

General Engineering Laboratories, Inc., Charleston, SC.
2040 Savage Rd
Charleston SC 29407

Chain of Custody/Analysis Request

COC/Lab Request #:
2013-926

Page 1 of 1

Client Contact:

Lab Agreement # : 126310011

Site Name: Los Alamos National Laboratory

Project Number :

Analysis Turnaround Time:

24 Hour - ☐ Other - ☐

7 Day - ☐

14 Day - ☐

21 Day - ☐

28 Day - ☒

Rad Screening Info:

Yes, Below Background

Special Instructions:

Field Sample ID

Sample Date

Sample
Time

Sample
Matrix

WSP-CL04

WSP-GENINORG

WSP-GrossA/B

WSP-Met+B+SN+SR+U

WSP-NH3+NO3/NO2+PO4

WSP-RAD

WSP-TKN+TOC

CAPIU-13-34773

Jun 5 2013

11:15

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CAPIU-13-34781

Jun 5 2013

11:15

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CAPIU-13-34778

Jun 5 2013

11:12

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CAPIU-13-34786

Jun 5 2013

11:12

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Special Instructions:

Relinquished by:

Relinquished by:

Relinquished by:

Date/Time:

Date/Time:

Date/Time:

Received by:

Received by:

Received by:

6/6/13 3:00

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4238

EVENT NAME:

LA/Pueblo (TA-21 and General
Surveillance Monitoring Group)
Q3 MY2013 Sampling
Event_Pueblo

SAMPLE ID: CAPU-13-34773

WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		06/05/2013	FIELD MATRIX:	WG	
TIME COLLECTED (HH:MM):		1115	MEDIA:	UA	
PRS ID:		ak	SAMPLE TECH CODE:	UA	
LOCATION ID: APCO-1			FIELD PREP:	UF	
LOCATION TYPE: MON			FIELD QC TYPE: REG		
PORT: SINGLE COMPLETION			SAMPLE USAGE: INV		

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-GrossA/B	1 LITER POLY	1	NONE	Y	NA
↓	WSP-RAD	1 GAL POLY	1	HNO3	↓	↓
↓	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	↓	↓

SAMPLE COMMENTS:

NA

LOCATION COMMENTS:

NA

FIELD PARAMETERS:

Dissolved Oxygen 1.85 mg/L Oxidation-Reduction Potential 142.8 MV pH 6.27 SU
 Specific Conductance 448 uS/cm Temperature 8.5 deg C Turbidity 26.2 NTU

COLLECTED BY (PRINT)

W. Staw

RELINQUISHED BY (Printed Name) <u>Andrew Stoker</u> (Signature) <u>[Signature]</u>	Date/Time <u>6/5/13</u> <u>1210</u>	RECEIVED BY (Printed Name) <u>A. Mant...</u> (Signature) <u>[Signature]</u>	Date/Time <u>6/5/13</u> <u>1210</u>
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 05/29/2013

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4238 EVENT NAME: LA/Pueblo (TA-21 and General Surveillance Monitoring Group)
Q3 MY2013 Sampling
Event_Pueblo

SAMPLE ID: CAPU-13-34778 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		06/05/2013	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):		1112	MEDIA:	UA	↓
PRS ID:		OK	SAMPLE TECH CODE:	UA	DF 6/5/13 65 RSP
LOCATION ID: R-3i		↓	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
NA	WSP-GrossA/B	1 LITER POLY	1	NONE	Y	NA
↓	WSP-RAD	1 GAL POLY	1	HNO3	↓	↓
↓	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	↓	↓

SAMPLE COMMENTS: NA

LOCATION COMMENTS: NA

FIELD PARAMETERS:

Dissolved Oxygen 8.48 mg/L Oxidation-Reduction Potential 184.8 MV pH 7.41 SU
Specific Conductance 509 uS/cm Temperature 13.94 deg C Turbidity 6.8 NTU

COLLECTED BY (PRINT) M. Green

RELINQUISHED BY (Printed Name) <u>M. Green</u> (Signature) <u>[Signature]</u>	Date/Time <u>6/5/13</u> <u>1210</u>	RECEIVED BY (Printed Name) <u>M. Green</u> (Signature) <u>[Signature]</u>	Date/Time <u>6/5/13</u> <u>1210</u>
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 05/29/2013

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4238

EVENT NAME:

LA/Pueblo (TA-21 and General
Surveillance Monitoring Group)
Q3 MY2013 Sampling
Event_Pueblo

SAMPLE ID: CAPU-13-34781

WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		06/05/2013	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):		1115	MEDIA:	UA	J
PRS ID:		ok	SAMPLE TECH CODE:	UA	BP
LOCATION ID: APCO-1		↓	FIELD PREP:	F	ok
LOCATION TYPE: MON			FIELD QC TYPE: REG		J
PORT: SINGLE COMPLETION		↓	SAMPLE USAGE: INV		J

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-CL04	250 ML POLY	1	ICE	Y	NA
	WSP-GENINORG	1 LITER POLY	1	ICE		J
	WSP-Met+B+SN+SR+U	1 LITER POLY	1	HNO3		
↓	WSP-NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4	↓	J

SAMPLE COMMENTS:

NA

LOCATION COMMENTS:

NA

FIELD PARAMETERS:

Dissolved Oxygen NA mg/LOxidation-Reduction Potential NA MVpH NA SUSpecific Conductance NA uS/cmTemperature NA deg CTurbidity NA NTU

COLLECTED BY (PRINT)

W. Sten

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 6/5/13 1210	RECEIVED BY (Printed Name) (Signature)	Date/Time 6/5/13 1210
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 05/29/2013

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4238 EVENT NAME: LA/Pueblo (TA-21 and General Surveillance Monitoring Group)
Q3 MY2013 Sampling
Event_Pueblo

SAMPLE ID: CAPU-13-34786 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		06/05/2013	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):		1112	MEDIA:	UA	↓
PRS ID:		OK	SAMPLE TECH CODE:	UA	RSP
LOCATION ID: R-3i		↓	FIELD PREP:	F	OK
LOCATION TYPE: MON		↓	FIELD QC TYPE: REG		↓
PORT: SINGLE COMPLETION			SAMPLE USAGE: INV		↓

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-CL04	250 ML POLY	1	ICE	Y	NA
↓	WSP-GENINORG	1 LITER POLY	1	ICE	↓	↓
↓	WSP-Met+B+SN+SR+U	1 LITER POLY	1	HNO3	↓	↓
↓	WSP-NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4	↓	↓

SAMPLE COMMENTS: NA

LOCATION COMMENTS: NA

FIELD PARAMETERS:

Dissolved Oxygen NA mg/L Oxidation-Reduction Potential NA MV pH NA SU
Specific Conductance NA uS/cm Temperature NA deg C Turbidity NA NTU

COLLECTED BY (PRINT) M. Green

RELINQUISHED BY (Printed Name) <u>M. Green</u> (Signature) <u>[Signature]</u>	Date/Time <u>6/5/13</u> <u>1210</u>	RECEIVED BY (Printed Name) <u>M. Martin</u> (Signature) <u>[Signature]</u>	Date/Time <u>6/5/13</u> <u>1210</u>
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 05/29/2013

Data Validation Report

Chain Of Custody No. 2013-926

1. Distribution Of Samples In EDD.

	Analytical	Regular	Field	Trip	Field	Equipment
SDG	Method	Samples	Duplicates	Blanks	Blanks	Blanks
327172	EPA:120.1	2				
327172	EPA:150.1	2				
327172	EPA:160.1	2				
327172	EPA:245.2	2				
327172	EPA:300.0	2				
327172	EPA:310.1	2				
327172	EPA:350.1	2				
327172	EPA:351.2	2				
327172	EPA:353.2	2				
327172	EPA:365.4	2				
327172	EPA:900	2				
327172	EPA:901.1	2				
327172	EPA:905.0	2				
327172	HASL-300:AM-241	2				
327172	HASL-300:ISOPU	2				
327172	HASL-300:ISOU	2				
327172	SM:A2340B	2				
327172	SW-846:6010B	2				
327172	SW-846:6020	2				
327172	SW-846:6850	2				
327172	SW-846:9060	2				

	Analytical	Analysis	Prep	Regular	Field	Trip	Field	Equipment	Method	Matrix	Matrix
SDG	Method	Lot ID	Lot ID	Samples	Duplicates	Blanks	Blanks	Blanks	Blanks	Spikes	Spike Dups
327172	EPA:120.1	1306822	1306822	2							
327172	EPA:150.1	1308135	1308135	2							
327172	EPA:160.1	1306714	1306714	2						1	
327172	EPA:245.2	1306762	1306759	2						1	1
327172	EPA:300.0	1306689	1306689	2						1	
327172	EPA:310.1	1307658	1307658	2						2	1
327172	EPA:350.1	1308128	1308126	2						1	1
327172	EPA:351.2	1308288	1308287	2						1	2
327172	EPA:353.2	1308114	1308114	2						1	
327172	EPA:365.4	1307629	1307628	2						1	1
327172	EPA:900	1308529	1308529	1						1	1
327172	EPA:900	1308555	1308555	1						1	1
327172	EPA:901.1	1306868	1306868	2						1	
327172	EPA:905.0	1306838	1306838	1						1	1
327172	EPA:905.0	1307879	1307879	1						1	1
327172	HASL-300:AM-241	1306186	1306186	2						1	
327172	HASL-300:ISOPU	1306187	1306187	1						1	
327172	HASL-300:ISOPU	1308641	1308641	1						1	
327172	HASL-300:ISOU	1306189	1306189	2						1	
327172	SM:A2340B	1311156	1311156	2							
327172	SW-846:6010B	1306962	1306961	2						1	1
327172	SW-846:6020	1306964	1306963	2						1	1
327172	SW-846:6850	1306713	1306712	2						1	1

[illegible]

327172	SW-846:9060	1307044	1307044	2				1	
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2. Distribution Of Analytes In EDD.

Analytical Method	Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spikes	TICS
EPA:120.1	GENERAL CHEMISTRY	CAPU-13-34781	1202889244	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPU-13-34781	327172002	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPU-13-34786	327172004	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1202889242	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAPU-13-34781	327172002	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPU-13-34783	1202892561	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	CAPU-13-34786	327172004	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1202892559	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	CAPU-13-34781	1202888873	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPU-13-34781	327172002	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPU-13-34786	327172004	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1202888875	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1202888872	MB	1	0	0	0
EPA:245.2	INORGANIC	CAPU-13-34781	327172002	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPU-13-34786	327172004	REG	1	0	0	0
EPA:245.2	INORGANIC	CAPU-13-34788	1202888994	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAPU-13-34788	1202888995	MS	0	0	1	0
EPA:245.2	INORGANIC	LCS	1202888993	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1202888992	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CALA-13-33434	1202888803	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPU-13-34781	327172002	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPU-13-34786	327172004	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1202888805	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1202888802	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CALA-13-33429	1202891329	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CALA-13-33429	1202891330	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAPU-13-34781	327172002	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPU-13-34786	327172004	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1202891328	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1202892334	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	MB	1202891327	MB	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	MB	1202892333	MB	2	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPU-13-34781	1202892528	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPU-13-34781	1202892530	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAPU-13-34781	327172002	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPU-13-34786	327172004	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1202892532	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1202892527	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPU-13-34773	1202892934	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPU-13-34773	1202892936	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAPU-13-34773	327172001	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPU-13-34778	1202892935	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPU-13-34778	1202892937	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAPU-13-34778	327172003	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1202892938	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1202892933	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPU-13-34781	1202892482	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPU-13-34781	327172002	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPU-13-34786	327172004	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1202892487	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1202892480	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPU-13-34781	1202891261	DUP	1	0	0	0

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EPA:365.4	GENERAL CHEMISTRY	CAPU-13-34781	1202891263	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAPU-13-34781	327172002	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPU-13-34786	327172004	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1202891265	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1202891260	MB	1	0	0	0
EPA:900	RAD	Buckman08-12-34754	1202893668	DUP	2	0	0	0
EPA:900	RAD	Buckman08-12-34754	1202893669	MS	0	0	2	0
EPA:900	RAD	Buckman08-12-34754	1202893670	MSD	0	0	2	0
EPA:900	RAD	CAPU-13-34773	327172001	REG	2	0	0	0
EPA:900	RAD	CAPU-13-34775	1202893585	DUP	2	0	0	0
EPA:900	RAD	CAPU-13-34775	1202893586	MS	0	0	2	0
EPA:900	RAD	CAPU-13-34775	1202893587	MSD	0	0	2	0
EPA:900	RAD	CAPU-13-34778	327172003	REG	2	0	0	0
EPA:900	RAD	LCS	1202893588	LCS	0	0	2	0
EPA:900	RAD	LCS	1202893671	LCS	0	0	2	0
EPA:900	RAD	MB	1202893584	MB	2	0	0	0
EPA:900	RAD	MB	1202893667	MB	2	0	0	0
EPA:901.1	RAD	CAPU-13-34773	327172001	REG	5	0	0	0
EPA:901.1	RAD	CAPU-13-34778	327172003	REG	5	0	0	0
EPA:901.1	RAD	CAPU-13-34780	1202889386	DUP	5	0	0	0
EPA:901.1	RAD	LCS	1202889387	LCS	0	0	3	0
EPA:901.1	RAD	MB	1202889385	MB	5	0	0	0
EPA:905.0	RAD	CALA-13-33411	1202889288	DUP	1	0	0	0
EPA:905.0	RAD	CALA-13-33411	1202889289	MS	0	0	1	0
EPA:905.0	RAD	CALA-13-33427	1202891917	DUP	1	0	0	0
EPA:905.0	RAD	CALA-13-33427	1202891918	MS	0	0	1	0
EPA:905.0	RAD	CAPU-13-34773	327172001	REG	1	0	0	0
EPA:905.0	RAD	CAPU-13-34778	327172003	REG	1	0	0	0
EPA:905.0	RAD	LCS	1202889290	LCS	0	0	1	0
EPA:905.0	RAD	LCS	1202891919	LCS	0	0	1	0
EPA:905.0	RAD	MB	1202889287	MB	1	0	0	0
EPA:905.0	RAD	MB	1202891916	MB	1	0	0	0
HASL-300:AM-241	RAD	CAPU-13-34773	327172001	REG	1	0	0	0
HASL-300:AM-241	RAD	CAPU-13-34776	1202887499	DUP	1	0	0	0
HASL-300:AM-241	RAD	CAPU-13-34778	327172003	REG	1	0	0	0
HASL-300:AM-241	RAD	LCS	1202887500	LCS	0	0	1	0
HASL-300:AM-241	RAD	MB	1202887498	MB	1	0	0	0
HASL-300:ISOPU	RAD	CAPU-13-34773	1202893968	DUP	2	0	0	0
HASL-300:ISOPU	RAD	CAPU-13-34773	327172001	REG	2	0	0	0
HASL-300:ISOPU	RAD	CAPU-13-34776	1202887502	DUP	2	0	0	0
HASL-300:ISOPU	RAD	CAPU-13-34778	327172003	REG	2	0	0	0
HASL-300:ISOPU	RAD	LCS	1202887503	LCS	0	0	1	0
HASL-300:ISOPU	RAD	LCS	1202893969	LCS	0	0	1	0
HASL-300:ISOPU	RAD	MB	1202887501	MB	2	0	0	0
HASL-300:ISOPU	RAD	MB	1202893967	MB	2	0	0	0
HASL-300:ISOU	RAD	CAPU-13-34773	327172001	REG	3	0	0	0
HASL-300:ISOU	RAD	CAPU-13-34776	1202887505	DUP	3	0	0	0
HASL-300:ISOU	RAD	CAPU-13-34778	327172003	REG	3	0	0	0
HASL-300:ISOU	RAD	LCS	1202887506	LCS	0	0	1	0
HASL-300:ISOU	RAD	MB	1202887504	MB	3	0	0	0
SM:A2340B	INORGANIC	CAPU-13-34781	327172002	REG	1	0	0	0
SM:A2340B	INORGANIC	CAPU-13-34786	327172004	REG	1	0	0	0
SW-846:6010B	INORGANIC	CAPU-13-34781	327172002	REG	17	0	0	0
SW-846:6010B	INORGANIC	CAPU-13-34786	327172004	REG	17	0	0	0

SW-846:6010B	INORGANIC	CAPU-13-34788	1202889610	DUP	17	0	0	0
SW-846:6010B	INORGANIC	CAPU-13-34788	1202889611	MS	0	0	17	0
SW-846:6010B	INORGANIC	LCS	1202889609	LCS	0	0	17	0
SW-846:6010B	INORGANIC	MB	1202889608	MB	17	0	0	0
SW-846:6020	INORGANIC	CAPU-13-34781	327172002	REG	11	0	0	0
SW-846:6020	INORGANIC	CAPU-13-34786	327172004	REG	11	0	0	0
SW-846:6020	INORGANIC	CAPU-13-34788	1202889615	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAPU-13-34788	1202889616	MS	0	0	11	0
SW-846:6020	INORGANIC	LCS	1202889614	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1202889613	MB	11	0	0	0
	LCMS/MS							
SW-846:6850	PERCHLORATE	CALA-13-33434	1202888869	MS	0	0	1	0
	LCMS/MS							
SW-846:6850	PERCHLORATE	CALA-13-33434	1202888870	MSD	0	0	1	0
	LCMS/MS							
SW-846:6850	PERCHLORATE	CAPU-13-34781	327172002	REG	1	0	0	0
	LCMS/MS							
SW-846:6850	PERCHLORATE	CAPU-13-34786	327172004	REG	1	0	0	0
	LCMS/MS							
SW-846:6850	PERCHLORATE	LCS	1202888868	LCS	0	0	1	0
	LCMS/MS							
SW-846:6850	PERCHLORATE	MB	1202888867	MB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPU-13-34773	327172001	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPU-13-34774	1202889801	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPU-13-34778	327172003	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1202889805	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1202889800	MB	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

Field	Lab	Type Of	Analytical	Sample	Parameter	Lab	Lab		Lab
Sample ID	Sample ID	Blank	Method	Matrix	Name	Result	Qualifier	Units	Detection Limit
MB	1202888872	METHOD BLANK	EPA:160.1	W	Total Dissolved Solids	7.14 J		mg/L	14.3
MB	1202889613	METHOD BLANK	SW-846:6020	W	Molybdenum	0.173 J		ug/L	0.5
MB	1202889613	METHOD BLANK	SW-846:6020	W	Nickel	0.602 J		ug/L	2
MB	1202891260	METHOD BLANK	EPA:365.4	W	Total Phosphate as Phosphorus	0.0384 J		mg/L	0.05
MB	1202892527	METHOD BLANK	EPA:350.1	W	Ammonia as Nitrogen	0.0223 J		mg/L	0.05

Any samples affected by the presence of contaminants in blanks?

Field	Blank Field	Blank Lab	Blank	Analytical	Parameter		Blank	Sample	Lab	Detect	
Sample ID	Sample ID	Sample ID	Type	Method	Name	Units	Result	Result	Qualifier	Limit	Detected
CAPU-13-34786	MB	1202892527	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	mg/L	0.0223	0.0876		0.05	Y
CAPU-13-34786	MB	1202891260	METHOD BLANK	EPA:365.4	Total Phosphate as Phosphorus	mg/L	0.0384	0.0982		0.05	Y

Correction	Correction	Use
Factor (ND)	Factor (J)	Factors
5		Y
5		Y

6. Any surrogate recoveries outside the control limits?

No.

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

Field	Matrix	Matrix	Analytical	Parameter	Analysis	Analysis	Sample	MS %	MSD %	Upper	Lower
Sample ID	Spike ID	Spike Dup ID	Method	Name	Lot ID	Date	Matrix	Recvry	Recvry	Limit	Limit
Buckman08-12-34754	1202893669	1202893670	EPA:900	Gross alpha	1308555	6/26/2013	W	84.7	122	125	75
CAPU-13-34775	1202893586	1202893587	EPA:900	Gross alpha	1308529	6/26/2013	W	94.2	109	125	75

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

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

Field	Lab	Lab Duplicate	Analytical	Parameter	Sample	Sample	Dup Sample	Units	Detected In Sample	Detected In Dup	RPD
Sample ID	SampleID	Sample ID	Method	Name	Matrix	Result	Result				
CAPU-13-34781	327172002	1202892528	EPA:350.1	Ammonia as Nitrogen	W	0.137	0.09	mg/L	Y	Y	41.4
CAPU-13-34773	327172001	1202892934	EPA:351.2	Total Kjeldahl Nitrogen	W	0.476	0.282	mg/L	Y	Y	51.2
CAPU-13-34773	327172001	1202893968	HASL-300:ISOPU	Plutonium-239/240	W	0.346	0.316	pCi/L	Y	Y	9.03

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

None.

13. Display Flagged Data.

Location ID	Chain Of Custody No	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detected
APCO-1	2013-926	CAPU-13-34773	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N
APCO-1	2013-926	CAPU-13-34773	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N
APCO-1	2013-926	CAPU-13-34773	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N
APCO-1	2013-926	CAPU-13-34773	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N
APCO-1	2013-926	CAPU-13-34773	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N
APCO-1	2013-926	CAPU-13-34773	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N
APCO-1	2013-926	CAPU-13-34773	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240		J	R10	Y
APCO-1	2013-926	CAPU-13-34773	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N
APCO-1	2013-926	CAPU-13-34773	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N
APCO-1	2013-926	CAPU-13-34773	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N
APCO-1	2013-926	CAPU-13-34773	REG	INIT	GENERAL CHEMISTRY		Total Kjeldahl Nitrogen		J	I10a	Y
APCO-1	2013-926	CAPU-13-34773	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N

Rejection	RPD	
Limit	RPD	Limit
10	34.6	18.7
10	14.9	2.13

RPD
Limit

20

20

0.055

Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent Moisture	Analysis Lot ID	Validation Status Code	Use Flag
0.0253	pCi/L	0.0253	pCi/L	0.035	0.00891	W	6/5/2013		1306186	VAL	Y
-2.36	pCi/L	-2.36	pCi/L	6	1.74	W	6/5/2013		1306868	VAL	Y
-0.282	pCi/L	-0.282	pCi/L	4.52	1.19	W	6/5/2013		1306868	VAL	Y
2.05	pCi/L	2.05	pCi/L	2.5	0.903	W	6/5/2013		1308555	VAL	Y
3.81	pCi/L	3.81	pCi/L	11.1	2.96	W	6/5/2013		1306868	VAL	Y
0.00286	pCi/L	0.00286	pCi/L	0.0267	0.00639	W	6/5/2013		1308641	VAL	Y
0.346	pCi/L	0.346	pCi/L	0.0563	0.0317	W	6/5/2013		1308641	VAL	Y
32.5	pCi/L	32.5	pCi/L	40.6	18.2	W	6/5/2013		1306868	VAL	Y
-1.51	pCi/L	-1.51	pCi/L	4.49	1.32	W	6/5/2013		1306868	VAL	Y
0.457	pCi/L	0.457	pCi/L	0.484	0.157	W	6/5/2013		1306838	VAL	Y
0.476	mg/L	0.476	mg/L			W	6/5/2013		1308288	VAL	Y
0.00346	pCi/L	0.00346	pCi/L	0.0478	0.0115	W	6/5/2013		1306189	VAL	Y

R-3i	2013-926	CAPU-13-34778	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N
R-3i	2013-926	CAPU-13-34778	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N
R-3i	2013-926	CAPU-13-34778	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N
R-3i	2013-926	CAPU-13-34778	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N
R-3i	2013-926	CAPU-13-34778	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N
R-3i	2013-926	CAPU-13-34778	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N
R-3i	2013-926	CAPU-13-34778	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N
R-3i	2013-926	CAPU-13-34778	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N
R-3i	2013-926	CAPU-13-34778	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N
APCO-1	2013-926	CAPU-13-34781	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen	J		I10a	Y
R-3i	2013-926	CAPU-13-34786	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen	U		I4	N
R-3i	2013-926	CAPU-13-34786	REG	INIT	GENERAL CHEMISTRY	EPA:365.4	Total Phosphate as Phosphorus	U		I4	N

Reason Code Description

I10a The sample and the duplicate sample results were $\geq 5X$ the RL and the duplicate RPD was $>20\%$ for water samples and $>35\%$ for soil samples.
I4 the sample result is $\leq 5x$ 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 qualfire. The analyte is detected in the sample.

R10 Associated duplicate sample has DER or RER $>$ the analytical laboratory's acceptance limits.

R5 Analyte is not detected because the amount reported is less than the MDC.

U_LAB The analytical laboratory qualified the analyte as not detected.

14. Useable Result Count.

Field	Location	Sample	Analytical	No. Unuseable	Total No. Of
Sample ID	ID	Purpose	Method	Records	Records
CAPU-13-34773	APCO-1	REG	EPA:351.2	0	1
CAPU-13-34773	APCO-1	REG	EPA:900	0	2
CAPU-13-34773	APCO-1	REG	EPA:901.1	0	5
CAPU-13-34773	APCO-1	REG	EPA:905.0	0	1
CAPU-13-34773	APCO-1	REG	HASL-300:AM-241	0	1
CAPU-13-34773	APCO-1	REG	HASL-300:ISOPU	0	2
CAPU-13-34773	APCO-1	REG	HASL-300:ISOU	0	3
CAPU-13-34773	APCO-1	REG	SW-846:9060	0	1
CAPU-13-34778	R-3i	REG	EPA:351.2	0	1
CAPU-13-34778	R-3i	REG	EPA:900	0	2
CAPU-13-34778	R-3i	REG	EPA:901.1	0	5
CAPU-13-34778	R-3i	REG	EPA:905.0	0	1
CAPU-13-34778	R-3i	REG	HASL-300:AM-241	0	1
CAPU-13-34778	R-3i	REG	HASL-300:ISOPU	0	2
CAPU-13-34778	R-3i	REG	HASL-300:ISOU	0	3
CAPU-13-34778	R-3i	REG	SW-846:9060	0	1
CAPU-13-34781	APCO-1	REG	EPA:120.1	0	1
CAPU-13-34781	APCO-1	REG	EPA:150.1	0	1
CAPU-13-34781	APCO-1	REG	EPA:160.1	0	1
CAPU-13-34781	APCO-1	REG	EPA:245.2	0	1
CAPU-13-34781	APCO-1	REG	EPA:300.0	0	4
CAPU-13-34781	APCO-1	REG	EPA:310.1	0	2
CAPU-13-34781	APCO-1	REG	EPA:350.1	0	1
CAPU-13-34781	APCO-1	REG	EPA:353.2	0	1

0.00571	pCi/L	0.00571	pCi/L	0.0433	0.00902	W	6/5/2013	1306186	VAL	Y
0.31	pCi/L	0.31	pCi/L	4.58	1.27	W	6/5/2013	1306868	VAL	Y
1.85	pCi/L	1.85	pCi/L	4.14	0.823	W	6/5/2013	1306868	VAL	Y
-0.881	pCi/L	-0.881	pCi/L	8.69	2.56	W	6/5/2013	1306868	VAL	Y
0.00901	pCi/L	0.00901	pCi/L	0.0211	0.00712	W	6/5/2013	1306187	VAL	Y
0.00675	pCi/L	0.00675	pCi/L	0.0443	0.00928	W	6/5/2013	1306187	VAL	Y
34.5	pCi/L	34.5	pCi/L	56.9	17.8	W	6/5/2013	1306868	VAL	Y
-0.71	pCi/L	-0.71	pCi/L	5.39	1.5	W	6/5/2013	1306868	VAL	Y
0.272	pCi/L	0.272	pCi/L	0.481	0.147	W	6/5/2013	1307879	VAL	Y
0.137	mg/L	0.137	mg/L			W	6/5/2013	1308128	VAL	Y
0.0876	mg/L	0.0876	mg/L			W	6/5/2013	1308128	VAL	Y
0.0982	mg/L	0.0982	mg/L			W	6/5/2013	1307629	VAL	Y

CAPU-13-34781	APCO-1	REG	EPA:365.4	0	1
CAPU-13-34781	APCO-1	REG	SM:A2340B	0	1
CAPU-13-34781	APCO-1	REG	SW-846:6010B	0	17
CAPU-13-34781	APCO-1	REG	SW-846:6020	0	11
CAPU-13-34781	APCO-1	REG	SW-846:6850	0	1
CAPU-13-34786	R-3i	REG	EPA:120.1	0	1
CAPU-13-34786	R-3i	REG	EPA:150.1	0	1
CAPU-13-34786	R-3i	REG	EPA:160.1	0	1
CAPU-13-34786	R-3i	REG	EPA:245.2	0	1
CAPU-13-34786	R-3i	REG	EPA:300.0	0	4
CAPU-13-34786	R-3i	REG	EPA:310.1	0	2
CAPU-13-34786	R-3i	REG	EPA:350.1	0	1
CAPU-13-34786	R-3i	REG	EPA:353.2	0	1
CAPU-13-34786	R-3i	REG	EPA:365.4	0	1
CAPU-13-34786	R-3i	REG	SM:A2340B	0	1
CAPU-13-34786	R-3i	REG	SW-846:6010B	0	17
CAPU-13-34786	R-3i	REG	SW-846:6020	0	11
CAPU-13-34786	R-3i	REG	SW-846:6850	0	1



July 02, 2013

www.gel.com

Mr. Keith Greene
Los Alamos National Laboratory
PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Re: LANL-WQH Water Samples
Work Order: 327172
SDG: 2013-926

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on June 07, 2013, and analyzed for General Chemistry, Metals, Perchlorates by LCMSMS and Radiochemistry. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,

Valerie Davis
Project Manager

Purchase Order: 63641-10
Chain of Custody: 2013-926
Enclosures



ARS International (63641-10)
LANL-WQH Water Samples
Work Order #: 327172
SDG: 2013-926

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Case Narrative

**Case Narrative for
ARS International (63641-10)
LANL-WQH Water Samples
Workorder #: 327172
SDG # : 2013-926**

July 02, 2013

Laboratory Identification:

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

Summary

Sample receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on June 07, 2013 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. The containers for Gross A/B were preserved prior to analysis. 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>
327172001	CAPU-13-34773
327172002	CAPU-13-34781
327172003	CAPU-13-34778
327172004	CAPU-13-34786

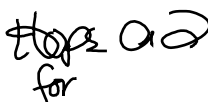
Case Narrative

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

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


for

Valerie Davis
Project Manager

List of current GEL Certifications as of 02 July 2013

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP A2LA ISO 17025	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	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
Nevada	SC000122011-1
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 Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-13-8
Utah NELAP	SC000122013-8
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12
Wisconsin	999887790

Chain of Custody and Supporting Documentation

General Engineering Laboratories, Inc., Charleston, SC.
2040 Savage Rd
Charleston SC 29407

Chain of Custody/Analysis Request

COC/Lab Request #:
2013-926

Page 1 of 1

Client Contact:

Lab Agreement # : 126310011

Site Name: Los Alamos National Laboratory

Project Number :

Analysis Turnaround Time:

24 Hour - ☐ Other - ☐
7 Day - ☐
14 Day - ☐
21 Day - ☐
28 Day - ☒

Field Sample ID

Sample Date

Sample Time

Sample Matrix

CAPU-13-34773

CAPU-13-34781

CAPU-13-34778

CAPU-13-34786

Jun 5 2013

Jun 5 2013

Jun 5 2013

Jun 5 2013

11:15

11:15

11:12

11:12

W

W

W

W

Rad Screening Info:

Yes, Below Background

Special Instructions:

Special Instructions:

Relinquished by:

Relinquished by:

Relinquished by:

Date/Time:

Date/Time:

Date/Time:

Received by:

Received by:

Received by:

6/6/13 3:00

060713 0900

SAMPLE RECEIPT & REVIEW FORM

Client: <u>LAN</u>		SDG/AR/COC/Work Order: <u>2013-926</u>	
Received By: <u>H. Taylor</u>		Date Received: <u>060713</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)
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) <u>4</u> *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: <u>61524649</u> Secondary Temperature Device Serial # (If Applicable):
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: <u>0.40-13-31773, 34778</u> If Preservation added, Lot#: <u>X6401-75</u>
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:
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>			
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
14 Carrier and tracking number.	<input checked="" type="checkbox"/>			Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>5462 9833 0619 14</u> <u>5462 9833 0620 14</u>

Comments (Use Continuation Form if needed):

Subject: Sample Receipt for 060713
From: Hope Taylor <Hope.Taylor@gel.com>
Date: 6/10/2013 8:03 AM
To: "Keith R. Greene" <kgreene@lanl.gov>
CC: LANL@amrad.com, "team.davis" <team.davis@gel.com>

The containers for Gross A/B were preserved prior to analysis.

RN 2013-928
for ID WST36-13-36146 lab received 1 container for 8082, chain indicates 2.

--
Hope Taylor
Project Manager Assistant
GEL Laboratories, LLC
2040 Savage Road
Charleston, SC 29407
Direct: 843.769.7376 ext. 4778
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TA00 BLDG 1237 DPU 03

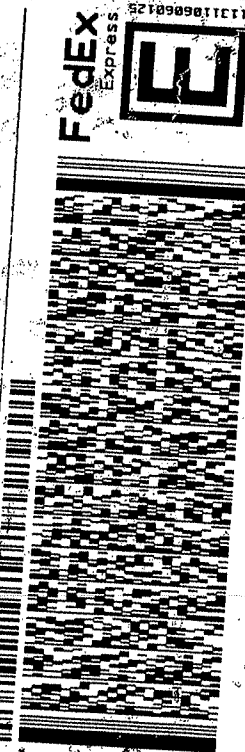
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LOS ALAMOS NM 87545
UNITED STATES US

BILL SENDER

TO VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

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(843) 556-8171
REF: WE991158W100

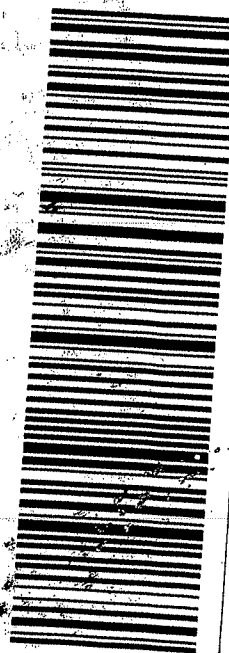


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SC-US CHS



Part # 156148-434 R1T2 09/10

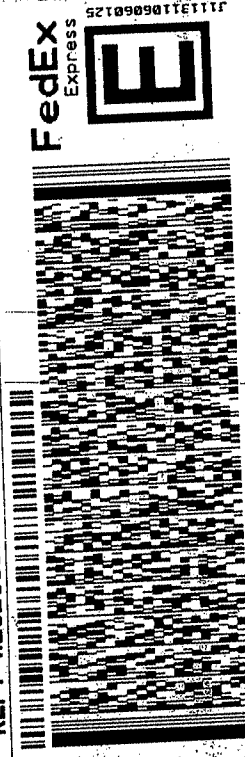
ORIGIN ID: SAFA (505) 665-9966
KEITH GREENE
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BILL SENDER

TO VALERIE DAVIS
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FRI - 07 JUN 10:30A
PRIORITY OVERNIGHT

TRK# 5462 9833 0620
0201

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29407
SC-US CHS



Part # 156148-434 R1T2 09/10

58DC1/D777/188C

J11131106060125

Data Review Qualifier Flag Definition Sheet

Data Review Qualifier Definitions

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

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

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

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorate by LC-MS/MS
ARS International (ARSL)
SDG 2013-926**

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: 1306713

Prep Batch Number: 1306712

Sample Analysis

Sample ID	Client ID
327172002	CAPU-13-34781
327172004	CAPU-13-34786
1202888871	Interference Check Sample (ICS)
1202888867	Method Blank (MB)
1202888868	Laboratory Control Sample (LCS)
1202888869	327024002(CALA-13-33434) Matrix Spike (MS)
1202888870	327024002(CALA-13-33434) 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# 10.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG.

Due to software constraints, all Initial Calibration Blanks must be designated as IPB001.

ICV Requirements

All associated initial calibration verification standards (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 met all recovery acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 327024002 (CALA-13-33434) from SDG 2013-916 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

Sample 327172004 (CAPU-13-34786) was diluted to bring the over range concentration within the calibration range.

Sample Re-extraction/Re-analysis

Due to poor injection of the MSD, both matrix spikes were re-analyzed the following day. The re-analysis data are reported.

Miscellaneous Information

Data Exception (DER) Documentation

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

A data exception report (DER) was not generated for this SDG.

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

ARSL001 ARS International (63641-10)

Client SDG: 2013-926 GEL Work Order: 327172

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: 26 JUN 2013

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1306712Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPU-13-34781Date Received: 07-JUN-13GEL Job No (SDG): 2013-926GEL Sample ID: 327172002Date Filtered: 13-JUN-13Injection 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	0.128	ug/L	J	1	13-JUN-13 20:36	per0613026a
	Perchlorate Isotope Ratio			3.2			1	13-JUN-13 20:36	per0613026a
14797-73-0	Perchlorate-101	.05	.2	0.124	ug/L	J	1	13-JUN-13 20:36	per0613026a
	Perchlorate-O(18)			0.514	ug/L		1	13-JUN-13 20:36	per0613026a

^ 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: 1306712Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPU-13-34786Date Received: 07-JUN-13GEL Job No (SDG): 2013-926GEL Sample ID: 327172004Date Filtered: 13-JUN-13Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.25	1	2.20	ug/L		5	14-JUN-13 18:20	per0614014a
	Perchlorate Isotope Ratio			3.03			5	14-JUN-13 18:20	per0614014a
14797-73-0	Perchlorate-101	.25	1	2.29	ug/L		5	14-JUN-13 18:20	per0614014a
	Perchlorate-O(18)			2.58	ug/L		5	14-JUN-13 18:20	per0614014a

^ 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): 2013-926

Extract Batch Code: 1306712

Date Filtered: 13-JUN-13

Matrix: WATER

Sample ID: 1202888868

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.222	ug/L	111		85 - 115
Perchlorate Isotope Ratio		3.17				-
Perchlorate-101	0.200	.217	ug/L	108		85 - 115
Perchlorate-O(18)		.568	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): 2013-926

Extract Batch Code: 1306712

Date Extracted: 13-JUN-13

GEL MS/PS ID: 1202888869

Client ID: CALA-13-33434

GEL MSD/PSD ID: 1202888870

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	0.491	ug/L	0.667	87.9	.67	89.7	.518	30	75 - 125
Perchlorate Isotope Ratio	0	3.12		3.08		3.08		.0359		-
Perchlorate-101	0.200	0.487	ug/L	0.683	97.6	.686	99.4	.553	30	75 - 125
Perchlorate-O(18)	0	0.504	ug/L	0.498		.508		1.93		-

^ 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: 1306712Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 13-JUN-13GEL Job No (SDG): 2013-926GEL Sample ID: 1202888867Date Filtered: 13-JUN-13Injection 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	13-JUN-13 18:44	per0613012a
	Perchlorate Isotope Ratio						1	13-JUN-13 18:44	per0613012a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	13-JUN-13 18:44	per0613012a
	Perchlorate-O(18)			0.506	ug/L		1	13-JUN-13 18:44	per0613012a

^ 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: 1306712Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 13-JUN-13GEL Job No (SDG): 2013-926GEL Sample ID: 1202888868Date Filtered: 13-JUN-13Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.222	ug/L		1	13-JUN-13 18:52	per0613013a
	Perchlorate Isotope Ratio			3.17			1	13-JUN-13 18:52	per0613013a
14797-73-0	Perchlorate-101	.05	.2	0.217	ug/L		1	13-JUN-13 18:52	per0613013a
	Perchlorate-O(18)			0.568	ug/L		1	13-JUN-13 18:52	per0613013a

^ 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: 1306712Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2013-926GEL Sample ID: 1202888871Date Filtered: 13-JUN-13Injection 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	0.201	ug/L		1	13-JUN-13 19:00	per0613014a
	Perchlorate Isotope Ratio			3.3			1	13-JUN-13 19:00	per0613014a
14797-73-0	Perchlorate-101	.05	.2	0.189	ug/L	J	1	13-JUN-13 19:00	per0613014a
	Perchlorate-O(18)			0.523	ug/L		1	13-JUN-13 19:00	per0613014a

^ 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: 1306712Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CALA-13-33434MSDate Received: 06-JUN-13GEL Job No (SDG): 2013-926GEL Sample ID: 1202888869Date Filtered: 13-JUN-13Injection 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	0.667	ug/L		1	14-JUN-13 18:04	per0614012a
	Perchlorate Isotope Ratio			3.08			1	14-JUN-13 18:04	per0614012a
14797-73-0	Perchlorate-101	.05	.2	0.683	ug/L		1	14-JUN-13 18:04	per0614012a
	Perchlorate-O(18)			0.498	ug/L		1	14-JUN-13 18:04	per0614012a

^ 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: 1306712Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CALA-13-33434MSDDate Received: 06-JUN-13GEL Job No (SDG): 2013-926GEL Sample ID: 1202888870Date Filtered: 13-JUN-13Injection 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	0.670	ug/L		1	14-JUN-13 18:12	per0614013a
	Perchlorate Isotope Ratio			3.08			1	14-JUN-13 18:12	per0614013a
14797-73-0	Perchlorate-101	.05	.2	0.686	ug/L		1	14-JUN-13 18:12	per0614013a
	Perchlorate-O(18)			0.508	ug/L		1	14-JUN-13 18:12	per0614013a

^ 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 =

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

Metals Analysis

Case Narrative

**Metals Fractional Narrative
ARS International (ARSL)
SDG 2013-926**

Sample Analysis

Sample ID	Client ID
327172002	CAPU-13-34781
327172004	CAPU-13-34786
1202889608	Method Blank (MB) ICP
1202889609	Laboratory Control Sample (LCS)
1202889612	327280002(CAPU-13-34788L) Serial Dilution (SD)
1202889610	327280002(CAPU-13-34788D) Sample Duplicate (DUP)
1202889611	327280002(CAPU-13-34788S) Matrix Spike (MS)
1202889613	Method Blank (MB) ICP-MS
1202889614	Laboratory Control Sample (LCS)
1202889617	327280002(CAPU-13-34788L) Serial Dilution (SD)
1202889615	327280002(CAPU-13-34788D) Sample Duplicate (DUP)
1202889616	327280002(CAPU-13-34788S) Matrix Spike (MS)
1202888992	Method Blank (MB) CVAA
1202888993	Laboratory Control Sample (LCS)
1202888996	327280002(CAPU-13-34788L) Serial Dilution (SD)
1202888994	327280002(CAPU-13-34788D) Sample Duplicate (DUP)
1202888995	327280002(CAPU-13-34788S) Matrix Spike (MS)

Method/Analysis Information

Analytical Batch:	1306962, 1306964, 1306762 and 1311156
Prep Batch :	1306961, 1306963 and 1306759
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# 26 and GL-GC-E-107 REV# 8
Analytical Method:	SW846 3005/6010B, SW846 3005/6020 DOE-AL, 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-ICP was performed on a PE 7300 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

All CRDL standard(s) met the referenced advisory control limits.

ICSA/ICSAB Statement

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

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 sample was selected as the quality control (QC) sample for this SDG: 327280002 (CAPU-13-34788).

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 detection 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 that are 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 acceptance criteria of less than 10% difference (%D).

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 instruments. Sample 327172004 required a dilution for tin in order to minimize suppression due to matrix interferences.

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 (DER) was not generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

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

Hardness = 2.497 (Ca) + 4.118 (Mg)

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


Certification Statement

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

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: 02/28/13

Sample Data Summary

GEL LABORATORIES LLC

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

Qualifier Definition Report for

ARSL001 ARS International (63641-10)

Client SDG: 2013-926 GEL Work Order: 327172

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

 02/28/13

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-926**CONTRACT:** ESHL00210**METHOD TYPE:** EPA**SAMPLE ID:** 327172002**BASIS:** As Received**DATE COLLECTED** 05-JUN-13**CLIENT ID:** CAPU-13-34781**LEVEL:** Low**DATE RECEIVED** 07-JUN-13**MATRIX:** Water**%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	06/11/13 11:36	061113W2-9	1306762

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-926

CONTRACT: ESHL00210

METHOD TYPE: SW846

SAMPLE ID: 327172002

BASIS: As Received

DATE COLLECTED 05-JUN-13

CLIENT ID: CAPU-13-34781

LEVEL: Low

DATE RECEIVED 07-JUN-13

MATRIX: Water

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	868	ug/L		68	200	200	1	P	HSC	06/19/13 12:14	061913A-1	1306962
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/20/13 20:51	130620-4	1306964
7440-38-2	Arsenic	4.1	ug/L	J	1.7	5	5	1	MS	BAJ	06/21/13 09:38	130620-7	1306964
7440-39-3	Barium	28.9	ug/L		1	5	5	1	P	HSC	06/19/13 12:14	061913A-1	1306962
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/19/13 12:14	061913A-1	1306962
7440-42-8	Boron	278	ug/L		15	50	50	1	P	HSC	06/19/13 12:14	061913A-1	1306962
7440-43-9	Cadmium	1	ug/L	U	0.11	1	1	1	MS	BAJ	06/20/13 20:51	130620-4	1306964
7440-70-2	Calcium	15700	ug/L		50	200	200	1	P	HSC	06/19/13 12:14	061913A-1	1306962
7440-47-3	Chromium	2.26	ug/L	J	2	10	10	1	MS	BAJ	06/20/13 20:51	130620-4	1306964
7440-48-4	Cobalt	1.06	ug/L	J	1	5	5	1	P	HSC	06/19/13 12:14	061913A-1	1306962
7440-50-8	Copper	7.07	ug/L	J	3	10	10	1	P	HSC	06/19/13 12:14	061913A-1	1306962
7439-89-6	Iron	522	ug/L		30	100	100	1	P	HSC	06/19/13 12:14	061913A-1	1306962
7439-92-1	Lead	0.691	ug/L	J	0.5	2	2	1	MS	BAJ	06/20/13 20:51	130620-4	1306964
7439-95-4	Magnesium	3310	ug/L		110	300	300	1	P	HSC	06/19/13 12:14	061913A-1	1306962
7439-96-5	Manganese	15.4	ug/L		2	10	10	1	P	HSC	06/19/13 12:14	061913A-1	1306962
7439-98-7	Molybdenum	1.43	ug/L		0.165	0.5	0.5	1	MS	BAJ	06/20/13 20:51	130620-4	1306964
7440-02-0	Nickel	5.53	ug/L		0.5	2	2	1	MS	BAJ	06/20/13 20:51	130620-4	1306964
7440-09-7	Potassium	11100	ug/L		50	150	150	1	P	HSC	06/19/13 14:48	061913A-2	1306962
7782-49-2	Selenium	5	ug/L	U	1.5	5	5	1	MS	BAJ	06/21/13 09:38	130620-7	1306964
7631-86-9	Silica	55100	ug/L		53	213	213	1	P	HSC	06/19/13 12:14	061913A-1	1306962
7440-22-4	Silver	1	ug/L	U	0.2	1	1	1	MS	BAJ	06/20/13 20:51	130620-4	1306964
7440-23-5	Sodium	61400	ug/L		100	300	300	1	P	HSC	06/19/13 12:14	061913A-1	1306962
7440-24-6	Strontium	74	ug/L		1	5	5	1	P	HSC	06/19/13 12:14	061913A-1	1306962
7440-28-0	Thallium	2	ug/L	U	0.45	2	2	1	MS	BAJ	06/20/13 20:51	130620-4	1306964
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	06/19/13 14:48	061913A-2	1306962
7440-61-1	Uranium	0.096	ug/L	J	0.067	0.2	0.2	1	MS	BAJ	06/21/13 13:23	130621-8	1306964
7440-62-2	Vanadium	13.1	ug/L		1	5	5	1	P	HSC	06/19/13 12:14	061913A-1	1306962
7440-66-6	Zinc	3.77	ug/L	J	3.3	10	10	1	P	HSC	06/19/13 12:14	061913A-1	1306962

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-926**CONTRACT:** ESHL00210**METHOD TYPE:****SAMPLE ID:** 327172002**BASIS:** As Received**DATE COLLECTED** 05-JUN-13**CLIENT ID:** CAPU-13-34781**LEVEL:** Low**DATE RECEIVED** 07-JUN-13**MATRIX:** Water**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	52.9	mg/L		0.453	1.24	1.24	1		JJ2	06/27/13 16:28		1311156

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1306762	1306759	EPA 245.1/245.2 Prep	20	mL	20	mL	06/10/13	AXS5
1306962	1306961	SW846 3005A	50	mL	50	mL	06/18/13	MTM1
1306964	1306963	SW846 3005A	50	mL	50	mL	06/18/13	MTM1

Analytical Methods:*MS** SW846 3005/6020 DOE-AL**P** SW846 3005/6010B**AV** EPA 245.1/245.2

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-926**CONTRACT:** ESHL00210**METHOD TYPE:** EPA**SAMPLE ID:** 327172004**BASIS:** As Received**DATE COLLECTED** 05-JUN-13**CLIENT ID:** CAPU-13-34786**LEVEL:** Low**DATE RECEIVED** 07-JUN-13**MATRIX:** Water**%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	06/11/13 11:37	061113W2-9	1306762

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-926

CONTRACT: ESHL00210

METHOD TYPE: SW846

SAMPLE ID: 327172004

BASIS: As Received

DATE COLLECTED 05-JUN-13

CLIENT ID: CAPU-13-34786

LEVEL: Low

DATE RECEIVED 07-JUN-13

MATRIX: Water

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	06/19/13 12:17	061913A-1	1306962
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	06/20/13 21:11	130620-4	1306964
7440-38-2	Arsenic	5	ug/L	U	1.7	5	5	1	MS	BAJ	06/21/13 09:42	130620-7	1306964
7440-39-3	Barium	100	ug/L		1	5	5	1	P	HSC	06/19/13 12:17	061913A-1	1306962
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	06/19/13 12:17	061913A-1	1306962
7440-42-8	Boron	101	ug/L		15	50	50	1	P	HSC	06/19/13 12:17	061913A-1	1306962
7440-43-9	Cadmium	1	ug/L	U	0.11	1	1	1	MS	BAJ	06/20/13 21:11	130620-4	1306964
7440-70-2	Calcium	60000	ug/L		50	200	200	1	P	HSC	06/19/13 12:17	061913A-1	1306962
7440-47-3	Chromium	10	ug/L	U	2	10	10	1	MS	BAJ	06/20/13 21:11	130620-4	1306964
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	06/19/13 12:17	061913A-1	1306962
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	06/19/13 12:17	061913A-1	1306962
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	06/19/13 12:17	061913A-1	1306962
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	06/20/13 21:11	130620-4	1306964
7439-95-4	Magnesium	16800	ug/L		110	300	300	1	P	HSC	06/19/13 12:17	061913A-1	1306962
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	06/19/13 12:17	061913A-1	1306962
7439-98-7	Molybdenum	1.13	ug/L		0.165	0.5	0.5	1	MS	BAJ	06/20/13 21:11	130620-4	1306964
7440-02-0	Nickel	9.56	ug/L		0.5	2	2	1	MS	BAJ	06/20/13 21:11	130620-4	1306964
7440-09-7	Potassium	6080	ug/L		50	150	150	1	P	HSC	06/19/13 14:51	061913A-2	1306962
7782-49-2	Selenium	5	ug/L	U	1.5	5	5	1	MS	BAJ	06/21/13 09:42	130620-7	1306964
7631-86-9	Silica	51300	ug/L		53	213	213	1	P	HSC	06/19/13 12:17	061913A-1	1306962
7440-22-4	Silver	1	ug/L	U	0.2	1	1	1	MS	BAJ	06/20/13 21:11	130620-4	1306964
7440-23-5	Sodium	18900	ug/L		100	300	300	1	P	HSC	06/19/13 12:17	061913A-1	1306962
7440-24-6	Strontium	280	ug/L		1	5	5	1	P	HSC	06/19/13 12:17	061913A-1	1306962
7440-28-0	Thallium	2	ug/L	U	0.45	2	2	1	MS	BAJ	06/20/13 21:11	130620-4	1306964
7440-31-5	Tin	50	ug/L	U	12.5	50	50	5	P	HSC	06/20/13 12:13	062013C-3	1306962
7440-61-1	Uranium	8.25	ug/L		0.067	0.2	0.2	1	MS	BAJ	06/21/13 13:26	130621-8	1306964
7440-62-2	Vanadium	3.69	ug/L	J	1	5	5	1	P	HSC	06/19/13 12:17	061913A-1	1306962
7440-66-6	Zinc	7.57	ug/L	J	3.3	10	10	1	P	HSC	06/19/13 12:17	061913A-1	1306962

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-926**CONTRACT:** ESHL00210**METHOD TYPE:****SAMPLE ID:** 327172004**BASIS:** As Received**DATE COLLECTED** 05-JUN-13**CLIENT ID:** CAPU-13-34786**LEVEL:** Low**DATE RECEIVED** 07-JUN-13**MATRIX:** Water**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	219	mg/L		0.453	1.24	1.24	1		JJ2	06/27/13 16:28		1311156

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1306762	1306759	EPA 245.1/245.2 Prep	20	mL	20	mL	06/10/13	AXS5
1306962	1306961	SW846 3005A	50	mL	50	mL	06/18/13	MTM1
1306964	1306963	SW846 3005A	50	mL	50	mL	06/18/13	MTM1

***Analytical Methods:**

MS SW846 3005/6020 DOE-AL
P SW846 3005/6010B
AV EPA 245.1/245.2

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2013-926
Contract: ESHL00210
Matrix: Water

<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>
1202888992	Mercury	0.067	ug/L	+/-0.2	U	AV	0.067	0.2
1202889608	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Strontium	1	ug/L	+/-5	U	P	1	5
	Barium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Iron	30	ug/L	+/-100	U	P	30	100
	Sodium	100	ug/L	+/-300	U	P	100	300
	Silica	53	ug/L	+/-213	U	P	53	213
	Potassium	50	ug/L	+/-150	U	P	50	150
	Manganese	2	ug/L	+/-10	U	P	2	10
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Copper	3	ug/L	+/-10	U	P	3	10
	Calcium	50	ug/L	+/-200	U	P	50	200
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Aluminum	68	ug/L	+/-200	U	P	68	200
1202889613	Antimony	1	ug/L	+/-3	U	MS	1	3
	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	0.173	ug/L	+/-0.5	J	MS	0.165	0.5
	Nickel	0.602	ug/L	+/-2	J	MS	0.5	2
	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

***Analytical Methods:**

MS SW846 3005/6020 DOE-AL
P SW846 3005/6010B
AV EPA 245.1/245.2

METALS

-5a-

Matrix Spike Summary

SDG NO. 2013-926 **Client ID:** CAPU-13-34788S**Contract:** ESHL00210 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 327280002 **Spike ID:** 1202888995

<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		0.067	U	2	100		AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-5a-

Matrix Spike Summary

SDG NO. 2013-926 Client ID: CAPU-13-34788S

Contract: ESHL00210 Level: Low

Matrix: WATER % Solids:

Sample ID: 327280002 Spike ID: 1202889611

<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	4900		68	U	5000	97.3		P
Barium	ug/L	75-125	554		62.4		500	98.2		P
Beryllium	ug/L	75-125	499		1	U	500	99.9		P
Boron	ug/L	75-125	653		157		500	99.3		P
Calcium	ug/L		42900		37200		5000	115	N/A	P
Cobalt	ug/L	75-125	476		1	U	500	95.2		P
Copper	ug/L	75-125	516		5.54	J	500	102		P
Iron	ug/L	75-125	5020		30	U	5000	99.8		P
Magnesium	ug/L	75-125	12000		6830		5000	102		P
Manganese	ug/L	75-125	486		4.03	J	500	96.3		P
Potassium	ug/L	75-125	7060		2170		5000	97.9		P
Silica	ug/L		81700		69400		10700	114	N/A	P
Sodium	ug/L		28100		22500		5000	112	N/A	P
Strontium	ug/L	75-125	694		196		500	99.5		P
Tin	ug/L	75-125	509		2.5	U	500	102		P
Vanadium	ug/L	75-125	505		1.41	J	500	101		P
Zinc	ug/L	75-125	492		3.42	J	500	97.8		P

*Analytical Methods:

P SW846 3005/6010B

METALS

-5a-

Matrix Spike Summary

SDG NO. 2013-926 **Client ID:** CAPU-13-34788S

Contract: ESHL00210 **Level:** Low

Matrix: WATER **% Solids:**

Sample ID: 327280002 **Spike ID:** 1202889616

<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	57.3		1	U	50	114		MS
Arsenic	ug/L	75-125	51.8		1.7	U	50	102		MS
Cadmium	ug/L	75-125	56.4		0.11	U	50	113		MS
Chromium	ug/L	75-125	57.8		3.23	J	50	109		MS
Lead	ug/L	75-125	55.6		0.5	U	50	111		MS
Molybdenum	ug/L	75-125	59.6		1.09		50	117		MS
Nickel	ug/L	75-125	70.5		20.1		50	101		MS
Selenium	ug/L	75-125	54.4		1.5	U	50	109		MS
Silver	ug/L	75-125	57.6		0.2	U	50	115		MS
Thallium	ug/L	75-125	53.4		0.45	U	50	107		MS
Uranium	ug/L	75-125	46.5		0.261		50	92.4		MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

Metals
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Duplicate Sample Summary

SDG No.: 2013–926**Lab Code:** GEL**Contract:** ESHL00210**Client ID:** CAPU–13–34788D**Matrix:** LIQUID**Level:** Low**Sample ID:** 327280002**Duplicate ID:** 1202888994**Percent Solids for Dup:** N/A

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

***Analytical Methods:**

AV EPA 245.1/245.2

Metals
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Duplicate Sample Summary

SDG No.: 2013-926

Lab Code: GEL

Contract: ESHL00210

Client ID: CAPU-13-34788D

Matrix: LIQUID

Level: Low

Sample ID: 327280002

Duplicate ID: 1202889610

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	+/-20%	62.4		64.8		3.76		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	157		161		2.66		P
Calcium	ug/L	+/-20%	37200		38600		3.69		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L	+/-10	5.54 J		6.49 J		15.8		P
Iron	ug/L		30 U		34.4 J		200		P
Magnesium	ug/L	+/-20%	6830		7070		3.33		P
Manganese	ug/L	+/-10	4.03 J		4.16 J		3.24		P
Potassium	ug/L	+/-20%	2170		2170		.276		P
Silica	ug/L	+/-20%	69400		72000		3.67		P
Sodium	ug/L	+/-20%	22500		23100		2.83		P
Strontium	ug/L	+/-20%	196		204		3.93		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	1.41 J		2.24 J		45.2		P
Zinc	ug/L	+/-10	3.42 J		3.61 J		5.15		P

*Analytical Methods:

P SW846 3005/6010B

Metals
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Duplicate Sample Summary

SDG No.: 2013–926

Lab Code: GEL

Contract: ESHL00210

Client ID: CAPU–13–34788D

Matrix: LIQUID

Level: Low

Sample ID: 327280002

Duplicate ID: 1202889615

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		3.23 J		2 U		200		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	1.09		0.968		11.9		MS
Nickel	ug/L	+/-20%	20.1		19.8		1.29		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	0.261		0.265		1.52		MS

*Analytical Methods:

MS SW846 3005/6020 DOE–AL

METALS

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Laboratory Control Sample Summary

SDG NO. 2013-926

Contract: ESHL00210

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>
1202888993	Mercury	ug/L	2	2.05		103	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Laboratory Control Sample Summary

SDG NO. 2013-926

Contract: ESHL00210

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>
1202889609								
	Strontium	ug/L	500	509		102	80-120	P
	Tin	ug/L	500	511		102	80-120	P
	Vanadium	ug/L	500	507		101	80-120	P
	Zinc	ug/L	500	495		99	80-120	P
	Aluminum	ug/L	5000	5020		100	80-120	P
	Barium	ug/L	500	499		99.8	80-120	P
	Beryllium	ug/L	500	499		99.7	80-120	P
	Boron	ug/L	500	490		98	80-120	P
	Calcium	ug/L	5000	5100		102	80-120	P
	Cobalt	ug/L	500	501		100	80-120	P
	Copper	ug/L	500	510		102	80-120	P
	Iron	ug/L	5000	5080		102	80-120	P
	Magnesium	ug/L	5000	5220		104	80-120	P
	Manganese	ug/L	500	500		100	80-120	P
	Potassium	ug/L	5000	5030		101	80-120	P
	Silica	ug/L	10700	10700		99.5	80-120	P
	Sodium	ug/L	5000	5140		103	80-120	P

*Analytical Methods:

P SW846 3005/6010B

METALS

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Laboratory Control Sample Summary

SDG NO. 2013-926

Contract: ESHL00210

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>
1202889614								
	Antimony	ug/L	50	52.3		105	80-120	MS
	Arsenic	ug/L	50	49		98	80-120	MS
	Cadmium	ug/L	50	52.6		105	80-120	MS
	Chromium	ug/L	50	51.1		102	80-120	MS
	Lead	ug/L	50	51.4		103	80-120	MS
	Molybdenum	ug/L	50	49.2		98.3	80-120	MS
	Nickel	ug/L	50	55.6		111	80-120	MS
	Selenium	ug/L	50	54		108	80-120	MS
	Silver	ug/L	50	55.1		110	80-120	MS
	Thallium	ug/L	50	48.3		96.6	80-120	MS
	Uranium	ug/L	50	50.9		102	80-120	MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

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Serial Dilution Sample Summary

SDG NO. 2013-926 **Client ID:** CAPU-13-34788L**Contract:** ESHL00210**Matrix:** LIQUID **Level:** Low**Sample ID:** 327280002 **Serial Dilution ID:** 1202888996

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

*Analytical Methods:

AV EPA 245.1/245.2

METALS

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Serial Dilution Sample Summary

SDG NO. 2013-926

Client ID: CAPU-13-34788L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 327280002

Serial Dilution ID: 1202889612

<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	62.4		63.7		1.97		10	P
Beryllium	1	U	5	U				P
Boron	157		150	J	4.1			P
Calcium	37200		37100		.33		10	P
Cobalt	1	U	5	U				P
Copper	5.54	J	15	U	100			P
Iron	30	U	150	U				P
Magnesium	6830		6950		1.68		10	P
Manganese	4.03	J	10	U	100			P
Potassium	2170		2380		9.93			P
Silica	69400		68300		1.7		10	P
Sodium	22500		22900		1.95		10	P
Strontium	196		197		.382		10	P
Tin	2.5	U	12.5	U				P
Vanadium	1.41	J	5.94	J	320			P
Zinc	3.42	J	16.5	U	100			P

*Analytical Methods:

P SW846 3005/6010B

METALS

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Serial Dilution Sample Summary

SDG NO. 2013-926

Client ID: CAPU-13-34788L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 327280002

Serial Dilution ID: 1202889617

<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	3.23	J	10	U	100			MS
Lead	.5	U	2.5	U				MS
Molybdenum	1.09		1.18	J	7.8			MS
Nickel	20.1		20.8		3.73			MS
Selenium	1.5	U	7.5	U				MS
Silver	.2	U	1	U				MS
Thallium	.45	U	2.26	J				MS
Uranium	.261		.45	J	72.4			MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

General Chem Analysis

Case Narrative

**General Chemistry Narrative
ARS International (ARSL)
SDG 2013-926**

Method/Analysis Information

Product: Carbon, Total Organic

Analytical Batch: 1307044

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
327172001	CAPU-13-34773
327172003	CAPU-13-34778
1202889800	Method Blank (MB)
1202889801	326938001(CAPU-13-34774) Sample Duplicate (DUP)
1202889803	326938001(CAPU-13-34774) Post Spike (PS)
1202889805	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: 326938001 (CAPU-13-34774).

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 following sample in this sample group was diluted due to matrix interference: 327172001 (CAPU-13-34773).

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

A 15 mg/L Total Inorganic Carbon check standard is analyzed with each analytical run to prove that the instrument is effectively sparging away the inorganic carbon.

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: 1306822

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
327172002	CAPU-13-34781
327172004	CAPU-13-34786
1202889242	Laboratory Control Sample (LCS)
1202889244	327172002(CAPU-13-34781) 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: 327172002 (CAPU-13-34781).

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: pH

Analytical Batch: 1308135 **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
327172002	CAPU-13-34781
327172004	CAPU-13-34786
1202892559	Laboratory Control Sample (LCS)
1202892561	327623002(CAPU-13-34783) 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 PerpHect pH Meter Orion 370.

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: 327623002 (CAPU-13-34783).

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 samples from this sample group were received by the lab outside of the method specified holding time: 327172002 (CAPU-13-34781) and 327172004 (CAPU-13-34786).

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: 1194703 327172002 (CAPU-13-34781) and 327172004 (CAPU-13-34786).

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: 1306689

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
327172002	CAPU-13-34781
327172004	CAPU-13-34786
1202888802	Method Blank (MB)
1202888803	327024002(CALA-13-33434) Sample Duplicate (DUP)
1202888804	327024002(CALA-13-33434) Post Spike (PS)
1202888805	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-086 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 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 sample was selected for QC analysis: 327024002 (CALA-13-33434).

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 values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1202888803 (CALA-13-33434).

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: 327172002 (CAPU-13-34781) and 327172004 (CAPU-13-34786).

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: 1202888803 (CALA-13-33434), 1202888804 (CALA-13-33434) and 327172002 (CAPU-13-34781).

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: 1308128 **Method:** EPA 350.1 Nitrogen and Ammonia L

Prep Batch : 1308126 **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
327172002	CAPU-13-34781
327172004	CAPU-13-34786
1202892527	Method Blank (MB)
1202892528	327172002(CAPU-13-34781) Sample Duplicate (DUP)
1202892530	327172002(CAPU-13-34781) Matrix Spike (MS)
1202892532	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-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: 327172002 (CAPU-13-34781).

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. 1202892528 (CAPU-13-34781).

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:	1308288	Method:	Nitrogen and Total Kjeldahl (TKN)
Prep Batch :	1308287	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
327172001	CAPU-13-34773
327172003	CAPU-13-34778
1202892933	Method Blank (MB)
1202892934	327172001(CAPU-13-34773) Sample Duplicate (DUP)
1202892935	327172003(CAPU-13-34778) Sample Duplicate (DUP)
1202892936	327172001(CAPU-13-34773) Matrix Spike (MS)
1202892937	327172003(CAPU-13-34778) Matrix Spike (MS)
1202892938	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-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 samples were selected for QC analysis: 327172001 (CAPU-13-34773) and 327172003 (CAPU-13-34778).

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 Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample: 1202892934 (CAPU-13-34773). The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1202892935 (CAPU-13-34778).

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**

The following DER was generated for this SDG: 1197089 1202892934 (CAPU-13-34773).

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:	1308114	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
327172002	CAPU-13-34781
327172004	CAPU-13-34786
1202892480	Method Blank (MB)
1202892482	327172002(CAPU-13-34781) Sample Duplicate (DUP)
1202892485	327172002(CAPU-13-34781) Post Spike (PS)
1202892487	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: 327172002 (CAPU-13-34781).

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 following samples in this sample group were diluted due to high concentration: 1202892482 (CAPU-13-34781), 1202892485 (CAPU-13-34781), 327172002 (CAPU-13-34781) and 327172004 (CAPU-13-34786).

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:	1307629	Method:	EPA 365.4 Phosphorus and Total in
Prep Batch :	1307628	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
327172002	CAPU-13-34781
327172004	CAPU-13-34786
1202891260	Method Blank (MB)
1202891261	327172002(CAPU-13-34781) Sample Duplicate (DUP)
1202891263	327172002(CAPU-13-34781) Matrix Spike (MS)
1202891265	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-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: 327172002 (CAPU-13-34781).

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 following sample was re-analyzed due to instrument failure: 1202891265 (LCS).

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, Total Dissolved

Analytical Batch: 1306714

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
327172002	CAPU-13-34781
327172004	CAPU-13-34786
1202888872	Method Blank (MB)
1202888873	327172002(CAPU-13-34781) Sample Duplicate (DUP)
1202888875	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# 13.

Preparation/Analytical Method Verification

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

Calibration Information

The 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: 327172002 (CAPU-13-34781).

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: 1307658 **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
327172002	CAPU-13-34781
327172004	CAPU-13-34786
1202891327	Method Blank (MB)
1202891328	Laboratory Control Sample (LCS)
1202891329	327279002(CALA-13-33429) Sample Duplicate (DUP)
1202891330	327279002(CALA-13-33429) 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# 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 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: 327279002 (CALA-13-33429).

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

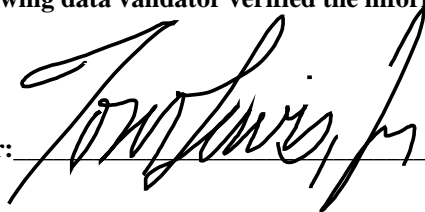
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

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:

03July13

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis Report for

ARSL001 ARS International (63641-10)

Client SDG: 2013-926 GEL Work Order: 327172

The Qualifiers in this report are defined as follows:

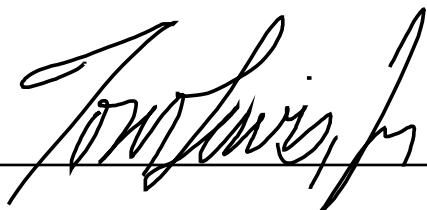
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- ** Analyte is a surrogate compound
- H Analytical holding time was exceeded
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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: June 29, 2013

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

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

Client SDG: 2013-926

Client Sample ID: CAPU-13-34773

Sample ID: 327172001

Matrix: Water

Collect Date: 05-JUN-13 11:15

Receive Date: 07-JUN-13

Collector: Client

Project: ESHL00210

Client ID: ARSL001

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		4.83	0.660	2.00	mg/L	2	TSM	06/14/13	1907	1307044	1
Nutrient Analysis											
Nitrogen, Total Kjeldahl (TKN) "As Received"											
Nitrogen, Total Kjeldahl		0.476	0.033	0.100	mg/L	1	KLP1	06/25/13	1103	1308288	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	06/24/13	1600	1308287

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060	
2	EPA 351.2	

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: June 29, 2013

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

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

Client SDG: 2013-926

Client Sample ID: CAPU-13-34781
Sample ID: 327172002
Matrix: Water
Collect Date: 05-JUN-13 11:15
Receive Date: 07-JUN-13
Collector: Client

Project: ESHL00210
Client ID: ARSL001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Conductivity Analysis											
EPA120.1 Specific Conductivity "As Received"											
Conductivity		447	1.00	1.00	umhos/cm	1	LXA1	06/11/13	1122	1306822	1
Electrode Analysis											
EPA 150.1 pH "As Received"											
pH at Temp 12.6C	H	7.08	0.010	0.100	SU	1	LXA1	06/14/13	1152	1308135	2
Ion Chromatography											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	J	0.136	0.067	0.200	mg/L	1	MAR1	06/18/13	0322	1306689	3
Fluoride		0.426	0.033	0.100	mg/L	1					
Chloride		54.5	0.670	2.00	mg/L	10	MAR1	06/18/13	1029	1306689	4
Sulfate		47.5	1.33	4.00	mg/L	10					
Nutrient Analysis											
EPA 350.1 Nitrogen, Ammonia L "As Received"											
Nitrogen, Ammonia		0.137	0.017	0.050	mg/L	1	KLP1	06/19/13	1315	1308128	5
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"											
Nitrogen, Nitrate/Nitrite		2.54	0.085	0.250	mg/L	5	KLP1	06/24/13	1113	1308114	6
EPA 365.4 Phosphorus, Total in "As Received"											
Phosphorus, Total as P		2.26	0.017	0.050	mg/L	1	KLP1	06/17/13	1541	1307629	7
Solids Analysis											
EPA 160.1 Solids, Dissolved-F "As Received"											
Total Dissolved Solids		304	3.40	14.3	mg/L		LYG1	06/10/13	0820	1306714	8
Titration Analysis											
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		58.1	0.725	1.00	mg/L		LXA1	06/13/13	1136	1307658	9
Carbonate alkalinity (CaCO3)	U	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	06/19/13	1230	1308126
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	06/14/13	1600	1307628

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 29, 2013

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 2013-926

Client Sample ID: CAPU-13-34781
Sample ID: 327172002

Project: ESHL00210
Client ID: ARSL001

The following Analytical Methods were performed:

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

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 29, 2013

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

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

Client SDG: 2013-926

Client Sample ID: CAPU-13-34778
Sample ID: 327172003
Matrix: Water
Collect Date: 05-JUN-13 11:12
Receive Date: 07-JUN-13
Collector: Client

Project: ESHL00210
Client ID: ARSL001

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		1.26	0.330	1.00	mg/L	1	TSM	06/14/13	1941	1307044	1
Nutrient Analysis											
Nitrogen, Total Kjeldahl (TKN) "As Received"											
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1	KLP1	06/25/13	1106	1308288	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 351.2 Prep	EPA 351.2 Total Kjeldahl Nitrogen Prep	KLP1	06/24/13	1600	1308287

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060	
2	EPA 351.2	

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: June 29, 2013

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

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

Client SDG: 2013-926

Client Sample ID: CAPU-13-34786
Sample ID: 327172004
Matrix: Water
Collect Date: 05-JUN-13 11:12
Receive Date: 07-JUN-13
Collector: Client

Project: ESHL00210
Client ID: ARSL001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Conductivity Analysis											
EPA120.1 Specific Conductivity "As Received"											
Conductivity		542	1.00	1.00	umhos/cm	1	LXA1	06/11/13	1122	1306822	1
Electrode Analysis											
EPA 150.1 pH "As Received"											
pH at Temp 11.2C	H	7.82	0.010	0.100	SU	1	LXA1	06/14/13	1200	1308135	2
Ion Chromatography											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	J	0.148	0.067	0.200	mg/L	1	MAR1	06/18/13	0352	1306689	3
Fluoride		0.351	0.033	0.100	mg/L	1					
Chloride		44.1	0.670	2.00	mg/L	10	MAR1	06/18/13	1059	1306689	4
Sulfate		28.2	1.33	4.00	mg/L	10					
Nutrient Analysis											
EPA 350.1 Nitrogen, Ammonia L "As Received"											
Nitrogen, Ammonia		0.0876	0.017	0.050	mg/L	1	KLP1	06/19/13	1318	1308128	5
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"											
Nitrogen, Nitrate/Nitrite		4.35	0.085	0.250	mg/L	5	KLP1	06/24/13	1121	1308114	6
EPA 365.4 Phosphorus, Total in "As Received"											
Phosphorus, Total as P		0.0982	0.017	0.050	mg/L	1	KLP1	06/17/13	1543	1307629	7
Solids Analysis											
EPA 160.1 Solids, Dissolved-F "As Received"											
Total Dissolved Solids		329	3.40	14.3	mg/L		LYG1	06/10/13	0820	1306714	8
Titration Analysis											
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		158	0.725	1.00	mg/L		LXA1	06/13/13	1150	1307658	9
Carbonate alkalinity (CaCO3)	U	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	06/19/13	1230	1308126
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	06/14/13	1600	1307628

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Certificate of Analysis

Report Date: June 29, 2013

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 2013-926

Client Sample ID: CAPU-13-34786
Sample ID: 327172004

Project: ESHL00210
Client ID: ARSL001

The following Analytical Methods were performed:

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

Notes:

Quality Control Summary

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QC Summary

Report Date: June 29, 2013

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Los Alamos National Laboratory
PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico

Contact: Mr. Keith Greene

Workorder: 327172

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1307044										
QC1202889801	326938001	DUP									
Total Organic Carbon Average		1.64		1.57	mg/L	4.37	^	(+/-1.00)	TSM	06/14/13	16:06
QC1202889805	LCS										
Total Organic Carbon Average	10.0			10.1	mg/L			(85%-115%)		06/14/13	13:56
QC1202889800	MB										
Total Organic Carbon Average			U	ND	mg/L					06/14/13	13:47
QC1202889803	326938001	PS									
Total Organic Carbon Average	10.0	1.64		11.6	mg/L			(65%-120%)		06/14/13	16:26
Conductivity Analysis											
Batch	1306822										
QC1202889244	327172002	DUP									
Conductivity		447		451	umhos/cm	0.891		(0%-10%)	LXA1	06/11/13	11:22
QC1202889242	LCS										
Conductivity	1410			1440	umhos/cm			(95%-105%)		06/11/13	11:08
Electrode Analysis											
Batch	1308135										
QC1202892561	327623002	DUP									
pH		H	7.63	H	7.61	SU	0.262	(0%-10%)	LXA1	06/14/13	15:19
QC1202892559	LCS										
pH	7.00			7.00	SU			(99%-101%)		06/14/13	11:50
Ion Chromatography											
Batch	1306689										
QC1202888803	327024002	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MAR1	06/17/13	23:52
Chloride			3.52		3.57	mg/L	1.24	(0%-20%)			
Fluoride			0.299		0.306	mg/L	2.18	^	(+/-0.100)		
Sulfate			3.47		3.45	mg/L	0.468	(0%-20%)			
QC1202888805	LCS										
Bromide	1.25			1.26	mg/L			(90%-110%)		06/17/13	21:53

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QC Summary

Workorder: 327172

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1306689										
Chloride	5.00			4.77	mg/L		95.3	(90%-110%)	MAR1	06/17/13	21:53
Fluoride	2.50			2.50	mg/L		100	(90%-110%)			
Sulfate	10.0			9.97	mg/L		99.7	(90%-110%)			
QC1202888802	MB										
Bromide			U	ND	mg/L					06/17/13	21:23
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1202888804	327024002 PS										
Bromide	1.25	U	ND	1.38	mg/L		106	(90%-110%)		06/18/13	00:22
Chloride	5.00		3.52	8.83	mg/L		106	(90%-110%)			
Fluoride	2.50		0.299	2.93	mg/L		105	(90%-110%)			
Sulfate	10.0		3.47	13.9	mg/L		105	(90%-110%)			
Nutrient Analysis											
Batch	1307629										
QC1202891261	327172002 DUP										
Phosphorus, Total as P			2.26	2.07	mg/L	8.78		(0%-31%)	KLP1	06/17/13	15:42
QC1202891265	LCS										
Phosphorus, Total as P	1.00			1.07	mg/L		107	(76%-120%)		06/17/13	15:51
QC1202891260	MB										
Phosphorus, Total as P			J	0.0384	mg/L					06/17/13	15:39
QC1202891263	327172002 MS										
Phosphorus, Total as P	1.00		2.26	3.25	mg/L		99	(62%-139%)		06/17/13	15:42
Batch	1308114										
QC1202892482	327172002 DUP										
Nitrogen, Nitrate/Nitrite			2.54	2.47	mg/L	2.79		(0%-20%)	KLP1	06/24/13	11:14
QC1202892487	LCS										
Nitrogen, Nitrate/Nitrite	1.00			1.03	mg/L		103	(90%-110%)		06/24/13	11:04

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QC Summary

Workorder: 327172

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1308114										
QC1202892480 MB											
Nitrogen, Nitrate/Nitrite			U	ND	mg/L				KLP1	06/24/13	11:03
QC1202892485 327172002 PS											
Nitrogen, Nitrate/Nitrite	1.00	0.508		1.52	mg/L		101	(90%-110%)		06/24/13	11:20
Batch	1308128										
QC1202892528 327172002 DUP											
Nitrogen, Ammonia		0.137		0.090	mg/L	41.4 ^		(+/-0.050)	KLP1	06/19/13	13:16
QC1202892532 LCS											
Nitrogen, Ammonia	1.00			1.01	mg/L		101	(90%-110%)		06/19/13	13:14
QC1202892527 MB											
Nitrogen, Ammonia			J	0.0223	mg/L					06/19/13	13:14
QC1202892530 327172002 MS											
Nitrogen, Ammonia	1.00	0.137		1.22	mg/L		108	(90%-110%)		06/19/13	13:17
Batch	1308288										
QC1202892934 327172001 DUP											
Nitrogen, Total Kjeldahl		0.476		0.282	mg/L	51.2* ^		(+/-0.100)	KLP1	06/25/13	11:04
QC1202892935 327172003 DUP											
Nitrogen, Total Kjeldahl		U	ND	J	0.0413	mg/L	N/A			06/25/13	11:07
QC1202892938 LCS											
Nitrogen, Total Kjeldahl	1.00			1.07	mg/L		107	(90%-110%)		06/25/13	11:02
QC1202892933 MB											
Nitrogen, Total Kjeldahl			U	ND	mg/L					06/25/13	11:02
QC1202892936 327172001 MS											
Nitrogen, Total Kjeldahl	1.00	0.476		1.38	mg/L		90.4	(90%-110%)		06/25/13	11:05
QC1202892937 327172003 MS											
Nitrogen, Total Kjeldahl	1.00	U	ND	1.00	mg/L		100	(90%-110%)		06/25/13	11:07
Solids Analysis											
Batch	1306714										
QC1202888873 327172002 DUP											
Total Dissolved Solids		304		309	mg/L	1.40		(0%-10%)	LYG1	06/10/13	08:20
QC1202888875 LCS											
Total Dissolved Solids	300			286	mg/L		95.2	(95%-105%)		06/10/13	08:20

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QC Summary

Workorder: 327172

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Solids Analysis											
Batch	1306714										
QC1202888872 MB											
Total Dissolved Solids			J	7.14	mg/L				LYG1	06/10/13	08:20
Titration Analysis											
Batch	1307658										
QC1202891329 327279002 DUP											
Alkalinity, Total as CaCO3		130		133	mg/L	1.59		(0%-20%)	LXA1	06/13/13	15:01
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1202891328 LCS											
Alkalinity, Total as CaCO3	50.0			52.4	mg/L		105	(90%-110%)		06/13/13	11:01
QC1202891327 MB											
Alkalinity, Total as CaCO3			U	ND	mg/L					06/13/13	11:00
Carbonate alkalinity (CaCO3)			U	ND	mg/L						
QC1202891330 327279002 MS											
Alkalinity, Total as CaCO3	50.0	130		182	mg/L		103	(80%-120%)		06/13/13	15:11

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

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QC Summary

Workorder: 327172

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

Originator's Name:		Data Validator/Group Leader:	
Lindsey Jensen	14-JUN-13	Jamie Johnson	26-JUN-13

DATA EXCEPTION REPORT			
Mo.Day Yr. 25-JUN-13	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: LACHAT Flow Injection Analyzer	Test / Method: EPA 351.2, EPA 351.2 SC	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1308288	Sample Numbers: See below.		
Potentially affected work order(s)(SDG): 327172(2013-926),327279(2013-934),327280(2013-935),327394,327396(2013-940),327527(2013-947),327622(2013-951),327623(2013-952),327635,327704(2013-956),327705(2013-957),327706(2013-958),327707(2013-959) Application Issues: Failed RPD for DUP			
Specification and Requirements Exception Description:		DER Disposition:	
1. Failed RPD for DUP: QC 1202892934DUP		1. The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample.	

Originator's Name:
Kristen Parson 25-JUN-13

Data Validator/Group Leader:
Julia Hamilton 25-JUN-13

Radiological Analysis

**Radiochemistry Case Narrative
ARS International (ARSL)
SDG 2013-926
Work Order 327172**

Method/Analysis Information

Product: Alphaspec Am241 Liquid
Analytical Method: DOE EML HASL-300, Am-05-RC Modified
Analytical Batch Number: 1306186

Sample ID	Client ID
327172001	CAPU-13-34773
327172003	CAPU-13-34778
1202887498	Method Blank (MB)
1202887499	327025001(CAPU-13-34776) Sample Duplicate (DUP)
1202887500	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 1202887498 (MB) and 1202887500 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 327025001 (CAPU-13-34776). The QC was from ARSL work order 327025.

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.

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.

Additional Comments

The MDCs 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:	1306187

Sample ID	Client ID
327172003	CAPU-13-34778
1202887501	Method Blank (MB)
1202887502	327025001(CAPU-13-34776) Sample Duplicate (DUP)
1202887503	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 1202887501 (MB) and 1202887503 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 327025001 (CAPU-13-34776). The QC was from ARSL work order 327025.

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.

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.

Additional Comments

The MDCs 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: 1306189

Sample ID	Client ID
327172001	CAPU-13-34773
327172003	CAPU-13-34778
1202887504	Method Blank (MB)
1202887505	327025001(CAPU-13-34776) Sample Duplicate (DUP)
1202887506	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 1202887504 (MB) and 1202887506 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 327025001 (CAPU-13-34776). The QC was from ARSL work order 327025.

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

Sample 327172001 (CAPU-13-34773) was recounted due to a peak shift. 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.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

The MDCs 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:	1308641

Sample ID	Client ID
327172001	CAPU-13-34773
1202893967	Method Blank (MB)
1202893968	327172001(CAPU-13-34773) Sample Duplicate (DUP)
1202893969	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

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 1202893967 (MB) and 1202893969 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 327172001 (CAPU-13-34773). The QC was from ARSL work order 327172.

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

Sample 327172001 (CAPU-13-34773) was reprepared to verify activity. The re-analysis verified the original prep and 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.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

The MDCs are calculated using a blank population.

Blank Decision Level

The blank result is less than the decision level.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: **GammaSpec**

Analytical Method: EPA 901.1

Analytical Batch Number: 1306868

Sample ID	Client ID
327172001	CAPU-13-34773
327172003	CAPU-13-34778
1202889385	Method Blank (MB)
1202889386	327280001(CAPU-13-34780) Sample Duplicate (DUP)
1202889387	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 2012, May 2013 and June 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: 327280001 (CAPU-13-34780). The QC was from ARSL work order 327280.

QC Information

All of the QC samples met the required acceptance limits.

CSU

The blank (1202889385 (MB)) results for Be-7, Cs-137 and I-131 are 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.

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.

Additional Comments

Additional comments were not required for this sample set.

Blank Decision Level

The blank (1202889385 (MB)) results for Be-7 and Cs-137 are greater than the decision level but less than the MDC.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Sr90, liquid

Analytical Method: EPA 905.0 Modified

Analytical Batch Number: 1306838

Sample ID	Client ID
327172001	CAPU-13-34773
1202889287	Method Blank (MB)
1202889288	327024006(CALA-13-33411) Sample Duplicate (DUP)
1202889289	327024006(CALA-13-33411) Matrix Spike (MS)
1202889290	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

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 1202889287 (MB) and 1202889290 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 327024006 (CALA-13-33411). The QC was from ARSL work order 327024.

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.

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.

Additional Comments

The matrix spike, 1202889289 (CALA-13-33411), aliquot was reduced to conserve sample volume.

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: 1307879

Sample ID	Client ID
327172003	CAPU-13-34778
1202891916	Method Blank (MB)
1202891917	327527001(CALA-13-33427) Sample Duplicate (DUP)
1202891918	327527001(CALA-13-33427) Matrix Spike (MS)
1202891919	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# 16.

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 1202891916 (MB) and 1202891919 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 327527001 (CALA-13-33427). The QC was from ARSL work order 327527.

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.

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.

Additional Comments

The matrix spike, 1202891918 (CALA-13-33427), aliquot was reduced to conserve sample volume.

Blank Decision Level

The blank result is less than the decision level.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	WSP-GrossA/B
Analytical Method:	EPA 900.0/SW846 9310
Analytical Batch Number:	1308529

Sample ID	Client ID
327172003	CAPU-13-34778
1202893584	Method Blank (MB)
1202893585	327623001(CAPU-13-34775) Sample Duplicate (DUP)
1202893586	327623001(CAPU-13-34775) Matrix Spike (MS)
1202893587	327623001(CAPU-13-34775) Matrix Spike Duplicate (MSD)
1202893588	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 December 2012.

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 1202893584 (MB) and 1202893588 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 327623001 (CAPU-13-34775). The QC was from ARSL work order 327623.

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

Sample 1202893586 (CAPU-13-34775) was recounted due to high recovery. The recount is reported. Sample 1202893585 (CAPU-13-34775) was recounted due to high relative percent difference/relative error ratio. The recount is reported.

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.

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.

Additional Comments

The matrix spike and matrix spike duplicate, 1202893586 (CAPU-13-34775) and 1202893587 (CAPU-13-34775), 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.

Method/Analysis Information

Product: WSP-GrossA/B

Analytical Method: EPA 900.0/SW846 9310

Analytical Batch Number: 1308555

Sample ID	Client ID
327172001	CAPU-13-34773
1202893667	Method Blank (MB)
1202893668	327707003(Buckman08-12-34754) Sample Duplicate (DUP)
1202893669	327707003(Buckman08-12-34754) Matrix Spike (MS)
1202893670	327707003(Buckman08-12-34754) Matrix Spike Duplicate (MSD)
1202893671	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 December 2012.

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 1202893667 (MB) and 1202893671 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 327707003 (Buckman08-12-34754). The QC was from ARSL work order 327707.

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The matrix spike and matrix spike duplicate, 1202893669 (Buckman08-12-34754) and 1202893670 (Buckman08-12-34754), do not meet the alpha relative percent difference requirement; however, they do meet the recovery requirement.

CSU

The blank, 1202893667 (MB), alpha 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.

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.

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.

Additional Comments

The matrix spike and matrix spike duplicate, 1202893669 (Buckman08-12-34754) and 1202893670 (Buckman08-12-34754), aliquots were reduced to conserve sample volume.

Blank Decision Level

The blank, 1202893667 (MB), alpha result is greater than the decision level but less than the MDC.

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

ARSL001 ARS International (63641-10)

Client SDG: 2013-926 GEL Work Order: 327172

The Qualifiers in this report are defined as follows:

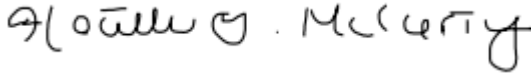
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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: Heather McCarty

Date: 28 JUN 2013

Title: Analyst II

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545
Contact: Mr. Keith Greene
Project: LANL-WQH Water Samples

Report Date: June 28, 2013

Client Sample ID: CAPU-13-34773
Sample ID: 327172001
Matrix: Water
Collect Date: 05-JUN-13
Receive Date: 07-JUN-13
Collector: Client
Project: ESHL00210
Client ID: ARSL001

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	0.0253	+/-0.00891	0.035	0.0144	+/-0.00897	0.050	pCi/L		HAKB	06/13/13	1012	1306186	1
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Alphaspec Pu, Liquid "As Received"

Plutonium-238	U	0.00286	+/-0.00639	0.0267	0.0095	+/-0.00639	0.050	pCi/L		HAKB	06/20/13	1248	1308641	2
Plutonium-239/240		0.346	+/-0.0317	0.0563	0.0243	+/-0.0352	0.050	pCi/L						

Alphaspec U, Liquid "As Received"

Uranium-234		0.0867	+/-0.0188	0.0615	0.0269	+/-0.0196	1.00	pCi/L		HAKB	06/14/13	1549	1306189	3
Uranium-235/236	U	0.00346	+/-0.0115	0.0478	0.0192	+/-0.0115	1.00	pCi/L						
Uranium-238		0.0699	+/-0.0145	0.0392	0.0158	+/-0.0152	0.500	pCi/L						

Rad Gamma Spec Analysis

Gammasesc "As Received"

Cesium-137	U	-2.36	+/-1.74	6.00	2.74	+/-1.82	8.00	pCi/L		MXR1	06/13/13	1026	1306868	4
Cobalt-60	U	-0.282	+/-1.19	4.52	1.88	+/-1.20	8.00	pCi/L						
Neptunium-237	U	3.81	+/-2.96	11.1	5.22	+/-3.09	10.0	pCi/L						
Potassium-40	U	32.5	+/-18.2	40.6	16.5	+/-18.2	10.0	pCi/L						
Sodium-22	U	-1.51	+/-1.32	4.49	1.88	+/-1.37	10.0	pCi/L						

Rad Gas Flow Proportional Counting

GFPC, Sr90, liquid "As Received"

Strontium-90	U	0.457	+/-0.157	0.484	0.220	+/-0.161	0.500	pCi/L		JXR1	06/23/13	1252	1306838	5
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WSP-GrossA/B "As Received"

Beta		14.9	+/-1.25	2.87	1.35	+/-1.78	3.00	pCi/L		DYT1	06/25/13	1444	1308555	6
Alpha	U	2.05	+/-0.903	2.50	0.854	+/-0.921	3.00	pCi/L		DYT1	06/26/13	1731	1308555	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"	1306186	75.4	(50%-105%)
Plutonium-242 Tracer	Alphaspec Pu, Liquid "As Received"	1308641	76.3	(50%-105%)
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"	1306189	77.5	(50%-105%)

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Certificate of Analysis

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Report Date: June 28, 2013

Contact: Mr. Keith Greene

Project: LANL-WQH Water Samples

Client Sample ID: CAPU-13-34773

Sample ID: 327172001

Project: ESHL00210

Client ID: ARSL001

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"						1306838	55.0	(50%-105%)				

Notes:

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

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Certificate of Analysis

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Report Date: June 28, 2013

Contact: Mr. Keith Greene

Project: LANL-WQH Water Samples

Client Sample ID: CAPU-13-34778

Sample ID: 327172003

Matrix: Water

Collect Date: 05-JUN-13

Receive Date: 07-JUN-13

Collector: Client

Project: ESHL00210

Client ID: ARSL001

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	0.00571	+/-0.00902	0.0433	0.0178	+/-0.00902	0.050	pCi/L		HAKB	06/13/13	1012	1306186	1
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Alphaspec Pu, Liquid "As Received"

Plutonium-238	U	0.00901	+/-0.00712	0.0211	0.00748	+/-0.00713	0.050	pCi/L		HAKB	06/13/13	1012	1306187	2
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Plutonium-239/240	U	0.00675	+/-0.00928	0.0443	0.0191	+/-0.00929	0.050	pCi/L						
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Alphaspec U, Liquid "As Received"

Uranium-234		4.35	+/-0.103	0.0539	0.0236	+/-0.297	1.00	pCi/L		HAKB	06/13/13	1008	1306189	3
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Uranium-235/236		0.203	+/-0.0252	0.0419	0.0168	+/-0.0283	1.00	pCi/L						
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Uranium-238		2.74	+/-0.0822	0.0344	0.0139	+/-0.194	0.500	pCi/L						
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Rad Gamma Spec Analysis

Gammasesc "As Received"

Cesium-137	U	0.310	+/-1.27	4.58	2.09	+/-1.28	8.00	pCi/L		MXR1	06/13/13	1034	1306868	4
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Cobalt-60	U	1.85	+/-0.823	4.14	1.77	+/-0.929	8.00	pCi/L						
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Neptunium-237	U	-0.881	+/-2.56	8.69	4.10	+/-2.57	10.0	pCi/L						
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Potassium-40	U	34.5	+/-17.8	56.9	25.5	+/-17.9	10.0	pCi/L						
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Sodium-22	U	-0.71	+/-1.50	5.39	2.41	+/-1.51	10.0	pCi/L						
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Rad Gas Flow Proportional Counting

GFPC, Sr90, liquid "As Received"

Strontium-90	U	0.272	+/-0.147	0.481	0.223	+/-0.148	0.500	pCi/L		JXR1	06/26/13	2024	1307879	5
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WSP-GrossA/B "As Received"

Beta		7.44	+/-0.681	2.00	0.980	+/-0.925	3.00	pCi/L		DYT1	06/24/13	1853	1308529	6
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Alpha		5.62	+/-1.46	2.71	0.854	+/-1.54	3.00	pCi/L		DYT1	06/26/13	1559	1308529	7
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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"	1306186	65.4	(50%-105%)
Plutonium-242 Tracer		Alphaspec Pu, Liquid "As Received"	1306187	77.4	(50%-105%)
Uranium-232 Tracer		Alphaspec U, Liquid "As Received"	1306189	87.8	(50%-105%)
Strontium Carrier		GFPC, Sr90, liquid "As Received"	1307879	84.2	(50%-105%)

GEL LABORATORIES LLC

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Certificate of Analysis

Company : Los Alamos National Laboratory
Address : PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Report Date: June 28, 2013

Contact: Mr. Keith Greene

Project: LANL-WQH Water Samples

Client Sample ID: CAPU-13-34778

Sample ID: 327172003

Project: ESHL00210

Client ID: ARSL001

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

Notes:

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

Quality Control Data

GEL LABORATORIES LLC

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QC Summary

Report Date: July 2, 2013
Page 1 of 8

Client : Los Alamos National Laboratory
PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico

Contact: Mr. Keith Greene

Workorder: 327172

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1306186										
QC1202887499	327025001	DUP									
Americium-241	U	0.00191	U	0.00445	pCi/L	0.133		(0-1)	HAKB	06/13/1310:12	
	Uncert:	+/-0.00506		+/-0.00445							
	TPU:	+/-0.00506		+/-0.00445							
**Americium-243 Tracer	2.62	2.24		2.16	pCi/L		82.7	(50%-105%)			
	Uncert:	+/-0.0704		+/-0.0759							
	TPU:	+/-0.124		+/-0.130							
QC1202887500	LCS										
Americium-241	1.41			1.26	pCi/L		89	(80%-120%)	HAKB	06/13/1310:12	
	Uncert:			+/-0.0435							
	TPU:			+/-0.0653							
**Americium-243 Tracer	2.09			1.81	pCi/L		86.5	(50%-105%)			
	Uncert:			+/-0.0557							
	TPU:			+/-0.0984							
QC1202887498	MB										
Americium-241			U	0.00363	pCi/L				HAKB	06/13/1310:12	
	Uncert:			+/-0.00679							
	TPU:			+/-0.00679							
**Americium-243 Tracer	2.09			1.66	pCi/L		79.3	(50%-105%)			
	Uncert:			+/-0.0613							
	TPU:			+/-0.105							
Batch	1306187										
QC1202887502	327025001	DUP									
Plutonium-238	U	0.00476	U	-0.00651	pCi/L	0.536		(0-1)	HAKB	06/13/1310:12	
	Uncert:	+/-0.00476		+/-0.00574							
	TPU:	+/-0.00477		+/-0.00574							
Plutonium-239/240	U	0.00952	U	-0.00217	pCi/L	0.381		(0-1)			
	Uncert:	+/-0.00753		+/-0.00782							
	TPU:	+/-0.00754		+/-0.00782							
**Plutonium-242 Tracer	2.44	1.71		1.97	pCi/L		80.6	(50%-105%)			
	Uncert:	+/-0.0764		+/-0.0735							
	TPU:	+/-0.128		+/-0.124							
QC1202887503	LCS										
Plutonium-238			U	0.0146	pCi/L			(80%-120%)	HAKB	06/13/1310:12	
	Uncert:			+/-0.00538							
	TPU:			+/-0.00541							
Plutonium-239/240	1.97			1.98	pCi/L		101	(80%-120%)			
	Uncert:			+/-0.0568							
	TPU:			+/-0.098							
**Plutonium-242 Tracer	1.95			1.78	pCi/L		91.1	(50%-105%)			
	Uncert:			+/-0.0564							
	TPU:			+/-0.0967							
QC1202887501	MB										

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1306187										
Plutonium-238			U	-0.00369	pCi/L				HAKB	06/13/1310:12	
				Uncert:							
				+/-0.00522							
				TPU:							
				+/-0.00522							
Plutonium-239/240			U	0.00922	pCi/L						
				Uncert:							
				+/-0.00612							
				TPU:							
				+/-0.00613							
**Plutonium-242 Tracer	1.95			1.55	pCi/L		79.6	(50%-105%)			
				Uncert:							
				+/-0.0611							
				TPU:							
				+/-0.102							
Batch	1306189										
QC1202887505	327025001	DUP									
Uranium-234				0.828	pCi/L	0.259		(0-1)	HAKB	06/13/1310:08	
				Uncert:							
				+/-0.051							
				TPU:							
				+/-0.0744							
Uranium-235/236		U	0.0288	U	0.00969	pCi/L	0.393	(0-1)			
				Uncert:							
				+/-0.0135							
				TPU:							
				+/-0.0136							
Uranium-238				0.434	pCi/L	0.179		(0-1)			
				Uncert:							
				+/-0.0377							
				TPU:							
				+/-0.0472							
**Uranium-232 Tracer	2.69		2.13	2.22	pCi/L		82.5	(50%-105%)			
				Uncert:							
				+/-0.0896							
				TPU:							
				+/-0.198							
QC1202887506	LCS										
Uranium-234				2.53	pCi/L				HAKB	06/13/1310:08	
				Uncert:							
				+/-0.0774							
				TPU:							
				+/-0.183							
Uranium-235/236				0.139	pCi/L						
				Uncert:							
				+/-0.0208							
				TPU:							
				+/-0.0227							
Uranium-238	2.70			2.72	pCi/L		101	(80%-120%)			
				Uncert:							
				+/-0.0799							
				TPU:							
				+/-0.195							
**Uranium-232 Tracer	2.15			1.70	pCi/L		79.1	(50%-105%)			
				Uncert:							
				+/-0.0716							
				TPU:							
				+/-0.158							
QC1202887504	MB										
Uranium-234			U	0.0108	pCi/L				HAKB	06/13/1310:08	
				Uncert:							
				+/-0.00836							
				TPU:							
				+/-0.00839							
Uranium-235/236			U	0.00267	pCi/L						
				Uncert:							
				+/-0.00462							
				TPU:							
				+/-0.00463							
Uranium-238			U	0.00864	pCi/L						
				Uncert:							
				+/-0.00529							
				TPU:							
				+/-0.00532							
**Uranium-232 Tracer	2.15			1.74	pCi/L		80.7	(50%-105%)			
				Uncert:							
				+/-0.0687							
				+/-0.156							

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1306189										
TPU:											
Batch	1308641										
QC1202893968	327172001	DUP									
Plutonium-238		U	0.00286	U	0.00	pCi/L	0.119	(0-1)	HAKB	06/20/13	12:48
		Uncert:	+/-0.00639		+/-0.00559						
		TPU:	+/-0.00639		+/-0.00559						
Plutonium-239/240			0.346		0.316	pCi/L	0.218	(0-1)			
		Uncert:	+/-0.0317		+/-0.0302						
		TPU:	+/-0.0352		+/-0.0333						
**Plutonium-242 Tracer	2.44		1.86		1.86	pCi/L	76.1	(50%-105%)			
		Uncert:	+/-0.0838		+/-0.0827						
		TPU:	+/-0.137		+/-0.136						
QC1202893969	LCS										
Plutonium-238				U	0.0159	pCi/L		(80%-120%)	HAKB	06/20/13	12:48
		Uncert:			+/-0.00588						
		TPU:			+/-0.00591						
Plutonium-239/240	1.97				1.88	pCi/L	95.2	(80%-120%)			
		Uncert:			+/-0.0578						
		TPU:			+/-0.0966						
**Plutonium-242 Tracer	1.95				1.95	pCi/L	99.7	(50%-105%)			
		Uncert:			+/-0.0589						
		TPU:			+/-0.0998						
QC1202893967	MB										
Plutonium-238				U	0.00	pCi/L			HAKB	06/20/13	12:48
		Uncert:			+/-0.00288						
		TPU:			+/-0.00288						
Plutonium-239/240				U	-0.00611	pCi/L					
		Uncert:			+/-0.00455						
		TPU:			+/-0.00455						
**Plutonium-242 Tracer	1.95				1.69	pCi/L	86.6	(50%-105%)			
		Uncert:			+/-0.0632						
		TPU:			+/-0.105						
Rad Gamma Spec											
Batch	1306868										
QC1202889386	327280001	DUP									
Cesium-137		U	-1.08	U	-0.289	pCi/L	0.139	(0-1)	MXR1	06/13/13	14:02
		Uncert:	+/-1.40		+/-1.42						
		TPU:	+/-1.43		+/-1.42						
Cobalt-60		U	2.20	U	-0.837	pCi/L	0.489	(0-1)			
		Uncert:	+/-1.21		+/-1.78						
		TPU:	+/-1.31		+/-1.79						
Neptunium-237		U	5.49	U	0.0831	pCi/L	0.506	(0-1)			
		Uncert:	+/-2.75		+/-2.31						
		TPU:	+/-3.03		+/-2.31						
Potassium-40		U	-31.3	U	2.10	pCi/L	0.390	(0-1)			
		Uncert:	+/-14.8		+/-26.3						
		TPU:	+/-16.5		+/-26.3						
Sodium-22		U	-0.30	U	-2.52	pCi/L	0.375	(0-1)			

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1306868										
		Uncert:	+/-1.41	+/-1.43							
		TPU:	+/-1.41	+/-1.55							
QC1202889387 LCS											
Americium-241	2780			2710	pCi/L		97.6	(80%-120%)	MXR1	06/13/1311:30	
		Uncert:		+/-105							
		TPU:		+/-177							
Cesium-137	6010			5990	pCi/L		99.6	(80%-120%)			
		Uncert:		+/-72.4							
		TPU:		+/-258							
Cobalt-60	5240			5190	pCi/L		99	(80%-120%)			
		Uncert:		+/-76.3							
		TPU:		+/-223							
Neptunium-237			U	-40.4	pCi/L						
		Uncert:		+/-28.0							
		TPU:		+/-29.5							
Potassium-40			U	15.9	pCi/L						
		Uncert:		+/-51.1							
		TPU:		+/-51.3							
Sodium-22			U	0.637	pCi/L						
		Uncert:		+/-9.58							
		TPU:		+/-9.59							
QC1202889385 MB											
Cesium-137			U	4.07	pCi/L				MXR1	06/13/1311:30	
		Uncert:		+/-2.08							
		TPU:		+/-2.09							
Cobalt-60			U	-1.75	pCi/L						
		Uncert:		+/-1.18							
		TPU:		+/-1.25							
Neptunium-237			U	3.72	pCi/L						
		Uncert:		+/-2.44							
		TPU:		+/-2.59							
Potassium-40			U	-10.5	pCi/L						
		Uncert:		+/-15.9							
		TPU:		+/-16.1							
Sodium-22			U	0.00232	pCi/L						
		Uncert:		+/-1.10							
		TPU:		+/-1.10							
Rad Gas Flow											
Batch	1306838										
QC1202889288 327024006 DUP											
Strontium-90		U	-0.138	U	0.301	pCi/L	0.788	(0-1)	JXR1	06/23/1312:51	
		Uncert:	+/-0.126		+/-0.150						
		TPU:	+/-0.126		+/-0.152						
**Strontium Carrier	8.55	5.40		6.40	mg		74.9	(50%-105%)			
QC1202889290 LCS											
Strontium-90	24.2			26.6	pCi/L		110	(80%-120%)	JXR1	06/23/1312:53	
		Uncert:		+/-0.717							
		TPU:		+/-2.42							

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gas Flow											
Batch	1306838										
**Strontium Carrier	8.55			5.70	mg		66.7	(50%-105%)			
QC1202889287 MB											
Strontium-90			U	-0.0012	pCi/L				JXR1	06/23/1312:51	
	Uncert:			+/-0.0691							
	TPU:			+/-0.0691							
**Strontium Carrier	8.55			5.90	mg		69	(50%-105%)			
QC1202889289 327024006 MS											
Strontium-90	243	U	-0.138	276	pCi/L		114	(75%-125%)	JXR1	06/23/1312:51	
	Uncert:		+/-0.126	+/-7.21							
	TPU:		+/-0.126	+/-23.3							
**Strontium Carrier	8.55			5.80	mg		67.8	(50%-105%)			
Batch	1307879										
QC1202891917 327527001 DUP											
Strontium-90		U	0.00638	0.328	pCi/L	0.570		(0-1)	JXR1	06/26/1319:32	
	Uncert:		+/-0.132	+/-0.147							
	TPU:		+/-0.132	+/-0.150							
**Strontium Carrier	8.55		8.10	8.00	mg		93.6	(50%-105%)			
QC1202891919 LCS											
Strontium-90	24.2			25.9	pCi/L		107	(80%-120%)	JXR1	06/26/1320:24	
	Uncert:			+/-0.697							
	TPU:			+/-2.17							
**Strontium Carrier	8.55			7.60	mg		88.9	(50%-105%)			
QC1202891916 MB											
Strontium-90			U	-0.115	pCi/L				JXR1	06/26/1319:33	
	Uncert:			+/-0.0644							
	TPU:			+/-0.0644							
**Strontium Carrier	8.55			6.40	mg		74.9	(50%-105%)			
QC1202891918 327527001 MS											
Strontium-90	243	U	0.00638	267	pCi/L		110	(75%-125%)	JXR1	06/26/1320:24	
	Uncert:		+/-0.132	+/-6.87							
	TPU:		+/-0.132	+/-22.2							
**Strontium Carrier	8.55		8.10	8.10	mg		94.7	(50%-105%)			
Batch	1308529										
QC1202893585 327623001 DUP											
Alpha		U	-0.0322	0.431	pCi/L	0.231		(0-1)	DYT1	06/26/1317:21	
	Uncert:		+/-0.464	+/-0.539							
	TPU:		+/-0.464	+/-0.540							
Beta		U	0.373	1.05	pCi/L	0.206		(0-1)		06/25/1317:45	
	Uncert:		+/-0.753	+/-0.878							
	TPU:		+/-0.754	+/-0.882							
QC1202893588 LCS											
Alpha	12.3			13.7	pCi/L		111	(80%-120%)	DYT1	06/26/1317:41	
	Uncert:			+/-0.643							
	TPU:			+/-1.43							
Beta	48.5			54.5	pCi/L		112	(80%-120%)		06/24/1316:29	
	Uncert:			+/-0.952							
	TPU:			+/-4.60							
QC1202893584 MB											
Alpha			U	-0.0731	pCi/L				DYT1	06/26/1317:21	

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Parname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gas Flow											
Batch	1308529										
		Uncert:		+/-0.0167							
		TPU:		+/-0.017							
Beta			U	-0.104	pCi/L					06/24/1318:48	
		Uncert:		+/-0.0438							
		TPU:		+/-0.0438							
QC1202893586	327623001 MS										
Alpha		82.3	U	-0.0322	pCi/L		94.2	(75%-125%)	DYT1	06/27/1312:54	
		Uncert:		+/-0.464							
		TPU:		+/-0.464							
Beta		1940	U	0.373	pCi/L		113	(75%-125%)		06/24/1316:29	
		Uncert:		+/-0.753							
		TPU:		+/-0.754							
QC1202893587	327623001 MSD										
Alpha		82.3	U	-0.0322	pCi/L	0.370	109	(0-1)	DYT1	06/26/1317:21	
		Uncert:		+/-0.464							
		TPU:		+/-0.464							
Beta		1940	U	0.373	pCi/L	0.129	118	(0-1)		06/24/1316:29	
		Uncert:		+/-0.753							
		TPU:		+/-0.754							
Batch	1308555										
QC1202893668	327707003 DUP										
Alpha				18.0	pCi/L	0.734		(0-1)	DYT1	06/26/1317:31	
		Uncert:		+/-2.21							
		TPU:		+/-2.67							
Beta				8.21	pCi/L	0.265		(0-1)		06/25/1315:09	
		Uncert:		+/-1.07							
		TPU:		+/-1.28							
QC1202893671	LCS										
Alpha		12.3			pCi/L		112	(80%-120%)	DYT1	06/26/1317:34	
		Uncert:									
		TPU:									
Beta		48.5			pCi/L		113	(80%-120%)		06/24/1316:33	
		Uncert:									
		TPU:									
QC1202893667	MB										
Alpha			U	0.193	pCi/L				DYT1	06/26/1317:31	
		Uncert:		+/-0.0853							
		TPU:		+/-0.087							
Beta			U	0.0802	pCi/L					06/25/1314:44	
		Uncert:		+/-0.118							
		TPU:		+/-0.118							
QC1202893669	327707003 MS										
Alpha		494		18.0	pCi/L		84.7	(75%-125%)	DYT1	06/26/1317:34	
		Uncert:		+/-2.21							
		TPU:		+/-2.67							
Beta		1940		8.21	pCi/L		111	(75%-125%)		06/24/1316:33	
		Uncert:		+/-1.07							
		TPU:		+/-1.28							
QC1202893670	327707003 MSD										

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Parmname	NOM	Sample Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gas Flow										
Batch	1308555									
Alpha	494	18.0	619	pCi/L	0.836	122	(0-1)	DYT1	06/26/13	17:34
	Uncert:	+/-2.21	+/-32.4							
	TPU:	+/-2.67	+/-62.2							
Beta	1940	8.21	2240	pCi/L	0.107	115	(0-1)		06/24/13	16:33
	Uncert:	+/-1.07	+/-39.2							
	TPU:	+/-1.28	+/-191							

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	REMP 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.
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

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