<i>o</i> -Nitrotoluene				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.85		0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1373603

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Matrix: WATER

GEL Sample ID: 1203052665

Sample Amount 1000 mL

Date Received: 14-MAR-14

Moisture: .

Extraction Batch ID: 1373603

Extraction Type Sol Exchange

Date Extracted: 19-MAR-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXS04020041.wiff

Date Analyzed: 03-APR-14 00:36

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-30-8	tris(o-cresyl) phosphate	2.81		0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
6629-29-4	2,4-Diamino-6-nitrotoluene	3.55		0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.04		0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
618-87-1	3,5-Dinitroaniline	4.59		0.300	1.00
618-87-1	3,5-Dinitroaniline				
3058-38-6	TATB	6.38		0.300	1.00
3058-38-6	TATB				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-14-54750(344737012MS)MS

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Matrix: WATER

GEL Sample ID: 1203052666

Sample Amount 980 mL

Date Received: 14-MAR-14

Moisture: .

Extraction Batch ID: 1373603

Extraction Type Sol Exchange

Date Extracted: 19-MAR-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0327031.wiff

Date Analyzed: 28-MAR-14 07:00

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
479-45-8	Tetryl	3.49		0.0816	0.510
<i>479-45-8</i>	<i>Tetryl</i>				
98-95-3	Nitrobenzene	3.76		0.0816	0.255
<i>98-95-3</i>	<i>Nitrobenzene</i>				
78-11-5	PETN	3.88		0.102	0.510
<i>78-11-5</i>	<i>PETN</i>				
88-72-2	o-Nitrotoluene	3.89		0.0837	0.255
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
121-82-4	RDX	3.94	Q	0.0816	0.255
<i>121-82-4</i>	<i>RDX</i>				
99-35-4	1,3,5-Trinitrobenzene	3.98		0.0816	0.255
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-99-0	p-Nitrotoluene	4.03		0.153	0.510
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
2691-41-0	HMX	4.08		0.0816	0.255
<i>2691-41-0</i>	<i>HMX</i>				
99-65-0	m-Dinitrobenzene	4.14		0.0816	0.255
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.2		0.0816	0.255
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.27		0.0816	0.255
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
99-08-1	m-Nitrotoluene	4.28		0.0816	0.255
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.43		0.0816	0.255
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-14-54750(344737012MS)MS

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Matrix: WATER

GEL Sample ID: 1203052666

Sample Amount 980 mL

Date Received: 14-MAR-14

Moisture: .

Extraction Batch ID: 1373603

Extraction Type Sol Exchange

Date Extracted: 19-MAR-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-14-2	2,4-Dinitrotoluene	4.46		0.0816	0.255
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.81		0.0816	0.255
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-14-54750(344737012MS)MS

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Matrix: WATER

GEL Sample ID: 1203052666

Sample Amount 980 mL

Date Received: 14-MAR-14

Moisture: .

Extraction Batch ID: 1373603

Extraction Type Sol Exchange

Date Extracted: 19-MAR-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXS04020046.wiff

Date Analyzed: 03-APR-14 02:00

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-30-8	tris(o-cresyl) phosphate	3.63		0.306	1.02
78-30-8	tris(o-cresyl) phosphate				
6629-29-4	2,4-Diamino-6-nitrotoluene	3.86		0.510	2.55
6629-29-4	2,4-Diamino-6-nitrotoluene				
59229-75-3	2,6-Diamino-4-nitrotoluene	3.97		0.510	2.55
59229-75-3	2,6-Diamino-4-nitrotoluene				
618-87-1	3,5-Dinitroaniline	4.68		0.306	1.02
618-87-1	3,5-Dinitroaniline				
3058-38-6	TATB	6.97		0.306	1.02
3058-38-6	TATB				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-14-54750(344737012MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Matrix: WATER

GEL Sample ID: 1203052667

Sample Amount 980 mL

Date Received: 14-MAR-14

Moisture: .

Extraction Batch ID: 1373603

Extraction Type Sol Exchange

Date Extracted: 19-MAR-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXP0327032.wiff

Date Analyzed: 28-MAR-14 07:35

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
479-45-8	Tetryl	3.39		0.0816	0.510
<i>479-45-8</i>	<i>Tetryl</i>				
98-95-3	Nitrobenzene	3.77		0.0816	0.255
<i>98-95-3</i>	<i>Nitrobenzene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.03		0.0816	0.255
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
78-11-5	PETN	4.03		0.102	0.510
<i>78-11-5</i>	<i>PETN</i>				
88-72-2	o-Nitrotoluene	4.05		0.0837	0.255
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
99-08-1	m-Nitrotoluene	4.09		0.0816	0.255
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.15		0.0816	0.255
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.17		0.0816	0.255
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	4.24		0.0816	0.255
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.29		0.153	0.510
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				
2691-41-0	HMX	4.38		0.0816	0.255
<i>2691-41-0</i>	<i>HMX</i>				
99-65-0	m-Dinitrobenzene	4.4		0.0816	0.255
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.41		0.0816	0.255
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-14-54750(344737012MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Matrix: WATER

GEL Sample ID: 1203052667

Sample Amount 980 mL

Date Received: 14-MAR-14

Moisture: .

Extraction Batch ID: 1373603

Extraction Type Sol Exchange

Date Extracted: 19-MAR-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

Cas No.	Compound	Concentration*	Q	MDL	PQL
121-82-4	RDX	4.42	Q	0.0816	0.255
<i>121-82-4</i>	<i>RDX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.7		0.0816	0.255
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAWA-14-54750(344737012MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 2014-2989

Matrix: WATER

GEL Sample ID: 1203052667

Sample Amount 980 mL

Date Received: 14-MAR-14

Moisture: .

Extraction Batch ID: 1373603

Extraction Type Sol Exchange

Date Extracted: 19-MAR-14

Concentrated Extract Volume (mL) 5

Injection Volume (uL):50

GEL data file: EXS04020047.wiff

Date Analyzed: 03-APR-14 02:16

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-30-8	tris(o-cresyl) phosphate	3.58		0.306	1.02
78-30-8	tris(o-cresyl) phosphate				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.04		0.510	2.55
6629-29-4	2,4-Diamino-6-nitrotoluene				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.18		0.510	2.55
59229-75-3	2,6-Diamino-4-nitrotoluene				
618-87-1	3,5-Dinitroaniline	4.77		0.306	1.02
618-87-1	3,5-Dinitroaniline				
3058-38-6	TATB	7.04		0.306	1.02
3058-38-6	TATB				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2014-2989Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 27-MAR-14 13:29GEL Data File: EXP0327001.wiffInstrument ID: LCMSMS3Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2014-2989Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 27-MAR-14 14:04GEL Data File: EXP0327002.wiffInstrument ID: LCMSMS3Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 2014-2989Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 02-APR-14 13:27GEL Data File: EXS04020001.wiffInstrument ID: LCMSMS4Column: YMC J'sphere ODS-H80

Compound	True	Found (ug/L)
2,6-Diamino-4-nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	3.15
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLC**GEL Job No(SDG):** 2014-2989**Lab Code:** GEL**Lab Sample ID:** XIBLK01**Analysis Date:** 02-APR-14 13:44**GEL Data File:** EXS04020002.wiff**Instrument ID:** LCMSMS4**Column:** YMC J'sphere ODS-H80

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2014-2989

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 27-MAR-14 18:09

GEL Data File: EXP0327009.wiff

Instrument ID: LCMSMS3

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2014-2989

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 27-MAR-14 19:19

GEL Data File: EXP0327011.wiff

Instrument ID: LCMSMS3

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2014-2989

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 28-MAR-14 01:10

GEL Data File: EXP0327021.wiff

Instrument ID: LCMSMS3

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2014-2989

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 28-MAR-14 02:20

GEL Data File: EXP0327023.wiff

Instrument ID: LCMSMS3

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2014-2989

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 28-MAR-14 08:09

GEL Data File: EXP0327033.wiff

Instrument ID: LCMSMS3

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0
p-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2014-2989

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 28-MAR-14 09:19

GEL Data File: EXP0327035.wiff

Instrument ID: LCMSMS3

Column: Ultracarb Phenomenex 5u ODS (20)

Compound	True	Found (ug/L)
p-Nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
1,3,5-Trinitrobenzene	0	0
2,4,6-Trinitrotoluene	0	0
2,4-Dinitrotoluene	0	0
2,6-Dinitrotoluene	0	0
2-Amino-4,6-dinitrotoluene	0	0
4-Amino-2,6-dinitrotoluene	0	0
HMX	0	0
Nitrobenzene	0	0
PETN	0	0
RDX	0	0
Tetryl	0	0
m-Dinitrobenzene	0	0
m-Nitrotoluene	0	0
o-Nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2014-2989

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 02-APR-14 15:58

GEL Data File: EXS04020010.wiff

Instrument ID: LCMSMS4

Column: YMC J'sphere ODS-H80

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	8.63
TATB	0	0
3,5-Dinitroaniline	0	1.3
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2014-2989

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 02-APR-14 16:31

GEL Data File: EXS04020012.wiff

Instrument ID: LCMSMS4

Column: YMC J'sphere ODS-H80

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	4.78
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2014-2989

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 02-APR-14 20:08

GEL Data File: EXS04020025.wiff

Instrument ID: LCMSMS4

Column: YMC J'sphere ODS-H80

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	4.23
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2014-2989

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 02-APR-14 20:59

GEL Data File: EXS04020028.wiff

Instrument ID: LCMSMS4

Column: YMC J'sphere ODS-H80

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2014-2989

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 02-APR-14 23:46

GEL Data File: EXS04020038.wiff

Instrument ID: LCMSMS4

Column: YMC J'sphere ODS-H80

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	5.01
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 2014-2989

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 03-APR-14 02:50

GEL Data File: EXS04020049.wiff

Instrument ID: LCMSMS4

Column: YMC J'sphere ODS-H80

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	1.67
tris(o-cresyl) phosphate	0	5.76
TATB	0	0
3,5-Dinitroaniline	0	2.92
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

Miscellaneous

DATA EXCEPTION REPORT			
Mo.Day Yr. 03-APR-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: LC-MS/MS	Test / Method: SW846 3535/8321A Modified	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1373604	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 344588(2014-2989),344674(2014-2999),344737(2014-3009) Application Issues: Failed Recovery for MS/PS Failed Recovery for MSD/PSD			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. The MS (1203052666) did not meet acceptance criteria for the recovery of TATB at 137%. The limits are 39-112%. 2. The MSD (1203052667) did not meet acceptance criteria for the recovery of TATB at 138%. The limits are 39-112%.		1. & 2. Since similar recoveries were observed between the MS and MSD, the noted exceptions are attributed to sample matrix interference. The LCS (1203052665) met spike recovery limits for for all target analytes. Since the TATB recoveries in the MS and MSD were biased high and TATB was not detected in the parent sample, 334737012 (CAWA-14-54750), the data are considered unaffected and are reported with the appropriate DER.	

Originator's Name:

Lynne Russell 03-APR-14

Data Validator/Group Leader:

Michael Penny 04-APR-14

Pesticide Analysis

Case Narrative

Pesticide Case Narrative
ARS International, LLC (ARSL)
SDG 2014-2989

Method/Analysis Information

Procedure:	Analysis of 1,2-Dibromoethane (EDB) and 1,2-Dibromo-3-Chloropropane (DBCP) in Water by GC/ECD Using Methods 504.1 or 8011
Analytical Method:	SW846 8011
Prep Method:	SW846 8011 PREP
Analytical Batch Number:	1372704
Prep Batch Number:	1372703

Sample Analysis

Sample ID	Client ID
344588001	CAAN-14-54788
344588008	CAAN-14-54786
1203050725	Method Blank (MB)
1203050726	Laboratory Control Sample (LCS)
1203050727	Laboratory Control Sample Duplicate (LCSD)

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-059 REV# 12.

Raw data reports are processed and reviewed by the analyst using ChemStation software. False positives have been removed from the ChemStation 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 calibration verification standards (CVS, ICV, or CCV) requirements have not been met for this SDG. The

bracketing standard failed with a negative or positive bias for one or more target analytes. All samples were re-analyzed. The bracketing standard failed in the same manner; therefore, the standard failure is attributed to matrix interference. The initial bracket is reported.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The laboratory control sample (LCS) spike recoveries met the acceptance limits.

Laboratory Control Sample Duplicate (LCSD) Recovery

The laboratory control sample duplicate (LCSD) spike recoveries met the acceptance limits.

LCS/LCSD Relative Percent Difference (RPD) Statement

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

QC Sample Designation

Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

Matrix Spike (MS) Recovery Statement

Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

Matrix Spike Duplicate (MSD) Recovery Statement

Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

MS/MSD Relative Percent Difference (RPD) Statement

Matrix spike and matrix spike duplicate analyses were not performed on a sample in this batch for this SDG.

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 in this analytical batch met the specified holding time.

Sample preservation

The following sample had a pH of 2: 344588008 (CAAN-14-54786).

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows.

Sample Dilutions

The samples in this SDG in this analytical 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:

Electronic Package Comment

This 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 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

Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this pesticide fraction.

Additional Comments

The higher result is reported.

System Configuration

The 504.1/8011 analysis of EDB/DBCP was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
ECD1A.I_1	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series ECD	Rtx-CLP I	30m x 0.25mm, 0.25um (Rtx-CLPesticide)
ECD1A.I_1	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series ECD	ZB-50-504/8011	30m x 0.53mm, 1.00um
ECD1A.I_2	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series ECD	Rtx-CLP II	30m x 0.25mm, 0.20um (Rtx-CLPesticide II)
ECD1A.I_2	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series ECD	ZB-XLB-504/8	30m x 0.53mm, 1.50um

Method/Analysis Information

Procedure: Organochlorine Pesticides and Chlorinated Hydrocarbons

Analytical Method: SW846 3535A/8081B

Prep Method: SW846 3535A

Analytical Batch Number: 1372943

Prep Batch Number: 1372942

Sample Analysis

Sample ID	Client ID
344588005	CAAN-14-54788
1203051297	Method Blank (MB)
1203051298	Laboratory Control Sample (LCS)
1203051299	344588005(CAAN-14-54788) Matrix Spike (MS)
1203051301	Laboratory Control Sample Duplicate (LCSD)

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-041 REV# 13.

Raw data reports are processed and reviewed by the analyst using ChemStation software. False positives have been removed from the ChemStation 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 requested 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

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

Laboratory Control Sample (LCS) Recovery

The laboratory control sample (LCS) spike recoveries met the acceptance limits.

Laboratory Control Sample Duplicate (LCSD) Recovery

The laboratory control sample duplicate (LCSD) spike recoveries met the acceptance limits.

LCS/LCSD Relative Percent Difference (RPD) Statement

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

QC Sample Designation

Sample 344588005 (CAAN-14-54788) was selected for the matrix spike analysis.

Matrix Spike (MS) Recovery Statement

The MS recoveries for this SDG 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 in this analytical batch met the specified holding time.

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows.

Sample Dilutions

The samples in this SDG in this analytical 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.

Florisil

Florisil clean-up was not performed on client and quality control samples in this batch.

Miscellaneous Information:

Electronic Package Comment

This 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 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

Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this pesticide fraction.

Additional Comments

The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of

sample analysis or review. The following additional comments were required:

Detected target analytes were reported from the analytical column with the lower concentration. Results below the method detection limit (non-detects) were reported from column one.

Due to software issue, the surrogate recovery range was not indicated or possibly indicated incorrectly in Quantitation Report. Please see Surrogate Recovery Report for correct surrogate recovery acceptance limits.

Due to rounding differences in the calculation between the forms, the data reported in Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description
ECD7A.I_1	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7673 Autosampler	HP6890 Series ECD	Rtx-CLP I	30m x 0.25mm, 0.25um (Rtx-CLPesticide I)
ECD7A.I_2	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7673 Autosampler	HP6890 Series ECD	Rtx-CLP II	30m x 0.25mm, 0.20um (Rtx-CLPesticide II)

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: 2014-2989 GEL Work Order: 344588

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, 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: Cameron Bearden

Date: 09 APR 2014

Title: Group Leader

Sample Data Summary

**Pesticide
Certificate of Analysis
Sample Summary**

Page 1 of 1

SDG Number: 2014-2989

Lab Sample ID: 344588001

Date Collected: 03/12/2014 10:15

Date Received: 03/14/2014 09:00

Matrix: W

Client ID: CAAN-14-54788

Batch ID: 1372704

Run Date: 03/21/2014 21:50

Prep Date: 03/21/2014 17:15

Data File: 032214HE\E1C2223.D

Client: ARSL004

Method: SW846 8011

Inst: ECD1A.I

Analyst: RXE1

Aliquot: 35 mL

Column: 1 ZB-50

Project: ESHL00714

SOP Ref: GL-OA-E-059

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 34.25 mL

2 ZB-XLB

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
96-12-8	1,2-Dibromo-3-chloropropane	U	0.0196	ug/L	0.00587	0.0196	1
106-93-4	1,2-Dibromoethane	U	0.0196	ug/L	0.00587	0.0196	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Bromofluorobenzene		3.50	3.57	ug/L	97.9	(73%-135%)	

**Pesticide
Certificate of Analysis
Sample Summary**

Page 1 of 1

SDG Number: 2014-2989
Lab Sample ID: 344588005

Client ID: CAAN-14-54788
Batch ID: 1372943
Run Date: 03/18/2014 19:25
Prep Date: 03/17/2014 06:48
Data File: 031814.B\c1824.D
031814.B\c1824.D

Date Collected: 03/12/2014 10:15
Date Received: 03/14/2014 09:00
Client: ARSL004
Method: SW846 3535A/8081B
Inst: ECD7A.I
Analyst: LOF
Aliquot: 960 mL
Column: 1 CLPesticides
2 CLPesticides2

Matrix: W
Project: ESHL00714
SOP Ref: GL-OA-E-041
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
118-74-1	Hexachlorobenzene	U	0.0208	ug/L	0.00651	0.0208	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Decachlorobiphenyl		0.994	1.04	ug/L	95.4	(41%-124%)	
4cmx		0.938	1.04	ug/L	90.0	(36%-106%)	

**Pesticide
Certificate of Analysis
Sample Summary**

SDG Number: 2014-2989
Lab Sample ID: 344588008

Client ID: CAAN-14-54786
Batch ID: 1372704
Run Date: 03/21/2014 22:11
Prep Date: 03/21/2014 17:15
Data File: 032214HE\E1C2224.D
032214HE\E1C2224.D

Date Collected: 03/12/2014 10:15
Date Received: 03/14/2014 09:00
Client: ARSL004
Method: SW846 8011
Inst: ECD1A.I
Analyst: RXE1
Aliquot: 35 mL
Column: 1 ZB-50
2 ZB-XLB

Matrix: W

Project: ESHL00714
SOP Ref: GL-OA-E-059
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 34.68 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
96-12-8	1,2-Dibromo-3-chloropropane	U	0.0198	ug/L	0.00595	0.0198	1
106-93-4	1,2-Dibromoethane	U	0.0198	ug/L	0.00595	0.0198	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Bromofluorobenzene		3.77	3.57	ug/L	106	(73%-135%)	

Quality Control Summary

Pesticide
Surrogate Recovery Report

Page 1 of 2

SDG Number: 2014-2989**Matrix Type: LIQUID**

Sample ID	Client ID	BFB 1 %REC #	BFB 2 %REC #
1203050725	MB for batch 1372703	93	85
1203050726	LCS for batch 1372703	97	95
1203050727	LCSD for batch 1372703	96	90
344588001	CAAN-14-54788	98	88
344588008	CAAN-14-54786	106	88

Surrogate**Acceptance Limits**

BFB = Bromofluorobenzene

(73%-135%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Pesticide
Surrogate Recovery Report

Page 2 of 2

SDG Number: 2014-2989**Matrix Type: LIQUID**

Sample ID	Client ID	4CMX 1 %REC #	4CMX 2 %REC #	DCB 1 %REC #	DCB 2 %REC #
1203051297	MB for batch 1372942	93	92	95	100
1203051298	LCS for batch 1372942	92	91	94	101
1203051301	LCSD for batch 1372942	87	86	89	93
344588005	CAAN-14-54788	91	90	95	101
1203051299	CAAN-14-54788MS	88	88	92	97

Surrogate**Acceptance Limits**

4CMX = 4cmx (36%-106%)

DCB = Decachlorobiphenyl (41%-124%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Pesticide
Quality Control Summary
Spike Recovery Report

Page 1 of 2

SDG Number: 2014-2989

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1372703

Matrix: WATER

Lab Sample ID 1203050726

Instrument: ECD1A.I

Analysis Date: 03/21/2014 16:34

Dilution: 1

Analyst: RXE1

Prep Batch ID:1372703

Inj. Vol: 1 uL

Batch ID: 1372704

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
106-93-4	LCS 1,2-Dibromoethane	0.200	0.0	0.189	95	70-130
96-12-8	LCS 1,2-Dibromo-3-chloropropane	0.200	0.0	0.201	100	70-130

Pesticide
Quality Control Summary
Spike Recovery Report

Page 2 of 2

SDG Number: 2014-2989

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1372703

Matrix: WATER

Lab Sample ID 1203050727

Instrument: ECD1A.I

Analysis Date: 03/21/2014 16:55

Dilution: 1

Analyst: RXE1

Prep Batch ID: 1372703

Inj. Vol: 1 uL

Batch ID: 1372704

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
106-93-4	LCSD 1,2-Dibromoethane	0.200	0.0	0.202	101	70-130	6	0-20
96-12-8	LCSD 1,2-Dibromo-3-chloropropane	0.200	0.0	0.202	101	70-130	1	0-20

Pesticide
Quality Control Summary
Spike Recovery Report

Page 1 of 2

SDG Number: 2014-2989

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1372942

Matrix: WATER

Lab Sample ID 1203051298

Instrument: ECD7A.I

Analysis Date: 03/18/2014 18:40

Dilution: 1

Analyst: LOF

Prep Batch ID:1372942

Inj. Vol: 1 uL

Batch ID: 1372943

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
118-74-1	LCS Hexachlorobenzene	0.100	0.0	0.0831	83	50-150

Pesticide

Page 2 of 2

Quality Control Summary
Spike Recovery Report

SDG Number: 2014-2989

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1372942

Matrix: WATER

Lab Sample ID 1203051301

Instrument: ECD7A.I

Analysis Date: 03/18/2014 18:55

Dilution: 1

Analyst: LOF

Prep Batch ID:1372942

Inj. Vol: 1 uL

Batch ID: 1372943

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
118-74-1	LCSD Hexachlorobenzene	0.100	0.0	0.0802	80	50-150	4	0-30

Pesticide

Page 1 of 1

Quality Control Summary
Spike Recovery Report

SDG Number: 2014-2989

Sample Type: Matrix Spike

Client ID: CAAN-14-54788MS

Matrix: W

Lab Sample ID 1203051299

Instrument: ECD7A.I

Analysis Date: 03/18/2014 19:40

Dilution: 1

Analyst: LOF

Prep Batch ID:1372942

Inj. Vol: 1 uL

Batch ID: 1372943

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
118-74-1	MS Hexachlorobenzene	0.102	0.00 U	0.0938	92	50-150

Method Blank Summary

Page 1 of 1

SDG Number:	2014-2989	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1372703	Instrument ID:	ECD1A.I_1	Data File:	032214HE\E1C2207.D
Lab Sample ID:	1203050725		ECD1A.I_2		032214HE\E1C2207.D
Column:	ZB-50	Prep Date:	03/21/2014 16:05	Analyzed:	03/21/14 16:13
	ZB-XLB				

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 1372703	1203050726	032214HE\E1C2208.D 032214HE\E1C2208.D	03/21/14	1634
02 LCSD for batch 1372703	1203050727	032214HE\E1C2209.D 032214HE\E1C2209.D	03/21/14	1655
03 CAAN-14-54788	344588001	032214HE\E1C2223.D 032214HE\E1C2223.D	03/21/14	2150
04 CAAN-14-54786	344588008	032214HE\E1C2224.D 032214HE\E1C2224.D	03/21/14	2211

Method Blank Summary

Page 1 of 1

SDG Number:	2014-2989	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1372942	Instrument ID:	ECD7A.I_1	Data File:	031814.B\ e7c1820.D
Lab Sample ID:	1203051297		ECD7A.I_2		031814.B\ e7c1820.D
Column:	CLPesticides	Prep Date:	03/17/2014 06:48	Analyzed:	03/18/14 18:25
	CLPesticides2				

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 1372942	1203051298	031814.B\ e7c1821.D 031814.B\ e7c1821.D	03/18/14	1840
02 LCSD for batch 1372942	1203051301	031814.B\ e7c1822.D 031814.B\ e7c1822.D	03/18/14	1855
03 CAAN-14-54788	344588005	031814.B\ e7c1824.D 031814.B\ e7c1824.D	03/18/14	1925
04 CAAN-14-54788MS	1203051299	031814.B\ e7c1825.D 031814.B\ e7c1825.D	03/18/14	1940

Quality Control Data

**Pesticide
Certificate of Analysis
Sample Summary**

Page 1 of 1

SDG Number: 2014-2989
Lab Sample ID: 1203050725
Client Sample: QC for batch 1372703
Client ID: MB for batch 1372703
Batch ID: 1372704
Run Date: 03/21/2014 16:13
Prep Date: 03/21/2014 16:05
Data File: 032214HE\E1C2207.D
032214HE\E1C2207.D

Client: ARSL004
Method: SW846 8011
Inst: ECD1A.I
Analyst: RXE1
Aliquot: 35 mL
Column: 1 ZB-50
2 ZB-XLB

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-059
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 35 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
96-12-8	1,2-Dibromo-3-chloropropane	U	0.020	ug/L	0.006	0.020	1
106-93-4	1,2-Dibromoethane	U	0.020	ug/L	0.006	0.020	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Bromofluorobenzene		3.34	3.57	ug/L	93.5	(73%-135%)	

**Pesticide
Certificate of Analysis
Sample Summary**

Page 1 of 1

SDG Number: 2014-2989
Lab Sample ID: 1203050726
Client Sample: QC for batch 1372703
Client ID: LCS for batch 1372703
Batch ID: 1372704
Run Date: 03/21/2014 16:34
Prep Date: 03/21/2014 16:05
Data File: 032214HE\E1C2208.D
032214HE\E1C2208.D

Client: ARSL004
Method: SW846 8011
Inst: ECD1A.I
Analyst: RXE1
Aliquot: 35 mL
Column: 1 ZB-50
2 ZB-XLB

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-059
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 35 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
96-12-8	1,2-Dibromo-3-chloropropane		0.201	ug/L	0.006	0.020	1
106-93-4	1,2-Dibromoethane		0.189	ug/L	0.006	0.020	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Bromofluorobenzene		3.47	3.57	ug/L	97.1	(73%-135%)	

**Pesticide
Certificate of Analysis
Sample Summary**

Page 1 of 1

SDG Number: 2014-2989

Lab Sample ID: 1203050727

Client Sample: QC for batch 1372703

Client ID: LCSD for batch 1372703

Batch ID: 1372704

Run Date: 03/21/2014 16:55

Prep Date: 03/21/2014 16:05

Data File: 032214HE\E1C2209.D
032214HE\E1C2209.D

Client: ARSL004

Method: SW846 8011

Inst: ECD1A.I

Analyst: RXE1

Aliquot: 35 mL

Column: 1 ZB-50
2 ZB-XLB

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-059

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 35 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
96-12-8	1,2-Dibromo-3-chloropropane		0.202	ug/L	0.006	0.020	1
106-93-4	1,2-Dibromoethane		0.202	ug/L	0.006	0.020	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Bromofluorobenzene		3.42	3.57	ug/L	95.9	(73%-135%)	

**Pesticide
Certificate of Analysis
Sample Summary**

Page 1 of 1

SDG Number: 2014-2989
Lab Sample ID: 1203051297
Client Sample: QC for batch 1372942
Client ID: MB for batch 1372942
Batch ID: 1372943
Run Date: 03/18/2014 18:25
Prep Date: 03/17/2014 06:48
Data File: 031814.B\c1820.D
031814.B\c1820.D

Client: ARSL004
Method: SW846 3535A/8081B
Inst: ECD7A.I
Analyst: LOF
Aliquot: 1000 mL
Column: 1 CLPesticides
2 CLPesticides2

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-041
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
118-74-1	Hexachlorobenzene	U	0.020	ug/L	0.00625	0.020	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
Decachlorobiphenyl	0.951	1.00	95.1	(41%-124%)
4cmx	0.918	1.00	91.8	(36%-106%)

**Pesticide
Certificate of Analysis
Sample Summary**

Page 1 of 1

SDG Number:	2014-2989	Matrix:	WATER
Lab Sample ID:	1203051298		
Client Sample:	QC for batch 1372942	Client:	ARSL004
Client ID:	LCS for batch 1372942	Method:	SW846 3535A/8081B
Batch ID:	1372943	Inst:	ECD7A.I
Run Date:	03/18/2014 18:40	Analyst:	LOF
Prep Date:	03/17/2014 06:48	Aliquot:	1000 mL
Data File:	031814.B\c7c1821.D	Column:	1 CLPesticides
	031814.B\c7c1821.D		2 CLPesticides2

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
118-74-1	Hexachlorobenzene		0.0831	ug/L	0.00625	0.020	2
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Decachlorobiphenyl		0.942	1.00	ug/L	94.2	(41%-124%)	
4cmx		0.905	1.00	ug/L	90.5	(36%-106%)	

**Pesticide
Certificate of Analysis
Sample Summary**

Page 1 of 1

SDG Number:	2014-2989	Date Collected:	03/12/2014 10:15	Matrix:	W
Lab Sample ID:	1203051299	Date Received:	03/14/2014 09:00		
Client Sample:	QC for batch 1372942	Client:	ARSL004	Project:	QC
Client ID:	CAAN-14-54788MS	Method:	SW846 3535A/8081B	SOP Ref:	GL-OA-E-041
Batch ID:	1372943	Inst:	ECD7A.I	Dilution:	1
Run Date:	03/18/2014 19:40	Analyst:	LOF	Inj. Vol:	1 uL
Prep Date:	03/17/2014 06:48	Aliquot:	980 mL	Final Volume:	5 mL
Data File:	031814.B\c1825.D	Column:	1 CLPesticides		
	031814.B\c1825.D		2 CLPesticides2		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
118-74-1	Hexachlorobenzene		0.0938	ug/L	0.00638	0.0204	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Decachlorobiphenyl		0.941	1.02	ug/L	92.2	(41%-124%)	
4cmx		0.893	1.02	ug/L	87.5	(36%-106%)	

Pesticide
Certificate of Analysis
Sample Summary

SDG Number: 2014-2989

Lab Sample ID: 1203051301

Client Sample: QC for batch 1372942

Client ID: LCSD for batch 1372942

Batch ID: 1372943

Run Date: 03/18/2014 18:55

Prep Date: 03/17/2014 06:48

Data File: 031814.B\c1822.D

031814.B\c1822.D

Client: ARSL004

Method: SW846 3535A/8081B

Inst: ECD7A.I

Analyst: LOF

Aliquot: 1000 mL

Column: 1 CLPesticides

2 CLPesticides2

Matrix: WATER

Project: QC

SOP Ref: GL-OA-E-041

Dilution: 1

Inj. Vol: 1 uL

Final Volume: 5 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
118-74-1	Hexachlorobenzene		0.0802	ug/L	0.00625	0.020	2
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
Decachlorobiphenyl		0.891	1.00	ug/L	89.1	(41%-124%)	
4cmx		0.862	1.00	ug/L	86.2	(36%-106%)	

Herbicide Analysis

Case Narrative

**Herbicide Case Narrative
ARS International, LLC (ARSL)
SDG 2014-2989**

Method/Analysis Information

Procedure: Analysis of Chlorophenoxy Acid Herbicides by ECD

Analytical Method: SW846 8151A

Prep Method: SW846 8151A

Analytical Batch Number: 1372945

Prep Batch Number: 1372944

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8151A:

Sample ID	Client ID
344588006	CAAN-14-54788
1203051302	Method Blank (MB)
1203051303	Laboratory Control Sample (LCS)
1203051304	344588006(CAAN-14-54788) Matrix Spike (MS)
1203051308	Laboratory Control Sample Duplicate (LCSD)

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-011 REV# 21.

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

Calibration Information

Initial Calibration

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

Continuing Calibration Verification (CCV) Requirements

All Initial Calibration Verification (ICV) requirements have been met for this SDG. However, not all Calibration Verification Standards (CCV) requirements were met for sample 344588006 (CAAN-14-54788) and associated QC. The surrogate failed acceptance criteria with a negative bias on one analytical column in the standards bracketing the samples in this SDG. The negative bias for the analytical data is a result of instrument response decreasing after the initial calibration. The instrument response never decreased to a point where the target analytes would not be detected. 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

The MS1203051304 (CAAN-14-54788) did not meet surrogate recovery acceptance criteria. Since there were no target analytes detected in the associated parent sample, the biased high surrogate recovery had no adverse impact on the data and the results have been reported.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Laboratory Control Sample Duplicate (LCSD) Recovery

The LCSD spike recoveries met the acceptance limits.

LCS/LCSD Relative Percent Difference (RPD) Statement

The RPD(s) between the LCS and LCSD met the acceptance limits.

QC Sample Designation

Sample 344588006 (CAAN-14-54788) was selected for analysis as the matrix spike. A matrix spike duplicate was not extracted or analyzed with this SDG. A LCSD was extracted and analyzed with the SDG to measure precision and accuracy of the spike analytes.

Matrix Spike (MS) Recovery Statement

The MS recoveries for this SDG were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement

There was no matrix spike duplicate extracted and analyzed with this SDG, only a matrix spike 1203051304 (CAAN-14-54788). A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

MS/MSD Relative Percent Difference (RPD) Statement

There are no reportable MS/MSD RDP values since a MSD was not extracted and analyzed with this batch, only a matrix spike 1203051304 (CAAN-14-54788). A LCSD was extracted and analyzed with the batch to measure precision and accuracy of the spike analytes.

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 procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported target analyte concentrations were confirmed on a dissimilar column.

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 in this analytical batch unless confirmations or dilutions were required.

Miscellaneous Information

Electronic Package 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 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.

Data Exception (DER) Documentation

The following DER was generated for this SDG: 1275957.

Manual Integrations

Some initial calibration standards, continuing calibration standards, and/or samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this Herbicide fraction.

Additional Comments

The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

The higher results from either column have been chosen and reported in the data package for the client sample 344588006 (CAAN-14-54788), MB and LCS. The data reported for the LCSD are from the same analytical column as the LCS. The data reported for the MS are from the same analytical column as the parent sample.

Due to rounding differences in the calculation between the forms, the data reported in the Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description
ECD6A.I_1	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series GC/ECD	Rtx-CLP I	30m x 0.32mm, 0.50um (Rtx-CLPesticide)

ECD6A.I_2	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series GC/ECD	Rtx-CLP II	30m x 0.32mm, 0.50um (Rtx-CLPesticide II)
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Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

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

Client SDG: 2014-2989 GEL Work Order: 344588

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, 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: 08 APR 2014

Title: Data Validator

Sample Data Summary

**Herbicide
Certificate of Analysis
Sample Summary**

SDG Number: 2014-2989
Lab Sample ID: 344588006

Client ID: CAAN-14-54788
Batch ID: 1372945
Run Date: 03/18/2014 22:23
Prep Date: 03/17/2014 10:15
Data File: 031814\E6c1820.D
031814\E6c1820.D

Date Collected: 03/12/2014 10:15
Date Received: 03/14/2014 09:00
Client: ARSL004
Method: SW846 8151A
Inst: ECD6A.I
Analyst: RXE1
Aliquot: 1000 mL
Column: 1 CLP
2 CLP2

Matrix: W

Project: ESHL00714
SOP Ref: GL-OA-E-011
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 10 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
87-86-5	Pentachlorophenol	U	0.250	ug/L	0.050	0.250	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
2,4-Dichlorophenylacetic acid		4.19	5.00	ug/L	83.7	(43%-137%)	

Quality Control Summary

Herbicide
Surrogate Recovery Report

Page 1 of 1

SDG Number: 2014-2989**Matrix Type: LIQUID**

Sample ID	Client ID	DCAA 1	DCAA 2
		%REC #	%REC #
1203051302	MB for batch 1372944	86	80
1203051303	LCS for batch 1372944	76	78
1203051308	LCSD for batch 1372944	93	101
344588006	CAAN-14-54788	83	84
1203051304	CAAN-14-54788MS	87	144 *

Surrogate**Acceptance Limits**

DCAA = 2,4-Dichlorophenylacetic acid

(43%-137%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Herbicide

Page 1 of 2

Quality Control Summary
Spike Recovery Report

SDG Number: 2014-2989

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 1372944

Matrix: WATER

Lab Sample ID 1203051303

Instrument: ECD6A.I

Analysis Date: 03/18/2014 17:03

Dilution: 1

Analyst: RXE1

Prep Batch ID:1372944

Inj. Vol: 1 uL

Batch ID: 1372945

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
87-86-5	LCS Pentachlorophenol	2.00	0.0	1.31	66	55-113

Herbicide

Page 2 of 2

Quality Control Summary
Spike Recovery Report

SDG Number: 2014-2989

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 1372944

Matrix: WATER

Lab Sample ID 1203051308

Instrument: ECD6A.I

Analysis Date: 03/18/2014 17:30

Dilution: 1

Analyst: RXE1

Prep Batch ID:1372944

Inj. Vol: 1 uL

Batch ID: 1372945

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
87-86-5	LCSD Pentachlorophenol	2.00	0.0	1.61	80	55-113	20	0-30

Herbicide

Page 1 of 1

Quality Control Summary
Spike Recovery Report

SDG Number: 2014-2989

Sample Type: Matrix Spike

Client ID: CAAN-14-54788MS

Matrix: W

Lab Sample ID 1203051304

Instrument: ECD6A.I

Analysis Date: 03/18/2014 22:51

Dilution: 1

Analyst: RXE1

Prep Batch ID:1372944

Inj. Vol: 1 uL

Batch ID: 1372945

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L	U	Spike Conc. ug/L	Recovery %	Acceptance Limits
87-86-5	MS Pentachlorophenol	2.00	0.00	U	1.27	64	37-114

Method Blank Summary

Page 1 of 1

SDG Number:	2014-2989	Client:	ARSL004	Matrix:	WATER
Client ID:	MB for batch 1372944	Instrument ID:	ECD6A.I_1	Data File:	031814\E6c1807.D
Lab Sample ID:	1203051302		ECD6A.I_2		031814\E6c1807.D
Column:	CLP	Prep Date:	03/17/2014 10:15	Analyzed:	03/18/14 16:35
	CLP2				

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 1372944	1203051303	031814\E6c1808.D 031814\E6c1808.D	03/18/14	1703
02 LCSD for batch 1372944	1203051308	031814\E6c1809.D 031814\E6c1809.D	03/18/14	1730
03 CAAN-14-54788	344588006	031814\E6c1820.D 031814\E6c1820.D	03/18/14	2223
04 CAAN-14-54788MS	1203051304	031814\E6c1821.D 031814\E6c1821.D	03/18/14	2251

Quality Control Data

**Herbicide
Certificate of Analysis
Sample Summary**

SDG Number: 2014-2989
Lab Sample ID: 1203051302
Client Sample: QC for batch 1372944
Client ID: MB for batch 1372944
Batch ID: 1372945
Run Date: 03/18/2014 16:35
Prep Date: 03/17/2014 10:15
Data File: 031814\E6c1807.D
031814\E6c1807.D

Client: ARSL004
Method: SW846 8151A
Inst: ECD6A.I
Analyst: RXE1
Aliquot: 1000 mL
Column: 1 CLP
2 CLP2

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-011
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 10 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
87-86-5	Pentachlorophenol	U	0.250	ug/L	0.050	0.250	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
2,4-Dichlorophenylacetic acid		4.29	5.00	ug/L	85.7	(43%-137%)	

**Herbicide
Certificate of Analysis
Sample Summary**

Page 1 of 1

SDG Number: 2014-2989
Lab Sample ID: 1203051303
Client Sample: QC for batch 1372944
Client ID: LCS for batch 1372944
Batch ID: 1372945
Run Date: 03/18/2014 17:03
Prep Date: 03/17/2014 10:15
Data File: 031814\E6c1808.D
031814\E6c1808.D

Client: ARSL004
Method: SW846 8151A
Inst: ECD6A.I
Analyst: RXE1
Aliquot: 1000 mL
Column: 1 CLP
2 CLP2

Matrix: WATER
Project: QC
SOP Ref: GL-OA-E-011
Dilution: 1
Inj. Vol: 1 uL
Final Volume: 10 mL

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
87-86-5	Pentachlorophenol		1.31	ug/L	0.050	0.250	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
2,4-Dichlorophenylacetic acid		3.88	5.00	ug/L	77.7	(43%-137%)	

**Herbicide
Certificate of Analysis
Sample Summary**

SDG Number:	2014-2989	Date Collected:	03/12/2014 10:15	Matrix:	W
Lab Sample ID:	1203051304	Date Received:	03/14/2014 09:00		
Client Sample:	QC for batch 1372944	Client:	ARSL004	Project:	QC
Client ID:	CAAN-14-54788MS	Method:	SW846 8151A	SOP Ref:	GL-OA-E-011
Batch ID:	1372945	Inst:	ECD6A.I	Dilution:	1
Run Date:	03/18/2014 22:51	Analyst:	RXE1	Inj. Vol:	1 uL
Prep Date:	03/17/2014 10:15	Aliquot:	1000 mL	Final Volume:	10 mL
Data File:	031814\E6c1821.D	Column:	1 CLP		
	031814\E6c1821.D		2 CLP2		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
87-86-5	Pentachlorophenol		1.27	ug/L	0.050	0.250	1
Surrogate/Tracer recovery		Result	Nominal		Recovery%	Acceptable Limits	
2,4-Dichlorophenylacetic acid		7.20	5.00	ug/L	144 *	(43%-137%)	

Herbicide
Certificate of Analysis
Sample Summary

SDG Number:	2014-2989	Matrix:	WATER
Lab Sample ID:	1203051308		
Client Sample:	QC for batch 1372944	Project:	QC
Client ID:	LCSD for batch 1372944	SOP Ref:	GL-OA-E-011
Batch ID:	1372945	Dilution:	1
Run Date:	03/18/2014 17:30	Inj. Vol:	1 uL
Prep Date:	03/17/2014 10:15	Final Volume:	10 mL
Data File:	031814\E6c1809.D		
	031814\E6c1809.D		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	Column
87-86-5	Pentachlorophenol		1.61	ug/L	0.050	0.250	1

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	5.03	5.00	101	(43%-137%)

Miscellaneous

DATA EXCEPTION REPORT

Mo.Day Yr. 19-MAR-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: GC/ECD	Test / Method: SW846 8151A	Matrix Type: Liquid	Client Code: BRKL, CARE, ESHL
Batch ID: 1372945	Sample Numbers: See Below		
<p>Potentially affected work order(s)(SDG): 344383(2014-2971),344384(2014-2970),344440(EUI-9553),344473(2014-2974),344499(34450),344588(2014-2989)</p> <p>Application Issues:</p> <p>Failed Recovery for MS/PS Failed RPD for MS/MSD, or PS/PSD Failed Yield for Surrogates Failed Recovery for MSD/PSD</p>			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Sample 344499001 did not meet surrogate recovery acceptance criteria.</p> <p>2. The MS(1203051304) did not meet surrogate recovery acceptance criteria.</p> <p>3. The MS(1203051306) did not meet spike recovery acceptance criteria.</p> <p>4. The MS(1203051306)/MSD(1203051307) pair did not meet RPD acceptance criteria.</p>		<p>1. Since there were no target analytes detected in the sample, the biased high surrogate recovery had no adverse impact on the data and the results have been reported.</p> <p>2. Since there were no target analytes detected in the associated parent sample, the biased high surrogate recovery had no adverse impact on the data and the results have been reported.</p> <p>3. The LCS and LCSD met the acceptance criteria for all spike analytes. Since there is insufficient sample volume remaining to re-extract the parent sample with an associated MS/MSD pair, the data results have been reported.</p> <p>4. The RPD failures were attributed to the higher recoveries in the MSD when compared to the MS. Since there is insufficient sample volume remaining to re-extract the parent sample with an associated MS/MSD pair, the data results have been reported.</p>	

Originator's Name:
Lloyd O Fox 19-MAR-14

Data Validator/Group Leader:
Barbara Bailey 20-MAR-14

Metals Analysis

Case Narrative

**Metals Fractional Narrative
ARS International, LLC (ARSL)
SDG 2014-2989**

Sample Analysis

Sample ID	Client ID
344588004	CAAN-14-54788
344588007	CAAN-14-54790
1203051199	Method Blank (MB) ICP
1203051200	Laboratory Control Sample (LCS)
1203051204	344588007(CAAN-14-54790L) Serial Dilution (SD)
1203051201	344588007(CAAN-14-54790D) Sample Duplicate (DUP)
1203051202	344588007(CAAN-14-54790S) Matrix Spike (MS)
1203051194	Method Blank (MB) ICP-MS
1203051195	Laboratory Control Sample (LCS)
1203051198	344588007(CAAN-14-54790L) Serial Dilution (SD)
1203051196	344588007(CAAN-14-54790D) Sample Duplicate (DUP)
1203051197	344588007(CAAN-14-54790S) Matrix Spike (MS)
1203058500	Method Blank (MB) CVAA
1203058501	Laboratory Control Sample (LCS)
1203058504	344674004(CAWA-14-54740L) Serial Dilution (SD)
1203058502	344674004(CAWA-14-54740D) Sample Duplicate (DUP)
1203058503	344674004(CAWA-14-54740S) Matrix Spike (MS)

Method/Analysis Information

Analytical Batch:	1372903, 1372901, 1376039 and 1379093
Prep Batch :	1372902, 1372900 and 1376037
Standard Operating Procedures:	GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 9, GL-MA-E-014 REV# 25, GL-MA-E-010 REV# 27 and GL-GC-E-107 REV# 9
Analytical Method:	SW846 3005A/6010C, SW846 3005A/6020A, EPA 245.1/245.2 and SM 2340 B
Prep Method :	SW846 3005A and EPA 245.1/245.2 Prep

Preparation/Analytical Method Verification

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

System Configuration

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

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/- 7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

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. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

Calibration Information

Instrument Calibration

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

CRDL Requirements

The CRDL standard recoveries met the advisory control limits except for tin and potassium in file 032814-1 at 11:35 and 13:02, respectively. Both analytes recovered high, however the potassium concentration in the client sample was greater than two times the PQL and tin was not detected above the MDL.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

Continuing Calibration Blank (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 (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: 344588007 (CAAN-14-54790)-ICP and ICP-MS and 344674004 (CAWA-14-54740)-CVAA.

Matrix Spike (MS) Recovery Statement

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable elements met the acceptance criteria.

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. All applicable analytes met these requirements.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the established acceptance criteria.

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 procedures were performed as stated in the SOP.

Sample Dilutions

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. The samples in this SDG did not require dilutions.

Preparation Information

The samples in this SDG were prepared exactly 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

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. 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.

Review Validation:

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

The following data validator verified the information presented in this case narrative:

Reviewer: Pat Steell Date: 04/10/2014

Sample Data Summary

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: 2014-2989 GEL Work Order: 344588

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, or LOD.

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 Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by

Pat Steele 04/10/2014

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2014-2989**CONTRACT:** ESHL00714**METHOD TYPE:** EPA

SAMPLE ID: 344588004 **BASIS:** As Received **DATE COLLECTED** 12-MAR-14
CLIENT ID: CAAN-14-54788 **LEVEL:** Low **DATE RECEIVED** 14-MAR-14
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	NOR1	04/02/14 10:17	040214W1-4	1376039

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1376039	1376037	EPA 245.1/245.2 Prep	20	mL	20	mL	04/01/14	AXS5

***Analytical Methods:**

AV EPA 245.1/245.2

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2014-2989**CONTRACT:** ESHL00714**METHOD TYPE:** EPA**SAMPLE ID:** 344588007**BASIS:** As Received**DATE COLLECTED** 12-MAR-14**CLIENT ID:** CAAN-14-54790**LEVEL:** Low**DATE RECEIVED** 14-MAR-14**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	NOR1	04/02/14 10:19	040214W1-4	1376039

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2014-2989

CONTRACT: ESHL00714

METHOD TYPE: SW846

SAMPLE ID: 344588007

BASIS: As Received

DATE COLLECTED 12-MAR-14

CLIENT ID: CAAN-14-54790

LEVEL: Low

DATE RECEIVED 14-MAR-14

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	03/28/14 12:46	032814-1	1372903
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	03/27/14 20:38	140327-3	1372901
7440-38-2	Arsenic	5	ug/L	U	1.7	5	5	1	MS	BAJ	03/27/14 20:38	140327-3	1372901
7440-39-3	Barium	17.4	ug/L		1	5	5	1	P	HSC	03/28/14 12:46	032814-1	1372903
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	03/28/14 12:46	032814-1	1372903
7440-42-8	Boron	50	ug/L	U	15	50	50	1	P	HSC	03/28/14 12:46	032814-1	1372903
7440-43-9	Cadmium	1	ug/L	U	0.11	1	1	1	MS	BAJ	03/27/14 20:38	140327-3	1372901
7440-70-2	Calcium	11100	ug/L		50	200	200	1	P	HSC	03/28/14 12:46	032814-1	1372903
7440-47-3	Chromium	2.22	ug/L	J	2	10	10	1	MS	BAJ	03/27/14 20:38	140327-3	1372901
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	03/28/14 12:46	032814-1	1372903
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	03/28/14 12:46	032814-1	1372903
7439-89-6	Iron	43	ug/L	J	30	100	100	1	P	HSC	03/31/14 08:44	033114-2	1372903
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	03/27/14 20:38	140327-3	1372901
7439-95-4	Magnesium	3290	ug/L		110	300	300	1	P	HSC	03/28/14 12:46	032814-1	1372903
7439-96-5	Manganese	16.1	ug/L		2	10	10	1	P	HSC	03/28/14 12:46	032814-1	1372903
7439-98-7	Molybdenum	2.57	ug/L		0.165	0.5	0.5	1	MS	BAJ	03/27/14 20:38	140327-3	1372901
7440-02-0	Nickel	0.942	ug/L	J	0.5	2	2	1	MS	BAJ	03/27/14 20:38	140327-3	1372901
7440-09-7	Potassium	1290	ug/L		50	150	150	1	P	HSC	03/28/14 12:46	032814-1	1372903
7782-49-2	Selenium	5	ug/L	U	1.5	5	5	1	MS	BAJ	03/27/14 20:38	140327-3	1372901
7631-86-9	Silica	63000	ug/L		53	213	213	1	P	HSC	03/31/14 08:44	033114-2	1372903
7440-22-4	Silver	1	ug/L	U	0.2	1	1	1	MS	BAJ	03/27/14 20:38	140327-3	1372901
7440-23-5	Sodium	12300	ug/L		100	300	300	1	P	HSC	03/28/14 12:46	032814-1	1372903
7440-24-6	Strontium	58.1	ug/L		1	5	5	1	P	HSC	03/31/14 08:44	033114-2	1372903
7440-28-0	Thallium	2	ug/L	U	0.45	2	2	1	MS	BAJ	03/27/14 20:38	140327-3	1372901
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	03/28/14 12:46	032814-1	1372903
7440-61-1	Uranium	0.543	ug/L		0.067	0.2	0.2	1	MS	BAJ	03/27/14 20:38	140327-3	1372901
7440-62-2	Vanadium	5.58	ug/L		1	5	5	1	P	HSC	03/28/14 12:46	032814-1	1372903
7440-66-6	Zinc	10	ug/L	U	3.3	10	10	1	P	HSC	03/28/14 12:46	032814-1	1372903

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2014-2989**CONTRACT:** ESHL00714**METHOD TYPE:****SAMPLE ID:** 344588007**BASIS:** As Received**DATE COLLECTED** 12-MAR-14**CLIENT ID:** CAAN-14-54790**LEVEL:** Low**DATE RECEIVED** 14-MAR-14**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	41.3	mg/L		0.453	1.24	1.24	1		JJ2	04/10/14 10:50		1379093

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1372901	1372900	SW846 3005A	50	mL	50	mL	03/19/14	MTM1
1372903	1372902	SW846 3005A	50	mL	50	mL	03/19/14	MTM1
1376039	1376037	EPA 245.1/245.2 Prep	20	mL	20	mL	04/01/14	AXS5

Analytical Methods:*P** SW846 3005A/6010C**MS** SW846 3005A/6020A**AV** EPA 245.1/245.2

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2014-2989

Contract: ESHL00714

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>
1203051194	Arsenic	1.7	ug/L	+/-5	U	MS	1.7	5
	Cadmium	0.11	ug/L	+/-1	U	MS	0.11	1
	Chromium	2	ug/L	+/-10	U	MS	2	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.165	ug/L	+/-0.5	U	MS	0.165	0.5
	Nickel	0.5	ug/L	+/-2	U	MS	0.5	2
	Antimony	1	ug/L	+/-3	U	MS	1	3
	Selenium	1.5	ug/L	+/-5	U	MS	1.5	5
	Silver	0.2	ug/L	+/-1	U	MS	0.2	1
	Thallium	0.45	ug/L	+/-2	U	MS	0.45	2
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
1203051199	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	-1.03	ug/L	+/-5	J	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	95.3	ug/L	+/-100	J	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2.98	ug/L	+/-10	J	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	4.53	ug/L	+/-10	J	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1203058500	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. 2014-2989 Client ID: CAAN-14-54790S

Contract: ESHL00714 Level: Low

Matrix: WATER % Solids:

Sample ID: 344588007 Spike ID: 1203051197

<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	56.5		1	U	50	113		MS
Arsenic	ug/L	75-125	50.3		1.7	U	50	99.3		MS
Cadmium	ug/L	75-125	55.2		0.11	U	50	110		MS
Chromium	ug/L	75-125	54.9		2.22	J	50	105		MS
Lead	ug/L	75-125	53		0.5	U	50	106		MS
Molybdenum	ug/L	75-125	57.4		2.57		50	110		MS
Nickel	ug/L	75-125	51.9		0.942	J	50	102		MS
Selenium	ug/L	75-125	48.6		1.5	U	50	96.5		MS
Silver	ug/L	75-125	54.7		0.2	U	50	109		MS
Thallium	ug/L	75-125	49.3		0.45	U	50	98.6		MS
Uranium	ug/L	75-125	56.2		0.543		50	111		MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

-5a-

Matrix Spike Summary

SDG NO. 2014-2989 Client ID: CAAN-14-54790S

Contract: ESHL00714 Level: Low

Matrix: WATER % Solids:

Sample ID: 344588007 Spike ID: 1203051202

<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	5320		68	U	5000	106		P
Barium	ug/L	75-125	546		17.4		500	106		P
Beryllium	ug/L	75-125	549		1	U	500	110		P
Boron	ug/L	75-125	535		15	U	500	105		P
Calcium	ug/L	75-125	16400		11100		5000	106		P
Cobalt	ug/L	75-125	536		1	U	500	107		P
Copper	ug/L	75-125	560		3	U	500	112		P
Iron	ug/L	75-125	5300		43	J	5000	105		P
Magnesium	ug/L	75-125	8600		3290		5000	106		P
Manganese	ug/L	75-125	554		16.1		500	108		P
Potassium	ug/L	75-125	6550		1290		5000	105		P
Silica	ug/L		73900		63000		10700	102	N/A	P
Sodium	ug/L	75-125	17400		12300		5000	102		P
Strontium	ug/L	75-125	565		58.1		500	101		P
Tin	ug/L	75-125	546		2.5	U	500	109		P
Vanadium	ug/L	75-125	562		5.58		500	111		P
Zinc	ug/L	75-125	524		3.3	U	500	104		P

*Analytical Methods:

P SW846 3005A/6010C

METALS

-5a-

Matrix Spike Summary

SDG NO. 2014-2989

Client ID: CAWA-14-54740S

Contract: ESHL00714

Level: Low

Matrix: WATER

% Solids:

Sample ID: 344674004

Spike ID: 1203058503

<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	2.03		0.067	U	2	101		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
-6-
Duplicate Sample Summary

SDG No.: 2014-2989

Lab Code: GEL

Contract: ESHL00714

Client ID: CAAN-14-54790D

Matrix: WATER

Level: Low

Sample ID: 344588007

Duplicate ID: 1203051196

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		1.7 U		1.7 U				MS
Cadmium	ug/L		0.11 U		0.11 U				MS
Chromium	ug/L		2.22 J		2 U		200		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/-20%	2.57		2.58		.233		MS
Nickel	ug/L	+/-2	0.942 J		0.988 J		4.77		MS
Selenium	ug/L		1.5 U		1.5 U				MS
Silver	ug/L		0.2 U		0.2 U				MS
Thallium	ug/L		0.45 U		0.45 U				MS
Uranium	ug/L	+/- .2	0.543		0.625		14		MS

*Analytical Methods:

MS SW846 3005A/6020A

Metals
-6-
Duplicate Sample Summary

SDG No.: 2014-2989

Lab Code: GEL

Contract: ESHL00714

Client ID: CAAN-14-54790D

Matrix: WATER

Level: Low

Sample ID: 344588007

Duplicate ID: 1203051201

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Aluminum	ug/L		68 U		68 U				P
Barium	ug/L	+/-5	17.4		17.4		.0634		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	11100		11100		.316		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L	+/-100	43 J		45.6 J		5.84		P
Magnesium	ug/L	+/-20%	3290		3250		1.27		P
Manganese	ug/L	+/-10	16.1		16.1		.416		P
Potassium	ug/L	+/-20%	1290		1350		4.51		P
Silica	ug/L	+/-20%	63000		62600		.674		P
Sodium	ug/L	+/-20%	12300		12200		.644		P
Strontium	ug/L	+/-20%	58.1		57.5		.974		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	5.58		5.06		9.85		P
Zinc	ug/L		3.3 U		3.3 U				P

*Analytical Methods:

P SW846 3005A/6010C

Metals
–6–
Duplicate Sample Summary

SDG No.: 2014–2989**Lab Code:** GEL**Contract:** ESHL00714**Client ID:** CAWA–14–54740D**Matrix:** WATER**Level:** Low**Sample ID:** 344674004**Duplicate ID:** 1203058502**Percent Solids for Dup:** N/A

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

***Analytical Methods:**

AV EPA 245.1/245.2

METALS

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Laboratory Control Sample Summary

SDG NO. 2014-2989

Contract: ESHL00714

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>
1203051195								
	Antimony	ug/L	50	54.7		109	80-120	MS
	Arsenic	ug/L	50	48.4		96.8	80-120	MS
	Cadmium	ug/L	50	53.5		107	80-120	MS
	Chromium	ug/L	50	55		110	80-120	MS
	Lead	ug/L	50	52.5		105	80-120	MS
	Molybdenum	ug/L	50	52.5		105	80-120	MS
	Nickel	ug/L	50	53.1		106	80-120	MS
	Selenium	ug/L	50	49.1		98.1	80-120	MS
	Silver	ug/L	50	54.3		109	80-120	MS
	Thallium	ug/L	50	49.4		98.8	80-120	MS
	Uranium	ug/L	50	55.4		111	80-120	MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Laboratory Control Sample Summary

SDG NO. 2014-2989

Contract: ESHL00714

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>
1203051200								
	Cobalt	ug/L	500	541		108	80-120	P
	Copper	ug/L	500	552		110	80-120	P
	Iron	ug/L	5000	5250		105	80-120	P
	Magnesium	ug/L	5000	5550		111	80-120	P
	Manganese	ug/L	500	549		110	80-120	P
	Potassium	ug/L	5000	5490		110	80-120	P
	Silica	ug/L	10700	10200		95.6	80-120	P
	Sodium	ug/L	5000	5440		109	80-120	P
	Strontium	ug/L	500	515		103	80-120	P
	Tin	ug/L	500	560		112	80-120	P
	Vanadium	ug/L	500	558		112	80-120	P
	Zinc	ug/L	500	526		105	80-120	P
	Aluminum	ug/L	5000	5850		117	80-120	P
	Barium	ug/L	500	536		107	80-120	P
	Beryllium	ug/L	500	549		110	80-120	P
	Boron	ug/L	500	528		106	80-120	P
	Calcium	ug/L	5000	5500		110	80-120	P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Laboratory Control Sample Summary

SDG NO. 2014-2989

Contract: ESHL00714

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>
1203058501	Mercury	ug/L	2	2.01		101	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Serial Dilution Sample Summary

SDG NO. 2014-2989

Client ID: CAAN-14-54790L

Contract: ESHL00714

Matrix: LIQUID

Level: Low

Sample ID: 344588007

Serial Dilution ID: 1203051198

<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	1.7	U	8.5	U				MS
Cadmium	.11	U	.55	U				MS
Chromium	2.22	J	10	U	100			MS
Lead	.5	U	2.5	U				MS
Molybdenum	2.57		3.03		17.7			MS
Nickel	.942	J	2.5	U	100			MS
Selenium	1.5	U	7.5	U				MS
Silver	.2	U	1	U				MS
Thallium	.45	U	2.25	U				MS
Uranium	.543		.485	J	10.7			MS

*Analytical Methods:

MS SW846 3005A/6020A

METALS

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Serial Dilution Sample Summary

SDG NO. 2014-2989

Client ID: CAAN-14-54790L

Contract: ESHL00714

Matrix: LIQUID

Level: Low

Sample ID: 344588007

Serial Dilution ID: 1203051204

<u>Analyte</u>	<u>Initial Value ug/L</u>	<u>C</u>	<u>Serial Value ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Aluminum	68	U	340	U				P
Barium	17.4		16.1	J	7.33			P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	11100		10800		3		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	43	J	150	U	100			P
Magnesium	3290		2990		9.01			P
Manganese	16.1		16.7	J	3.69			P
Potassium	1290		1620		25.4			P
Silica	63000		62400		.914		10	P
Sodium	12300		12300		.061		10	P
Strontium	58.1		60.6		4.32		10	P
Tin	2.5	U	12.5	U				P
Vanadium	5.58		6.32	J	13.3			P
Zinc	3.3	U	16.5	U				P

*Analytical Methods:

P SW846 3005A/6010C

METALS

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Serial Dilution Sample Summary

SDG NO. 2014-2989 **Client ID:** CAWA-14-54740L**Contract:** ESHL00714**Matrix:** LIQUID **Level:** Low**Sample ID:** 344674004 **Serial Dilution ID:** 1203058504

<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 Narrative
ARS International, LLC (ARSL)
SDG 2014-2989**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1373397

Method: SW 9060 Total Organic Carbon

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9060:

Sample ID	Client ID
344588004	CAAN-14-54788
1203052108	Method Blank (MB)
1203052109	344291004(CAWA-14-54733) Sample Duplicate (DUP)
1203052111	344291004(CAWA-14-54733) Post Spike (PS)
1203052113	Laboratory Control Sample (LCS)

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# 12.

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 Model 1010 Total Organic 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 (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 344291004 (CAWA-14-54733).

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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: 1375626

Method: EPA120.1 Specific Conductivity

Sample Analysis

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

Sample ID	Client ID
344588007	CAAN-14-54790
1203057547	Laboratory Control Sample (LCS)
1203057549	344383007(CAWA-14-54768) 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# 11.

Preparation/Analytical Method Verification

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

Calibration Information

The Conductivity analysis was performed on a Orion 160 Conductivity Meter.

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.

Quality Control (QC) Information

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 344383007 (CAWA-14-54768).

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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Method/Analysis Information

Product: pH

Analytical Batch: 1376069 **Method:** EPA 150.1 pH

Sample Analysis

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

Sample ID	Client ID
344588007	CAAN-14-54790
1203058582	Laboratory Control Sample (LCS)
1203058583	344837008(CAWA-14-54760) 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# 21.

Preparation/Analytical Method Verification

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

Calibration Information

The Electrode analysis was performed on a Thermo Orion Star A111. Immediates

Initial Calibration

All initial calibration requirements have been met for this SDG.

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 344837008 (CAWA-14-54760).

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

The following sample from this sample group was received by the lab outside of the method specified holding time: 344588007 (CAAN-14-54790).

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

The following DER was generated for this SDG: 1279288 344588007 (CAAN-14-54790).

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product:	Cyanide and Total		
Analytical Batch:	1372104	Method:	WSP-CN(T)
Prep Batch :	1372103	Method:	EPA 335.4

Sample Analysis

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

Sample ID	Client ID
344588004	CAAN-14-54788
1203049220	Method Blank (MB)
1203049221	344291004(CAWA-14-54733) Sample Duplicate (DUP)
1203049223	344291004(CAWA-14-54733) Matrix Spike (MS)
1203049225	Laboratory Control Sample (LCS)
1203049933	344440001(MW Pond (Liquid) 031014-01) Matrix Spike Duplicate (MSD)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-095 REV# 17.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

acceptance limits.

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following samples were selected for QC analysis: 344291004 (CAWA-14-54733) and 344440001 (MW Pond (Liquid) 031014-01).

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

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

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD recovery for this sample set was within the required acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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: 1371922

Method: EPA 300.0 Anions Liquid 28 day

Sample Analysis

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

Sample ID	Client ID
344588007	CAAN-14-54790
1203048735	Method Blank (MB)
1203048736	344332016(CAWA-14-54785) Sample Duplicate (DUP)
1203048737	344332016(CAWA-14-54785) Post Spike (PS)
1203048738	Laboratory Control Sample (LCS)
1203052102	344674007(CAWA-14-54761) Sample Duplicate (DUP)
1203052103	344674007(CAWA-14-54761) 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# 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 Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

acceptance limits.

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following samples were selected for QC analysis: 344332016 (CAWA-14-54785) and 344674007 (CAWA-14-54761).

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following samples in this sample group were diluted due to high concentration: 1203052102 (CAWA-14-54761) and 1203052103 (CAWA-14-54761).

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

The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1203048736 (CAWA-14-54785), 1203048737 (CAWA-14-54785), 1203052102 (CAWA-14-54761), 1203052103 (CAWA-14-54761) and 344588007 (CAAN-14-54790).

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Ammonia Nitrogen

Analytical Batch: 1373240 **Method:** EPA 350.1 Nitrogen and Ammonia L

Prep Batch : 1373238 **Method:** EEPA 350.2 Prep

Sample Analysis

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

Sample ID	Client ID
344588007	CAAN-14-54790
1203051754	Method Blank (MB)
1203051755	Laboratory Control Sample (LCS)
1203051756	344674007(CAWA-14-54761) Sample Duplicate (DUP)
1203051757	344674007(CAWA-14-54761) 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 (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 344674007 (CAWA-14-54761).

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

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

Duplicate Relative Percent Difference (RPD) Statement

One or more of the values for the sample and/or duplicate are less than 5 times the Practical Quantitation Limit (PQL), and the difference is within one PQL value; therefore, the RPD is not applicable. 1203051756 (CAWA-14-54761).

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:	Total Kjeldahl Nitrogen		
Analytical Batch:	1373249	Method:	Nitrogen and Total Kjeldahl (TKN)
Prep Batch :	1373248	Method:	EEPA 351.2 Prep

Sample Analysis

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

Sample ID	Client ID
344588004	CAAN-14-54788
1203051777	Method Blank (MB)
1203051778	Laboratory Control Sample (LCS)
1203051779	344674004(CAWA-14-54740) Sample Duplicate (DUP)
1203051780	344674004(CAWA-14-54740) 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.

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 (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 344674004 (CAWA-14-54740).

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

The spike recovery falls outside of the GEL acceptance limits but within the client specified limits. 1203051780 (CAWA-14-54740).

Duplicate Relative Percent Difference (RPD) Statement

One or more of the values for the sample and/or duplicate are less than 5 times the Practical Quantitation Limit (PQL), and the difference is within one PQL value; therefore, the RPD is not applicable. 1203051779 (CAWA-14-54740).

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 re-analyzed due to instrument failure. The results from the reanalysis are reported. 1203051779 (CAWA-14-54740). The following sample was accidentally reanalyzed. 1203051780 (CAWA-14-54740).

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

The following DER was generated for this SDG: 1277969 1203051780 (CAWA-14-54740).

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: 1373256

Method: EPA 353.2 Nitrogen and Nitrate/Nitrite

Sample Analysis

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

Sample ID	Client ID
344588007	CAAN-14-54790
1203051806	Method Blank (MB)
1203051808	344473007(CAWA-14-54770) Sample Duplicate (DUP)
1203051811	344473007(CAWA-14-54770) Post Spike (PS)
1203051813	Laboratory Control Sample (LCS)

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.

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 (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 344473007 (CAWA-14-54770).

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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:	Total Phosphorus		
Analytical Batch:	1373244	Method:	EPA 365.4 Phosphorus and Total in
Prep Batch :	1373241	Method:	EEPA 365.4 Prep

Sample Analysis

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

Sample ID	Client ID
344588007	CAAN-14-54790
1203051760	Method Blank (MB)
1203051761	Laboratory Control Sample (LCS)
1203051762	344588007(CAAN-14-54790) Sample Duplicate (DUP)
1203051763	344588007(CAAN-14-54790) 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.

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 (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 344588007 (CAAN-14-54790).

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

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

Duplicate Relative Percent Difference (RPD) Statement

One or more of the values for the sample and/or duplicate are less than 5 times the Practical Quantitation Limit (PQL), and the difference is within one PQL value; therefore, the RPD is not applicable. 1203051762 (CAAN-14-54790).

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: 1373214

Method: EPA 160.1 Solids and Dissolved-F

Sample Analysis

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

Sample ID	Client ID
344588007	CAAN-14-54790
1203051683	Method Blank (MB)
1203051684	344674007(CAWA-14-54761) Sample Duplicate (DUP)
1203051685	Laboratory Control Sample (LCS)

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 (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 344674007 (CAWA-14-54761).

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.

Sample Aliquot

A sufficient amount of sample was provided by the client for 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: Alkalinity

Analytical Batch: 1373531 **Method:** EPA 310.1 Total Alkalinity

Sample Analysis

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

Sample ID	Client ID
344588007	CAAN-14-54790
1203052468	Method Blank (MB)
1203052469	Laboratory Control Sample (LCS)
1203052472	344737007(CAWA-14-54756) Sample Duplicate (DUP)
1203052473	344737007(CAWA-14-54756) 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# 11.

Preparation/Analytical Method Verification

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

Calibration Information

The Titration analysis was performed on a manually operated buret.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 344737007 (CAWA-14-54756).

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample 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

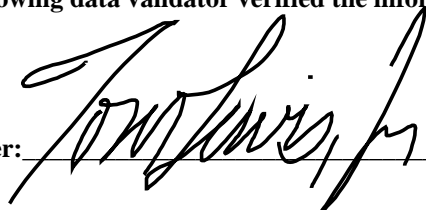
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Review Validation:

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

The following data validator verified the information presented in this case narrative:

Reviewer:



Date:

10 April 14

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis Report for

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

Client SDG: 2014-2989 GEL Work Order: 344588

The Qualifiers in this report are defined as follows:

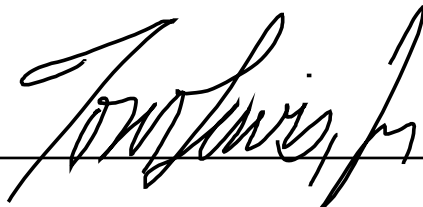
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- ** Analyte is a surrogate compound
- H Analytical holding time was exceeded
- J Value is estimated
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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 Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by



GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: April 7, 2014

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 Groundwater Samples

Client SDG: 2014-2989

Client Sample ID: CAAN-14-54788
Sample ID: 344588004
Matrix: W
Collect Date: 12-MAR-14 10:15
Receive Date: 14-MAR-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis											
SW 9060 Total Organic Carbon "As Received"											
Total Organic Carbon Average	J	0.561	0.330	1.00	mg/L	1	EXF1	03/19/14	2141	1373397	1
Flow Injection Analysis											
WSP-CN(T) "As Received"											
Cyanide, Total	U	ND	1.67	5.00	ug/L	1	AXH3	03/17/14	1420	1372104	2
Nutrient Analysis											
Nitrogen, Total Kjeldahl (TKN) "As Received"											
Nitrogen, Total Kjeldahl		0.443	0.033	0.100	mg/L	1	KLP1	03/26/14	1510	1373249	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 335.4	EPA 335.4 Total Cyanide	AXH3	03/17/14	1249	1372103
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	03/25/14	1700	1373248

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060	
2	EPA 335.4	
3	EPA 351.2	

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: April 7, 2014

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 Groundwater Samples

Client SDG: 2014-2989

Client Sample ID: CAAN-14-54790
Sample ID: 344588007
Matrix: W
Collect Date: 12-MAR-14 10:15
Receive Date: 14-MAR-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Conductivity Analysis											
EPA120.1 Specific Conductivity "As Received"											
Conductivity		127	1.00	1.00	umhos/cm	1	LXA1	03/27/14	1522	1375626	1
Electrode Analysis											
EPA 150.1 pH "As Received"											
pH at Temp 14.6C	H	7.10	0.010	0.100	SU	1	LXA1	03/29/14	1348	1376069	2
Ion Chromatography											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	U	ND	0.067	0.200	mg/L	1	DM	03/18/14	2255	1371922	3
Chloride		1.77	0.067	0.200	mg/L	1					
Fluoride		0.179	0.033	0.100	mg/L	1					
Sulfate		4.28	0.133	0.400	mg/L	1					
Nutrient Analysis											
EPA 350.1 Nitrogen, Ammonia L "As Received"											
Nitrogen, Ammonia		0.0582	0.017	0.050	mg/L	1	KLP1	03/19/14	1419	1373240	4
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"											
Nitrogen, Nitrate/Nitrite		0.770	0.017	0.050	mg/L	1	KLP1	03/19/14	1414	1373256	5
EPA 365.4 Phosphorus, Total in "As Received"											
Phosphorus, Total as P		0.0574	0.017	0.050	mg/L	1	KLP1	04/02/14	1300	1373244	6
Solids Analysis											
EPA 160.1 Solids, Dissolved-F "As Received"											
Total Dissolved Solids		119	3.40	14.3	mg/L		LYG1	03/17/14	0923	1373214	7
Titration Analysis											
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		56.9	0.725	1.00	mg/L		LXA1	03/19/14	1159	1373531	8
Carbonate alkalinity (CaCO3)		ND	0.725	1.00	mg/L						

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.2 Prep	EPA 350.1 Ammonia Nitrogen Prep	KLP1	03/19/14	1350	1373238
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	04/01/14	1700	1373241

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: April 7, 2014

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

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

Client SDG: 2014-2989

Client Sample ID: CAAN-14-54790
Sample ID: 344588007

Project: ESHL00714
Client ID: ARSL004

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 120.1	
2	EPA 150.1	
3	EPA 300.0	
4	EPA 350.1	
5	EPA 353.2	
6	EPA 365.4	
7	EPA 160.1	
8	EPA 310.1	

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: April 7, 2014

Page 1 of 5

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

Contact: Mr. Keith Greene

Workorder: 344588

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1373397										
QC1203052109	344291004	DUP									
Total Organic Carbon Average		1.34		1.45	mg/L	8.09	^	(+/-1.00)	TSM	03/19/14	15:18
QC1203052113	LCS										
Total Organic Carbon Average	10.0			9.90	mg/L			(85%-115%)		03/19/14	14:36
QC1203052108	MB										
Total Organic Carbon Average			U	ND	mg/L					03/19/14	14:27
QC1203052111	344291004	PS									
Total Organic Carbon Average	10.0	1.34		11.5	mg/L			(65%-120%)		03/19/14	15:38
Conductivity Analysis											
Batch	1375626										
QC1203057549	344383007	DUP									
Conductivity		127		127	umhos/cm	0.236		(0%-10%)	LXA1	03/27/14	15:17
QC1203057547	LCS										
Conductivity	1410			1390	umhos/cm			(95%-105%)		03/27/14	15:04
Electrode Analysis											
Batch	1376069										
QC1203058583	344837008	DUP									
pH		H	7.44	H	7.47	SU	0.402	(0%-10%)	LXA1	03/29/14	14:12
QC1203058582	LCS										
pH	7.00			6.97	SU			(99%-101%)		03/29/14	13:41
Flow Injection Analysis											
Batch	1372104										
QC1203049221	344291004	DUP									
Cyanide, Total		U	ND	U	ND	ug/L	N/A		AXH3	03/17/14	13:53
QC1203049225	LCS										
Cyanide, Total	50.0			49.2	ug/L			(90%-110%)		03/17/14	13:47
QC1203049220	MB										
Cyanide, Total			U	ND	ug/L					03/17/14	13:46
QC1203049223	344291004	MS									
Cyanide, Total	100	U	ND	100	ug/L			(90%-110%)		03/17/14	13:54
QC1203049933	344440001	MSD									

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QC Summary

Workorder: 344588

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Flow Injection Analysis											
Batch	1372104										
Cyanide, Total	100	U	ND	104	ug/L	1.94	104	(0%-21%)		03/17/14	14:12
Ion Chromatography											
Batch	1371922										
QC1203048736	344332016	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		DM	03/18/14	18:48
Chloride			1.34		1.35	mg/L	0.417	(0%-20%)			
Fluoride			0.149		0.151	mg/L	1.40 ^	(+/-0.100)			
Sulfate			1.96		1.92	mg/L	2.06 ^	(+/-0.400)			
QC1203052102	344674007	DUP									
Bromide		U	ND	U	ND	mg/L	N/A			03/18/14	23:57
Chloride			18.7		18.6	mg/L	0.557	(0%-20%)		03/20/14	02:36
Fluoride			0.171		0.166	mg/L	3.32 ^	(+/-0.100)		03/18/14	23:57
Sulfate			6.44		6.47	mg/L	0.480	(0%-20%)			
QC1203048738	LCS										
Bromide			1.25		1.33	mg/L		107 (90%-110%)		03/18/14	14:40
Chloride			5.00		4.84	mg/L		96.8 (90%-110%)			
Fluoride			2.50		2.49	mg/L		99.5 (90%-110%)			
Sulfate			10.0		9.98	mg/L		99.8 (90%-110%)			
QC1203048735	MB										
Bromide			U		ND	mg/L				03/18/14	14:09
Chloride			U		ND	mg/L					
Fluoride			U		ND	mg/L					
Sulfate			U		ND	mg/L					
QC1203048737	344332016	PS									
Bromide		U	ND		1.31	mg/L		105 (90%-110%)		03/18/14	20:20
Chloride			1.34		6.37	mg/L		101 (90%-110%)			

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QC Summary

Workorder: 344588

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1371922										
Fluoride	2.50	0.149		2.61	mg/L		98.4	(90%-110%)			
Sulfate	10.0	1.96		12.0	mg/L		101	(90%-110%)	DM	03/18/14	20:20
QC1203052103 344674007 PS											
Bromide	1.25	U	ND	1.36	mg/L		103	(90%-110%)		03/19/14	00:28
Chloride	5.00	3.75		9.06	mg/L		106	(90%-110%)		03/20/14	03:07
Fluoride	2.50	0.171		2.62	mg/L		98.1	(90%-110%)		03/19/14	00:28
Sulfate	10.0	6.44		16.9	mg/L		105	(90%-110%)			
Nutrient Analysis											
Batch	1373240										
QC1203051756 344674007 DUP											
Nitrogen, Ammonia		0.0706		0.0507	mg/L	32.8 ^		(+/-0.050)	KLP1	03/19/14	14:31
QC1203051755 LCS											
Nitrogen, Ammonia	1.00			1.04	mg/L		104	(90%-110%)		03/19/14	14:13
QC1203051754 MB											
Nitrogen, Ammonia		U	ND		mg/L					03/19/14	14:12
QC1203051757 344674007 MS											
Nitrogen, Ammonia	1.00	0.0706		1.06	mg/L		98.9	(90%-110%)		03/19/14	14:36
Batch	1373244										
QC1203051762 344588007 DUP											
Phosphorus, Total as P		0.0574	J	0.0361	mg/L	45.6 ^		(+/-0.050)	KLP1	04/02/14	13:01
QC1203051761 LCS											
Phosphorus, Total as P	1.00			1.08	mg/L		108	(79%-126%)		04/02/14	12:37
QC1203051760 MB											
Phosphorus, Total as P		U	ND		mg/L					04/02/14	12:36
QC1203051763 344588007 MS											
Phosphorus, Total as P	1.00	0.0574		1.01	mg/L		95.3	(64%-134%)		04/02/14	13:02
Batch	1373249										
QC1203051779 344674004 DUP											
Nitrogen, Total Kjeldahl		0.340		0.274	mg/L	21.5 ^		(+/-0.100)	KLP1	03/26/14	15:16
QC1203051778 LCS											
Nitrogen, Total Kjeldahl	1.00			1.08	mg/L		108	(90%-110%)		03/26/14	14:31

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QC Summary

Workorder: 344588

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1373249										
QC1203051777 MB											
Nitrogen, Total Kjeldahl			U	ND	mg/L				KLP1	03/26/14	14:30
QC1203051780 344674004 MS											
Nitrogen, Total Kjeldahl	1.00	0.340		1.12	mg/L		78 *	(90%-110%)		03/26/14	15:13
Batch	1373256										
QC1203051808 344473007 DUP											
Nitrogen, Nitrate/Nitrite		0.459		0.463	mg/L	0.868		(0%-20%)	KLP1	03/19/14	14:09
QC1203051813 LCS											
Nitrogen, Nitrate/Nitrite	1.00			1.07	mg/L		107	(90%-110%)		03/19/14	13:50
QC1203051806 MB											
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					03/19/14	13:49
QC1203051811 344473007 PS											
Nitrogen, Nitrate/Nitrite	1.00	0.459		1.49	mg/L		103	(90%-110%)		03/19/14	14:10
Solids Analysis											
Batch	1373214										
QC1203051684 344674007 DUP											
Total Dissolved Solids		164		163	mg/L	0.873		(0%-10%)	LYG1	03/17/14	09:23
QC1203051685 LCS											
Total Dissolved Solids	300			289	mg/L		96.2	(95%-105%)		03/17/14	09:23
QC1203051683 MB											
Total Dissolved Solids			U	ND	mg/L					03/17/14	09:23
Titration Analysis											
Batch	1373531										
QC1203052472 344737007 DUP											
Alkalinity, Total as CaCO3		62.1		62.6	mg/L	0.830		(0%-20%)	LXA1	03/19/14	14:53
Carbonate alkalinity (CaCO3)		0.00		0.00	mg/L	0.00 ^		(+/-1.00)			
QC1203052469 LCS											
Alkalinity, Total as CaCO3	50.0			49.7	mg/L		99.4	(90%-110%)		03/19/14	11:55
QC1203052468 MB											
Alkalinity, Total as CaCO3				0.00	mg/L					03/19/14	11:52
Carbonate alkalinity (CaCO3)				0.00	mg/L						

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QC Summary

Workorder: 344588

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Titration Analysis											
Batch	1373531										
QC1203052473 344737007 MS											
Alkalinity, Total as CaCO3	50.0	62.1		110	mg/L		95.2	(80%-120%)	LXA1	03/19/14	14:55

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, 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.

^ 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

Mo.Day Yr. 26-MAR-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: LACHAT Flow Injection Analyzer	Test / Method: EPA 351.2	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1373249	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 344227(2014-2943),344291(2014-2957),344293(2014-2958),344296(2014-2959),344332(2014-2960),344383(2014-2971),344384(2014-2970),344473(2014-2974),344588(2014-2989),344674(2014-2999) Application Issues: Failed Recovery for MS/PS			
Specification and Requirements Exception Description:		DER Disposition:	
1. Failed Recovery for MS: QC 1203051780MS		1. The spike recovery falls outside of the GEL acceptance limits but within the client specified limits.	

Originator's Name:

Kristen Parson 26-MAR-14

Data Validator/Group Leader:

Elzbieta Szulc 01-APR-14

DATA EXCEPTION REPORT			
Mo.Day Yr. 01-APR-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ELECTRODE	Test / Method: EPA 150.1, SW846 9040C	Matrix Type: Liquid	Client Code: BETT, BOEN, CARE, ESHL,
Batch ID: 1376069	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 344504,344588(2014-2989),344674(2014-2999),344737(2014-3009),344836,344837(2014-3019),344905,345281(EUI-9580),345375 Application Issues: Sample received out of holding			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Sample received out of holding: 344504 002,006,010 344588 007 344674 007 344737 007,016 344836 001,002 344837 008,022 344905 007,011,012,016,017 345281 001 345375 001,004,005		1. The following samples from this sample group were received by the lab outside of the method specified holding time.	

Originator's Name:
Lindsey Jensen 01-APR-14

Data Validator/Group Leader:
Elzbieta Szulc 02-APR-14

Radiological Analysis

**Radiochemistry Case Narrative
ARS International, LLC (ARSL)
SDG 2014-2989
Work Order 344588**

Method/Analysis Information

Product: Alphaspec Am241 Liquid
Analytical Method: DOE EML HASL-300, Am-05-RC Modified
Analytical Batch Number: 1373330

Sample ID	Client ID
344588004	CAAN-14-54788
1203051954	Method Blank (MB)
1203051955	344674004(CAWA-14-54740) Sample Duplicate (DUP)
1203051956	Laboratory Control Sample (LCS)

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# 24.

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.

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 1203051954 (MB) and 1203051956 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 344674004 (CAWA-14-54740). The QC was from ARSL work order 344674.

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Data Exception Report (DER).

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 batch 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. The following DER was generated for this SDG: DER 1277796 was generated due to RDL less than MDA. 1. Samples 344588004, 344674004, 344997004, 345000005, and 1203051955 did not meet the Am-241 detection limit due to the high standard deviation. 1. When a blank population is performed the MDC is greater than the RDL due to the high standard deviation. The samples were counted the maximum count time of 1000 minutes in order to achieve the lowest possible MDCs. 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

Product:	Alphaspec Pu, Liquid
Analytical Method:	DOE EML HASL-300, Pu-11-RC Modified
Analytical Batch Number:	1373331

Sample ID	Client ID
344588004	CAAN-14-54788
1203051957	Method Blank (MB)
1203051958	344674004(CAWA-14-54740) Sample Duplicate (DUP)
1203051959	Laboratory Control Sample (LCS)

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# 24.

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.

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 1203051957 (MB) and 1203051959 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 344674004 (CAWA-14-54740). The QC was from ARSL work order 344674.

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: Refer to Data Exception Report (DER).

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 batch 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. The following DER was generated for this SDG: DER 1278116 was generated due to RDL less than MDA. 1. Samples 344588004, 344674004, 344997004, 345000005, 1203051957, and 1203051958 did not meet the detection limits for Pu-239/240 due to the high standard deviation. 1. When a blank population is performed, the MDC is greater than the RDL due to the high standard deviation. Samples were counted for the maximum count time of 1000 minutes in order to achieve the best possible MDC's. 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

Product:	Alphaspec U, Liquid
Analytical Method:	DOE EML HASL-300, U-02-RC Modified
Analytical Batch Number:	1373332

Sample ID	Client ID
344588004	CAAN-14-54788
1203051960	Method Blank (MB)
1203051961	344674004(CAWA-14-54740) Sample Duplicate (DUP)
1203051962	Laboratory Control Sample (LCS)

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# 24.

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.

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 1203051960 (MB) and 1203051962 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 344674004 (CAWA-14-54740). The QC was from ARSL work order 344674.

QC Information

All of the QC samples met the required acceptance limits.

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 batch 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: **Gammasec**

Analytical Method: EPA 901.1

Analytical Batch Number: 1372823

Sample ID	Client ID
344588004	CAAN-14-54788
1203051017	Method Blank (MB)
1203051018	344588004(CAAN-14-54788) Sample Duplicate (DUP)
1203051019	Laboratory Control Sample (LCS)

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# 25.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The initial Calibrations were performed in July 2013, August 2013 and November 2013.

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.

Designated QC

The following sample was used for QC: 344588004 (CAAN-14-54788). The QC was from ARSL work order 344588.

QC Information

All of the QC samples met the required acceptance limits.

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 batch 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

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Sr90, liquid

Analytical Method: EPA 905.0 Modified

Analytical Batch Number: 1374041

Sample ID	Client ID
344588004	CAAN-14-54788
1203053724	Method Blank (MB)
1203053725	344063004(CAPA-14-54777) Sample Duplicate (DUP)
1203053726	344063004(CAPA-14-54777) Matrix Spike (MS)
1203053727	Laboratory Control Sample (LCS)

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# 17.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibration was performed in March 2013.

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 1203053724 (MB) and 1203053727 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 344063004 (CAPA-14-54777). The QC was from ARSL work order 344063.

QC Information

All of the QC samples met the required acceptance limits.

CSU

The blank 1203053724 (MB) result is greater than 1.65 times the CSU but less than the MDC.

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 344588004 (CAAN-14-54788) was recounted due to results more negative than the three sigma TPU. 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, 1203053726 (CAPA-14-54777), aliquot was reduced to conserve sample volume.

Blank Decision Level

The blank 1203053724 (MB) result is greater than the decision level but less than the MDC.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: WSP-GrossA/B

Analytical Method: EPA 900.0/SW846 9310

Analytical Batch Number: 1374043

Sample ID	Client ID
344588004	CAAN-14-54788
1203053744	Method Blank (MB)
1203053745	344296017(CAWA-14-54704) Sample Duplicate (DUP)
1203053746	344296017(CAWA-14-54704) Matrix Spike (MS)
1203053747	344296017(CAWA-14-54704) Matrix Spike Duplicate (MSD)
1203053748	Laboratory Control Sample (LCS)

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# 16.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibration was performed in October 2013.

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 1203053744 (MB) and 1203053748 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 344296017 (CAWA-14-54704). The QC was from ARSL work order 344296.

QC Information

All of the QC samples met the required acceptance limits.

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 1203053748 (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, 1203053746 (CAWA-14-54704) and 1203053747 (CAWA-14-54704), 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.

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Qualifier Definition Report for

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

Client SDG: 2014-2989 GEL Work Order: 344588

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, or LOD.

Review/Validation

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

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

Signature:



Name: Kate Gellatly

Date: 07 APR 2014

Title: Analyst I

DATA EXCEPTION REPORT			
Mo.Day Yr. 26-MAR-14	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Am-05-RC Modified	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1373330	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 344588(2014-2989),344674(2014-2999),344997(2014-3042),345000(2014-3032) Application Issues: RDL less than MDA			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Samples 344588004, 344674004, 344997004, 345000005, and 1203051955 did not meet the Am-241 detection limit due to the high standard deviation.		1. When a blank population is performed the MDC is greater than the RDL due to the high standard deviation. The samples were counted the maximum count time of 1000 minutes in order to achieve the lowest possible MDCs. Reporting results.	

Originator's Name:

Melanie Aycock 26-MAR-14

Data Validator/Group Leader:

Jessica Davis 28-MAR-14

DATA EXCEPTION REPORT			
Mo.Day Yr. 27-MAR-14	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Pu-11-RC Modified	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1373331	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 344588(2014-2989),344674(2014-2999),344997(2014-3042),345000(2014-3032) Application Issues: RDL less than MDA			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Samples 344588004, 344674004, 344997004, 345000005, 1203051957, and 1203051958 did not meet the detection limits for Pu-239/240 due to the high standard deviation.		1. When a blank population is performed, the MDC is greater than the RDL due to the high standard deviation. Samples were counted for the maximum count time of 1000 minutes in order to achieve the best possible MDC's. Reporting results.	

Originator's Name:

Jessica Downey 27-MAR-14

Data Validator/Group Leader:

Jessica Davis 28-MAR-14

Sample Data Summary

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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 Groundwater Samples

Report Date: April 7, 2014

Client Sample ID: CAAN-14-54788
Sample ID: 344588004
Matrix: W
Collect Date: 12-MAR-14
Receive Date: 14-MAR-14
Collector: Client

Project: ESHL00714
Client ID: ARSL004

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

Alphaspec Am241 Liquid "As Received"

Americium-241	U	0.00312	+/-0.0054	0.0625	0.027	+/-0.00541	0.050	pCi/L		MXS2	03/25/14	1204	1373330	1
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Alphaspec Pu, Liquid "As Received"

Plutonium-238	U	0.00	+/-0.00999	0.0455	0.018	+/-0.00999	0.050	pCi/L		MXS2	03/25/14	1204	1373331	2
Plutonium-239/240	U	0.00706	+/-0.00999	0.104	0.0471	+/-0.010	0.050	pCi/L						

Alphaspec U, Liquid "As Received"

Uranium-234		0.271	+/-0.0345	0.0652	0.0273	+/-0.0391	1.00	pCi/L		MXS2	03/25/14	1205	1373332	3
Uranium-235/236	U	0.00486	+/-0.00842	0.0622	0.0245	+/-0.00843	1.00	pCi/L						
Uranium-238		0.173	+/-0.0267	0.0609	0.0251	+/-0.0292	0.500	pCi/L						

Rad Gamma Spec Analysis

Gammaspex "As Received"

Cesium-137	U	-2.25	+/-1.95	6.39	2.83	+/-2.02	8.00	pCi/L		RXF2	03/20/14	0949	1372823	4
Cobalt-60	U	-2.47	+/-2.01	5.03	1.96	+/-2.09	8.00	pCi/L						
Neptunium-237	U	4.53	+/-3.01	11.8	5.45	+/-3.19	10.0	pCi/L						
Potassium-40	U	22.7	+/-21.2	89.8	39.3	+/-21.8	10.0	pCi/L						
Sodium-22	U	-1.91	+/-1.48	4.80	1.86	+/-1.54	10.0	pCi/L						

Rad Gas Flow Proportional Counting

GFPC, Sr90, liquid "As Received"

Strontium-90	U	-0.000552	+/-0.126	0.475	0.207	+/-0.126	0.500	pCi/L		KSD1	03/31/14	1117	1374041	5
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WSP-GrossA/B "As Received"

Beta		10.0	+/-0.506	1.15	0.553	+/-0.999	3.00	pCi/L		DXG3	03/28/14	1625	1374043	6
Alpha	U	-0.49	+/-0.530	2.43	0.982	+/-0.531	3.00	pCi/L		DXG3	03/31/14	1148	1374043	7

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Am-05-RC Modified
2	DOE EML HASL-300, Pu-11-RC Modified
3	DOE EML HASL-300, U-02-RC Modified
4	EPA 901.1
5	EPA 905.0 Modified
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"	1373330	71.2	(50%-105%)
Plutonium-242 Tracer	Alphaspec Pu, Liquid "As Received"	1373331	62.0	(50%-105%)
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"	1373332	57.8	(50%-105%)

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Certificate of Analysis

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

Los Alamos, New Mexico 87545

Report Date: April 7, 2014

Contact: Mr. Keith Greene

Project: LANL-WQH Groundwater Samples

Client Sample ID: CAAN-14-54788

Project: ESHL00714

Sample ID: 344588004

Client ID: ARSL004

Parameter	Qualifier	Result	Uncertainty	MDC	Lc	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Surrogate/Tracer Recovery	Test							Batch ID	Recovery%	Acceptable Limits				
Strontium Carrier		GFPC, Sr90, liquid "As Received"						1374041	70.7	(50%-105%)				

Notes:

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

Quality Control Data

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QC Summary

Report Date: April 7, 2014

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: 344588

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1373330										
QC1203051955	344674004	DUP									
Americium-241	U	0.00	U	0.0116	pCi/L	0.442		(0-1)	MXS2	03/25/1412:04	
	Uncert:	+/-0.00602		+/-0.00713							
	TPU:	+/-0.00603		+/-0.00715							
**Americium-243 Tracer	2.67	1.99		2.02	pCi/L		75.7	(50%-105%)			
	Uncert:	+/-0.0894		+/-0.088							
	TPU:	+/-0.149		+/-0.147							
QC1203051956	LCS										
Americium-241	1.41			1.36	pCi/L		96.4	(80%-120%)	MXS2	03/25/1412:04	
	Uncert:			+/-0.0595							
	TPU:			+/-0.086							
**Americium-243 Tracer	2.13			1.60	pCi/L		75.1	(50%-105%)			
	Uncert:			+/-0.0744							
	TPU:			+/-0.123							
QC1203051954	MB										
Americium-241			U	0.00726	pCi/L				MXS2	03/25/1412:04	
	Uncert:			+/-0.0064							
	TPU:			+/-0.00641							
**Americium-243 Tracer	2.13			1.62	pCi/L		75.7	(50%-105%)			
	Uncert:			+/-0.0714							
	TPU:			+/-0.119							
Batch	1373331										
QC1203051958	344674004	DUP									
Plutonium-238	U	0.00265	U	0.00618	pCi/L	0.163		(0-1)	MXS2	03/25/1412:04	
	Uncert:	+/-0.0046		+/-0.00618							
	TPU:	+/-0.0046		+/-0.00618							
Plutonium-239/240	U	0.00796	U	-0.00618	pCi/L	0.365		(0-1)			
	Uncert:	+/-0.00702		+/-0.0124							
	TPU:	+/-0.00703		+/-0.0124							
**Plutonium-242 Tracer	2.43	2.02		1.69	pCi/L		69.6	(50%-105%)			
	Uncert:	+/-0.0804		+/-0.0869							
	TPU:	+/-0.133		+/-0.141							
QC1203051959	LCS										
Plutonium-238			U	0.0151	pCi/L			(80%-120%)	MXS2	03/25/1412:04	
	Uncert:			+/-0.0071							
	TPU:			+/-0.00713							
Plutonium-239/240	1.97			1.85	pCi/L		94.1	(80%-120%)			
	Uncert:			+/-0.0684							
	TPU:			+/-0.109							
**Plutonium-242 Tracer	1.94			1.36	pCi/L		69.8	(50%-105%)			
	Uncert:			+/-0.0701							
	TPU:			+/-0.113							

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QC Summary

Workorder: 344588

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1373331										
QC1203051957	MB										
Plutonium-238			U	0.00237	pCi/L				MXS2	03/25/1412:04	
				Uncert: +/-0.00411							
				TPU: +/-0.00411							
Plutonium-239/240			U	0.00949	pCi/L						
				Uncert: +/-0.00949							
				TPU: +/-0.0095							
**Plutonium-242 Tracer	1.94			1.54	pCi/L		79	(50%-105%)			
				Uncert: +/-0.0682							
				TPU: +/-0.111							
Batch	1373332										
QC1203051961	344674004	DUP									
Uranium-234			U	0.0644	pCi/L	0.0983		(0-1)	MXS2	03/25/1412:05	
				Uncert: +/-0.0267							
				TPU: +/-0.0271							
Uranium-235/236			U	0.0149	pCi/L	0.537		(0-1)			
				Uncert: +/-0.0132							
				TPU: +/-0.0132							
Uranium-238			U	0.101	pCi/L	0.462		(0-1)			
				Uncert: +/-0.0217							
				TPU: +/-0.0227							
**Uranium-232 Tracer	2.75			1.50	pCi/L		52.2	(50%-105%)			
				Uncert: +/-0.106							
				TPU: +/-0.216							
QC1203051962	LCS										
Uranium-234				2.63	pCi/L				MXS2	03/25/1412:05	
				Uncert: +/-0.0739							
				TPU: +/-0.185							
Uranium-235/236				0.143	pCi/L						
				Uncert: +/-0.0198							
				TPU: +/-0.0218							
Uranium-238	2.70			2.61	pCi/L		96.6	(80%-120%)			
				Uncert: +/-0.0736							
				TPU: +/-0.183							
**Uranium-232 Tracer	2.20			2.03	pCi/L		92.2	(50%-105%)			
				Uncert: +/-0.0677							
				TPU: +/-0.157							
QC1203051960	MB										
Uranium-234			U	0.0109	pCi/L				MXS2	03/25/1412:05	
				Uncert: +/-0.0073							
				TPU: +/-0.00733							
Uranium-235/236			U	0.00676	pCi/L						
				Uncert: +/-0.00596							
				TPU: +/-0.00598							
Uranium-238			U	0.00	pCi/L						
				Uncert: +/-0.00516							
				TPU: +/-0.00516							

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QC Summary

Workorder: 344588

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1373332										
*Uranium-232 Tracer	2.20			2.06	pCi/L		93.6	(50%-105%)			
	Uncert:			+/-0.0638							
	TPU:			+/-0.153							
Rad Gamma Spec											
Batch	1372823										
QC1203051018	344588004	DUP									
Cesium-137	U	-2.25	U	-0.677	pCi/L	0.214		(0-1)	RXF2	03/20/14	12:01
	Uncert:	+/-1.95		+/-1.66							
	TPU:	+/-2.02		+/-1.67							
Cobalt-60	U	-2.47	U	1.75	pCi/L	0.617		(0-1)			
	Uncert:	+/-2.01		+/-1.25							
	TPU:	+/-2.09		+/-1.32							
Neptunium-237	U	4.53	U	-6.87	pCi/L	0.868		(0-1)			
	Uncert:	+/-3.01		+/-2.96							
	TPU:	+/-3.19		+/-3.37							
Potassium-40	U	22.7	U	-25.6	pCi/L	0.573		(0-1)			
	Uncert:	+/-21.2		+/-19.4							
	TPU:	+/-21.8		+/-20.3							
Sodium-22	U	-1.91	U	-0.745	pCi/L	0.203		(0-1)			
	Uncert:	+/-1.48		+/-1.33							
	TPU:	+/-1.54		+/-1.34							
QC1203051019	LCS										
Americium-241	34500			38800	pCi/L		112	(80%-120%)	RXF2	03/20/14	12:59
	Uncert:			+/-896							
	TPU:			+/-1930							
Cesium-137	14100			14200	pCi/L		100	(80%-120%)			
	Uncert:			+/-184							
	TPU:			+/-599							
Cobalt-60	18200			18600	pCi/L		102	(80%-120%)			
	Uncert:			+/-218							
	TPU:			+/-796							
Neptunium-237			U	-25.6	pCi/L						
	Uncert:			+/-89.2							
	TPU:			+/-89.4							
Potassium-40			U	-99.9	pCi/L						
	Uncert:			+/-184							
	TPU:			+/-185							
Sodium-22			U	-23.2	pCi/L						
	Uncert:			+/-27.0							
	TPU:			+/-27.6							
QC1203051017	MB										
Cesium-137			U	1.15	pCi/L				RXF2	03/20/14	11:36
	Uncert:			+/-1.45							
	TPU:			+/-1.48							
Cobalt-60			U	0.355	pCi/L						
	Uncert:			+/-1.20							

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QC Summary

Workorder: 344588

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1372823										
Neptunium-237	TPU:			+/-1.21							
			U	2.89	pCi/L						
	Uncert:			+/-2.47							
Potassium-40	TPU:			+/-2.56							
			U	16.1	pCi/L						
	Uncert:			+/-20.2							
Sodium-22	TPU:			+/-20.2							
			U	-0.659	pCi/L						
	Uncert:			+/-1.12							
	TPU:			+/-1.13							
Rad Gas Flow											
Batch	1374041										
QC1203053725	344063004	DUP									
Strontium-90	U	-0.30	U	0.0798	pCi/L	0.896		(0-1)	KSD1	03/28/1415:04	
	Uncert:	+/-0.123		+/-0.0888							
	TPU:	+/-0.123		+/-0.089							
**Strontium Carrier	8.20	7.20		7.30	mg		89	(50%-105%)			
QC1203053727	LCS										
Strontium-90	22.7			26.1	pCi/L		115	(80%-120%)	KSD1	03/28/1408:52	
	Uncert:			+/-0.693							
	TPU:			+/-2.21							
**Strontium Carrier	8.20			7.30	mg		89	(50%-105%)			
QC1203053724	MB										
Strontium-90			U	0.096	pCi/L				KSD1	03/28/1415:04	
	Uncert:			+/-0.0463							
	TPU:			+/-0.0469							
**Strontium Carrier	8.20			6.80	mg		82.9	(50%-105%)			
QC1203053726	344063004	MS									
Strontium-90	182	U	-0.30	200	pCi/L		110	(75%-125%)	KSD1	03/28/1408:52	
	Uncert:		+/-0.123	+/-5.46							
	TPU:		+/-0.123	+/-17.3							
**Strontium Carrier	8.20	7.20		6.60	mg		80.5	(50%-105%)			
Batch	1374043										
QC1203053745	344296017	DUP									
Alpha	U	-0.474	U	-0.338	pCi/L	0.0659		(0-1)	DXG3	03/31/1411:49	
	Uncert:	+/-0.373		+/-0.653							
	TPU:	+/-0.374		+/-0.653							
Beta	U	-0.0466	U	1.18	pCi/L	0.763		(0-1)		03/28/1417:51	
	Uncert:	+/-0.309		+/-0.486							
	TPU:	+/-0.310		+/-0.497							
QC1203053748	LCS										
Alpha	12.3			12.9	pCi/L		104	(80%-120%)	DXG3	03/31/1415:35	
	Uncert:			+/-0.655							
	TPU:			+/-1.39							
Beta	45.5			52.1	pCi/L		115	(80%-120%)		03/28/1416:27	

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QC Summary

Workorder: 344588

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gas Flow											
Batch	1374043										
				Uncert:	+/-0.939						
				TPU:	+/-4.41						
QC1203053744	MB										
Alpha			U	-0.165	pCi/L				DXG3	03/31/14	11:48
				Uncert:	+/-0.0458						
				TPU:	+/-0.0458						
Beta			U	0.00391	pCi/L					03/28/14	16:25
				Uncert:	+/-0.0514						
				TPU:	+/-0.0514						
QC1203053746	344296017	MS									
Alpha	494	U	-0.474	581	pCi/L		118	(75%-125%)	DXG3	03/31/14	12:03
			Uncert:	+/-0.373	+/-28.2						
			TPU:	+/-0.374	+/-56.0						
Beta	1820	U	-0.0466	2080	pCi/L		114	(75%-125%)		03/28/14	16:27
			Uncert:	+/-0.309	+/-37.6						
			TPU:	+/-0.310	+/-177						
QC1203053747	344296017	MSD									
Alpha	494	U	-0.474	528	pCi/L	0.244	107	(0-1)	DXG3	03/31/14	12:03
			Uncert:	+/-0.373	+/-26.9						
			TPU:	+/-0.374	+/-52.1						
Beta	1820	U	-0.0466	2180	pCi/L	0.134	120	(0-1)		03/28/14	16:27
			Uncert:	+/-0.309	+/-38.5						
			TPU:	+/-0.310	+/-185						

Notes:

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

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMF Result > MDC/CL and < RDL
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.

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QC Summary

Workorder: 344588

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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, 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.

** 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.