

2040 Savage Rd
Charleston SC 29407

COC/Lab Request #:
12-1277

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[illegible]

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3855 EVENT NAME: Pajarito (General Surveillance)
 Q3 Watershed Sampling
 SAMPLE ID: CAPA-12-13285 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		05/03/2012	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):		1028	MEDIA:	WGR	↓
PRS ID:		OK	SAMPLE TECH CODE:	UA	WES
LOCATION ID: R-19 S3		↓	FIELD PREP:	UF	OK
LOCATION TYPE: MON		↓	FIELD QC TYPE: REG		↓
PORT: MP3A			SAMPLE USAGE: INV		↓

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8321A-NMED HEXP	1 LITER AMBER GLASS	2	ICE DF 5/3/12	Y	NA
↓	WSP-GrossA/B	1 LITER POLY	1	NONE	↓	↓
↓	WSP-HEXMOD	1 LITER AMBER GLASS	2	ICE	↓	↓
↓	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 5.82 mg/L Oxidation-Reduction Potential NA MV pH 7.94 SU
 Specific Conductance 135 uS/cm Temperature 20.59 deg C Turbidity 0.36 NTU

COLLECTED BY (PRINT) B. Rappe

RELINQUISHED BY (Printed Name) David Fellenz (Signature) <i>[Signature]</i>	Date/Time 5/3/12 1445	RECEIVED BY (Printed Name) <i>[Signature]</i> (Signature) <i>[Signature]</i>	Date/Time 5/3/12 1445
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 04/11/2012

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3855 EVENT NAME: Pajarito (General Surveillance)
 Q3 Watershed Sampling
 SAMPLE ID: CAPA-12-13295 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		05/03/2012	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):		1028	MEDIA:	WGR	↓
PRS ID:		OK	SAMPLE TECH CODE:	UA	WES
LOCATION ID: R-19 S3		↓	FIELD PREP:	F	OK
LOCATION TYPE: MON		↓	FIELD QC TYPE: REG		↓
PORT: MP3A		↓	SAMPLE USAGE: INV		↓

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

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

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

COLLECTED BY (PRINT) B. Rappe

RELINQUISHED BY (Printed Name) David Fellenz (Signature) <i>[Signature]</i>	Date/Time 5/3/12 1445	RECEIVED BY (Printed Name) S. Sherwood (Signature) <i>[Signature]</i>	Date/Time 5/3/12 1445
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 04/11/2012

Data Validation Report

Chain Of Custody No. 12-1277

1. Distribution Of Samples In EDD.

	Analytical	Regular	Field	Trip	Field	Equipment
SDG	Method	Samples	Duplicates	Blanks	Blanks	Blanks
303859	EPA:120.1	1				
303859	EPA:150.1	1				
303859	EPA:160.1	1				
303859	EPA:245.2	1				
303859	EPA:300.0	1				
303859	EPA:310.1	1				
303859	EPA:350.1	1				
303859	EPA:351.2	1				
303859	EPA:353.2	1				
303859	EPA:365.4	1				
303859	EPA:900	1				
303859	EPA:901.1	1				
303859	EPA:905.0	1				
303859	HASL-300:AM-241	1				
303859	HASL-300:ISOPU	1				
303859	HASL-300:ISOU	1				
303859	SM:A2340B	1				
303859	SW-846:6010B	1				
303859	SW-846:6020	1				
303859	SW-846:6850	1				
303859	SW-846:8321A_MOD	1				
303859	SW-846:9060	1				

	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
303859	EPA:120.1	1211663	1211663	1							
303859	EPA:150.1	1210490	1210490	1							
303859	EPA:160.1	1211219	1211219	1						1	
303859	EPA:245.2	1210437	1210434	1						1	1
303859	EPA:300.0	1209599	1209599	1						1	
303859	EPA:310.1	1212148	1212148	1						2	1
303859	EPA:350.1	1210499	1210496	1						1	1
303859	EPA:351.2	1210493	1210489	1						1	1
303859	EPA:353.2	1210456	1210456	1						1	
303859	EPA:365.4	1209639	1209638	1						1	1
303859	EPA:900	1212200	1212200	1						1	1
303859	EPA:901.1	1211536	1211536	1						1	
303859	EPA:905.0	1210551	1210551	1						1	1
303859	HASL-300:AM-241	1210896	1210896	1						1	
303859	HASL-300:ISOPU	1210899	1210899	1						1	
303859	HASL-300:ISOU	1210900	1210900	1						1	
303859	SM:A2340B	1216196	1216196	1							
303859	SW-846:6010B	1209957	1209955	1						1	1
303859	SW-846:6020	1209953	1209952	1						1	1
303859	SW-846:6850	1211963	1211962	1						1	1
303859	SW-846:8321A_MOD	1210233	1210231	1						1	1
303859	SW-846:9060	1210398	1210398	1						1	

Analytical	Post-Digestion	Lab Control	Lab Control	Blank	Blank	Lab	Storage	Preparation	Reagent
Spikes	Spikes	Samples	Sample Dups	Spikes	Spike Dups	Duplicates	Blanks	Blanks	Blanks
		1				1			
		1				2			
		1				1			
		1				1			
		1				1			
		2				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				1			
		1				2			

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	CAPA-12-13272	1202655278	DUP	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	CAPA-12-13295	303859002	REG	1	0	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1202655279	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	CAPA-12-13295	303859002	REG	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1202652325	LCS	0	0	1	0
EPA:150.1	GENERAL CHEMISTRY	WST54-12-13826	1202652323	DUP	1	0	0	0
EPA:150.1	GENERAL CHEMISTRY	WST54-12-13827	1202652324	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-12-13295	1202654160	DUP	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	CAPA-12-13295	303859002	REG	1	0	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1202654164	LCS	0	0	1	0
EPA:160.1	GENERAL CHEMISTRY	MB	1202654159	MB	1	0	0	0
EPA:245.2	INORGANIC	CAPA-12-13272	1202652153	DUP	1	0	0	0
EPA:245.2	INORGANIC	CAPA-12-13272	1202652154	MS	0	0	1	0
EPA:245.2	INORGANIC	CAPA-12-13295	303859002	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1202652152	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1202652151	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-12-13292	1202650165	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAPA-12-13295	303859002	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1202650167	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1202650164	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-12-13272	1202656551	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-12-13272	1202656554	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CAPA-12-13295	303859002	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1202656556	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1202657251	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	MB	1202656549	MB	3	0	0	0
EPA:310.1	GENERAL CHEMISTRY	MB	1202657250	MB	3	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-12-13292	1202652346	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-12-13292	1202652347	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-12-13292	1202652348	MSD	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CAPA-12-13295	303859002	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1202652349	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1202652345	MB	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-12-13282	1202652329	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-12-13282	1202652330	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-12-13282	1202652331	MSD	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAPA-12-13285	303859001	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1202652332	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1202652328	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-12-13292	1202652207	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAPA-12-13295	303859002	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1202652211	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1202652204	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-12-13292	1202650266	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-12-13292	1202650267	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-12-13292	1202650268	MSD	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CAPA-12-13295	303859002	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1202650269	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1202650265	MB	1	0	0	0
EPA:900	RAD	CAPA-12-13285	1202656704	DUP	2	0	0	0
EPA:900	RAD	CAPA-12-13285	1202656705	MS	0	0	2	0
EPA:900	RAD	CAPA-12-13285	1202656706	MSD	0	0	2	0
EPA:900	RAD	CAPA-12-13285	303859001	REG	2	0	0	0

EPA:900	RAD	LCS	1202656707	LCS	0	0	2	0
EPA:900	RAD	MB	1202656703	MB	2	0	0	0
EPA:901.1	RAD	CAPA-12-13285	1202654975	DUP	5	0	0	0
EPA:901.1	RAD	CAPA-12-13285	303859001	REG	5	0	0	0
EPA:901.1	RAD	LCS	1202654976	LCS	0	0	3	0
EPA:901.1	RAD	MB	1202654974	MB	5	0	0	0
EPA:905.0	RAD	CAPA-12-13278	1202652529	DUP	1	0	0	0
EPA:905.0	RAD	CAPA-12-13278	1202652530	MS	0	0	1	0
EPA:905.0	RAD	CAPA-12-13285	303859001	REG	1	0	0	0
EPA:905.0	RAD	LCS	1202652531	LCS	0	0	1	0
EPA:905.0	RAD	MB	1202652528	MB	1	0	0	0
HASL-300:AM-241	RAD	CAPA-12-13285	1202653324	DUP	1	0	0	0
HASL-300:AM-241	RAD	CAPA-12-13285	303859001	REG	1	0	0	0
HASL-300:AM-241	RAD	LCS	1202653325	LCS	0	0	1	0
HASL-300:AM-241	RAD	MB	1202653323	MB	1	0	0	0
HASL-300:ISOPU	RAD	CAPA-12-13285	1202653327	DUP	2	0	0	0
HASL-300:ISOPU	RAD	CAPA-12-13285	303859001	REG	2	0	0	0
HASL-300:ISOPU	RAD	LCS	1202653328	LCS	0	0	1	0
HASL-300:ISOPU	RAD	MB	1202653326	MB	2	0	0	0
HASL-300:ISOU	RAD	CAPA-12-13285	1202653330	DUP	3	0	0	0
HASL-300:ISOU	RAD	CAPA-12-13285	303859001	REG	3	0	0	0
HASL-300:ISOU	RAD	LCS	1202653331	LCS	0	0	1	0
HASL-300:ISOU	RAD	MB	1202653329	MB	3	0	0	0
SM:A2340B	INORGANIC	CAPA-12-13295	303859002	REG	1	0	0	0
SW-846:6010B	INORGANIC	CAPA-12-13292	1202650972	DUP	17	0	0	0
SW-846:6010B	INORGANIC	CAPA-12-13292	1202650973	MS	0	0	17	0
SW-846:6010B	INORGANIC	CAPA-12-13295	303859002	REG	17	0	0	0
SW-846:6010B	INORGANIC	LCS	1202650971	LCS	0	0	17	0
SW-846:6010B	INORGANIC	MB	1202650970	MB	17	0	0	0
SW-846:6020	INORGANIC	CAPA-12-13292	1202650967	DUP	11	0	0	0
SW-846:6020	INORGANIC	CAPA-12-13292	1202650968	MS	0	0	11	0
SW-846:6020	INORGANIC	CAPA-12-13295	303859002	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1202650966	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1202650965	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-12-13292	1202655998	MS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-12-13292	1202655999	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CAPA-12-13295	303859002	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1202655997	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1202655996	MB	1	0	0	0
SW-846:8321A_MOD	LCMS/MS HIGH EXPLOSIVES	CAPA-12-13282	1202651709	MS	0	2	23	0
SW-846:8321A_MOD	LCMS/MS HIGH EXPLOSIVES	CAPA-12-13282	1202651710	MSD	0	2	23	0
SW-846:8321A_MOD	LCMS/MS HIGH EXPLOSIVES	CAPA-12-13285	303859001	REG	23	2	0	0
SW-846:8321A_MOD	LCMS/MS HIGH EXPLOSIVES	LCS	1202651708	LCS	0	2	23	0
SW-846:8321A_MOD	LCMS/MS HIGH EXPLOSIVES	MB	1202651707	MB	23	2	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-12-13277	1202652080	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-12-13285	303859001	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAPA-12-13286	1202655722	DUP	1	0	0	0

SW-846:9060	GENERAL CHEMISTRY	LCS	1202652082	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1202652079	MB	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

No.

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
CAPA-12-13295	MB	1202652345	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	mg/L	0.0337	0.0755		0.05	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
CAPA-12-13282	1202652330	1202652331	EPA:351.2	Total Kjeldahl Nitrogen	1210489	5/9/2012	W	116	106	110	90
CAPA-12-13285	1202656705	1202656706	EPA:900	Gross alpha	1212200	5/25/2012	W	91.8	103	125	75
CAPA-12-13285	1202656705	1202656706	EPA:900	Gross alpha	1212200	5/25/2012	W	91.8	103	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		Detected	Detected	
Sample ID	SampleID	Sample ID	Method	Name	Matrix	Result	Result	Units	In Sample	In Dup	RPD
CAPA-12-13285	303859001	1202653330	HASL-300:ISOU	Uranium-234	W	0.282	0.204	pCi/L	Y	Y	32.1
CAPA-12-13285	303859001	1202653330	HASL-300:ISOU	Uranium-238	W	0.119	0.0789	pCi/L	Y	Y	40.2

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Coments.

None.

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

Rejection			RPD
Limit	RPD		Limit
10	8.93		20
10	11.7		6.13
10	11.7		6.13

RPD
Limit
0.0749
0.0378

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
R-19 S3	12-1277	CAPA-12-13285	REG	INIT	RAD	HASL-300:AM-241	Americium-241	U	U	R5	N
R-19 S3	12-1277	CAPA-12-13285	REG	INIT	RAD	EPA:901.1	Cesium-137	U	U	R5	N
R-19 S3	12-1277	CAPA-12-13285	REG	INIT	RAD	EPA:901.1	Cobalt-60	U	U	R5	N
R-19 S3	12-1277	CAPA-12-13285	REG	INIT	RAD	EPA:900	Gross alpha	U	U	R5	N
R-19 S3	12-1277	CAPA-12-13285	REG	INIT	RAD	EPA:900	Gross beta	U	U	R5	N
R-19 S3	12-1277	CAPA-12-13285	REG	INIT	RAD	EPA:901.1	Neptunium-237	U	U	R5	N
R-19 S3	12-1277	CAPA-12-13285	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-238	U	U	R5	N
R-19 S3	12-1277	CAPA-12-13285	REG	INIT	RAD	HASL-300:ISOPU	Plutonium-239/240	U	U	R5	N
R-19 S3	12-1277	CAPA-12-13285	REG	INIT	RAD	EPA:901.1	Potassium-40	U	U	R5	N
R-19 S3	12-1277	CAPA-12-13285	REG	INIT	RAD	EPA:901.1	Sodium-22	U	U	R5	N
R-19 S3	12-1277	CAPA-12-13285	REG	INIT	RAD	EPA:905.0	Strontium-90	U	U	R5	N
R-19 S3	12-1277	CAPA-12-13285	REG	INIT	RAD	HASL-300:ISOU	Uranium-234		J	R10	Y
R-19 S3	12-1277	CAPA-12-13285	REG	INIT	RAD	HASL-300:ISOU	Uranium-235/236	U	U	R5	N
R-19 S3	12-1277	CAPA-12-13285	REG	INIT	RAD	HASL-300:ISOU	Uranium-238		J	R10	Y
R-19 S3	12-1277	CAPA-12-13295	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen		U	I4	N

Reason Code

Description

I4

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

J_LAB

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

NQ

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

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
CAPA-12-13285	R-19 S3	REG	EPA:351.2	0	1
CAPA-12-13285	R-19 S3	REG	EPA:900	0	2
CAPA-12-13285	R-19 S3	REG	EPA:901.1	0	5
CAPA-12-13285	R-19 S3	REG	EPA:905.0	0	1
CAPA-12-13285	R-19 S3	REG	HASL-300:AM-241	0	1
CAPA-12-13285	R-19 S3	REG	HASL-300:ISOPU	0	2
CAPA-12-13285	R-19 S3	REG	HASL-300:ISOU	0	3
CAPA-12-13285	R-19 S3	REG	SW-846:8321A_MOD	0	23
CAPA-12-13285	R-19 S3	REG	SW-846:9060	0	1
CAPA-12-13295	R-19 S3	REG	EPA:120.1	0	1
CAPA-12-13295	R-19 S3	REG	EPA:150.1	0	1
CAPA-12-13295	R-19 S3	REG	EPA:160.1	0	1
CAPA-12-13295	R-19 S3	REG	EPA:245.2	0	1
CAPA-12-13295	R-19 S3	REG	EPA:300.0	0	4
CAPA-12-13295	R-19 S3	REG	EPA:310.1	0	2
CAPA-12-13295	R-19 S3	REG	EPA:350.1	0	1
CAPA-12-13295	R-19 S3	REG	EPA:353.2	0	1
CAPA-12-13295	R-19 S3	REG	EPA:365.4	0	1
CAPA-12-13295	R-19 S3	REG	SM:A2340B	0	1

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
0.00399	pCi/L	0.00399	pCi/L	0.0478	0.00564	W	5/3/2012		1210896	VAL	Y
2.17	pCi/L	2.17	pCi/L	5.86	1.53	W	5/3/2012		1211536	VAL	Y
1.02	pCi/L	1.02	pCi/L	6.11	1.58	W	5/3/2012		1211536	VAL	Y
0.746	pCi/L	0.746	pCi/L	1.82	0.543	W	5/3/2012		1212200	VAL	Y
1.47	pCi/L	1.47	pCi/L	2.28	0.722	W	5/3/2012		1212200	VAL	Y
0.939	pCi/L	0.939	pCi/L	10.3	2.96	W	5/3/2012		1211536	VAL	Y
0.00269	pCi/L	0.00269	pCi/L	0.0418	0.00806	W	5/3/2012		1210899	VAL	Y
0	pCi/L	0	pCi/L	0.0354	0.00658	W	5/3/2012		1210899	VAL	Y
-6.35	pCi/L	-6.35	pCi/L	69.6	18.8	W	5/3/2012		1211536	VAL	Y
0.451	pCi/L	0.451	pCi/L	5.2	1.34	W	5/3/2012		1211536	VAL	Y
-0.141	pCi/L	-0.141	pCi/L	0.481	0.136	W	5/3/2012		1210551	VAL	Y
0.282	pCi/L	0.282	pCi/L	0.078	0.0366	W	5/3/2012		1210900	VAL	Y
0.00158	pCi/L	0.00158	pCi/L	0.0558	0.00695	W	5/3/2012		1210900	VAL	Y
0.119	pCi/L	0.119	pCi/L	0.0394	0.0233	W	5/3/2012		1210900	VAL	Y
0.0755	mg/L	0.0755	mg/L			W	5/3/2012		1210499	VAL	Y

CAPA-12-13295	R-19 S3	REG	SW-846:6010B	0	17
CAPA-12-13295	R-19 S3	REG	SW-846:6020	0	11
CAPA-12-13295	R-19 S3	REG	SW-846:6850	0	1



May 24, 2012

www.gel.com

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: 303859
SDG: 12-1277

Dear Keith Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on May 05, 2012, and analyzed for Explosives by LCMSMS, 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,

Hope Taylor for
Valerie Davis
Project Manager

Purchase Order: 63641-10
Chain of Custody: 12-1277
Enclosures



ARS International (63641-10)
LANL-WQH Water Samples
Work Order #: 303859
SDG: 12-1277

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Case Narrative

**Case Narrative for
ARS International (63641-10)
LANL-WQH Water Samples
Workorder #: 303859
SDG # : 12-1277**

May 24, 2012

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 May 05, 2012 for analysis. Please see attached email for discrepancies. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. 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>
303859001	CAPA-12-13285
303859002	CAPA-12-13295

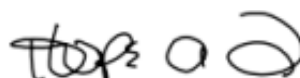
Case Narrative

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

Data Package

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Explosives by LCMSMS, General Chemistry, Metals, 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.



Hope Taylor for
Valerie Davis
Project Manager

List of current GEL Certifications as of 24 May 2012

State	Certification
Arizona	AZ0766
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	P330-09-00191
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	LA120008
Maryland	270
Massachusetts	M-SC012
Mississippi	SC00012
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
South Carolina Chemistry	10120001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-12-7
Utah NELAP	SC00012
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
Wisconsin	999887790

Chain of Custody and Supporting Documentation



SAMPLE RECEIPT & REVIEW FORM

Client: LANL		SDG/AR/COC/Work Order: 12-1277	
Received By: Patricia Dent		Date Received: MAY 5, 2012	
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?		X	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 CPM
Classified Radioactive II or III by RSO?		X	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		X	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		X	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		X	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		X	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	X			Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius 2-4C
2a Daily check performed and passed on IR temperature gun?	X			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): 61524646
3 Chain of custody documents included with shipment?	X			
4 Sample containers intact and sealed?	X			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?			X	Sample ID's, containers affected and observed pH: CAPA-12-13285 for Gross A/B If Preservation added, Lot#: K45047
6 VOA vials free of headspace (defined as < 6mm bubble)?		X		
7 Are Encore containers present?			X	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	X			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	X			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	X			Sample ID's affected:
11 Number of containers received match number indicated on COC?			X	Sample ID's affected: CAPA-12-13285 for HEXP the lab received (2)- containers instead of (3) as indicated on COC.
12 Are sample containers identifiable as GEL provided?			X	CLIENT
13 COC form is properly signed in relinquished/received sections?	X			
14 Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 7209 7856 6240 2C 7209 7856 6239 3C 7209 7856 6250 4C

Comments (Use Continuation Form if needed):

HA

050112

1

Subject: ISSUES FROM 05/05/12
From: Pat Dent <Pat.Dent@gel.com>
Date: Sat, 05 May 2012 14:22:24 -0400
To: "Keith R. Greene" <kgreene@lanl.gov>
CC: "team.davis" <team.davis@gel.com>

Good Afternoon all listed below are today's issues

Container received for Gross A/B was preserved prior to analysis

RN#2012-2021 we didn't receive any containers
RN#12-1277 lab received (2)-HEXP containers ID-CAPA-12-13285 COC indicates (3).
RN#12-1279 lab received (1)-8260B container ID-CAPA-12-13412 COC indicates (2)
RN#12-1278 for RCRA Metals ID-WST54-12-13526 received unpreserve, please advise

Thanks!
Pat Dent

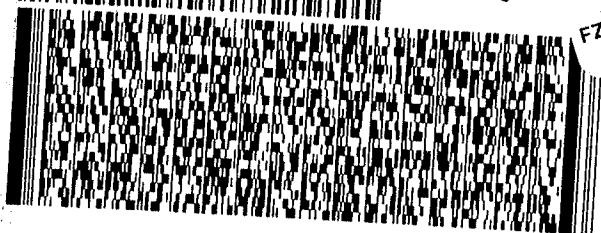
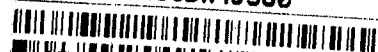
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Patricia Dent
Project Manager Assistant
GEL Laboratories, LLC
2040 Savage Rd.
Charleston, S.C. 29407
Main: 843-556-8171 Ext 4264
Fax: 843-766-1178
Email: pad@gel.com
Web: www.gel.com

JOYLENE VALDEZ (505) 665-9968
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 04MAY12
ACTWGT: 54.0 LB MAN
CAD: 0014176/CAFE2511
BILL SENDER

VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: M348CDW4J580



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2 of 3
MPS# 0263 7209 7856 6240
Mstr# 7209 7856 6239

SATURDAY ### A1
PRIORITY OVERNIGHT
0201

X0 CHSA

29407
SC-US CHS



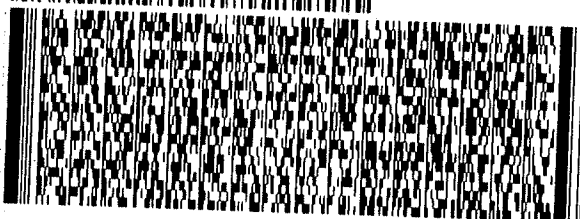
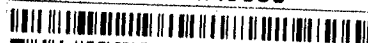
Part # 156148-434 NRIT V3 09-09

JOYLENE VALDEZ (505) 665-9968
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 04MAY12
ACTWGT: 48.0 LB MAN
CAD: 0014176/CAFE2511
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GENERAL ENGINEERING
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1 of 3
TRK# 0201 7209 7856 6239
M# MASTER M#

SATURDAY ### A1
PRIORITY OVERNIGHT

X0 CHSA

29407
SC-US CHS



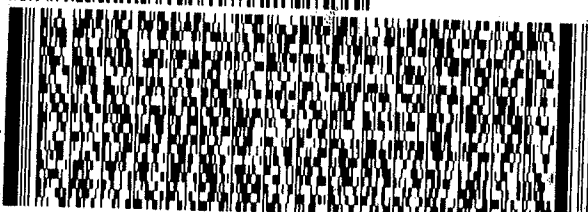
Part # 156148-434 NRIT V3 09-09

ORIGIN ID: SAFA (505) 665-9968
JOYLENE VALDEZ
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 04MAY12
ACTWGT: 23.0 LB MAN
CAD: 0014176/CAFE2511
BILL SENDER

VALERIE DAVIS
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407
(843) 556-8171
REF: M348CDW4J580



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3 of 3
MPS# 0263 7209 7856 6250
Mstr# 7209 7856 6239

SATURDAY ### A1
PRIORITY OVERNIGHT
0201

X0 CHSA

29407
SC-US CHS

580CJ/6104/188C

Data Review Qualifier Flag Definition Sheet

Data Review Qualifier Definitions

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

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorate by LC/MSMS
ARS International (ARSL)
SDG 12-1277**

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: 1211963

Prep Batch Number: 1211962

Sample Analysis

Sample ID	Client ID
303859002	CAPA-12-13295
1202656000	Interference Check Sample (ICS)
1202655996	Method Blank (MB)
1202655997	Laboratory Control Sample (LCS)
1202655998	303750002(CAPA-12-13292) Matrix Spike (MS)
1202655999	303750002(CAPA-12-13292) 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# 9.

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.

CCV Requirements

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

Interference Check Sample (ICS)

The interference check sample (ICS) met all recovery acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 303750002 (CAPA-12-13292) 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 RPD(s) between the MS and MSD met the acceptance limits.

Retention Time Standard Area Acceptance

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

Retention Time

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard. The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by Method 332.0, has been used. In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information**Holding Time Specifications**

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

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

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

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

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: 12-1277 GEL Work Order: 303859


The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Patricia Steele

Date: 25 MAY 2012

Title: Data Validator

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1211962Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-12-13295Date Received: 05-MAY-12GEL Job No (SDG): 12-1277GEL Sample ID: 303859002Date Filtered: 17-MAY-12Injection 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	0.248	ug/L		1	18-MAY-12 18:45	per0518036a
	Perchlorate Isotope Ratio			3.13			1	18-MAY-12 18:45	per0518036a
14797-73-0	Perchlorate-101	.05	.2	0.250	ug/L		1	18-MAY-12 18:45	per0518036a
	Perchlorate-O(18)			0.526	ug/L		1	18-MAY-12 18:45	per0518036a

^ 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): 12-1277

Extract Batch Code: 1211962

Date Filtered: 17-MAY-12

Matrix: WATER

Sample ID: 1202655997

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.211	ug/L	106		85 - 115
Perchlorate Isotope Ratio		3.21				-
Perchlorate-101	0.200	.207	ug/L	104		85 - 115
Perchlorate-O(18)		.523	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): 12-1277

Extract Batch Code: 1211962

Date Extracted: 17-MAY-12

GEL MS/PS ID: 1202655998

Client ID: CAPA-12-13292

GEL MSD/PSD ID: 1202655999

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	0.268	ug/L	0.469	101	.492	112	4.82	30	75 - 125
Perchlorate Isotope Ratio	0	3.17		3.17		3.16		.5		-
Perchlorate-101	0.200	0.267	ug/L	0.466	99.7	.491	112	5.32	30	75 - 125
Perchlorate-O(18)	0	0.518	ug/L	0.516		.537		3.83		-

^ 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: 1211962Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 17-MAY-12GEL Job No (SDG): 12-1277GEL Sample ID: 1202655996Date Filtered: 17-MAY-12Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.050	ug/L	U	1	18-MAY-12 17:14	per0518024a
	Perchlorate Isotope Ratio						1	18-MAY-12 17:14	per0518024a
14797-73-0	Perchlorate-101	.05	.2	0.050	ug/L	U	1	18-MAY-12 17:14	per0518024a
	Perchlorate-O(18)			0.492	ug/L		1	18-MAY-12 17:14	per0518024a

^ 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: 1211962Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 17-MAY-12GEL Job No (SDG): 12-1277GEL Sample ID: 1202655997Date Filtered: 17-MAY-12Injection 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	0.211	ug/L		1	18-MAY-12 17:22	per0518025a
	Perchlorate Isotope Ratio			3.21			1	18-MAY-12 17:22	per0518025a
14797-73-0	Perchlorate-101	.05	.2	0.207	ug/L		1	18-MAY-12 17:22	per0518025a
	Perchlorate-O(18)			0.523	ug/L		1	18-MAY-12 17:22	per0518025a

^ 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: 1211962Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 12-1277GEL Sample ID: 1202656000Date Filtered: 17-MAY-12Injection 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	0.228	ug/L		1	18-MAY-12 17:30	per0518026a
	Perchlorate Isotope Ratio			3.22			1	18-MAY-12 17:30	per0518026a
14797-73-0	Perchlorate-101	.05	.2	0.223	ug/L		1	18-MAY-12 17:30	per0518026a
	Perchlorate-O(18)			0.544	ug/L		1	18-MAY-12 17:30	per0518026a

^ 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: 1211962Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-12-13292MSDate Received: 04-MAY-12GEL Job No (SDG): 12-1277GEL Sample ID: 1202655998Date Filtered: 17-MAY-12Injection 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	0.469	ug/L		1	18-MAY-12 17:45	per0518028a
	Perchlorate Isotope Ratio			3.17			1	18-MAY-12 17:45	per0518028a
14797-73-0	Perchlorate-101	.05	.2	0.466	ug/L		1	18-MAY-12 17:45	per0518028a
	Perchlorate-O(18)			0.516	ug/L		1	18-MAY-12 17:45	per0518028a

^ 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: 1211962Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAPA-12-13292MSDDate Received: 04-MAY-12GEL Job No (SDG): 12-1277GEL Sample ID: 1202655999Date Filtered: 17-MAY-12Injection 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	0.492	ug/L		1	18-MAY-12 17:52	per0518029a
	Perchlorate Isotope Ratio			3.16			1	18-MAY-12 17:52	per0518029a
14797-73-0	Perchlorate-101	.05	.2	0.491	ug/L		1	18-MAY-12 17:52	per0518029a
	Perchlorate-O(18)			0.537	ug/L		1	18-MAY-12 17:52	per0518029a

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

*Concentration =

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

Explosives by LCMSMS Analysis

Case Narrative

**LC/MS/MS Case Narrative
ARS International (ARSL)
SDG 12-1277**

Method/Analysis Information

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

Analytical Method: SW846 3535/8321A Modified

Prep Method: SW846 Method 3535

Analytical Batch Number: 1210233

Prep Batch Number: 1210231

Sample Analysis

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

Sample ID	Client ID
303859001	CAPA-12-13285
1202651707	Method Blank (MB)
1202651708	Laboratory Control Sample (LCS)
1202651709	303750001(CAPA-12-13282) Matrix Spike (MS)
1202651710	303750001(CAPA-12-13282) Matrix Spike Duplicate (MSD)

Preparation/Analytical Method Verification

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-056 REV# 16.

Primary Analyte Analysis

Calibration Information

Initial Calibration

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

Calibration Verification Standard Requirements

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

Calibration Blank Requirements

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

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

CRI Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

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

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries were within the established acceptance limits.

QC Sample Designation

Client sample 303750001 (CAPA-12-13282) from SDG 12-1274 was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS spike recoveries were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD spike recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD(s) between the MS and MSD met the acceptance limits for this analysis.

Internal Standard (ISTD) Acceptance

A final internal standard concentration of 100ug/L is employed in order to meet the minimum response factor requirement of 0.01 per EPA Method 8000C for the analysis of explosives on the API 4000. The internal standard responses were within the required acceptance criteria for all samples and QC in this SDG.

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

According to the GEL SOP for Method 8321A, all sample and QC extracts are diluted 1:1 v/v with HPLC grade water. The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

Sample Re-extraction/Re-analysis

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

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

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

Calibration Verification Standard Requirements

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

Calibration Blank Requirements

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

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

CRI Requirements

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

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

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

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries were within the established acceptance limits.

QC Sample Designation

Client sample 303750001 (CAPA-12-13282) from SDG 12-1274 was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS spike recoveries were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD spike recoveries were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD(s) between the MS and MSD met the acceptance limits for this analysis.

Internal Standard (ISTD) Acceptance

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

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

According to the GEL SOP for Method 8321A, all sample and QC extracts are diluted 1:1 v/v with HPLC grade water. The samples in this SDG in this analytical batch for this analysis did not require any additional dilutions.

Sample Re-extraction/Re-analysis

Samples were re-analyzed for low recoveries in the closing CRI of the initial Secondary analyte analysis. The low recovery was not confirmed. Only the data from the re-analysis 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.

Flagging Convention

The samples were not originally analyzed using SW-846 Method 8330.

Additional Comments

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

Due to software limitations in the Secondary analyte analysis, false positives and analytes detected below the MDL cannot be deleted from the raw data.

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

System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Primary analyte analysis. It is coupled with 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 APCI (Atmospheric Pressure chemical Ionization) probe that is operated in the negative ionization mode for the Primary analyte analysis. The laboratory also utilizes an Agilent 1100 liquid chromatography instrument for either Primary or Secondary analyte analysis. It is coupled with an Applied Biosystems 4000 Mass Spectrometer/ Mass Spectrometer, designated as either LCMSMS #3 or LCMSMS #4. It is fitted with an APCI (Atmospheric Pressure chemical Ionization) probe that is operated in the negative ionization mode for both the Primary and Secondary analyte analysis.

Electronic Packaging Comment

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

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

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

Chromatographic Columns

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

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

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

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

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

ARSL001 ARS International (63641-10)

Client SDG: 12-1277 GEL Work Order: 303859

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 06 JUN 2012

Title: Group Leader

Sample Data Summary

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13285

Lab Code: GEL

GEL Job No (SDG) 12-1277

Matrix: WATER

GEL Sample ID: 303859001

Sample Amount 860 mL

Date Received: 05-MAY-12

Moisture: .

Extraction Batch ID: 1210231

Extraction Type Sol Exchange

Date Extracted: 08-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXP0604021.wiff

Date Analyzed: 05-JUN-12 01:43

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	0.291	U	0.093	0.291
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	0.291	U	0.093	0.291
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	0.291	U	0.093	0.291
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	0.291	U	0.093	0.291
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	0.291	U	0.093	0.291
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	0.291	U	0.093	0.291
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	0.291	U	0.093	0.291
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
5755-27-1	MNX	0.291	U	0.093	0.291
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	0.291	U	0.093	0.291
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	0.291	U	0.093	0.291
<i>80251-29-2</i>	<i>DNX</i>				
88-72-2	o-Nitrotoluene	0.291	U	0.0953	0.291
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	0.291	U	0.093	0.291
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	0.291	U	0.093	0.291
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13285

Lab Code: GEL

GEL Job No (SDG) 12-1277

Matrix: WATER

GEL Sample ID: 303859001

Sample Amount 860 mL

Date Received: 05-MAY-12

Moisture: .

Extraction Batch ID: 1210231

Extraction Type Sol Exchange

Date Extracted: 08-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4	1,3,5-Trinitrobenzene	0.291	U	0.093	0.291
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
99-65-0	m-Dinitrobenzene	0.291	U	0.093	0.291
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
479-45-8	Tetryl	0.581	U	0.093	0.581
<i>479-45-8</i>	<i>Tetryl</i>				
78-11-5	PETN	0.581	U	0.116	0.581
<i>78-11-5</i>	<i>PETN</i>				
99-99-0	p-Nitrotoluene	0.581	U	0.174	0.581
<i>99-99-0</i>	<i>p-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13285

Lab Code: GEL

GEL Job No (SDG) 12-1277

Matrix: WATER

GEL Sample ID: 303859001

Sample Amount 860 mL

Date Received: 05-MAY-12

Moisture: .

Extraction Batch ID: 1210231

Extraction Type Sol Exchange

Date Extracted: 08-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXS05140020.wiff

Date Analyzed: 14-MAY-12 16:42

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
3058-38-6	TATB	1.16	U	0.349	1.16
<i>3058-38-6</i>	<i>TATB</i>				
618-87-1	3,5-Dinitroaniline	1.16	U	0.349	1.16
<i>618-87-1</i>	<i>3,5-Dinitroaniline</i>				
78-30-8	tris(o-cresyl) phosphate	1.16	U	0.349	1.16
<i>78-30-8</i>	<i>tris(o-cresyl) phosphate</i>				
59229-75-3	2,6-Diamino-4-nitrotoluene	2.91	U	0.581	2.91
<i>59229-75-3</i>	<i>2,6-Diamino-4-nitrotoluene</i>				
6629-29-4	2,4-Diamino-6-nitrotoluene	2.91	U	0.581	2.91
<i>6629-29-4</i>	<i>2,4-Diamino-6-nitrotoluene</i>				

Quality Control Summary

High Explosives Surrogate Recovery Summary

Lab Name: GEL Laboratories LLCGEL Job No (SDG): 12-1277Lab Code: GELHPLC Column: Phenomenex Ultracarb 5u ODS(20)

Lab Sample ID	Client Sample ID	DNT	QC Limits	Flg
303859001	CAPA-12-13285	92.4	68 - 122	
303859001	CAPA-12-13285	88.4	68 - 122	
1202651707	MB for batch 1210231	91.6	68 - 122	
1202651707	MB for batch 1210231	92.8	68 - 122	
1202651708	LCS for batch 1210231	94	68 - 122	
1202651708	LCS for batch 1210231	95.2	68 - 122	
1202651709	CAPA-12-13282(303750001MS)	92	68 - 122	
1202651709	CAPA-12-13282(303750001MS)	92.8	68 - 122	
1202651710	CAPA-12-13282(303750001MSD)	92	68 - 122	
1202651710	CAPA-12-13282(303750001MSD)	87.2	68 - 122	

DNT = 3,4-Dinitrotoluene

3B
High Explosives LCS/LCS Duplicate Summary

Lab Name: GEL Laboratories LLC

Client ID: LCS

Lab Code: GEL

GEL Job No (SDG) 12-1277

Extract Batch Code: 1210231

Date Extracted: 08-MAY-12

GEL LCS ID: 1202651708

GEL LCSDUP ID:

Analysis Date/Time: 04-JUN-12 21:39

DUP Analysis Date/Time:

Reporting Units: ug/L

QC Type: LCS/LCSD

Compound	Spike Added	LCS Conc	LCS Rec #	LCSD Conc	LCSD Rec #	RPD #	RPD	Recovery Limits
1,3,5-Trinitrobenzene	5	4.54	90.8					60 - 115
2,4,6-Trinitrotoluene	5	4.75	95					77 - 132
2,4-Dinitrotoluene	5	4.55	91					78 - 125
2,6-Dinitrotoluene	5	4.5	90					82 - 111
2-Amino-4,6-dinitrotoluene	5	4.55	91					75 - 129
4-Amino-2,6-dinitrotoluene	5	4.49	89.8					78 - 125
DNX	5	4.31	86.2					73 - 117
HMX	5	3.8	76					65 - 112
MXN	5	4.36	87.2					68 - 129
Nitrobenzene	5	4.88	97.6					63 - 110
PETN	5	4.26	85.2					61 - 138
RDX	5	4.35	87					79 - 128
TNX	5	4.06	81.2					66 - 118
Tetryl	5	4.36	87.2					38 - 150
m-Dinitrobenzene	5	4.73	94.6					86 - 119
m-Nitrotoluene	5	4.93	98.6					63 - 109
o-Nitrotoluene	5	4.65	93					61 - 109
p-Nitrotoluene	5	4.98	99.6					64 - 112

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

* Values outside of QC limits

3B
High Explosives LCS/LCS Duplicate Summary

Lab Name: GEL Laboratories LLC

Client ID: LCS

Lab Code: GEL

GEL Job No (SDG) 12-1277

Extract Batch Code: 1210231

Date Extracted: 08-MAY-12

GEL LCS ID: 1202651708

GEL LCSDUP ID: .

Analysis Date/Time: 12-MAY-12 04:07

DUP Analysis Date/Time:

Reporting Units: ug/L

QC Type: LCS/LCSD

Compound	Spike Added	LCS Conc	LCS Rec #	LCSD Conc	LCSD Rec #	RPD #	RPD	Recovery Limits
2,4-Diamino-6-nitrotoluene	5	4.14	82.8					49 - 112
2,6-Diamino-4-nitrotoluene	5	4.35	87					61 - 116
3,5-Dinitroaniline	5	4.74	94.8					66 - 119
TATB	5	3.45	69					32 - 169
tris(o-cresyl) phosphate	5	2.73	54.6					38 - 87

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

* Values outside of QC limits

3
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAPA-12-13282

Lab Code: GEL

GEL Job No (SDG) 12-1277

Extract Batch Code: 1210231

Date Extracted: 08-MAY-12

GEL Spike ID: 1202651709

GEL SpikeDup ID: 1202651710

Analysis Date/Time: 04-JUN-12 22:49

MSD Analysis Date/Time: 04-JUN-12 23:24

Reporting Units: ug/L

QC Type: MS/MSD

Compound	Spike Added	Sample Conc	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Rec Limits
m-Dinitrobenzene	5.31915	0	4.79	90	5.24	97.4	8.97	25	79 - 126
m-Nitrotoluene	5.31915	0	4.8	90.2	4.86	90.4	1.29	25	55 - 123
o-Nitrotoluene	5.31915	0	4.93	92.6	4.96	92.2	.637	25	57 - 119
2,4,6-Trinitrotoluene	5.31915	0	5.01	94.2	5.13	95.4	2.34	25	65 - 140
1,3,5-Trinitrobenzene	5.31915	0	4.74	89.2	5.01	93.2	5.46	25	58 - 114
p-Nitrotoluene	5.31915	0	5.14	96.6	5.3	98.6	3.12	25	57 - 124
2,4-Dinitrotoluene	5.31915	0	5.03	94.6	5.09	94.6	1.07	25	73 - 128
2-Amino-4,6-dinitrotoluene	5.31915	0	5	94	5.08	94.4	1.49	25	66 - 137
DNX	5.31915	0	4.74	89.2	5.05	94	6.31	34	67 - 126
Tetryl	5.31915	0	4.39	82.6	4.59	85.4	4.4	28	31 - 119
TNX	5.31915	0	4.54	85.4	4.75	88.4	4.52	31	51 - 133
RDX	5.31915	0	4.54	85.4	5.18	96.4	13.2	25	63 - 145
PETN	5.31915	0	4.37	82.2	4.48	83.4	2.52	27	53 - 143
Nitrobenzene	5.31915	0	4.89	92	5.26	97.8	7.18	25	61 - 118
MXN	5.31915	0	4.55	85.6	5.05	94	10.4	25	74 - 127
HMX	5.31915	0	4.15	78	4.66	86.6	11.5	25	51 - 128
4-Amino-2,6-dinitrotoluene	5.31915	0	4.96	93.2	5.06	94.2	2.14	25	65 - 137
2,6-Dinitrotoluene	5.31915	0	4.79	90	4.92	91.6	2.83	25	79 - 115

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

3
High Explosives MS/MSD Summary

Lab Name: GEL Laboratories LLC

Client ID: CAPA-12-13282

Lab Code: GEL

GEL Job No (SDG) 12-1277

Extract Batch Code: 1210231

Date Extracted: 08-MAY-12

GEL Spike ID: 1202651709

GEL SpikeDup ID: 1202651710

Analysis Date/Time: 12-MAY-12 04:40

MSD Analysis Date/Time: 12-MAY-12 04:57

Reporting Units: ug/L

QC Type: MS/MSD

Compound	Spike Added	Sample Conc	MS Conc	MS Rec #	MSD Conc	MSD Rec #	RPD #	RPD Limit	Rec Limits
2,4-Diamino-6-nitrotoluene	5.31915	0	4.88	91.8	4.73	88	3.16	25	42 - 117
2,6-Diamino-4-nitrotoluene	5.31915	0	4.88	91.8	5.1	94.8	4.29	25	50 - 121
3,5-Dinitroaniline	5.31915	0	5.1	95.8	5.02	93.4	1.47	25	59 - 125
TATB	5.31915	0	3.98	74.8	3.99	74.2	.264	25	30 - 169
tris(o-cresyl) phosphate	5.31915	0	3.31	62.2	2.86	53.2	14.5	25	28 - 87

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

Quality Control Data

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1210231

Lab Code: GEL

GEL Job No (SDG) 12-1277

Matrix: WATER

GEL Sample ID: 1202651707

Sample Amount 1000 mL

Date Received: 05-MAY-12

Moisture: .

Extraction Batch ID: 1210231

Extraction Type Sol Exchange

Date Extracted: 08-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXP0604013.wiff

Date Analyzed: 04-JUN-12 21:04

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7	2,4,6-Trinitrotoluene	0.250	U	0.080	0.250
<i>118-96-7</i>	<i>2,4,6-Trinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	0.250	U	0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
121-82-4	RDX	0.250	U	0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	0.250	U	0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	0.250	U	0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
2691-41-0	HMX	0.250	U	0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	0.250	U	0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
5755-27-1	MNX	0.250	U	0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
606-20-2	2,6-Dinitrotoluene	0.250	U	0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
80251-29-2	DNX	0.250	U	0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
88-72-2	o-Nitrotoluene	0.250	U	0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
98-95-3	Nitrobenzene	0.250	U	0.080	0.250
<i>98-95-3</i>	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	0.250	U	0.080	0.250
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1210231

Lab Code: GEL

GEL Job No (SDG) 12-1277

Matrix: WATER

GEL Sample ID: 1202651707

Sample Amount 1000 mL

Date Received: 05-MAY-12

Moisture: .

Extraction Batch ID: 1210231

Extraction Type Sol Exchange

Date Extracted: 08-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-35-4 <i>99-35-4</i>	1,3,5-Trinitrobenzene <i>1,3,5-Trinitrobenzene</i>	0.250	U	0.080	0.250
99-65-0 <i>99-65-0</i>	m-Dinitrobenzene <i>m-Dinitrobenzene</i>	0.250	U	0.080	0.250
479-45-8 <i>479-45-8</i>	Tetryl <i>Tetryl</i>	0.500	U	0.080	0.500
78-11-5 <i>78-11-5</i>	PETN <i>PETN</i>	0.500	U	0.100	0.500
99-99-0 <i>99-99-0</i>	p-Nitrotoluene <i>p-Nitrotoluene</i>	0.500	U	0.150	0.500

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: MB for batch 1210231

Lab Code: GEL

GEL Job No (SDG) 12-1277

Matrix: WATER

GEL Sample ID: 1202651707

Sample Amount 1000 mL

Date Received: 05-MAY-12

Moisture: .

Extraction Batch ID: 1210231

Extraction Type Sol Exchange

Date Extracted: 08-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXS05110040.wiff

Date Analyzed: 12-MAY-12 03:50

Dilution Factor: 2

Concentration Units: ug/L

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

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1210231

Lab Code: GEL

GEL Job No (SDG) 12-1277

Matrix: WATER

GEL Sample ID: 1202651708

Sample Amount 1000 mL

Date Received: 05-MAY-12

Moisture: .

Extraction Batch ID: 1210231

Extraction Type Sol Exchange

Date Extracted: 08-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXP0604014.wiff

Date Analyzed: 04-JUN-12 21:39

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
2691-41-0	HMX	3.8		0.080	0.250
<i>2691-41-0</i>	<i>HMX</i>				
13980-04-6	TNX	4.06		0.080	0.250
<i>13980-04-6</i>	<i>TNX</i>				
78-11-5	PETN	4.26		0.100	0.500
<i>78-11-5</i>	<i>PETN</i>				
80251-29-2	DNX	4.31		0.080	0.250
<i>80251-29-2</i>	<i>DNX</i>				
121-82-4	RDX	4.35		0.080	0.250
<i>121-82-4</i>	<i>RDX</i>				
479-45-8	Tetryl	4.36		0.080	0.500
<i>479-45-8</i>	<i>Tetryl</i>				
5755-27-1	MNX	4.36		0.080	0.250
<i>5755-27-1</i>	<i>MNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	4.49		0.080	0.250
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.5		0.080	0.250
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	4.54		0.080	0.250
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
121-14-2	2,4-Dinitrotoluene	4.55		0.080	0.250
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	4.55		0.080	0.250
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	4.65		0.082	0.250
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1210231

Lab Code: GEL

GEL Job No (SDG) 12-1277

Matrix: WATER

GEL Sample ID: 1202651708

Sample Amount 1000 mL

Date Received: 05-MAY-12

Moisture: .

Extraction Batch ID: 1210231

Extraction Type Sol Exchange

Date Extracted: 08-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

Cas No.	Compound	Concentration*	Q	MDL	PQL
99-65-0	m-Dinitrobenzene	4.73		0.080	0.250
99-65-0	<i>m-Dinitrobenzene</i>				
118-96-7	2,4,6-Trinitrotoluene	4.75		0.080	0.250
118-96-7	<i>2,4,6-Trinitrotoluene</i>				
98-95-3	Nitrobenzene	4.88		0.080	0.250
98-95-3	<i>Nitrobenzene</i>				
99-08-1	m-Nitrotoluene	4.93		0.080	0.250
99-08-1	<i>m-Nitrotoluene</i>				
99-99-0	p-Nitrotoluene	4.98		0.150	0.500
99-99-0	<i>p-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: LCS for batch 1210231

Lab Code: GEL

GEL Job No (SDG) 12-1277

Matrix: WATER

GEL Sample ID: 1202651708

Sample Amount 1000 mL

Date Received: 05-MAY-12

Moisture: .

Extraction Batch ID: 1210231

Extraction Type Sol Exchange

Date Extracted: 08-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXS05110041.wiff

Date Analyzed: 12-MAY-12 04:07

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-30-8	tris(o-cresyl) phosphate	2.73		0.300	1.00
78-30-8	tris(o-cresyl) phosphate				
3058-38-6	TATB	3.45		0.300	1.00
3058-38-6	TATB				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.14		0.500	2.50
6629-29-4	2,4-Diamino-6-nitrotoluene				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.35		0.500	2.50
59229-75-3	2,6-Diamino-4-nitrotoluene				
618-87-1	3,5-Dinitroaniline	4.74		0.300	1.00
618-87-1	3,5-Dinitroaniline				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13282(303750001MS)MS

Lab Code: GEL

GEL Job No (SDG) 12-1277

Matrix: WATER

GEL Sample ID: 1202651709

Sample Amount 940 mL

Date Received: 05-MAY-12

Moisture: .

Extraction Batch ID: 1210231

Extraction Type Sol Exchange

Date Extracted: 08-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXP0604016.wiff

Date Analyzed: 04-JUN-12 22:49

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
2691-41-0	HMX	4.15		0.0851	0.266
<i>2691-41-0</i>	<i>HMX</i>				
78-11-5	PETN	4.37		0.106	0.532
<i>78-11-5</i>	<i>PETN</i>				
479-45-8	Tetryl	4.39		0.0851	0.532
<i>479-45-8</i>	<i>Tetryl</i>				
121-82-4	RDX	4.54		0.0851	0.266
<i>121-82-4</i>	<i>RDX</i>				
13980-04-6	TNX	4.54		0.0851	0.266
<i>13980-04-6</i>	<i>TNX</i>				
5755-27-1	MNX	4.55		0.0851	0.266
<i>5755-27-1</i>	<i>MNX</i>				
80251-29-2	DNX	4.74		0.0851	0.266
<i>80251-29-2</i>	<i>DNX</i>				
99-35-4	1,3,5-Trinitrobenzene	4.74		0.0851	0.266
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
606-20-2	2,6-Dinitrotoluene	4.79		0.0851	0.266
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
99-65-0	m-Dinitrobenzene	4.79		0.0851	0.266
<i>99-65-0</i>	<i>m-Dinitrobenzene</i>				
99-08-1	m-Nitrotoluene	4.8		0.0851	0.266
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
98-95-3	Nitrobenzene	4.89		0.0851	0.266
<i>98-95-3</i>	<i>Nitrobenzene</i>				
88-72-2	o-Nitrotoluene	4.93		0.0872	0.266
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13282(303750001MS)MS

Lab Code: GEL

GEL Job No (SDG) 12-1277

Matrix: WATER

GEL Sample ID: 1202651709

Sample Amount 940 mL

Date Received: 05-MAY-12

Moisture: .

Extraction Batch ID: 1210231

Extraction Type Sol Exchange

Date Extracted: 08-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

Cas No.	Compound	Concentration*	Q	MDL	PQL
19406-51-0 <i>19406-51-0</i>	4-Amino-2,6-dinitrotoluene <i>4-Amino-2,6-dinitrotoluene</i>	4.96		0.0851	0.266
35572-78-2 <i>35572-78-2</i>	2-Amino-4,6-dinitrotoluene <i>2-Amino-4,6-dinitrotoluene</i>	5		0.0851	0.266
118-96-7 <i>118-96-7</i>	2,4,6-Trinitrotoluene <i>2,4,6-Trinitrotoluene</i>	5.01		0.0851	0.266
121-14-2 <i>121-14-2</i>	2,4-Dinitrotoluene <i>2,4-Dinitrotoluene</i>	5.03		0.0851	0.266
99-99-0 <i>99-99-0</i>	p-Nitrotoluene <i>p-Nitrotoluene</i>	5.14		0.160	0.532

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13282(303750001MS)MS

Lab Code: GEL

GEL Job No (SDG) 12-1277

Matrix: WATER

GEL Sample ID: 1202651709

Sample Amount 940 mL

Date Received: 05-MAY-12

Moisture: .

Extraction Batch ID: 1210231

Extraction Type Sol Exchange

Date Extracted: 08-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXS05110043.wiff

Date Analyzed: 12-MAY-12 04:40

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-30-8	tris(o-cresyl) phosphate	3.31		0.319	1.06
78-30-8	tris(o-cresyl) phosphate				
3058-38-6	TATB	3.98		0.319	1.06
3058-38-6	TATB				
59229-75-3	2,6-Diamino-4-nitrotoluene	4.88		0.532	2.66
59229-75-3	2,6-Diamino-4-nitrotoluene				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.88		0.532	2.66
6629-29-4	2,4-Diamino-6-nitrotoluene				
618-87-1	3,5-Dinitroaniline	5.1		0.319	1.06
618-87-1	3,5-Dinitroaniline				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13282(303750001MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 12-1277

Matrix: WATER

GEL Sample ID: 1202651710

Sample Amount 930 mL

Date Received: 05-MAY-12

Moisture: .

Extraction Batch ID: 1210231

Extraction Type Sol Exchange

Date Extracted: 08-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXP0604017.wiff

Date Analyzed: 04-JUN-12 23:24

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-11-5	PETN	4.48		0.108	0.538
<i>78-11-5</i>	<i>PETN</i>				
479-45-8	Tetryl	4.59		0.086	0.538
<i>479-45-8</i>	<i>Tetryl</i>				
2691-41-0	HMX	4.66		0.086	0.269
<i>2691-41-0</i>	<i>HMX</i>				
13980-04-6	TNX	4.75		0.086	0.269
<i>13980-04-6</i>	<i>TNX</i>				
99-08-1	m-Nitrotoluene	4.86		0.086	0.269
<i>99-08-1</i>	<i>m-Nitrotoluene</i>				
606-20-2	2,6-Dinitrotoluene	4.92		0.086	0.269
<i>606-20-2</i>	<i>2,6-Dinitrotoluene</i>				
88-72-2	o-Nitrotoluene	4.96		0.0882	0.269
<i>88-72-2</i>	<i>o-Nitrotoluene</i>				
99-35-4	1,3,5-Trinitrobenzene	5.01		0.086	0.269
<i>99-35-4</i>	<i>1,3,5-Trinitrobenzene</i>				
5755-27-1	MNX	5.05		0.086	0.269
<i>5755-27-1</i>	<i>MNX</i>				
80251-29-2	DNX	5.05		0.086	0.269
<i>80251-29-2</i>	<i>DNX</i>				
19406-51-0	4-Amino-2,6-dinitrotoluene	5.06		0.086	0.269
<i>19406-51-0</i>	<i>4-Amino-2,6-dinitrotoluene</i>				
35572-78-2	2-Amino-4,6-dinitrotoluene	5.08		0.086	0.269
<i>35572-78-2</i>	<i>2-Amino-4,6-dinitrotoluene</i>				
121-14-2	2,4-Dinitrotoluene	5.09		0.086	0.269
<i>121-14-2</i>	<i>2,4-Dinitrotoluene</i>				

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13282(303750001MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 12-1277

Matrix: WATER

GEL Sample ID: 1202651710

Sample Amount 930 mL

Date Received: 05-MAY-12

Moisture: .

Extraction Batch ID: 1210231

Extraction Type Sol Exchange

Date Extracted: 08-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

Cas No.	Compound	Concentration*	Q	MDL	PQL
118-96-7 <i>118-96-7</i>	2,4,6-Trinitrotoluene <i>2,4,6-Trinitrotoluene</i>	5.13		0.086	0.269
121-82-4 <i>121-82-4</i>	RDX <i>RDX</i>	5.18		0.086	0.269
99-65-0 <i>99-65-0</i>	m-Dinitrobenzene <i>m-Dinitrobenzene</i>	5.24		0.086	0.269
98-95-3 <i>98-95-3</i>	Nitrobenzene <i>Nitrobenzene</i>	5.26		0.086	0.269
99-99-0 <i>99-99-0</i>	p-Nitrotoluene <i>p-Nitrotoluene</i>	5.3		0.161	0.538

1
High Explosives Analysis Data Sheet

Lab Name: GEL Laboratories LLC

Client Sample ID: CAPA-12-13282(303750001MSD)MSD

Lab Code: GEL

GEL Job No (SDG) 12-1277

Matrix: WATER

GEL Sample ID: 1202651710

Sample Amount 930 mL

Date Received: 05-MAY-12

Moisture: .

Extraction Batch ID: 1210231

Extraction Type Sol Exchange

Date Extracted: 08-MAY-12

Concentrated Extract Volume (mL) 5

Injection Volume (uL): 50

GEL data file: EXS05110044.wiff

Date Analyzed: 12-MAY-12 04:57

Dilution Factor: 2

Concentration Units: ug/L

Cas No.	Compound	Concentration*	Q	MDL	PQL
78-30-8	tris(o-cresyl) phosphate	2.86		0.323	1.08
78-30-8	tris(o-cresyl) phosphate				
3058-38-6	TATB	3.99		0.323	1.08
3058-38-6	TATB				
6629-29-4	2,4-Diamino-6-nitrotoluene	4.73		0.538	2.69
6629-29-4	2,4-Diamino-6-nitrotoluene				
618-87-1	3,5-Dinitroaniline	5.02		0.323	1.08
618-87-1	3,5-Dinitroaniline				
59229-75-3	2,6-Diamino-4-nitrotoluene	5.1		0.538	2.69
59229-75-3	2,6-Diamino-4-nitrotoluene				

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 12-1277Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 04-JUN-12 14:05GEL Data File: EXP0604001.wiffInstrument ID: LCMSMSColumn: Phenomenex Ultracarb 5u ODS(20)

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

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 12-1277Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 04-JUN-12 14:40GEL Data File: EXP0604002.wiffInstrument ID: LCMSMSColumn: Phenomenex Ultracarb 5u ODS(20)

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

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 12-1277Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 11-MAY-12 16:58GEL Data File: EXS05110001.wiffInstrument ID: LCMSMSColumn: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	10.9
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 12-1277Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 11-MAY-12 17:15GEL Data File: EXS05110002.wiffInstrument ID: LCMSMSColumn: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	7.08
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 12-1277Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 14-MAY-12 11:24GEL Data File: EXS05140001.wiffInstrument ID: LCMSMSColumn: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	4.73
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

Explosives Initial Calibration Blank

Lab Name: GEL Laboratories LLCGEL Job No(SDG): 12-1277Lab Code: GELLab Sample ID: XIBLK01Analysis Date: 14-MAY-12 11:41GEL Data File: EXS05140002.wiffInstrument ID: LCMSMSColumn: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	1.64
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 12-1277

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 04-JUN-12 18:44

GEL Data File: EXP0604009.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 12-1277

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 04-JUN-12 19:54

GEL Data File: EXP0604011.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 12-1277

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 05-JUN-12 02:53

GEL Data File: EXP0604023.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

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

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 12-1277

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 11-MAY-12 19:29

GEL Data File: EXS05110010.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	13.2
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 12-1277

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 11-MAY-12 20:02

GEL Data File: EXS05110012.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	9.15
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 12-1277

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 11-MAY-12 22:32

GEL Data File: EXS05110021.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	9.06
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 12-1277

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 12-MAY-12 02:10

GEL Data File: EXS05110034.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	8.06
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 12-1277

Lab Code: GEL

Lab Sample ID: XIBLK06

Analysis Date: 12-MAY-12 03:33

GEL Data File: EXS05110039.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	6.56
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 12-1277

Lab Code: GEL

Lab Sample ID: XIBLK07

Analysis Date: 12-MAY-12 05:30

GEL Data File: EXS05110046.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	8.4
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 12-1277

Lab Code: GEL

Lab Sample ID: XIBLK02

Analysis Date: 14-MAY-12 13:55

GEL Data File: EXS05140010.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	10.4
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 12-1277

Lab Code: GEL

Lab Sample ID: XIBLK03

Analysis Date: 14-MAY-12 14:28

GEL Data File: EXS05140012.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	5.33
TATB	0	0
3,5-Dinitroaniline	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 12-1277

Lab Code: GEL

Lab Sample ID: XIBLK04

Analysis Date: 14-MAY-12 15:35

GEL Data File: EXS05140016.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	2.33
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

4A
Explosives Continuing Calibration Blank

Lab Name: GEL Laboratories LLC

GEL Job No(SDG): 12-1277

Lab Code: GEL

Lab Sample ID: XIBLK05

Analysis Date: 14-MAY-12 17:15

GEL Data File: EXS05140022.wiff

Instrument ID: LCMSMS

Column: Phenomenex Ultracarb 5u ODS(20)

Compound	True	Found (ug/L)
3,4-Dinitrotoluene	0	0
tris(o-cresyl) phosphate	0	4.01
TATB	0	0
3,5-Dinitroaniline	0	0
2,4-Diamino-6-nitrotoluene	0	0
2,6-Diamino-4-nitrotoluene	0	0

Metals Analysis

Case Narrative

**Metals Fractional Narrative
ARS International (ARSL)
SDG 12-1277**

Sample Analysis

Sample ID	Client ID
303859002	CAPA-12-13295
1202650970	Method Blank (MB) ICP
1202650971	Laboratory Control Sample (LCS)
1202650974	303750002(CAPA-12-13292L) Serial Dilution (SD)
1202650972	303750002(CAPA-12-13292D) Sample Duplicate (DUP)
1202650973	303750002(CAPA-12-13292S) Matrix Spike (MS)
1202650965	Method Blank (MB) ICP-MS
1202650966	Laboratory Control Sample (LCS)
1202650969	303750002(CAPA-12-13292L) Serial Dilution (SD)
1202650967	303750002(CAPA-12-13292D) Sample Duplicate (DUP)
1202650968	303750002(CAPA-12-13292S) Matrix Spike (MS)
1202652151	Method Blank (MB) CVAA
1202652152	Laboratory Control Sample (LCS)
1202652155	303613003(CAPA-12-13272L) Serial Dilution (SD)
1202652153	303613003(CAPA-12-13272D) Sample Duplicate (DUP)
1202652154	303613003(CAPA-12-13272S) Matrix Spike (MS)

Method/Analysis Information

Analytical Batch:	1209957, 1209953, 1210437 and 1216196
Prep Batch :	1209955, 1209952 and 1210434
Standard Operating Procedures:	GL-MA-E-013 REV# 20, GL-MA-E-006 REV# 9, GL-MA-E-014 REV# 24, GL-MA-E-010 REV# 25 and GL-GC-E-107 REV# 7
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 - 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

The instrument calibrations are conducted using the method and instrument manufacturer's specifications. All initial calibration requirements were not met for this SDG. CVAA. The ICV is slightly over-range for the Hg 245 method. However, all samples are below the MDL. Reporting Results. CVAA.

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 samples were selected as the quality control (QC) samples for this SDG: 303750002 (CAPA-12-13292)-ICP and ICP-MS and 303613003 (CAPA-12-13272)-CVAA.

Matrix Spike (MS) Recovery Statement

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

Duplicate Relative Percent Difference (RPD) Statement

The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required 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 instrument. The samples in this SDG did not require dilutions.

Preparation Information

The samples in this SDG were prepared exactly according to the cited SOP.

Miscellaneous Information

Electronic Packaging Comment

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

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

Data Exception (DER) Documentation

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

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

Please refer to the Total Ca and Total Mg data to validate results appearing on the Hardness Summary sheet. Both results are in the Inorganic/metals section of the package.

There is no Batch QC for calculated results, and thus no QC Summary for the Hardness by Calculation Batch. The MDLs and PQLs are calculated using the higher of the two calculated values of Ca or Mg.

Certification Statement

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

Review Validation:

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

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

Reviewer: Duke **Date:** 06/01/12

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: 12-1277 GEL Work Order: 303859

The Qualifiers in this report are defined as follows:

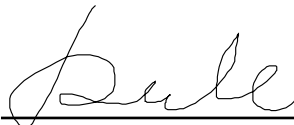
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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 detection limit.

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

 06/01/12

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 12-1277

METHOD TYPE: EPA

SAMPLE ID: 303859002

CLIENT ID: CAPA-12-13295

CONTRACT: ESHL00210

MATRIX:W

DATE RECEIVED 05-MAY-12

LEVEL: Low %SOLIDS:

<u>CAS No</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>C</u>	<u>Qual</u>	<u>M*</u>	<u>MDL</u>	<u>DF</u>	<u>Inst ID</u>	<u>Analytical Run</u>
7439-97-6	Mercury	0.067	ug/L	U		AV	0.067	1	MER536	050912W5-4
7631-86-9	Silica	71.9	mg/L			P	0.053	1	OPTIMA3	051712-1
7429-90-5	Aluminum	68	ug/L	U		P	68	1	OPTIMA3	051712-1
7440-36-0	Antimony	1	ug/L	U		MS	1	1	ICPMS6	120521-3
7440-38-2	Arsenic	1.7	ug/L	U		MS	1.7	1	ICPMS6	120521-3
7440-39-3	Barium	17.6	ug/L			P	1	1	OPTIMA3	051712-1
7440-41-7	Beryllium	1	ug/L	U		P	1	1	OPTIMA3	051712-1
7440-42-8	Boron	15	ug/L	U		P	15	1	OPTIMA3	051712-1
7440-43-9	Cadmium	0.11	ug/L	U		MS	0.11	1	ICPMS6	120518-2
7440-70-2	Calcium	12300	ug/L			P	50	1	OPTIMA3	051712-1
7440-47-3	Chromium	3.36	ug/L	J		MS	2	1	ICPMS6	120521-3
7440-48-4	Cobalt	1	ug/L	U		P	1	1	OPTIMA3	051712-1
7440-50-8	Copper	3	ug/L	U		P	3	1	OPTIMA3	051712-1
7439-89-6	Iron	30	ug/L	U		P	30	1	OPTIMA3	051712-1
7439-92-1	Lead	0.5	ug/L	U		MS	0.5	1	ICPMS6	120518-2
7439-95-4	Magnesium	3150	ug/L			P	110	1	OPTIMA3	051712-1
7439-96-5	Manganese	3.32	ug/L	J		P	2	1	OPTIMA3	051712-1
7439-98-7	Molybdenum	0.946	ug/L			MS	0.165	1	ICPMS6	120518-2
7440-02-0	Nickel	0.546	ug/L	J		MS	0.5	1	ICPMS6	120521-3
7440-09-7	Potassium	1210	ug/L			P	50	1	OPTIMA3	051712-1
7782-49-2	Selenium	1.5	ug/L	U		MS	1.5	1	ICPMS6	120521-3
7440-22-4	Silver	0.2	ug/L	U		MS	0.2	1	ICPMS6	120521-3
7440-23-5	Sodium	10100	ug/L			P	100	1	OPTIMA3	051712-1
7440-24-6	Strontium	52.6	ug/L			P	1	1	OPTIMA3	051712-1
7440-28-0	Thallium	0.45	ug/L	U		MS	0.45	1	ICPMS6	120518-2
7440-31-5	Tin	2.5	ug/L	U		P	2.5	1	OPTIMA3	051712-1

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 12-1277

METHOD TYPE: EPA

SAMPLE ID: 303859002

CLIENT ID: CAPA-12-13295

CONTRACT: ESHL00210

MATRIX:W

DATE RECEIVED 05-MAY-12

LEVEL: Low %SOLIDS:

<u>CAS No</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>C</u>	<u>Qual</u>	<u>M*</u>	<u>MDL</u>	<u>DF</u>	<u>Inst ID</u>	<u>Analytical Run</u>
7440-61-1	Uranium	0.275	ug/L			MS	0.067	1	ICPMS6	120518-2
7440-62-2	Vanadium	3.85	ug/L	J		P	1	1	OPTIMA3	051712-1
7440-66-6	Zinc	38.5	ug/L			P	3.3	1	OPTIMA3	051712-1
	Hardness as CaCO3	43.6	mg/L				0.453	1	CALC001	

***Analytical Methods:**

MS SW846 3005/6020 DOE-AL
P SW846 3005/6010B
AV EPA 245.1/245.2
SM 2340 B

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 12-1277
Contract: ESHL00210
Matrix: W

<u>Sample ID</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Acceptance Window</u>	<u>Conc Qual</u>	<u>M*</u>	<u>MDL</u>	<u>RDL</u>
1202650965	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
	Molybdenum	0.165	ug/L	+/-0.5	U	MS	0.165	0.5
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Chromium	2	ug/L	+/-10	U	MS	2	10
	Nickel	0.5	ug/L	+/-2	U	MS	0.5	2
	Silver	0.2	ug/L	+/-1	U	MS	0.2	1
	Uranium	0.067	ug/L	+/-0.2	U	MS	0.067	0.2
	Thallium	0.45	ug/L	+/-2	U	MS	0.45	2
	Selenium	1.5	ug/L	+/-5	U	MS	1.5	5
1202650970	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	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	0.053	mg/L	+/-0.213	U	P	0.053	0.213
	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
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1202652151	Mercury	0.067	ug/L	+/-0.2	U	AV	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. 12-1277

Client ID: CAPA-12-13292S

Contract: ESHL00210

Level: Low

Matrix: WATER

% Solids:

Sample ID: 303750002

Spike ID: 1202650968

<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	204		1	U	200	102		MS
Arsenic	ug/L	75-125	80		1.7	U	80	100		MS
Cadmium	ug/L	75-125	10.4		0.11	U	10	104		MS
Chromium	ug/L	75-125	52.5		3.78	J	50	97.5		MS
Lead	ug/L	75-125	40.4		0.5	U	40	101		MS
Molybdenum	ug/L	75-125	51.1		1.2		50	99.8		MS
Nickel	ug/L	75-125	54.7		2.84		50	104		MS
Selenium	ug/L	75-125	21.5		1.5	U	20	102		MS
Silver	ug/L	75-125	54.4		0.2	U	50	109		MS
Thallium	ug/L	75-125	94		0.45	U	100	93.8		MS
Uranium	ug/L	75-125	52.3		0.509		50	104		MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

-5a-

Matrix Spike Summary

SDG NO. 12-1277

Client ID: CAPA-12-13292S

Contract: ESHL00210

Level: Low

Matrix: WATER

% Solids:

Sample ID: 303750002

Spike ID: 1202650973

<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>
Barium	ug/L	75-125	556		38.8		500	103		P
Beryllium	ug/L	75-125	519		1	U	500	104		P
Aluminum	ug/L	75-125	5040		68	U	5000	101		P
Boron	ug/L	75-125	529		15	U	500	103		P
Calcium	ug/L	75-125	14900		10200		5000	93.6		P
Cobalt	ug/L	75-125	511		1	U	500	102		P
Copper	ug/L	75-125	534		3	U	500	107		P
Iron	ug/L	75-125	5250		67.8	J	5000	104		P
Magnesium	ug/L	75-125	8180		3050		5000	102		P
Manganese	ug/L	75-125	515		2	U	500	103		P
Potassium	ug/L	75-125	6690		1650		5000	101		P
Silica	mg/L		86.5		77.2		10.7	87.5	N/A	P
Sodium	ug/L	75-125	16900		11900		5000	101		P
Strontium	ug/L	75-125	551		44.7		500	101		P
Tin	ug/L	75-125	516		2.5	U	500	103		P
Vanadium	ug/L	75-125	527		4.99	J	500	104		P
Zinc	ug/L	75-125	507		3.55	J	500	101		P

*Analytical Methods:

P

SW846 3005/6010B

METALS

-5a-

Matrix Spike Summary

SDG NO. 12-1277 Client ID: CAPA-12-13272S

Contract: ESHL00210 Level: Low

Matrix: WATER % Solids:

Sample ID: 303613003 Spike ID: 1202652154

<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	2.25		0.067	U	2	112		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
–6–
Duplicate Sample Summary

SDG No.: 12-1277

Lab Code: GEL

Contract: ESHL00210

Client ID: CAPA-12-13292D

Matrix: LIQUID

Level: Low

Sample ID: 303750002

Duplicate ID: 1202650967

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	+/-10	3.78 J		3.49 J		7.98		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	1.2		1.11		8.03		MS
Nickel	ug/L	+/-2	2.84		2.79		1.67		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	0.509		0.485		4.83		MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

Metals
-6-
Duplicate Sample Summary

SDG No.: 12-1277

Lab Code: GEL

Contract: ESHL00210

Client ID: CAPA-12-13292D

Matrix: LIQUID

Level: Low

Sample ID: 303750002

Duplicate ID: 1202650972

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%	38.8		38.8		.106		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L		15 U		15 U				P
Calcium	ug/L	+/-20%	10200		10300		.468		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L	+/-100	67.8 J		68.3 J		.798		P
Magnesium	ug/L	+/-20%	3050		3050		.23		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1650		1620		1.71		P
Silica	mg/L	+/-20%	77.2		77.2		.00648		P
Sodium	ug/L	+/-20%	11900		12000		1.11		P
Strontium	ug/L	+/-20%	44.7		45.2		1.06		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	4.99 J		4.86 J		2.63		P
Zinc	ug/L		3.55 J		3.3 U		200		P

*Analytical Methods:

P SW846 3005/6010B

Metals
–6–
Duplicate Sample Summary

SDG No.: 12-1277**Lab Code:** GEL**Contract:** ESHL00210**Client ID:** CAPA-12-13272D**Matrix:** LIQUID**Level:** Low**Sample ID:** 303613003**Duplicate ID:** 1202652153**Percent Solids for Dup:** N/A

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

***Analytical Methods:**

AV EPA 245.1/245.2

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 12-1277

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>
1202650966								
	Cadmium	ug/L	50	51		102	80-120	MS
	Chromium	ug/L	50	52.2		104	80-120	MS
	Lead	ug/L	50	48.6		97.3	80-120	MS
	Molybdenum	ug/L	50	51.3		103	80-120	MS
	Nickel	ug/L	50	54.1		108	80-120	MS
	Selenium	ug/L	50	53.5		107	80-120	MS
	Silver	ug/L	50	55.1		110	80-120	MS
	Thallium	ug/L	50	46.5		93.1	80-120	MS
	Uranium	ug/L	50	49.7		99.3	80-120	MS
	Antimony	ug/L	50	52.2		104	80-120	MS
	Arsenic	ug/L	50	50.7		101	80-120	MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 12-1277

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>
1202650971								
	Aluminum	ug/L	5000	5240		105	80-120	P
	Barium	ug/L	500	537		107	80-120	P
	Beryllium	ug/L	500	529		106	80-120	P
	Boron	ug/L	500	526		105	80-120	P
	Calcium	ug/L	5000	5340		107	80-120	P
	Cobalt	ug/L	500	529		106	80-120	P
	Copper	ug/L	500	532		106	80-120	P
	Iron	ug/L	5000	5320		106	80-120	P
	Magnesium	ug/L	5000	5510		110	80-120	P
	Manganese	ug/L	500	530		106	80-120	P
	Potassium	ug/L	5000	5320		106	80-120	P
	Silica	mg/L	10.7	11.3		106	80-120	P
	Sodium	ug/L	5000	5250		105	80-120	P
	Strontium	ug/L	500	528		106	80-120	P
	Tin	ug/L	500	538		108	80-120	P
	Vanadium	ug/L	500	537		107	80-120	P
	Zinc	ug/L	500	517		103	80-120	P

*Analytical Methods:

P SW846 3005/6010B

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 12-1277

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>
1202652152	Mercury	ug/L	2	2.27		114	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 12-1277

Client ID: CAPA-12-13292L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 303750002

Serial Dilution ID: 1202650969

<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	3.78	J	10	U	100			MS
Lead	.5	U	2.5	U				MS
Molybdenum	1.2		1.15	J	4.9			MS
Nickel	2.84		2.93	J	2.96			MS
Selenium	1.5	U	7.5	U				MS
Silver	.2	U	1	U				MS
Thallium	.45	U	2.25	U				MS
Uranium	.509		.57	J	12			MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 12-1277

Client ID: CAPA-12-13292L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 303750002

Serial Dilution ID: 1202650974

<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	38.8		39.5		1.78			P
Beryllium	1	U	5	U				P
Boron	15	U	75	U				P
Calcium	10200		10000		2.23		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	67.8	J	150	U	100			P
Magnesium	3050		3180		4.27			P
Manganese	2	U	10	U				P
Potassium	1650		1700		2.94			P
Silica	77200		76800		.523		10	P
Sodium	11900		11900		.249		10	P
Strontium	44.7		47.2		5.58			P
Tin	2.5	U	12.5	U				P
Vanadium	4.99	J	5	U	100			P
Zinc	3.55	J	16.5	U	100			P

*Analytical Methods:

P SW846 3005/6010B

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 12-1277 Client ID: CAPA-12-13272L

Contract: ESHL00210

Matrix: LIQUID Level: Low

Sample ID: 303613003 Serial Dilution ID: 1202652155

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

*Analytical Methods:

AV EPA 245.1/245.2

General Chem Analysis

Case Narrative

**General Chemistry Narrative
ARS International (ARSL)
SDG 12-1277**

Method/Analysis Information

Product: Carbon, Total Organic

Analytical Batch: 1210398

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
303859001	CAPA-12-13285
1202652079	Method Blank (MB)
1202652080	303221002(CAPA-12-13277) Sample Duplicate (DUP)
1202652081	303221002(CAPA-12-13277) Post Spike (PS)
1202652082	Laboratory Control Sample (LCS)
1202655722	303971001(CAPA-12-13286) Sample Duplicate (DUP)
1202655723	303971001(CAPA-12-13286) Post Spike (PS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-093 REV# 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 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 samples were selected for QC analysis: 303221002 (CAPA-12-13277) and 303971001 (CAPA-12-13286).

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample 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

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: 1211663

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
303859002	CAPA-12-13295
1202655278	303613003(CAPA-12-13272) Sample Duplicate (DUP)
1202655279	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-009 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 Conductivity analysis was performed on a Orion 160 Conductivity Meter.

Initial Calibration

All initial calibration requirements have been met for this SDG.

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: 303613003 (CAPA-12-13272).

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: 1210490 **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
303859002	CAPA-12-13295
1202652323	303860001(WST54-12-13826) Sample Duplicate (DUP)
1202652324	303903001(WST54-12-13827) Sample Duplicate (DUP)
1202652325	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-008 REV# 20.

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 samples were selected for QC analysis: 303860001 (WST54-12-13826) and 303903001 (WST54-12-13827).

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

The following sample from this sample group was received by the lab outside of the method specified holding time: 303859002 (CAPA-12-13295).

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: 1076615 303859002 (CAPA-12-13295).

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: 1209599

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
303859002	CAPA-12-13295
1202650164	Method Blank (MB)
1202650165	303750002(CAPA-12-13292) Sample Duplicate (DUP)
1202650166	303750002(CAPA-12-13292) Post Spike (PS)
1202650167	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: 303750002 (CAPA-12-13292).

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.

Manual Integrations

The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1202650165 (CAPA-12-13292), 1202650166 (CAPA-12-13292) and 303859002 (CAPA-12-13295).

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: 1210499 **Method:** EPA 350.1 Nitrogen and Ammonia L

Prep Batch : 1210496 **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
303859002	CAPA-12-13295
1202652345	Method Blank (MB)
1202652346	303750002(CAPA-12-13292) Sample Duplicate (DUP)
1202652347	303750002(CAPA-12-13292) Matrix Spike (MS)
1202652348	303750002(CAPA-12-13292) Matrix Spike Duplicate (MSD)
1202652349	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# 7.

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: 303750002 (CAPA-12-13292).

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

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

Matrix Spike Duplicate (MSD) Recovery Statement

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

MS/MSD Relative Percent Difference (RPD) Statement

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The following samples were re-analyzed due to their proximity to an overrange sample: 1202652345 (MB) and 1202652349 (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:	Total Kjeldahl Nitrogen		
Analytical Batch:	1210493	Method:	Nitrogen and Total Kjeldahl (TKN)
Prep Batch :	1210489	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
303859001	CAPA-12-13285
1202652328	Method Blank (MB)
1202652329	303750001(CAPA-12-13282) Sample Duplicate (DUP)
1202652330	303750001(CAPA-12-13282) Matrix Spike (MS)
1202652331	303750001(CAPA-12-13282) Matrix Spike Duplicate (MSD)
1202652332	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# 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 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: 303750001 (CAPA-12-13282).

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

The spike recovery falls outside of the established acceptance limits. Since both the spike duplicate recovery and the RPD between the spike and spike duplicate fall within acceptance limits, the data is reported. 1202652330 (CAPA-12-13282).

Matrix Spike Duplicate (MSD) Recovery Statement

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

MS/MSD Relative Percent Difference (RPD) Statement

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

Duplicate Relative Percent Difference (RPD) Statement

The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1202652329 (CAPA-12-13282).

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: 1077098 1202652330 (CAPA-12-13282).

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: 1210456

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
303859002	CAPA-12-13295
1202652204	Method Blank (MB)
1202652207	303750002(CAPA-12-13292) Sample Duplicate (DUP)
1202652210	303750002(CAPA-12-13292) Post Spike (PS)
1202652211	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# 7.

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.

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: 303750002 (CAPA-12-13292).

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 values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1202652207 (CAPA-12-13292).

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 matrix interference: 1202652207 (CAPA-12-13292), 1202652210 (CAPA-12-13292) and 303859002 (CAPA-12-13295).

Sample Re-analysis

The following samples were reanalyzed due to PS failure: 1202652207 (CAPA-12-13292) and 1202652210 (CAPA-12-13292).

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.

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:	1209639	Method:	EPA 365.4 Phosphorus and Total in
Prep Batch :	1209638	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
303859002	CAPA-12-13295
1202650265	Method Blank (MB)
1202650266	303750002(CAPA-12-13292) Sample Duplicate (DUP)
1202650267	303750002(CAPA-12-13292) Matrix Spike (MS)
1202650268	303750002(CAPA-12-13292) Matrix Spike Duplicate (MSD)
1202650269	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# 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+ 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: 303750002 (CAPA-12-13292).

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

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

Matrix Spike Duplicate (MSD) Recovery Statement

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

MS/MSD Relative Percent Difference (RPD) Statement

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The following sample was re-analyzed due to their proximity to an overrange sample: 1202650266 (CAPA-12-13292).

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: 1211219

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
303859002	CAPA-12-13295
1202654159	Method Blank (MB)
1202654160	303859002(CAPA-12-13295) Sample Duplicate (DUP)
1202654164	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# 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 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: 303859002 (CAPA-12-13295).

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 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.

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: 1212148 **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
303859002	CAPA-12-13295
1202656549	Method Blank (MB)
1202656551	303613003(CAPA-12-13272) Sample Duplicate (DUP)
1202656554	303613003(CAPA-12-13272) Matrix Spike (MS)
1202656556	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-033 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 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: 303613003 (CAPA-12-13272).

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 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

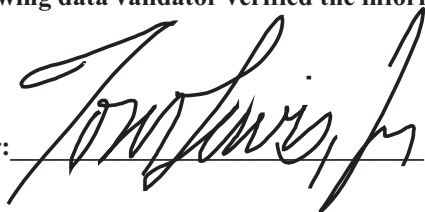
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

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:

01Jun12

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: 12-1277 GEL Work Order: 303859

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

H Analytical holding time was exceeded

J Value is estimated

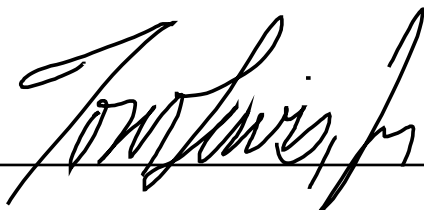
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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 detection limit.

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

A handwritten signature in black ink, appearing to read 'Valerie Davis', is written over a horizontal line.

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: May 29, 2012

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

Contact: Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 12-1277

Client Sample ID: CAPA-12-13285
Sample ID: 303859001
Matrix: W
Collect Date: 03-MAY-12 10:28
Receive Date: 05-MAY-12
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	J	0.499	0.330	1.00	mg/L	1	TSM	05/11/12	2211	1210398	1
Nutrient Analysis											
Nitrogen, Total Kjeldahl (TKN) "As Received"											
Nitrogen, Total Kjeldahl	U	ND	0.035	0.100	mg/L	1	KLP1	05/09/12	1613	1210493	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	05/09/12	1246	1210489

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060	
2	EPA 351.2	

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Certificate of Analysis

Report Date: May 29, 2012

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

Contact: Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 12-1277

Client Sample ID: CAPA-12-13295
Sample ID: 303859002
Matrix: W
Collect Date: 03-MAY-12 10:28
Receive Date: 05-MAY-12
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		134	1.00	1.00	umhos/cm	1	TXT1	05/11/12	1748	1211663	1
Electrode Analysis											
EPA 150.1 pH "As Received"											
pH at Temp 13.3C	H	7.97	0.010	0.100	SU	1	LXA1	05/08/12	1217	1210490	2
Ion Chromatography											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	U	ND	0.067	0.200	mg/L	1	MAR1	05/09/12	1003	1209599	3
Chloride		1.92	0.067	0.200	mg/L	1					
Fluoride		0.356	0.033	0.100	mg/L	1					
Sulfate		1.95	0.133	0.400	mg/L	1					
Nutrient Analysis											
EPA 350.1 Nitrogen, Ammonia L "As Received"											
Nitrogen, Ammonia		0.0755	0.017	0.050	mg/L	1	KLP1	05/09/12	1014	1210499	4
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"											
Nitrogen, Nitrate/Nitrite		0.336	0.085	0.250	mg/L	5	AXH3	05/08/12	1411	1210456	5
EPA 365.4 Phosphorus, Total in "As Received"											
Phosphorus, Total as P	U	ND	0.017	0.050	mg/L	1	KLP1	05/09/12	1510	1209639	6
Solids Analysis											
EPA 160.1 Solids, Dissolved-F "As Received"											
Total Dissolved Solids		129	3.40	14.3	mg/L		LYG1	05/10/12	1051	1211219	7
Titration Analysis											
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		59.5	0.725	1.00	mg/L		LXA1	05/14/12	1805	1212148	8
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	05/08/12	1541	1210496
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	05/09/12	1245	1209638

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Certificate of Analysis

Report Date: May 29, 2012

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

Contact: Keith Greene
Project: LANL-WQH Water Samples

Client SDG: 12-1277

Client Sample ID: CAPA-12-13295
Sample ID: 303859002

Project: ESHL00210
Client ID: ARSL001

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

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: May 29, 2012
Page 1 of 4

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

Contact: Keith Greene

Workorder: 303859

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1210398										
QC1202652080	303221002	DUP									
Total Organic Carbon Average		4.18		4.15	mg/L	0.865	^	(+/-1.00)	TSM	05/11/12	16:22
QC1202655722	303971001	DUP									
Total Organic Carbon Average		1.71		1.70	mg/L	0.234	^	(+/-1.00)		05/11/12	23:18
QC1202652082	LCS										
Total Organic Carbon Average	10.0			9.59	mg/L			95.9 (85%-115%)		05/11/12	15:41
QC1202652079	MB										
Total Organic Carbon Average			U	ND	mg/L					05/11/12	15:32
QC1202652081	303221002	PS									
Total Organic Carbon Average	10.0	4.18		12.8	mg/L			86.2 (65%-120%)		05/11/12	16:42
QC1202655723	303971001	PS									
Total Organic Carbon Average	10.0	1.71		11.1	mg/L			94.3 (65%-120%)		05/11/12	23:37
Conductivity Analysis											
Batch	1211663										
QC1202655278	303613003	DUP									
Conductivity		312		312	umhos/cm	0.00		(0%-10%)	TXT1	05/11/12	17:48
QC1202655279	LCS										
Conductivity	1410			1420	umhos/cm			100 (95%-105%)		05/11/12	17:48
Electrode Analysis											
Batch	1210490										
QC1202652323	303860001	DUP									
pH		H	7.49	H	7.45	SU	0.535	(0%-10%)	LXA1	05/08/12	12:27
QC1202652324	303903001	DUP									
pH		H	5.12	H	5.08	SU	0.784	(0%-10%)		05/08/12	13:08
QC1202652325	LCS										
pH	7.00			6.99	SU			99.9 (99%-101%)		05/08/12	12:13
Ion Chromatography											
Batch	1209599										
QC1202650165	303750002	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MAR1	05/09/12	07:19
Chloride			1.85		1.93	mg/L	4.36	(0%-20%)			
Fluoride			0.211		0.219	mg/L	3.35	^ (+/-0.100)			
Sulfate			1.94		2.01	mg/L	3.53	^ (+/-0.400)			
QC1202650167	LCS										
Bromide	2.50			2.66	mg/L			106 (90%-110%)		05/09/12	06:13
Chloride	10.0			9.77	mg/L			97.7 (90%-110%)			
Fluoride	5.00			5.08	mg/L			102 (90%-110%)			
Sulfate	20.0			19.9	mg/L			99.7 (90%-110%)			
QC1202650164	MB										
Bromide			U	ND	mg/L					05/09/12	05:40
Chloride			U	ND	mg/L						

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QC Summary

Workorder: 303859

Page 2 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1209599										
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L				MAR1	05/09/12	05:40
QC1202650166 303750002 PS											
Bromide	2.50	U	ND	2.59	mg/L		103	(90%-110%)		05/09/12	07:52
Chloride	10.0		1.85	12.0	mg/L		101	(90%-110%)			
Fluoride	5.00		0.211	5.30	mg/L		102	(90%-110%)			
Sulfate	20.0		1.94	21.9	mg/L		99.7	(90%-110%)			
Nutrient Analysis											
Batch	1209639										
QC1202650266 303750002 DUP											
Phosphorus, Total as P		0.0663		0.071	mg/L	6.85 ^		(+/-0.050)	KLP1	05/09/12	15:10
QC1202650269 LCS											
Phosphorus, Total as P	1.00			1.08	mg/L		108	(84%-122%)		05/09/12	14:57
QC1202650265 MB											
Phosphorus, Total as P			U	ND	mg/L					05/09/12	14:56
QC1202650267 303750002 MS											
Phosphorus, Total as P	1.00		0.0663	1.08	mg/L		101	(46%-146%)		05/09/12	15:00
QC1202650268 303750002 MSD											
Phosphorus, Total as P	1.00		0.0663	1.05	mg/L	2.82	98.4	(0%-21%)		05/09/12	15:01
Batch	1210456										
QC1202652207 303750002 DUP											
Nitrogen, Nitrate/Nitrite		J	0.297 J	0.229	mg/L	25.9 ^		(+/-0.500)	AXH3	05/08/12	14:52
QC1202652211 LCS											
Nitrogen, Nitrate/Nitrite	1.00			1.07	mg/L		107	(90%-110%)		05/08/12	12:56
QC1202652204 MB											
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					05/08/12	12:55
QC1202652210 303750002 PS											
Nitrogen, Nitrate/Nitrite	1.00	J	0.0297	1.09	mg/L		106	(90%-110%)		05/08/12	14:54
Batch	1210493										
QC1202652329 303750001 DUP											
Nitrogen, Total Kjeldahl		U	ND U	ND	mg/L	N/A			KLP1	05/09/12	16:03
QC1202652332 LCS											
Nitrogen, Total Kjeldahl	1.00			1.04	mg/L		104	(90%-110%)		05/09/12	16:02
QC1202652328 MB											
Nitrogen, Total Kjeldahl			U	ND	mg/L					05/09/12	16:01
QC1202652330 303750001 MS											
Nitrogen, Total Kjeldahl	1.00	U	ND	1.17	mg/L		116 *	(90%-110%)		05/09/12	16:04
QC1202652331 303750001 MSD											
Nitrogen, Total Kjeldahl	1.00	U	ND	1.07	mg/L	8.93	106	(0%-20%)		05/09/12	16:05
Batch	1210499										
QC1202652346 303750002 DUP											
Nitrogen, Ammonia			0.107	0.114	mg/L	6.33 ^		(+/-0.050)	KLP1	05/09/12	10:03
QC1202652349 LCS											
Nitrogen, Ammonia	1.00			1.06	mg/L		106	(90%-110%)		05/09/12	10:08
QC1202652345 MB											
Nitrogen, Ammonia			J	0.0337	mg/L					05/09/12	10:07
QC1202652347 303750002 MS											

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QC Summary

Workorder: 303859

Page 3 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1210499										
Nitrogen, Ammonia	1.00	0.107		1.20	mg/L		109	(90%-110%)		05/09/12	10:09
QC1202652348 303750002 MSD											
Nitrogen, Ammonia	1.00	0.107		1.17	mg/L	2.53	106	(0%-15%)	KLP1	05/09/12	10:10
Solids Analysis											
Batch	1211219										
QC1202654160 303859002 DUP											
Total Dissolved Solids		129		129	mg/L	0.00		(0%-10%)	LYG1	05/10/12	10:51
QC1202654164 LCS											
Total Dissolved Solids	300			306	mg/L		102	(95%-105%)		05/10/12	10:51
QC1202654159 MB											
Total Dissolved Solids			U	ND	mg/L					05/10/12	10:51
Titration Analysis											
Batch	1212148										
QC1202656551 303613003 DUP											
Alkalinity, Total as CaCO3		84.9		84.4	mg/L	0.612		(0%-20%)	LXA1	05/14/12	17:21
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1202656556 LCS											
Alkalinity, Total as CaCO3	50.0			50.7	mg/L		101	(90%-110%)		05/14/12	14:49
QC1202656549 MB											
Alkalinity, Total as CaCO3			U	ND	mg/L					05/14/12	14:36
Carbonate alkalinity (CaCO3)			U	ND	mg/L						
QC1202656554 303613003 MS											
Alkalinity, Total as CaCO3	50.0	84.9		136	mg/L		101	(80%-120%)		05/14/12	17:28

Notes:

RER is calculated at the 95% confidence level (2-sigma).

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- 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
- E General Chemistry--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
- E Organics--Concentration of the target analyte exceeds the instrument calibration range
- F Estimated Value
- FB Mercury was found present at quantifiable concentrations in field blanks received with these samples. Data associated with the blank are deemed invalid for reporting to regulatory agencies
- H Analytical holding time was exceeded

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QC Summary

Workorder: 303859

Page 4 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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	Matrix Related Failure										
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	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										
P	Organics--The concentrations between the primary and confirmation columns/detectors is >40% different. For HPLC, difference is also <70%										
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	QC Samples were not spiked with this compound										
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

DATA EXCEPTION REPORT			
Mo.Day Yr. 08-MAY-12	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ELECTRODE	Test / Method: EPA 150.1	Matrix Type: Liquid	Client Code: ESHL, INPA, LANL, PAES
Batch ID: 1210490	Sample Numbers: See below.		
Potentially affected work order(s)(SDG): 303600,303859(12-1277),303860(12-1278),303895,303903(12-1281) Application Issues: Sample received out of holding			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Sample received out of holding: 303600 001 303859 002 303860 001 303895 001,002,003,004,005,006,007,008,009, 010,011,012,013 303903 001,002		1. Samples were received out of holding.	

Originator's Name:
Lindsey Jensen 08-MAY-12

Data Validator/Group Leader:
Julia Hamilton 09-MAY-12

DATA EXCEPTION REPORT			
Mo.Day Yr. 09-MAY-12	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: LACHAT Flow Injection Analyzer	Test / Method: EPA 351.2	Matrix Type: Liquid	Client Code: AECM, ESHL
Batch ID: 1210493	Sample Numbers: See below.		
Potentially affected work order(s)(SDG): 303750(12-1274),303759,303859(12-1277) Application Issues: Failed Recovery for MS/PS			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Failed Recovery for MS: QC 1202652330MS 1. Failed Recovery for MS (for WOs 303750 and 303859): QC 1202652330MS		1. The spike recovery falls outside of the established acceptance limits. Since both the spike duplicate recovery and the RPD between the spike and spike duplicate fall within acceptance limits, the data is reported. 2. The spike recovery falls outside of the GEL acceptance limits but within the client specified limits.	

Originator's Name:
Kristen Parson 09-MAY-12

Data Validator/Group Leader:
Julia Hamilton 09-MAY-12

Radiological Analysis

**Radiochemistry Case Narrative
ARS International (ARSL)
SDG 12-1277
Work Order 303859**

Method/Analysis Information

Product: Alphaspec Am241 Liquid
Analytical Method: DOE EML HASL-300, Am-05-RC Modified
Analytical Batch Number: 1210896

Sample ID	Client ID
303859001	CAPA-12-13285
1202653323	Method Blank (MB)
1202653324	303859001(CAPA-12-13285) Sample Duplicate (DUP)
1202653325	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# 21.

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 1202653323 (MB) and 1202653325 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 303859001 (CAPA-12-13285). The QC was from ARSL work order 303859.

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 1202653324 (CAPA-12-13285) was recounted due to high MDC. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation

The following DER was generated for this SDG: 1080472 The following DER was generated for this SDG: DER 1080472 was generated due to RDL less than MDA. 1. Sample 1202653324 does not meet the detection limits for Americium-241 due to the high standard deviation. 1. When a blank population is performed, the MDC is greater than the RDL due to the high standard deviation. Sample did achieve more than 400 tracer counts and was counted for the maximum count time of 1000 minutes. Reporting results.

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:	1210899

Sample ID	Client ID
303859001	CAPA-12-13285
1202653326	Method Blank (MB)
1202653327	303859001(CAPA-12-13285) Sample Duplicate (DUP)
1202653328	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# 21.

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 1202653326 (MB) and 1202653328 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 303859001 (CAPA-12-13285). The QC was from ARSL work order 303859.

QC Information

All of the QC samples met the required acceptance limits.

CSU

The Pu-239/240 blank result, 1202653326 (MB), 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

Sample 303859001 (CAPA-12-13285) was recounted due to high MDC. 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 Pu-239/240 blank result, 1202653326 (MB), is greater than the decision level but less than the MDC.

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: 1210900

Sample ID	Client ID
303859001	CAPA-12-13285
1202653329	Method Blank (MB)
1202653330	303859001(CAPA-12-13285) Sample Duplicate (DUP)
1202653331	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# 21.

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 1202653329 (MB) and 1202653331 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 303859001 (CAPA-12-13285). The QC was from ARSL work order 303859.

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: **Gammascpec**

Analytical Method: EPA 901.1

Analytical Batch Number: 1211536

Sample ID	Client ID
303859001	CAPA-12-13285
1202654974	Method Blank (MB)
1202654975	303859001(CAPA-12-13285) Sample Duplicate (DUP)
1202654976	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# 24.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The initial Calibrations were performed in August 2011, February 2012 and March 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

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

Designated QC

The following sample was used for QC: 303859001 (CAPA-12-13285). The QC was from ARSL work order 303859.

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.

Additional Comments

Additional comments were not required for this sample set.

Blank Decision Level

The blank result is less than the decision level.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Sr90, liquid
Analytical Method: EPA 905.0 Modified
Analytical Batch Number: 1210551

Sample ID	Client ID
303859001	CAPA-12-13285
1202652528	Method Blank (MB)
1202652529	303489001(CAPA-12-13278) Sample Duplicate (DUP)
1202652530	303489001(CAPA-12-13278) Matrix Spike (MS)
1202652531	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# 15.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The initial Calibration was performed in April 2012.

Calibration Information

All of the calibration verification standard requirements were met.

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 1202652528 (MB) and 1202652531 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 303489001 (CAPA-12-13278). The QC was from ARSL work order 303489.

QC Information

All of the QC samples met the required acceptance limits.

CSU

The blank 1202652528 (MB) result is greater than 1.65 times the CSU but less than the MDC.

Technical Information:**Holding Time**

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

Sample Re-prep/Re-analysis

Sample 1202652528 (MB) was recounted due to high MDC. The recount is reported.

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, 1202652530 (CAPA-12-13278), 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:	1212200

Sample ID	Client ID
303859001	CAPA-12-13285
1202656703	Method Blank (MB)
1202656704	303859001(CAPA-12-13285) Sample Duplicate (DUP)
1202656705	303859001(CAPA-12-13285) Matrix Spike (MS)
1202656706	303859001(CAPA-12-13285) Matrix Spike Duplicate (MSD)
1202656707	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# 15.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met. The initial Calibration was performed in September 2011. The discrimination settings are calibrated in beta discriminating mode to reduce beta to alpha crosstalk.

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 1202656703 (MB) and 1202656707 (LCS) were changed to 1.0 per client request.

Designated QC

The following sample was used for QC: 303859001 (CAPA-12-13285). The QC was from ARSL work order 303859.

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 303859001 (CAPA-12-13285) was recounted due to results more negative than the three sigma TPU. The second count 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, 1202656705 (CAPA-12-13285) and 1202656706 (CAPA-12-13285), aliquots were reduced to conserve sample volume.

Blank Decision Level

The blank result is less than the decision level.

Qualifier Information

Manual qualifiers were not required.

Certification Statement

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

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Qualifier Definition Report for

ARSL001 ARS International (63641-10)

Client SDG: 12-1277 GEL Work Order: 303859

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature:



Name: Kate Gellatly

Date: 01 JUN 2012

Title: Analyst I

DATA EXCEPTION REPORT			
Mo.Day Yr. 19-MAY-12	Division: Radiochemistry	Quality Criteria: SOP	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Am-05-RC Modified	Matrix Type: Liquid	Client Code: ARSL
Batch ID: 1210896	Sample Numbers: see below		
Potentially affected work order(s)(SDG): 303859(12-1277),303971(12-1287) Application Issues: RDL less than MDA			
Specification and Requirements Exception Description:		DER Disposition:	
1. Sample 1202653324 does not meet the detection limits for Americium-241 due to the high standard deviation.		1. When a blank population is performed, the MDC is greater than the RDL due to the high standard deviation. Sample did achieve more than 400 tracer counts and was counted for the maximum count time of 1000 minutes. Reporting results.	

Originator's Name:
Matelon DeFreese 19-MAY-12

Data Validator/Group Leader:
Jessica Davis 31-MAY-12

Sample Data Summary

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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: Keith Greene
 Project: LANL-WQH Water Samples

Report Date: May 31, 2012

Client Sample ID: CAPA-12-13285
 Sample ID: 303859001
 Matrix: W
 Collect Date: 03-MAY-12
 Receive Date: 05-MAY-12
 Collector: Client

Project: ESHL00210
 Client ID: ARSL001

Parameter	Qualifier	Result	Uncertainty	DL	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis													
<i>Alphaspec Am241 Liquid "As Received"</i>													
Americium-241	U	0.00399	+/-0.00564	0.0478	+/-0.00564	0.050	pCi/L		JXD2	05/12/12	1212	1210896	1
<i>Alphaspec Pu, Liquid "As Received"</i>													
Plutonium-238	U	0.00269	+/-0.00806	0.0418	+/-0.00807	0.050	pCi/L		JXD2	05/21/12	1619	1210899	2
Plutonium-239/240	U	0.00	+/-0.00658	0.0354	+/-0.00658	0.050	pCi/L						
<i>Alphaspec U, Liquid "As Received"</i>													
Uranium-234		0.282	+/-0.0366	0.078	+/-0.0415	1.00	pCi/L		JXD2	05/15/12	1736	1210900	3
Uranium-235/236	U	0.00158	+/-0.00695	0.0558	+/-0.00696	1.00	pCi/L						
Uranium-238		0.119	+/-0.0233	0.0394	+/-0.0247	0.500	pCi/L						
Rad Gamma Spec Analysis													
<i>Gammasec "As Received"</i>													
Cesium-137	U	2.17	+/-1.53	5.86	+/-1.53	8.00	pCi/L		KXG3	05/20/12	1011	1211536	4
Cobalt-60	U	1.02	+/-1.58	6.11	+/-1.58	8.00	pCi/L						
Neptunium-237	U	0.939	+/-2.96	10.3	+/-2.96	10.0	pCi/L						
Potassium-40	U	-6.35	+/-18.8	69.6	+/-18.8	10.0	pCi/L						
Sodium-22	U	0.451	+/-1.34	5.20	+/-1.34	10.0	pCi/L						
Rad Gas Flow Proportional Counting													
<i>GFPC, Sr90, liquid "As Received"</i>													
Strontium-90	U	-0.141	+/-0.136	0.481	+/-0.136	0.500	pCi/L		VXC2	05/25/12	0934	1210551	5
<i>WSP-GrossA/B "As Received"</i>													
Beta	U	1.47	+/-0.722	2.28	+/-0.733	3.00	pCi/L		BXF1	05/24/12	1246	1212200	6
Alpha	U	0.746	+/-0.543	1.82	+/-0.547	3.00	pCi/L		BXF1	05/25/12	0830	1212200	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"	1210896	86.1	(50%-105%)
Plutonium-242 Tracer	Alphaspec Pu, Liquid "As Received"	1210899	77.3	(50%-105%)
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"	1210900	64.0	(50%-105%)
Strontium Carrier	GFPC, Sr90, liquid "As Received"	1210551	67.8	(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: May 31, 2012

Contact: Keith Greene

Project: LANL-WQH Water Samples

Client Sample ID: CAPA-12-13285

Sample ID: 303859001

Project: ESHL00210

Client ID: ARSL001

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

Notes:

TPU and Uncertainty are calculated at the 67% confidence level (1-sigma).

Quality Control Data

GEL LABORATORIES LLC

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QC Summary

Report Date: May 31, 2012

Page 1 of 6

Client : Los Alamos National Laboratory
PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm
Los Alamos, New Mexico
Contact: Keith Greene
Workorder: 303859

Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1210896										
QC1202653324	303859001	DUP									
Americium-241	U	0.00399	U	0.00	pCi/L	0.323		(0-1)	JXD2	05/17/12	14:07
	Uncert:	+/-0.00564		+/-0.0028							
	TPU:	+/-0.00564		+/-0.0028							
	Yield:	86.1		53.9							
QC1202653325	LCS										
Americium-241	1.42			1.37	pCi/L		96.8	(80%-120%)		05/12/12	12:12
	Uncert:			+/-0.056							
	TPU:			+/-0.082							
	Yield:			60.7							
QC1202653323	MB										
Americium-241			U	-0.00166	pCi/L						
	Uncert:			+/-0.00438							
	TPU:			+/-0.00438							
	Yield:			90.4							
Batch	1210899										
QC1202653327	303859001	DUP									
Plutonium-238	U	0.00269	U	0.00506	pCi/L	0.0904		(0-1)	JXD2	05/16/12	14:33
	Uncert:	+/-0.00806		+/-0.00506							
	TPU:	+/-0.00807		+/-0.00507							
	Yield:	77.3		92.6							
Plutonium-239/240	U	0.00	U	0.0127	pCi/L	0.475		(0-1)			
	Uncert:	+/-0.00658		+/-0.0067							
	TPU:	+/-0.00658		+/-0.00673							
	Yield:	77.3		92.6							
QC1202653328	LCS										
Plutonium-238			U	0.0227	pCi/L			(80%-120%)		05/16/12	14:33
	Uncert:			+/-0.00909							
	TPU:			+/-0.00917							
	Yield:			77.4							
Plutonium-239/240	2.03			2.28	pCi/L		113	(80%-120%)			
	Uncert:			+/-0.0723							
	TPU:			+/-0.142							
	Yield:			77.4							
QC1202653326	MB										
Plutonium-238			U	0.00836	pCi/L						05/16/12
	Uncert:			+/-0.00782							
	TPU:			+/-0.00783							
	Yield:			82.4							
Plutonium-239/240			U	0.0125	pCi/L						
	Uncert:			+/-0.00512							
	TPU:			+/-0.00516							
	Yield:			82.4							

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QC Summary

Workorder: 303859

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1210900										
QC1202653330	303859001	DUP									
Uranium-234		0.282		0.204	pCi/L	0.510		(0-1)	JXD2	05/15/1217:36	
		Uncert:	+/-0.0366	+/-0.0318							
		TPU:	+/-0.0415	+/-0.0348							
		Yield:	64.0	67.4							
Uranium-235/236		U	0.00158	U 0.00152	pCi/L	0.00227		(0-1)			
		Uncert:	+/-0.00695	+/-0.00668							
		TPU:	+/-0.00696	+/-0.00669							
		Yield:	64.0	67.4							
Uranium-238		0.119		0.0789	pCi/L	0.451		(0-1)			
		Uncert:	+/-0.0233	+/-0.0186							
		TPU:	+/-0.0247	+/-0.0194							
		Yield:	64.0	67.4							
QC1202653331	LCS										
Uranium-234				2.38	pCi/L					05/15/1217:36	
		Uncert:		+/-0.087							
		TPU:		+/-0.183							
		Yield:		75.5							
Uranium-235/236				0.129	pCi/L						
		Uncert:		+/-0.0224							
		TPU:		+/-0.024							
		Yield:		75.5							
Uranium-238	2.67			2.58	pCi/L		96.8	(80%-120%)			
		Uncert:		+/-0.0903							
		TPU:		+/-0.197							
		Yield:		75.5							
QC1202653329	MB										
Uranium-234			U	-0.00638	pCi/L					05/15/1217:36	
		Uncert:		+/-0.00541							
		TPU:		+/-0.00541							
		Yield:		77.4							
Uranium-235/236			U	0.00488	pCi/L						
		Uncert:		+/-0.00605							
		TPU:		+/-0.00606							
		Yield:		77.4							
Uranium-238			U	-0.00444	pCi/L						
		Uncert:		+/-0.0044							
		TPU:		+/-0.00441							
		Yield:		77.4							
Rad Gamma Spec											
Batch	1211536										
QC1202654975	303859001	DUP									
Cesium-137		U	2.17	U -0.484	pCi/L	0.519		(0-1)	KXG3	05/20/1214:28	
		Uncert:	+/-1.53	+/-1.04							
		TPU:	+/-1.53	+/-1.04							
Cobalt-60		U	1.02	U -0.664	pCi/L	0.289		(0-1)			
		Uncert:	+/-1.58	+/-1.33							
		TPU:	+/-1.58	+/-1.33							

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QC Summary

Workorder: 303859

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1211536										
Neptunium-237	U	0.939	U	3.10	pCi/L	0.202		(0-1)			
	Uncert:	+/-2.96		+/-2.41							
	TPU:	+/-2.96		+/-2.41							
Potassium-40	U	-6.35	U	-6.3	pCi/L	0.00063		(0-1)			
	Uncert:	+/-18.8		+/-16.9							
	TPU:	+/-18.8		+/-16.9							
Sodium-22	U	0.451	U	-0.0324	pCi/L	0.0916		(0-1)			
	Uncert:	+/-1.34		+/-1.29							
	TPU:	+/-1.34		+/-1.29							
QC1202654976 LCS											
Americium-241	2780			3020	pCi/L		108	(80%-120%)		05/20/1215:36	
	Uncert:			+/-177							
	TPU:			+/-177							
Cesium-137	6160			6360	pCi/L		103	(80%-120%)			
	Uncert:			+/-269							
	TPU:			+/-269							
Cobalt-60	6040			6030	pCi/L		99.7	(80%-120%)			
	Uncert:			+/-253							
	TPU:			+/-253							
Neptunium-237			U	7.02	pCi/L						
	Uncert:			+/-25.1							
	TPU:			+/-25.1							
Potassium-40			U	-23.6	pCi/L						
	Uncert:			+/-55.5							
	TPU:			+/-55.5							
Sodium-22			U	-22.6	pCi/L						
	Uncert:			+/-8.54							
	TPU:			+/-8.54							
QC1202654974 MB											
Cesium-137			U	2.05	pCi/L					05/20/1210:13	
	Uncert:			+/-1.36							
	TPU:			+/-1.36							
Cobalt-60			U	0.709	pCi/L						
	Uncert:			+/-1.38							
	TPU:			+/-1.38							
Neptunium-237			U	0.820	pCi/L						
	Uncert:			+/-2.84							
	TPU:			+/-2.84							
Potassium-40			U	-12.5	pCi/L						
	Uncert:			+/-15.9							
	TPU:			+/-15.9							
Sodium-22			U	-1.04	pCi/L						
	Uncert:			+/-1.56							
	TPU:			+/-1.56							
Rad Gas Flow											
Batch	1210551										
QC1202652529 303489001 DUP											
Strontium-90	U	-0.158	U	0.0466	pCi/L	0.383		(0-1)	VXC2	05/25/1209:44	

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Parmname	NOM	Sample	Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gas Flow											
Batch	1210551										
		Uncert:	+/-0.130	+/-0.137							
		TPU:	+/-0.130	+/-0.137							
		Yield:	90.0	91.1							
QC1202652531	LCS										
Strontium-90		25.1		22.4	pCi/L		89.3	(80%-120%)		05/25/1209:48	
		Uncert:		+/-0.633							
		TPU:		+/-1.92							
		Yield:		94.4							
QC1202652528	MB										
Strontium-90			U	0.228	pCi/L					05/25/1216:27	
		Uncert:		+/-0.133							
		TPU:		+/-0.134							
		Yield:		90.0							
QC1202652530	303489001	MS									
Strontium-90		126	U	-0.158	pCi/L		93.5	(75%-125%)		05/25/1209:48	
		Uncert:		+/-0.130							
		TPU:		+/-0.130							
		Yield:		90.0							
Batch	1212200										
QC1202656704	303859001	DUP									
Alpha			U	0.746	pCi/L	0.463		(0-1)	BXF1	05/25/1208:31	
		Uncert:		+/-0.543							
		TPU:		+/-0.547							
Beta			U	1.47	pCi/L	0.109		(0-1)		05/24/1210:00	
		Uncert:		+/-0.722							
		TPU:		+/-0.733							
QC1202656707	LCS										
Alpha		12.0		11.4	pCi/L		94.4	(80%-120%)		05/25/1208:15	
		Uncert:		+/-0.568							
		TPU:		+/-1.13							
Beta		50.2		56.3	pCi/L		112	(80%-120%)		05/24/1207:49	
		Uncert:		+/-0.985							
		TPU:		+/-4.83							
QC1202656703	MB										
Alpha			U	-0.0173	pCi/L					05/25/1208:31	
		Uncert:		+/-0.0535							
		TPU:		+/-0.0536							
Beta			U	-0.0467	pCi/L					05/24/1209:56	
		Uncert:		+/-0.149							
		TPU:		+/-0.149							
QC1202656705	303859001	MS									
Alpha		241	U	0.746	pCi/L		91.8	(75%-125%)		05/25/1208:15	
		Uncert:		+/-0.543							
		TPU:		+/-0.547							
Beta		1000	U	1.47	pCi/L		111	(75%-125%)		05/24/1207:49	
		Uncert:		+/-0.722							
		TPU:		+/-0.733							
QC1202656706	303859001	MSD									
Alpha		241	U	0.746	pCi/L	0.296	103	(0-1)		05/25/1208:15	

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Parmname	NOM	Sample Qual	QC	Units	RER	REC%	Range	Anlst	Date	Time
Rad Gas Flow										
Batch	1212200									
		Uncert:	+/-0.543							
		TPU:	+/-0.547							
Beta	1000	U	1.47	1130	pCi/L	0.0276	112	(0-1)		05/24/1207:49
		Uncert:	+/-0.722							
		TPU:	+/-0.733							

Notes:

The Qualifiers in this report are defined as follows:

**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
A	The TIC is a suspected aldol-condensation product
B	For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
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
E	General Chemistry--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
E	Organics--Concentration of the target analyte exceeds the instrument calibration range
F	Estimated Value
FB	Mercury was found present at quantifiable concentrations in field blanks received with these samples. Data associated with the blank are deemed invalid for reporting to regulatory agencies
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	Matrix Related Failure
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	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
P	Organics--The concentrations between the primary and confirmation columns/detectors is >40% different. For HPLC, difference is also <70%
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.

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

** Indicates analyte is a surrogate 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.