

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4303 EVENT NAME: Mortandad/Sandia (Chromium Investigation) MY2013 Q4 Watershed Sampling SANDIA
SAMPLE ID: CASA-13-36988 WORK ORDER: NA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		7/12/13	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):		1203	MEDIA:	UA	
PRS ID:		OK	SAMPLE TECH CODE:	UA	GSP
LOCATION ID: R-11			FIELD PREP:	UF	OK
LOCATION TYPE: MON			FIELD QC TYPE:	REG	
PORT: SINGLE COMPLETION			SAMPLE USAGE:	INV	

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	X	NA

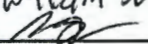
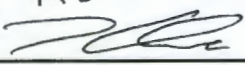
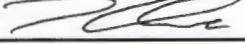
SAMPLE COMMENTS: NA

LOCATION COMMENTS: NA

FIELD PARAMETERS:

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

COLLECTED BY (PRINT) M Shando

RELINQUISHED BY (Printed Name) William Shaw (Signature) 	Date/Time 7/12/13 1233	RECEIVED BY (Printed Name) K. G.  (Signature) 	Date/Time 7/12/13 12:33
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 07/01/2013

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 4303 EVENT NAME: Mortandad/Sandia (Chromium Investigation) MY2013 Q4
 SAMPLE ID: CASA-13-36992 WORK ORDER: NA
 Watershed Sampling SANDIA

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED (MM/DD/YYYY):		7/12/13	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):		1203	MEDIA:	UA	I
PRS ID:		OK	SAMPLE TECH CODE:	UA	GSP
LOCATION ID: R-11		I	FIELD PREP:	F	OK
LOCATION TYPE: MON		I	FIELD QC TYPE: REG		I
PORT: SINGLE COMPLETION		I	SAMPLE USAGE: INV		I

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

SAMPLE COMMENTS: Diesel generator running while sampling

LOCATION COMMENTS: N/A

FIELD PARAMETERS:

Dissolved Oxygen 7.59 mg/L Oxidation-Reduction Potential 157.9 MV pH 8.02 SU
 Specific Conductance 240 uS/cm Temperature 22.28 deg C Turbidity 0.7 NTU

COLLECTED BY (PRINT) M Shendo

RELINQUISHED BY (Printed Name) William Shaw (Signature) <i>W. Shaw</i>	Date/Time 7/12/13 12:33	RECEIVED BY (Printed Name) K. G. Lee (Signature) <i>K. G. Lee</i>	Date/Time 7/12/13 12:33
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date 07/01/2013

Data Validation Report

Chain Of Custody No. 2013-1129

1. Distribution Of Samples In EDD.

	Analytical	Regular	Field	Trip	Field	Equipment
SDG	Method	Samples	Duplicates	Blanks	Blanks	Blanks
329546	EPA:120.1	1				
329546	EPA:150.1	1				
329546	EPA:160.1	1				
329546	EPA:245.2	1				
329546	EPA:300.0	1				
329546	EPA:310.1	1				
329546	EPA:350.1	1				
329546	EPA:351.2	1				
329546	EPA:353.2	1				
329546	EPA:365.4	1				
329546	SM:A2340B	1				
329546	SW-846:6010B	1				
329546	SW-846:6020	1				
329546	SW-846:6850	1				
329546	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
329546	EPA:120.1	1319860	1319860	1							
329546	EPA:150.1	1315750	1315750	1							
329546	EPA:160.1	1315616	1315616	1						1	
329546	EPA:245.2	1318882	1318879	1						1	2
329546	EPA:300.0	1315209	1315209	1						1	
329546	EPA:310.1	1315566	1315566	1						1	1
329546	EPA:350.1	1319983	1319982	1						1	2
329546	EPA:351.2	1315708	1315707	1						1	2
329546	EPA:353.2	1317211	1317211	1						1	
329546	EPA:365.4	1315711	1315709	1						1	2
329546	SM:A2340B	1320801	1320801	1							
329546	SW-846:6010B	1315228	1315227	1						1	1
329546	SW-846:6020	1315230	1315229	1						1	1
329546	SW-846:6850	1315482	1315481	1						1	1
329546	SW-846:9060	1315287	1315287	1						1	

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	CAMO-13-36986	1202920986	DUP		1	0	0
EPA:120.1	GENERAL CHEMISTRY	CASA-13-36992	329546002	REG		1	0	0
EPA:120.1	GENERAL CHEMISTRY	LCS	1202920985	LCS		0	0	1
EPA:150.1	GENERAL CHEMISTRY	CASA-13-36992	1202910955	DUP		1	0	0
EPA:150.1	GENERAL CHEMISTRY	CASA-13-36992	329546002	REG		1	0	0
EPA:150.1	GENERAL CHEMISTRY	LCS	1202910960	LCS		0	0	1
EPA:160.1	GENERAL CHEMISTRY	CAMO-13-37047	1202910656	DUP		1	0	0
EPA:160.1	GENERAL CHEMISTRY	CASA-13-36992	329546002	REG		1	0	0
EPA:160.1	GENERAL CHEMISTRY	LCS	1202910658	LCS		0	0	1
EPA:160.1	GENERAL CHEMISTRY	MB	1202910655	MB		1	0	0

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				1			
		1				1			
		1				2			
		1				1			
		1				1			
		1				2			
		1				2			
		1				1			
		1				1			
		1				2			
		1				1			
		1				1			
		1				2			

EPA:245.2	INORGANIC	BDDRIO-13-34179	1202918722	DUP	1	0	0	0
EPA:245.2	INORGANIC	BDDRIO-13-34179	1202918723	MS	0	0	1	0
EPA:245.2	INORGANIC	CASA-13-36992	1202918719	DUP	1	0	0	0
EPA:245.2	INORGANIC	CASA-13-36992	1202918720	MS	0	0	1	0
EPA:245.2	INORGANIC	CASA-13-36992	329546002	REG	1	0	0	0
EPA:245.2	INORGANIC	LCS	1202918718	LCS	0	0	1	0
EPA:245.2	INORGANIC	MB	1202918717	MB	1	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CAMO-13-37047	1202909724	DUP	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	CASA-13-36992	329546002	REG	4	0	0	0
EPA:300.0	GENERAL CHEMISTRY	LCS	1202909726	LCS	0	0	4	0
EPA:300.0	GENERAL CHEMISTRY	MB	1202909723	MB	4	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CASA-13-36992	1202910531	DUP	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	CASA-13-36992	1202910532	MS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	CASA-13-36992	329546002	REG	2	0	0	0
EPA:310.1	GENERAL CHEMISTRY	LCS	1202910526	LCS	0	0	1	0
EPA:310.1	GENERAL CHEMISTRY	MB	1202910525	MB	2	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CASA-13-36992	1202921248	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	CASA-13-36992	1202921250	MS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	CASA-13-36992	329546002	REG	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	LCS	1202921252	LCS	0	0	1	0
EPA:350.1	GENERAL CHEMISTRY	MB	1202921247	MB	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	WTMSGP-13-39433	1202921249	DUP	1	0	0	0
EPA:350.1	GENERAL CHEMISTRY	WTMSGP-13-39433	1202921251	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-13-36976	1202911679	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-13-36976	1202911680	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-13-36977	1202910856	DUP	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	CAMO-13-36977	1202910857	MS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	CASA-13-36988	329546001	REG	1	0	0	0
EPA:351.2	GENERAL CHEMISTRY	LCS	1202910855	LCS	0	0	1	0
EPA:351.2	GENERAL CHEMISTRY	MB	1202910854	MB	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CAMO-13-37047	1202914706	DUP	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	CASA-13-36992	329546002	REG	1	0	0	0
EPA:353.2	GENERAL CHEMISTRY	LCS	1202914710	LCS	0	0	1	0
EPA:353.2	GENERAL CHEMISTRY	MB	1202914705	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-13-37047	1202910859	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	CAMO-13-37047	1202910861	MS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	CASA-13-36992	329546002	REG	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	LCS	1202910863	LCS	0	0	1	0
EPA:365.4	GENERAL CHEMISTRY	MB	1202910858	MB	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	NP160-13-38789	1202910860	DUP	1	0	0	0
EPA:365.4	GENERAL CHEMISTRY	NP160-13-38789	1202910862	MS	0	0	1	0
SM:A2340B	INORGANIC	CASA-13-36992	329546002	REG	1	0	0	0
SW-846:6010B	INORGANIC	CASA-13-36992	1202909752	DUP	17	0	0	0
SW-846:6010B	INORGANIC	CASA-13-36992	1202909753	MS	0	0	17	0
SW-846:6010B	INORGANIC	CASA-13-36992	329546002	REG	17	0	0	0
SW-846:6010B	INORGANIC	LCS	1202909751	LCS	0	0	17	0
SW-846:6010B	INORGANIC	MB	1202909750	MB	17	0	0	0
SW-846:6020	INORGANIC	CASA-13-36992	1202909761	DUP	11	0	0	0
SW-846:6020	INORGANIC	CASA-13-36992	1202909762	MS	0	0	11	0
SW-846:6020	INORGANIC	CASA-13-36992	329546002	REG	11	0	0	0
SW-846:6020	INORGANIC	LCS	1202909760	LCS	0	0	11	0
SW-846:6020	INORGANIC	MB	1202909759	MB	11	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	CAMO-13-36980	1202910328	MS	0	0	1	0

Data Validation Report for:

Chain Of Custody No. 2013-1129

SW-846:6850	LCMS/MS PERCHLORATE	CAMO-13-36980	1202910329	MSD	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	CASA-13-36992	329546002	REG	1	0	0	0
SW-846:6850	LCMS/MS PERCHLORATE	LCS	1202910327	LCS	0	0	1	0
SW-846:6850	LCMS/MS PERCHLORATE	MB	1202910326	MB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CAMO-13-36975	1202909879	DUP	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	CASA-13-36988	329546001	REG	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	LCS	1202909881	LCS	0	0	1	0
SW-846:9060	GENERAL CHEMISTRY	MB	1202909878	MB	1	0	0	0
SW-846:9060	GENERAL CHEMISTRY	WTLAP-13-39037	1202910591	DUP	1	0	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

Field	Lab	Type Of	Analytical	Sample	Parameter	Lab	Lab		Lab
Sample ID	Sample ID	Blank	Method	Matrix	Name	Result	Qualifier	Units	Detection Limit
MB	1202909759	METHOD BLANK	SW-846:6020	W	Uranium	0.074	J	ug/L	0.2
MB	1202910525	METHOD BLANK	EPA:310.1	W	Alkalinity- CO ₃ +HCO ₃	1.04		mg/L	1
MB	1202921247	METHOD BLANK	EPA:350.1	W	Ammonia as Nitrogen	0.0441	J	mg/L	0.05

Any samples affected by the presence of contaminants in blanks?

Field	Blank Field	Blank Lab	Blank	Analytical	Parameter		Blank	Sample	Lab	Detect	
Sample ID	Sample ID	Sample ID	Type	Method	Name	Units	Result	Result	Qualifier	Limit	Detected
CASA-13-36992	MB	1202921247	METHOD BLANK	EPA:350.1	Ammonia as Nitrogen	mg/L	0.0441	0.0986		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
CAMO-13-36977	1202910857		EPA:351.2	Total Kjeldahl Nitrogen	1315707	8/6/2013	W	132		110	90

8. Any LCS/LCSD or 85/BSR recoveries or RPDs outside the control limits?

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

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

Rejection	RPD
Limit	Limit
10	

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

None.

13. Display Flagged Data.

Location ID	Chain Of Custody No	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detected
R-11	2013-1129	CASA-13-36992	REG	INIT	GENERAL CHEMISTRY	EPA:350.1	Ammonia as Nitrogen		U	I4	N

Reason Code

I4

Description

the sample result is $\leq 5 \times$ the concentration of related analyte in the method blank.

J_LAB

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

NQ

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

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
CASA-13-36988	R-11	REG	EPA:351.2	0	1
CASA-13-36988	R-11	REG	SW-846:9060	0	1
CASA-13-36992	R-11	REG	EPA:120.1	0	1
CASA-13-36992	R-11	REG	EPA:150.1	0	1
CASA-13-36992	R-11	REG	EPA:160.1	0	1
CASA-13-36992	R-11	REG	EPA:245.2	0	1
CASA-13-36992	R-11	REG	EPA:300.0	0	4
CASA-13-36992	R-11	REG	EPA:310.1	0	2
CASA-13-36992	R-11	REG	EPA:350.1	0	1
CASA-13-36992	R-11	REG	EPA:353.2	0	1
CASA-13-36992	R-11	REG	EPA:365.4	0	1
CASA-13-36992	R-11	REG	SM:A2340B	0	1
CASA-13-36992	R-11	REG	SW-846:6010B	0	17
CASA-13-36992	R-11	REG	SW-846:6020	0	11
CASA-13-36992	R-11	REG	SW-846:6850	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
0.0986	mg/L	0.0986	mg/L			W	7/12/2013		1319983	VAL	Y



August 12, 2013

www.gel.com

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

Re: LANL-WQH Water Samples
Work Order: 329546
SDG: 2013-1129

Dear Mr. Greene:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on July 16, 2013, and analyzed for General Chemistry, Metals and Perchlorates by LCMSMS. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

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

Sincerely,

Valerie Davis
Project Manager

Purchase Order: 63641-10
Chain of Custody: 2013-1129
Enclosures



ARS International (63641-10)
LANL-WQH Water Samples
Work Order #: 329546
SDG: 2013-1129

Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	4
Data Review Qualifier Flag Definition Sheet.....	8
Perchlorates by LCMSMS Analysis.....	11
Case Narrative.....	12
Sample Data Summary.....	18
Quality Control Summary.....	20
Quality Control Data.....	23
Miscellaneous.....	29
Metals Analysis.....	31
Case Narrative.....	32
Sample Data Summary.....	38
Quality Control Summary.....	43
General Chem Analysis.....	57
Case Narrative.....	58
Sample Data Summary.....	86
Quality Control Summary.....	91
Miscellaneous.....	97

Case Narrative

**Case Narrative for
ARS International (63641-10)
LANL-WQH Water Samples
Workorder #: 329546
SDG # : 2013-1129**

August 12, 2013

Laboratory Identification:

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

Summary

Sample receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on July 16, 2013 for analysis. The samples were delivered with proper chain of custody documentation and signatures. The samples were screened according to GEL Standard Operating Procedure. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Shipping container temperature was within specification (0 - 6C). Shipping container temperatures were checked, documented, and within specifications. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
329546001	CASA-13-36988
329546002	CASA-13-36992

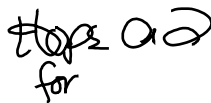
Case Narrative

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

Data Package

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

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.



Valerie Davis
Project Manager

List of current GEL Certifications as of 12 August 2013

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP A2LA ISO 17025	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA130005
Maryland	270
Massachusetts	M-SC012
Nevada	SC000122011-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
South Carolina Chemistry	10120001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-13-8
Utah NELAP	SC000122013-8
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12
Wisconsin	999887790

Chain of Custody and Supporting Documentation



SAMPLE RECEIPT & REVIEW FORM

Client: <u>LANL</u>		SDG/AR/COC/Work Order: <u>329546</u>
Received By: <u>JP</u>		Date Received: <u>7-16-13</u>
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0 cpm</u>
Classified Radioactive II or III by RSO?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Ice bags <u>Blue ice</u> Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial # <u>51050004</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sample ID's, containers affected and observed pH: <u>CAMO-13-37038 Gross A/B preserved upon receipt</u> If Preservation added, Lot#: <u>NX0309-75</u>
6 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 Are Encore containers present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: <u>See below</u>
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14 Carrier and tracking number.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other <u>5462 9833 1660-4°</u> <u>5462 9833 1659-4°</u>

Comments (Use Continuation Form if needed):
 2013-1128 - CAMO-13-37038 only received 2 SVOA bottles
 CAMO-13-37053 only received 1 VOA container
 2013-1135 - CAMO-13-36950 only one VOA container received
 2013-1127 - CAMO-13-36939 + 36940 only one VOA container received

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

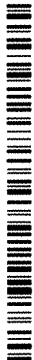
SHIP DATE: 15JUL13
ACTWGT: 52.0 LB MAN
CAD: 0014176/CAFE2511

BILL SENDER

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

CHARLESTON SC 29407

(843) 556-8171
REF: WE991155W300



FedEx
Express



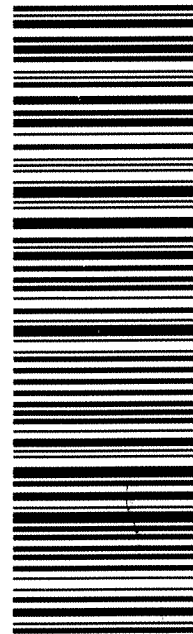
500C1/AR04/108C

TUE - 16 JUL 10:30A
PRIORITY OVERNIGHT

TRK# 5462 9833 1659
0201

XX CHSA

29407
SC-US CHS



Part # 156148-434 R1T2 09/10 *

ORIGIN ID: SAFA (505) 665-9966

KEITH GREENE
LOS ALAMOS NATL LAB
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

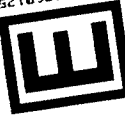
TO **VALERIE DAVIS**
GENERAL ENGINEERING LAB
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171
REF: MR1A015AGWKO



FedEx
Express



500C1/AR04/108C

TUE - 16 JUL 10:30A
PRIORITY OVERNIGHT

TRK# 5462 9833 1660
0201

XX CHSA

29407
SC-US CHS



Part # 156148-434 R1T2 09/10 *

Data Review Qualifier Flag Definition Sheet

Data Review Qualifier Definitions

Qualifier Explanation

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

< Result is less than value reported

> Result is greater than value reported

^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL

A The TIC is a suspected aldol-condensation product

B Target analyte was detected in the associated blank

B Metals-Either presence of analyte detected in the associated blank, or
MDL/IDL < sample value < PQL

BD Results are either below the MDC or tracer recovery is low

C Analyte has been confirmed by GC/MS analysis

D Results are reported from a diluted aliquot of the sample

d 5-day BOD-The 2:1 depletion requirement was not met for this sample

E Organics-Concentration of the target analyte exceeds the instrument calibration range

E Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria

H Analytical holding time was exceeded

h Preparation or preservation holding time was exceeded

J Value is estimated

N Metals-The Matrix spike sample recovery is not within specified control limits

N Organics-Presumptive evidence based on mass spectral library search to make a tentative
identification of the analyte (TIC). Quantitation is based on nearest internal standard
response factor

N/A Spike recovery limits do not apply. Sample concentration exceeds spike concentration
by 4X or more

ND Analyte concentration is not detected above the reporting limit

UI Gamma Spectroscopy-Uncertain identification

X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Y QC Samples were not spiked with this compound

Z Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

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

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

Perchlorates by LCMSMS Analysis

Case Narrative

**Perchlorate by LC-MS/MS
ARS International (ARSL)
SDG 2013-1129**

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: 1315482

Prep Batch Number: 1315481

Sample Analysis

Sample ID	Client ID
329546002	CASA-13-36992
1202910330	Interference Check Sample (ICS)
1202910326	Method Blank (MB)
1202910327	Laboratory Control Sample (LCS)
1202910328	329247002(CAMO-13-36980) Matrix Spike (MS)
1202910329	329247002(CAMO-13-36980) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

SOP Reference

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

The data discussed in this narrative has been analyzed in accordance with GL-OA-E-067 REV# 10.

Calibration Information

Initial Calibration

All initial calibration requirements have been met for this SDG.

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

ICV Requirements

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

CCB Requirements

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

CCV Requirements

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

Low Level Standard (CRI) Requirements

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

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

The MB analyzed with this SDG met the acceptance criteria.

Interference Check Sample (ICS)

The ICS met all recovery acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Client sample 329247002 (CAMO-13-36980) from SDG 2013-1092 was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

Outliers were observed in 1202910328(MS) for Perchlorate and Perchlorate-101. Please see the Form 3 in the package for a complete list of recoveries. The acceptance range for both is 75-125%. The noted exception in the MS can be attributed to the background concentration present in the parent sample, 329247002 (CAMO-13-36980), and the need to dilute all at 1:100 prior to analysis. The data are reported with the appropriate DER.

Matrix Spike Duplicate (MSD) Recovery Statement

Outliers were observed in 1202910329(MSD) for Perchlorate and Perchlorate-101. Please see the Form 3 in the package for a complete list of recoveries. The acceptance range for both is 75-125%. The noted exception in the MSD can be attributed to the background concentration present in the parent sample, 329247002 (CAMO-13-36980), and the need to dilute all at 1:100 prior to analysis. The data are reported with the appropriate DER.

MS/MSD Relative Percent Difference (RPD) Statement

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

Retention Time Standard Area Acceptance

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

Retention Time

During the analysis of Perchlorate by LC/MS/MS, retention time shifts are commonly observed. These retention time shifts, which are caused by fouling of the column by the sample matrices, are problematic when the retention time is used as one of the criterion for confirmation. To overcome this problem, a known amount of O(18) labeled Perchlorate was added to each sample as a retention time standard.

The presence of Perchlorate was confirmed by the relative retention time (RRT) of the Perchlorate peak and the O(18) standard. A RRT window of 0.98 to 1.02, as required by Method 332.0, has been used.

In addition to the isotopic ratio, the presence of Perchlorate in the samples associated with this data package have been confirmed using the relative retention criteria stated above, not the absolute retention time.

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

All procedures were performed as stated in the SOP.

Sample Dilutions

QC samples 1202910328 (MS) and 1202910329 (MSD) were diluted to bring the over range concentrations within the calibration range.

Sample Re-extraction/Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

Data Exception Report 1203735 was generated for this SDG.

Outliers were observed in 1202910328(MS) for Perchlorate and Perchlorate-101. Please see the Form 3 in the package for a complete list of recoveries. The acceptance range for both is 75-125%. The noted exception in the MS can be attributed to the background concentration present in the parent sample, 329247002 (CAMO-13-36980), and the need to dilute all at 1:100 prior to analysis. The data are reported with the appropriate DER.

Outliers were observed in 1202910329(MSD) for Perchlorate and Perchlorate-101. Please see the Form 3 in the package for a complete list of recoveries. The acceptance range for both is 75-125%. The noted exception in the MSD can be attributed to the background concentration present in the parent sample, 329247002 (CAMO-13-36980), and the need to dilute all at 1:100 prior to analysis. The data are reported with the appropriate DER.

Manual Integrations

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

Method Comments

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

Additional Comments

The Perchlorate Isotope Ratio on the Form I may differ slightly from the ratio on the corresponding raw data due to rounding rules and/or significant figures or due to software limitations when there are manual integrations, dilutions or other factors. The ratio value of the Form I is the correct value.

The retention time marker, Perchlorate-O (18), is added to all samples, instrument blanks, and standards prior to injection. It is used to verify the retention time of Perchlorate and Perchlorate-101 and to insure an accurate injection occurred.

Due to various anions affecting the recovery of Perchlorate-O (18) and not Perchlorate and Perchlorate-101, the calibration curves of Perchlorate and Perchlorate-101 are not internally corrected for using Perchlorate-O (18). They are external calibrations.

Perchlorate Isotope Ratio

The Perchlorate isotope ratio met acceptance criteria for all samples and QC samples.

Please see the isotope ratio criteria in the Miscellaneous Section.

System Configuration

The laboratory utilizes a Waters LC 2795 liquid chromatography instrument for Perchlorate analysis. It is coupled with either a Micromass Quattro Micro Mass Spectrometer/ Mass Spectrometer, or a Micromass Quattro Ultima Mass Spectrometer/ Mass Spectrometer. Each being designated as LCMSMS #1 and LCMSMS #2, respectively. It is fitted with an electrospray probe that is operated in the negative electrospray ionization mode for Perchlorate analysis.

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

Electronic Packaging Comment

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

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

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

Chromatographic Columns

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

Dionex: IonPac AG-16 2 x 50 mm.

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report for

ARSL001 ARS International (63641-10)

Client SDG: 2013-1129 GEL Work Order: 329546

The Qualifiers in this report are defined as follows:

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

Review/Validation

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

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

Signature: 

Name: Michael Penny

Date: 26 JUL 2013

Title: Group Leader

Sample Data Summary

Perchlorate Analysis Data Sheet

Lab Name: GEL Laboratories LLCLab Code: GELInstrument: LCMSMSMethod: SW846 6850 ModifiedMatrix: WATERExtraction Batch ID: 1315481Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CASA-13-36992Date Received: 16-JUL-13GEL Job No (SDG): 2013-1129GEL Sample ID: 329546002Date Filtered: 17-JUL-13Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.889	ug/L		1	17-JUL-13 19:20	per0717037a
	Perchlorate Isotope Ratio			3			1	17-JUL-13 19:20	per0717037a
14797-73-0	Perchlorate-101	.05	.2	0.871	ug/L		1	17-JUL-13 19:20	per0717037a
	Perchlorate-O(18)			0.556	ug/L		1	17-JUL-13 19:20	per0717037a

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

*Concentration =

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

Quality Control Summary

Perchlorate Laboratory Control Sample

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No. (SDG): 2013-1129

Extract Batch Code: 1315481

Date Filtered: 17-JUL-13

Matrix: WATER

Sample ID: 1202910327

Analyte^	True	Found	Units	%Rec	Q	Control Limits
Perchlorate	0.200	.194	ug/L	96.9		85 - 115
Perchlorate Isotope Ratio		3.06				-
Perchlorate-101	0.200	.186	ug/L	93.1		85 - 115
Perchlorate-O(18)		.479	ug/L			-

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

Perchlorate Spike/Spike Duplicate Summary

Lab Name: General Engineering Laboratories

Lab Code: GEL

GEL Job No (SDG): 2013-1129

Extract Batch Code: 1315481

Date Extracted: 17-JUL-13

GEL MS/PS ID: 1202910328

Client ID: CAMO-13-36980

GEL MSD/PSD ID: 1202910329

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	60.8	ug/L	57.2	-1780 *	63.4	1280 *	10.1	30	75 - 125
Perchlorate Isotope Ratio	0	3.12		3.08		3.13		1.54		-
Perchlorate-101	0.200	61.8	ug/L	59.0	-1440 *	64.3	1220 *	8.6	30	75 - 125
Perchlorate-O(18)	0	49.0	ug/L	48.5		51.9		6.82		-

^ 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: 1315481Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

MBDate Received: 17-JUL-13GEL Job No (SDG): 2013-1129GEL Sample ID: 1202910326Date Filtered: 17-JUL-13Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.200	ug/L	U	1	17-JUL-13 17:29	per0717022a
	Perchlorate Isotope Ratio						1	17-JUL-13 17:29	per0717022a
14797-73-0	Perchlorate-101	.05	.2	0.200	ug/L	U	1	17-JUL-13 17:29	per0717022a
	Perchlorate-O(18)			0.532	ug/L		1	17-JUL-13 17:29	per0717022a

^ 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: 1315481Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

LCSDate Received: 17-JUL-13GEL Job No (SDG): 2013-1129GEL Sample ID: 1202910327Date Filtered: 17-JUL-13Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.194	ug/L	J	1	17-JUL-13 17:36	per0717023a
	Perchlorate Isotope Ratio			3.06			1	17-JUL-13 17:36	per0717023a
14797-73-0	Perchlorate-101	.05	.2	0.186	ug/L	J	1	17-JUL-13 17:36	per0717023a
	Perchlorate-O(18)			0.479	ug/L		1	17-JUL-13 17:36	per0717023a

^ 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: 1315481Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

ICS

Date Received:

GEL Job No (SDG): 2013-1129GEL Sample ID: 1202910330Date Filtered: 17-JUL-13Injection Volume (uL): 20

%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	.05	.2	0.197	ug/L	J	1	17-JUL-13 17:44	per0717024a
	Perchlorate Isotope Ratio			2.94			1	17-JUL-13 17:44	per0717024a
14797-73-0	Perchlorate-101	.05	.2	0.197	ug/L	J	1	17-JUL-13 17:44	per0717024a
	Perchlorate-O(18)			0.558	ug/L		1	17-JUL-13 17:44	per0717024a

^ 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: 1315481Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-13-36980MSDate Received: 11-JUL-13GEL Job No (SDG): 2013-1129GEL Sample ID: 1202910328Date Filtered: 17-JUL-13Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	5	20	57.2	ug/L		100	18-JUL-13 15:23	per0718015a
	Perchlorate Isotope Ratio			3.08			100	18-JUL-13 15:23	per0718015a
14797-73-0	Perchlorate-101	5	20	59.0	ug/L		100	18-JUL-13 15:23	per0718015a
	Perchlorate-O(18)			48.5	ug/L		100	18-JUL-13 15:23	per0718015a

^ 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: 1315481Extraction Type: Filter/DAISample Volume/Weight: 10.0 mLConcentrated Extract Volume: 10.0

Client Sample No.

CAMO-13-36980MSDDate Received: 11-JUL-13GEL Job No (SDG): 2013-1129GEL Sample ID: 1202910329Date Filtered: 17-JUL-13Injection Volume (uL): 20%Solids:

CAS No.	Analyte^	MDL	RL	Conc*	Units	Q	Dilution Factor	Date Analyzed	GEL File ID
14797-73-0	Perchlorate	5	20	63.4	ug/L		100	18-JUL-13 15:30	per0718016a
	Perchlorate Isotope Ratio			3.13			100	18-JUL-13 15:30	per0718016a
14797-73-0	Perchlorate-101	5	20	64.3	ug/L		100	18-JUL-13 15:30	per0718016a
	Perchlorate-O(18)			51.9	ug/L		100	18-JUL-13 15:30	per0718016a

^ 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 =

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

Miscellaneous

DATA EXCEPTION REPORT			
Mo.Day Yr. 18-JUL-13	Division: Federal	Quality Criteria: Others	Type: Process
Instrument Type: LC-MS/MS	Test / Method: SW846 6850 Modified	Matrix Type: Liquid	Client Code: ARSL001
Batch ID: 1315482	Sample Numbers: See below		
Potentially affected work order(s)(SDG): 329247(2013-1092),329250(2013-1091),329376(2013-1100),329377(2013-1101),329378(2013-1103),329545(2013-1128),329546(2013-1129) Application Issues: Failed Recovery for MS/PS Failed Recovery for MSD/PSD			
Specification and Requirements		DER Disposition:	
Exception Description:			
1. Outliers were observed for both 1202910328(MS) and 1202910329(MSD) for Perchlorate and Perchlorate-101. Please see the Form 3 in the package for a complete list of recoveries. The acceptance range for both is 75-125%.		1. The noted exceptions can be attributed to the background concentrations found in the parent sample, 329247002, and the need to dilute all at 1:100 prior to analysis. Both the LCS and ICS met acceptance criteria, therefore the data are reported with the appropriate DER. The discrepancies are noted in the case narrative.	

Originator's Name:

Charles Wilson

18-JUL-13

Data Validator/Group Leader:

Michael Penny

22-JUL-13

Metals Analysis

Case Narrative

**Metals Fractional Narrative
ARS International (ARSL)
SDG 2013-1129**

Sample Analysis

Sample ID	Client ID
329546002	CASA-13-36992
1202909750	Method Blank (MB) ICP
1202909751	Laboratory Control Sample (LCS)
1202909754	329546002(CASA-13-36992L) Serial Dilution (SD)
1202909752	329546002(CASA-13-36992D) Sample Duplicate (DUP)
1202909753	329546002(CASA-13-36992S) Matrix Spike (MS)
1202909759	Method Blank (MB) ICP-MS
1202909760	Laboratory Control Sample (LCS)
1202909763	329546002(CASA-13-36992L) Serial Dilution (SD)
1202909761	329546002(CASA-13-36992D) Sample Duplicate (DUP)
1202909762	329546002(CASA-13-36992S) Matrix Spike (MS)
1202918717	Method Blank (MB) CVAA
1202918718	Laboratory Control Sample (LCS)
1202918721	329546002(CASA-13-36992L) Serial Dilution (SD)
1202918719	329546002(CASA-13-36992D) Sample Duplicate (DUP)
1202918720	329546002(CASA-13-36992S) Matrix Spike (MS)

Method/Analysis Information

Analytical Batch:	1315228, 1315230, 1318882 and 1320801
Prep Batch :	1315227, 1315229 and 1318879
Standard Operating Procedures:	GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 9, GL-MA-E-014 REV# 25, GL-MA-E-010 REV# 26 and GL-GC-E-107 REV# 8
Analytical Method:	SW846 3005/6010B, SW846 3005/6020 DOE-AL, EPA 245.1/245.2 and SM 2340 B
Prep Method :	SW846 3005A and EPA 245.1/245.2 Prep

Preparation/Analytical Method Verification

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

System Configuration

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

The Metals analysis-ICP was performed on a PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

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

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

Calibration Information

Instrument Calibration

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

CRDL Requirements

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

ICSA/ICSAB Statement

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

Continuing Calibration Blank (CCB) Requirements

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

acceptance criteria.

Continuing Calibration Verification (CCV) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following sample was selected as the quality control (QC) sample for this SDG: 329546002 (CASA-13-36992).

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.

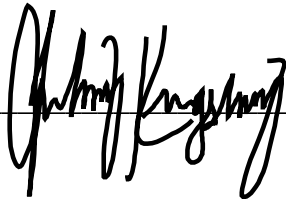
Certification Statement

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:  Date: 08/01/13

Sample Data Summary

GEL LABORATORIES LLC

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

Qualifier Definition Report for

ARSL001 ARS International (63641-10)

Client SDG: 2013-1129 GEL Work Order: 329546

The Qualifiers in this report are defined as follows:

* A quality control analyte recovery is outside of specified acceptance criteria

J Value is estimated

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

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

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

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

Reviewed by



08/01/13

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-1129**CONTRACT:** ESHL00210**METHOD TYPE:** EPA**SAMPLE ID:** 329546002**BASIS:** As Received**DATE COLLECTED** 12-JUL-13**CLIENT ID:** CASA-13-36992**LEVEL:** Low**DATE RECEIVED** 16-JUL-13**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7439-97-6	Mercury	0.20	ug/L	U	0.067	0.2	0.2	1	AV	NOR1	08/01/13 11:51	080113W1-4	1318882

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-1129

CONTRACT: ESHL00210

METHOD TYPE: SW846

SAMPLE ID: 329546002

BASIS: As Received

DATE COLLECTED 12-JUL-13

CLIENT ID: CASA-13-36992

LEVEL: Low

DATE RECEIVED 16-JUL-13

MATRIX: W

%SOLIDS: 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7429-90-5	Aluminum	200	ug/L	U	68	200	200	1	P	HSC	08/05/13 15:44	080513A-1	1315228
7440-36-0	Antimony	3	ug/L	U	1	3	3	1	MS	BAJ	08/08/13 05:26	130807-2	1315230
7440-38-2	Arsenic	5	ug/L	U	1.7	5	5	1	MS	BAJ	08/08/13 05:26	130807-2	1315230
7440-39-3	Barium	40	ug/L		1	5	5	1	P	HSC	08/05/13 15:44	080513A-1	1315228
7440-41-7	Beryllium	5	ug/L	U	1	5	5	1	P	HSC	08/05/13 15:44	080513A-1	1315228
7440-42-8	Boron	25.8	ug/L	J	15	50	50	1	P	HSC	08/05/13 15:44	080513A-1	1315228
7440-43-9	Cadmium	1	ug/L	U	0.11	1	1	1	MS	BAJ	08/08/13 05:26	130807-2	1315230
7440-70-2	Calcium	23200	ug/L		50	200	200	1	P	HSC	08/05/13 15:44	080513A-1	1315228
7440-47-3	Chromium	26.4	ug/L		2	10	10	1	MS	BAJ	08/08/13 05:26	130807-2	1315230
7440-48-4	Cobalt	5	ug/L	U	1	5	5	1	P	HSC	08/05/13 15:44	080513A-1	1315228
7440-50-8	Copper	10	ug/L	U	3	10	10	1	P	HSC	08/05/13 15:44	080513A-1	1315228
7439-89-6	Iron	100	ug/L	U	30	100	100	1	P	HSC	08/05/13 15:44	080513A-1	1315228
7439-92-1	Lead	2	ug/L	U	0.5	2	2	1	MS	BAJ	08/08/13 05:26	130807-2	1315230
7439-95-4	Magnesium	6440	ug/L		110	300	300	1	P	HSC	08/05/13 15:44	080513A-1	1315228
7439-96-5	Manganese	10	ug/L	U	2	10	10	1	P	HSC	08/05/13 15:44	080513A-1	1315228
7439-98-7	Molybdenum	1.64	ug/L		0.165	0.5	0.5	1	MS	BAJ	08/08/13 13:26	130808-3	1315230
7440-02-0	Nickel	0.630	ug/L	J	0.5	2	2	1	MS	BAJ	08/08/13 05:26	130807-2	1315230
7440-09-7	Potassium	1430	ug/L		50	150	150	1	P	HSC	08/05/13 15:44	080513A-1	1315228
7782-49-2	Selenium	1.64	ug/L	J	1.5	5	5	1	MS	BAJ	08/08/13 05:26	130807-2	1315230
7631-86-9	Silica	73500	ug/L		53	213	213	1	P	HSC	08/05/13 15:44	080513A-1	1315228
7440-22-4	Silver	1	ug/L	U	0.2	1	1	1	MS	BAJ	08/08/13 05:26	130807-2	1315230
7440-23-5	Sodium	11600	ug/L		100	300	300	1	P	HSC	08/05/13 15:44	080513A-1	1315228
7440-24-6	Strontium	92.4	ug/L		1	5	5	1	P	HSC	08/05/13 15:44	080513A-1	1315228
7440-28-0	Thallium	2	ug/L	U	0.45	2	2	1	MS	BAJ	08/08/13 05:26	130807-2	1315230
7440-31-5	Tin	10	ug/L	U	2.5	10	10	1	P	HSC	08/05/13 15:44	080513A-1	1315228
7440-61-1	Uranium	0.792	ug/L		0.067	0.2	0.2	1	MS	BAJ	08/08/13 13:26	130808-3	1315230
7440-62-2	Vanadium	7.26	ug/L		1	5	5	1	P	HSC	08/05/13 15:44	080513A-1	1315228
7440-66-6	Zinc	8.48	ug/L	J	3.3	10	10	1	P	HSC	08/05/13 15:44	080513A-1	1315228

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 2013-1129**CONTRACT:** ESHL00210**METHOD TYPE:****SAMPLE ID:** 329546002**BASIS:** As Received**DATE COLLECTED** 12-JUL-13**CLIENT ID:** CASA-13-36992**LEVEL:** Low**DATE RECEIVED** 16-JUL-13**MATRIX:** W**%SOLIDS:** 0

CAS No.	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
	Hardness as CaCO3	84.4	mg/L		0.453	1.24	1.24	1		JJ2	08/07/13 11:27		1320801

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
1315228	1315227	SW846 3005A	50	mL	50	mL	08/03/13	BCD1
1315230	1315229	SW846 3005A	50	mL	50	mL	08/03/13	BCD1
1318882	1318879	EPA 245.1/245.2 Prep	20	mL	20	mL	07/31/13	AXS5

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

Quality Control Summary

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 2013-1129

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>
1202909750								
	Aluminum	68	ug/L	+/-200	U	P	68	200
	Barium	1	ug/L	+/-5	U	P	1	5
	Beryllium	1	ug/L	+/-5	U	P	1	5
	Boron	15	ug/L	+/-50	U	P	15	50
	Calcium	50	ug/L	+/-200	U	P	50	200
	Cobalt	1	ug/L	+/-5	U	P	1	5
	Copper	3	ug/L	+/-10	U	P	3	10
	Iron	30	ug/L	+/-100	U	P	30	100
	Magnesium	110	ug/L	+/-300	U	P	110	300
	Manganese	2	ug/L	+/-10	U	P	2	10
	Potassium	50	ug/L	+/-150	U	P	50	150
	Silica	53	ug/L	+/-213	U	P	53	213
	Sodium	100	ug/L	+/-300	U	P	100	300
	Strontium	1	ug/L	+/-5	U	P	1	5
	Tin	2.5	ug/L	+/-10	U	P	2.5	10
	Vanadium	1	ug/L	+/-5	U	P	1	5
	Zinc	3.3	ug/L	+/-10	U	P	3.3	10
1202909759								
	Antimony	1	ug/L	+/-3	U	MS	1	3
	Arsenic	1.7	ug/L	+/-5	U	MS	1.7	5
	Cadmium	0.11	ug/L	+/-1	U	MS	0.11	1
	Chromium	2	ug/L	+/-10	U	MS	2	10
	Lead	0.5	ug/L	+/-2	U	MS	0.5	2
	Molybdenum	0.165	ug/L	+/-0.5	U	MS	0.165	0.5
	Nickel	0.5	ug/L	+/-2	U	MS	0.5	2
	Selenium	1.5	ug/L	+/-5	U	MS	1.5	5
	Silver	0.2	ug/L	+/-1	U	MS	0.2	1
	Thallium	0.45	ug/L	+/-2	U	MS	0.45	2
	Uranium	0.074	ug/L	+/-0.2	J	MS	0.067	0.2
1202918717								
	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. 2013-1129 Client ID: CASA-13-36992S

Contract: ESHL00210 Level: Low

Matrix: WATER % Solids:

Sample ID: 329546002 Spike ID: 1202909753

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Aluminum	ug/L	75-125	4640		68	U	5000	92.3		P
Barium	ug/L	75-125	539		40		500	99.7		P
Beryllium	ug/L	75-125	500		1	U	500	100		P
Boron	ug/L	75-125	504		25.8	J	500	95.7		P
Calcium	ug/L		28300		23200		5000	103	N/A	P
Cobalt	ug/L	75-125	489		1	U	500	97.9		P
Copper	ug/L	75-125	519		3	U	500	104		P
Iron	ug/L	75-125	5000		30	U	5000	99.8		P
Magnesium	ug/L	75-125	11500		6440		5000	101		P
Manganese	ug/L	75-125	495		2	U	500	99		P
Potassium	ug/L	75-125	6310		1430		5000	97.6		P
Silica	ug/L		83300		73500		10700	92.2	N/A	P
Sodium	ug/L	75-125	16300		11600		5000	93.9		P
Strontium	ug/L	75-125	583		92.4		500	98		P
Tin	ug/L	75-125	487		2.5	U	500	97.4		P
Vanadium	ug/L	75-125	519		7.26		500	102		P
Zinc	ug/L	75-125	498		8.48	J	500	97.8		P

*Analytical Methods:

P SW846 3005/6010B

METALS

-5a-

Matrix Spike Summary

SDG NO. 2013-1129 **Client ID:** CASA-13-36992S

Contract: ESHL00210 **Level:** Low

Matrix: WATER **% Solids:**

Sample ID: 329546002 **Spike ID:** 1202909762

<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	52.6		1	U	50	105		MS
Arsenic	ug/L	75-125	47.8		1.7	U	50	93.7		MS
Cadmium	ug/L	75-125	50.5		0.11	U	50	101		MS
Chromium	ug/L	75-125	75.1		26.4		50	97.3		MS
Lead	ug/L	75-125	45.7		0.5	U	50	91.5		MS
Molybdenum	ug/L	75-125	55.8		1.64		50	108		MS
Nickel	ug/L	75-125	48		0.63	J	50	94.7		MS
Selenium	ug/L	75-125	51.6		1.64	J	50	99.9		MS
Silver	ug/L	75-125	51.5		0.2	U	50	103		MS
Thallium	ug/L	75-125	44.3		0.45	U	50	88.5		MS
Uranium	ug/L	75-125	57.5		0.792		50	113		MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

-5a-

Matrix Spike Summary

SDG NO. 2013-1129 **Client ID:** CASA-13-36992S**Contract:** ESHL00210 **Level:** Low**Matrix:** WATER **% Solids:****Sample ID:** 329546002 **Spike ID:** 1202918720

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Mercury	ug/L	75-125	2		0.067	U	2	100		AV

*Analytical Methods:

AV EPA 245.1/245.2

Metals
–6–
Duplicate Sample Summary

SDG No.: 2013–1129

Lab Code: GEL

Contract: ESHL00210

Client ID: CASA–13–36992D

Matrix: LIQUID

Level: Low

Sample ID: 329546002

Duplicate ID: 1202909752

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%	40		41.3		3.08		P
Beryllium	ug/L		1 U		1 U				P
Boron	ug/L	+/-50	25.8 J		25.7 J		.171		P
Calcium	ug/L	+/-20%	23200		23600		1.68		P
Cobalt	ug/L		1 U		1 U				P
Copper	ug/L		3 U		3 U				P
Iron	ug/L		30 U		30 U				P
Magnesium	ug/L	+/-20%	6440		6660		3.28		P
Manganese	ug/L		2 U		2 U				P
Potassium	ug/L	+/-20%	1430		1520		6.07		P
Silica	ug/L	+/-20%	73500		74400		1.29		P
Sodium	ug/L	+/-20%	11600		11800		1.72		P
Strontium	ug/L	+/-20%	92.4		94.2		1.88		P
Tin	ug/L		2.5 U		2.5 U				P
Vanadium	ug/L	+/-5	7.26		7.4		1.87		P
Zinc	ug/L	+/-10	8.48 J		8.45 J		.386		P

*Analytical Methods:

P SW846 3005/6010B

Metals
–6–
Duplicate Sample Summary

SDG No.: 2013–1129

Lab Code: GEL

Contract: ESHL00210

Client ID: CASA–13–36992D

Matrix: LIQUID

Level: Low

Sample ID: 329546002

Duplicate ID: 1202909761

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	26.4		26.7		.855		MS
Lead	ug/L		0.5 U		0.5 U				MS
Molybdenum	ug/L	+/- .5	1.64		1.58		3.6		MS
Nickel	ug/L	+/-2	0.63 J		0.571 J		9.83		MS
Selenium	ug/L	+/-5	1.64 J		1.81 J		10		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	0.792		0.777		1.91		MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

Metals
–6–
Duplicate Sample Summary

SDG No.: 2013–1129**Lab Code:** GEL**Contract:** ESHL00210**Client ID:** CASA–13–36992D**Matrix:** LIQUID**Level:** Low**Sample ID:** 329546002**Duplicate ID:** 1202918719**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. 2013-1129

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>
1202909751								
	Aluminum	ug/L	5000	4750		95	80-120	P
	Barium	ug/L	500	503		101	80-120	P
	Beryllium	ug/L	500	503		101	80-120	P
	Boron	ug/L	500	470		93.9	80-120	P
	Calcium	ug/L	5000	5020		100	80-120	P
	Cobalt	ug/L	500	504		101	80-120	P
	Copper	ug/L	500	506		101	80-120	P
	Iron	ug/L	5000	5020		100	80-120	P
	Magnesium	ug/L	5000	5140		103	80-120	P
	Manganese	ug/L	500	502		100	80-120	P
	Potassium	ug/L	5000	4960		99.3	80-120	P
	Silica	ug/L	10700	10400		97.2	80-120	P
	Sodium	ug/L	5000	4760		95.3	80-120	P
	Strontium	ug/L	500	498		99.5	80-120	P
	Tin	ug/L	500	495		99.1	80-120	P
	Vanadium	ug/L	500	512		102	80-120	P
	Zinc	ug/L	500	492		98.4	80-120	P

*Analytical Methods:

P SW846 3005/6010B

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2013-1129

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>
1202909760								
	Antimony	ug/L	50	51.9		104	80-120	MS
	Arsenic	ug/L	50	48.7		97.4	80-120	MS
	Cadmium	ug/L	50	51.7		103	80-120	MS
	Chromium	ug/L	50	50.2		100	80-120	MS
	Lead	ug/L	50	46.4		92.9	80-120	MS
	Molybdenum	ug/L	50	53.9		108	80-120	MS
	Nickel	ug/L	50	51.5		103	80-120	MS
	Selenium	ug/L	50	51.8		104	80-120	MS
	Silver	ug/L	50	52.5		105	80-120	MS
	Thallium	ug/L	50	45		90	80-120	MS
	Uranium	ug/L	50	54.4		109	80-120	MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 2013-1129

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>
1202918718	Mercury	ug/L	2	1.99		99.6	85-115	AV

*Analytical Methods:

AV EPA 245.1/245.2

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2013-1129

Client ID: CASA-13-36992L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 329546002

Serial Dilution ID: 1202909754

<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	40		40.4		1.06			P
Beryllium	1	U	5	U				P
Boron	25.8	J	75	U	100			P
Calcium	23200		23200		.035		10	P
Cobalt	1	U	5	U				P
Copper	3	U	15	U				P
Iron	30	U	150	U				P
Magnesium	6440		6410		.543		10	P
Manganese	2	U	10	U				P
Potassium	1430		1620		13.1			P
Silica	73500		71600		2.49		10	P
Sodium	11600		11500		.208		10	P
Strontium	92.4		92.1		.393		10	P
Tin	2.5	U	12.5	U				P
Vanadium	7.26		10.3	J	42.2			P
Zinc	8.48	J	16.5	U	100			P

*Analytical Methods:

P SW846 3005/6010B

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2013-1129

Client ID: CASA-13-36992L

Contract: ESHL00210

Matrix: LIQUID

Level: Low

Sample ID: 329546002

Serial Dilution ID: 1202909763

<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	26.4		25.6	J	3.13			MS
Lead	.5	U	2.5	U				MS
Molybdenum	1.64		1.95	J	19			MS
Nickel	.63	J	2.5	U	100			MS
Selenium	1.64	J	7.5	U	100			MS
Silver	.2	U	1	U				MS
Thallium	.45	U	2.25	U				MS
Uranium	.792		.915	J	15.5			MS

*Analytical Methods:

MS SW846 3005/6020 DOE-AL

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 2013-1129 **Client ID:** CASA-13-36992L**Contract:** ESHL00210**Matrix:** LIQUID **Level:** Low**Sample ID:** 329546002 **Serial Dilution ID:** 1202918721

<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 2013-1129**

Method/Analysis Information

Product: Carbon and Total Organic

Analytical Batch: 1315287

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
329546001	CASA-13-36988
1202909878	Method Blank (MB)
1202909879	329250001(CAMO-13-36975) Sample Duplicate (DUP)
1202909880	329250001(CAMO-13-36975) Post Spike (PS)
1202909881	Laboratory Control Sample (LCS)
1202910591	329748007(WTLAP-13-39037) Sample Duplicate (DUP)
1202910592	329748007(WTLAP-13-39037) 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# 12.

Preparation/Analytical Method Verification

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

Calibration Information

The Carbon analysis was performed on a O-I Analytical Model 1010 Total Organic Carbon Analyzer.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following samples were selected for QC analysis: 329250001 (CAMO-13-36975) and 329748007 (WTLAP-13-39037).

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: 1319860

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
329546002	CASA-13-36992
1202920985	Laboratory Control Sample (LCS)
1202920986	329767002(CAMO-13-36986) Sample Duplicate (DUP)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-009 REV# 11.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Quality Control (QC) Information

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 329767002 (CAMO-13-36986).

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: 1315750 **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
329546002	CASA-13-36992
1202910955	329546002(CASA-13-36992) Sample Duplicate (DUP)
1202910960	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# 21.

Preparation/Analytical Method Verification

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

Calibration Information

The Electrode analysis was performed on a PerpHect pH Meter Orion 370.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information (CCV)

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

Quality Control (QC) Information

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 329546002 (CASA-13-36992).

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: 329546002 (CASA-13-36992).

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: 1203679 329546002 (CASA-13-36992).

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: 1315209

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
329546002	CASA-13-36992
1202909723	Method Blank (MB)
1202909724	329545002(CAMO-13-37047) Sample Duplicate (DUP)
1202909725	329545002(CAMO-13-37047) Post Spike (PS)
1202909726	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# 22.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 329545002 (CAMO-13-37047).

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: 1202909724 (CAMO-13-37047), 1202909725 (CAMO-13-37047) and 329546002 (CASA-13-36992).

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: 1319983 **Method:** EPA 350.1 Nitrogen and Ammonia L

Prep Batch : 1319982 **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
329546002	CASA-13-36992
1202921247	Method Blank (MB)
1202921248	329546002(CASA-13-36992) Sample Duplicate (DUP)
1202921249	330736001(WTMSGP-13-39433) Sample Duplicate (DUP)
1202921250	329546002(CASA-13-36992) Matrix Spike (MS)
1202921251	330736001(WTMSGP-13-39433) Matrix Spike (MS)
1202921252	Laboratory Control Sample (LCS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following samples were selected for QC analysis: 329546002 (CASA-13-36992) and 330736001 (WTMSGP-13-39433).

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 following samples were re-analyzed due to CCV failure: 1202921249 (WTMSGP-13-39433) and 1202921251 (WTMSGP-13-39433).

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:	1315708	Method:	Nitrogen and Total Kjeldahl (TKN)
Prep Batch :	1315707	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
329546001	CASA-13-36988
1202910854	Method Blank (MB)
1202910855	Laboratory Control Sample (LCS)
1202910856	329653001(CAMO-13-36977) Sample Duplicate (DUP)
1202910857	329653001(CAMO-13-36977) Matrix Spike (MS)
1202911679	329377001(CAMO-13-36976) Sample Duplicate (DUP)
1202911680	329377001(CAMO-13-36976) Matrix Spike (MS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 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 samples were selected for QC analysis: 329377001 (CAMO-13-36976) and 329653001 (CAMO-13-36977).

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

The spike recovery falls outside of the established acceptance limits due to matrix interference: 1202910857 (CAMO-13-36977).

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. 1202910856 (CAMO-13-36977) and 1202911679 (CAMO-13-36976).

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: 1208720 1202910857 (CAMO-13-36977).

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:	1317211	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
329546002	CASA-13-36992
1202914705	Method Blank (MB)
1202914706	329545002(CAMO-13-37047) Sample Duplicate (DUP)
1202914708	329545002(CAMO-13-37047) Post Spike (PS)
1202914710	Laboratory Control Sample (LCS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Calibration Verification Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

acceptance limits.

Y Intercept Rule

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 329545002 (CAMO-13-37047).

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

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

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Preservation/Integrity

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

Sample Dilutions

The following sample in this sample group was diluted due to high concentration: 329546002 (CASA-13-36992).

Sample Re-analysis

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

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

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

Method/Analysis Information

Product:	Total Phosphorus		
Analytical Batch:	1315711	Method:	EPA 365.4 Phosphorus and Total in
Prep Batch :	1315709	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
329546002	CASA-13-36992
1202910858	Method Blank (MB)
1202910859	329545002(CAMO-13-37047) Sample Duplicate (DUP)
1202910860	329663001(NP160-13-38789) Sample Duplicate (DUP)
1202910861	329545002(CAMO-13-37047) Matrix Spike (MS)
1202910862	329663001(NP160-13-38789) Matrix Spike (MS)
1202910863	Laboratory Control Sample (LCS)

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

SOP Reference

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

Preparation/Analytical Method Verification

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

Calibration Information

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

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following samples were selected for QC analysis: 329545002 (CAMO-13-37047) and 329663001 (NP160-13-38789).

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

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages

electronically. The following change from traditional packages should be noted:

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

Method/Analysis Information

Product: Solids and Total Dissolved

Analytical Batch: 1315616

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
329546002	CASA-13-36992
1202910655	Method Blank (MB)
1202910656	329545002(CAMO-13-37047) Sample Duplicate (DUP)
1202910658	Laboratory Control Sample (LCS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-001 REV# 13.

Preparation/Analytical Method Verification

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

Calibration Information

The Solids analysis was performed on a Sartorius Balance BAL216. Solids lab

Initial Calibration

All initial calibration requirements have been met for this SDG.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 329545002 (CAMO-13-37047).

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

Sample Aliquot

A sufficient amount of sample was provided by the client for analysis.

Miscellaneous Information

Data Exception (DER) Documentation

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Alkalinity

Analytical Batch: 1315566 **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
329546002	CASA-13-36992
1202910526	Laboratory Control Sample (LCS)
1202910531	329546002(CASA-13-36992) Sample Duplicate (DUP)
1202910532	329546002(CASA-13-36992) Matrix Spike (MS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 10.

Preparation/Analytical Method Verification

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

Calibration Information

The Titration analysis was performed on a manually operated buret.

Initial Standardization

The titrant was properly standardized

Quality Control (QC) Information

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: 329546002 (CASA-13-36992).

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.

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

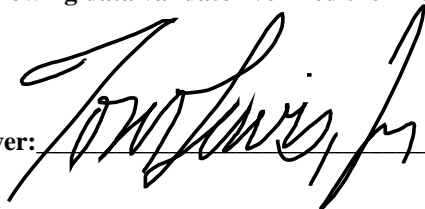
Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

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:

10Aug13

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis Report for

ARSL001 ARS International (63641-10)

Client SDG: 2013-1129 GEL Work Order: 329546

The Qualifiers in this report are defined as follows:

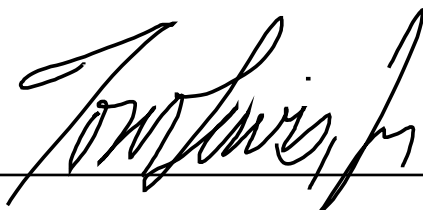
- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a Tracer compound
- ** Analyte is a surrogate compound
- H Analytical holding time was exceeded
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

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

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

Reviewed by



GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: August 9, 2013

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

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

Client SDG: 2013-1129

Client Sample ID: CASA-13-36988
Sample ID: 329546001
Matrix: W
Collect Date: 12-JUL-13 12:03
Receive Date: 16-JUL-13
Collector: Client

Project: ESHL00210
Client ID: ARSL001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Carbon Analysis											
SW 9060 Total Organic Carbon "As Received"											
Total Organic Carbon Average	J	0.770	0.330	1.00	mg/L	1	TSM	07/19/13	1816	1315287	1
Nutrient Analysis											
Nitrogen, Total Kjeldahl (TKN) "As Received"											
Nitrogen, Total Kjeldahl	U	ND	0.033	0.100	mg/L	1	KLP1	08/06/13	1448	1315708	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	08/05/13	1700	1315707

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9060	
2	EPA 351.2	

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: August 9, 2013

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

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

Client SDG: 2013-1129

Client Sample ID: CASA-13-36992
Sample ID: 329546002
Matrix: W
Collect Date: 12-JUL-13 12:03
Receive Date: 16-JUL-13
Collector: Client

Project: ESHL00210
Client ID: ARSL001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Conductivity Analysis											
EPA120.1 Specific Conductivity "As Received"											
Conductivity		235	1.00	1.00	umhos/cm	1	LXA1	08/03/13	1407	1319860	1
Electrode Analysis											
EPA 150.1 pH "As Received"											
pH at Temp 11.7C	H	7.98	0.010	0.100	SU	1	LYG1	07/18/13	0929	1315750	2
Ion Chromatography											
EPA 300.0 Anions Liquid 28 day "As Received"											
Bromide	J	0.0974	0.067	0.200	mg/L	1	MAR1	08/01/13	1912	1315209	3
Chloride		5.95	0.067	0.200	mg/L	1					
Fluoride		0.362	0.033	0.100	mg/L	1					
Sulfate		14.9	0.133	0.400	mg/L	1					
Nutrient Analysis											
EPA 350.1 Nitrogen, Ammonia L "As Received"											
Nitrogen, Ammonia		0.0986	0.017	0.050	mg/L	1	KLP1	08/06/13	1334	1319983	4
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"											
Nitrogen, Nitrate/Nitrite		6.05	0.170	0.500	mg/L	10	KLP1	08/05/13	1306	1317211	5
EPA 365.4 Phosphorus, Total in "As Received"											
Phosphorus, Total as P	J	0.0188	0.017	0.050	mg/L	1	KLP1	07/24/13	1607	1315711	6
Solids Analysis											
EPA 160.1 Solids, Dissolved-F "As Received"											
Total Dissolved Solids		184	3.40	14.3	mg/L		LYG1	07/17/13	1343	1315616	7
Titration Analysis											
EPA 310.1 Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		68.6	0.725	1.00	mg/L		LXA1	07/17/13	1725	1315566	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	08/06/13	1230	1319982
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	07/24/13	1515	1315709

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Certificate of Analysis

Report Date: August 9, 2013

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

Client SDG: 2013-1129

Client Sample ID: CASA-13-36992
Sample ID: 329546002

Project: ESHL00210
Client ID: ARSL001

The following Analytical Methods were performed:

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

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: August 9, 2013

Page 1 of 5

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

Contact: Mr. Keith Greene

Workorder: 329546

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Carbon Analysis											
Batch	1315287										
QC1202909879	329250001	DUP									
Total Organic Carbon Average		1.16		1.12	mg/L	3.51	^	(+/-1.00)	TSM	07/19/13	16:07
QC1202910591	329748007	DUP									
Total Organic Carbon Average		5.23		5.26	mg/L	0.553		(0%-20%)		07/19/13	20:49
QC1202909881	LCS										
Total Organic Carbon Average	10.0			9.79	mg/L			(85%-115%)		07/19/13	14:51
QC1202909878	MB										
Total Organic Carbon Average			U	ND	mg/L					07/19/13	14:42
QC1202909880	329250001	PS									
Total Organic Carbon Average	10.0	1.16		11.0	mg/L			(65%-120%)		07/19/13	16:27
QC1202910592	329748007	PS									
Total Organic Carbon Average	10.0	5.23		14.9	mg/L			(65%-120%)		07/19/13	21:08
Conductivity Analysis											
Batch	1319860										
QC1202920986	329767002	DUP									
Conductivity		167		171	umhos/cm	2.54		(0%-10%)	LXA1	08/03/13	14:46
QC1202920985	LCS										
Conductivity	1410			1420	umhos/cm			(95%-105%)		08/03/13	14:04
Electrode Analysis											
Batch	1315750										
QC1202910955	329546002	DUP									
pH		H	7.98	H	8.00	SU	0.250	(0%-10%)	LYG1	07/18/13	09:30
QC1202910960	LCS										
pH	7.00			6.95	SU			(99%-101%)		07/18/13	08:47
Ion Chromatography											
Batch	1315209										
QC1202909724	329545002	DUP									
Bromide		U	ND	U	ND	mg/L	N/A		MAR1	08/01/13	18:06
Chloride			1.97		1.98	mg/L	0.162	(0%-20%)			
Fluoride			0.191		0.193	mg/L	1.30	^	(+/-0.100)		

GEL LABORATORIES LLC

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QC Summary

Workorder: 329546

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1315209										
Sulfate		2.21		2.21	mg/L	0.208		(0%-20%)	MAR1	08/01/13	18:06
QC1202909726	LCS										
Bromide	1.25			1.28	mg/L		102	(90%-110%)		08/01/13	17:00
Chloride	5.00			4.70	mg/L		94	(90%-110%)			
Fluoride	2.50			2.44	mg/L		97.5	(90%-110%)			
Sulfate	10.0			9.64	mg/L		96.4	(90%-110%)			
QC1202909723	MB										
Bromide			U	ND	mg/L					08/01/13	16:27
Chloride			U	ND	mg/L						
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1202909725	329545002	PS									
Bromide	1.25	U	ND	1.29	mg/L		100	(90%-110%)		08/01/13	18:39
Chloride	5.00		1.97	6.97	mg/L		99.9	(90%-110%)			
Fluoride	2.50		0.191	2.65	mg/L		98.4	(90%-110%)			
Sulfate	10.0		2.21	12.1	mg/L		98.5	(90%-110%)			
Nutrient Analysis											
Batch	1315708										
QC1202910856	329653001	DUP									
Nitrogen, Total Kjeldahl		U	ND	J	0.0756	mg/L	N/A		KLP1	08/06/13	14:50
QC1202911679	329377001	DUP									
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A			08/06/13	14:45
QC1202910855	LCS										
Nitrogen, Total Kjeldahl	1.00			0.990	mg/L		99	(90%-110%)		08/06/13	14:44
QC1202910854	MB										
Nitrogen, Total Kjeldahl			J	0.0554	mg/L					08/06/13	14:43
QC1202910857	329653001	MS									

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QC Summary

Workorder: 329546

Page 3 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1315708										
Nitrogen, Total Kjeldahl	1.00	U	ND	1.32	mg/L		132 *	(90%-110%)		08/06/13	14:51
QC1202911680 329377001 MS											
Nitrogen, Total Kjeldahl	1.00	U	ND	0.919	mg/L		91.9	(90%-110%)	KLP1	08/06/13	14:46
Batch	1315711										
QC1202910859 329545002 DUP											
Phosphorus, Total as P		J	0.0349 J	0.0387	mg/L	10.3 ^		(+/-0.050)	KLP1	07/24/13	16:06
QC1202910860 329663001 DUP											
Phosphorus, Total as P		J	0.0179 U	ND	mg/L	N/A ^				07/24/13	16:14
QC1202910863 LCS											
Phosphorus, Total as P	1.00			1.06	mg/L		106	(76%-120%)		07/24/13	16:02
QC1202910858 MB											
Phosphorus, Total as P			U	ND	mg/L					07/24/13	16:01
QC1202910861 329545002 MS											
Phosphorus, Total as P	1.00	J	0.0349	0.787	mg/L		75.2	(62%-139%)		07/24/13	16:06
QC1202910862 329663001 MS											
Phosphorus, Total as P	1.00	J	0.0179	1.06	mg/L		104	(62%-139%)		07/24/13	16:15
Batch	1317211										
QC1202914706 329545002 DUP											
Nitrogen, Nitrate/Nitrite			0.324	0.320	mg/L	1.24		(0%-20%)	KLP1	08/05/13	13:03
QC1202914710 LCS											
Nitrogen, Nitrate/Nitrite	1.00			1.01	mg/L		101	(90%-110%)		08/05/13	13:01
QC1202914705 MB											
Nitrogen, Nitrate/Nitrite			U	ND	mg/L					08/05/13	13:00
QC1202914708 329545002 PS											
Nitrogen, Nitrate/Nitrite	1.00		0.324	1.34	mg/L		102	(90%-110%)		08/05/13	13:05
Batch	1319983										
QC1202921248 329546002 DUP											
Nitrogen, Ammonia			0.0986	0.113	mg/L	13.6 ^		(+/-0.050)	KLP1	08/06/13	13:35
QC1202921249 330736001 DUP											
Nitrogen, Ammonia			0.663	0.642	mg/L	3.22		(0%-20%)		08/06/13	14:43
QC1202921252 LCS											
Nitrogen, Ammonia	1.00			1.01	mg/L		101	(90%-110%)		08/06/13	13:33
QC1202921247 MB											

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QC Summary

Workorder: 329546

Page 4 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Nutrient Analysis											
Batch	1319983										
Nitrogen, Ammonia			J	0.0441	mg/L				KLP1	08/06/13	13:33
QC1202921250 329546002 MS											
Nitrogen, Ammonia	1.00	0.0986		1.18	mg/L		108	(90%-110%)		08/06/13	13:36
QC1202921251 330736001 MS											
Nitrogen, Ammonia	1.00	0.663		1.62	mg/L		95.7	(90%-110%)		08/06/13	14:44
Solids Analysis											
Batch	1315616										
QC1202910656 329545002 DUP											
Total Dissolved Solids		117		120	mg/L	2.41		(0%-10%)	LYG1	07/17/13	13:43
QC1202910658 LCS											
Total Dissolved Solids	300			289	mg/L		96.2	(95%-105%)		07/17/13	13:43
QC1202910655 MB											
Total Dissolved Solids			U	ND	mg/L					07/17/13	13:43
Titration Analysis											
Batch	1315566										
QC1202910531 329546002 DUP											
Alkalinity, Total as CaCO3		68.6		68.1	mg/L	0.760		(0%-20%)	LXA1	07/17/13	17:30
Carbonate alkalinity (CaCO3)	U	ND	U	ND	mg/L	N/A					
QC1202910526 LCS											
Alkalinity, Total as CaCO3	50.0			51.0	mg/L		102	(90%-110%)		07/17/13	13:59
QC1202910532 329546002 MS											
Alkalinity, Total as CaCO3	50.0	68.6		119	mg/L		101	(80%-120%)		07/17/13	17:32

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

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QC Summary

Workorder: 329546

Page 5 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.										
R	Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes.										
R	Sample results are rejected										
U	Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Z	Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.										
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
d	5-day BOD--The 2:1 depletion requirement was not met for this sample										
e	5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes										
h	Preparation or preservation holding time was exceeded										

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Miscellaneous

DATA EXCEPTION REPORT			
Mo.Day Yr. 18-JUL-13	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ELECTRODE	Test / Method: See Below	Matrix Type: Liquid	Client Code: CARE, ESHL, GELC, NFSR,
Batch ID: 1315750	Sample Numbers: See below.		
<p>Potentially affected work order(s)(SDG): 329157(CAH-13-070),329245(WS-204),329456,329540(2013-1126),329543,329545(2013-1128),329546(2013-1129),329576,329638,329639,329653(2013-1150),329655(2013-1151),329704(EUI-9324)</p> <p>Application Issues:</p> <p>Sample received out of holding Sample Logged out of Holding</p>			
Specification and Requirements Exception Description:		DER Disposition:	
<p>Test/Methods: EPA 150.1, SM 4500-H B, SW846 9040B/9040C, SW846 9040C</p> <p>1. Sample received out of holding:</p> <p>329157 002</p> <p>329456 001,002</p> <p>329540 006</p> <p>329543 002</p> <p>329545 002</p> <p>329546 002</p> <p>329576 004,007,010</p> <p>329638 001,002</p> <p>329639 002,007,011,016</p> <p>329653 002</p> <p>329655 001</p> <p>329704 001</p>		<p>1. Samples were received out of holding.</p>	

Originator's Name:

Lisa Gregory 18-JUL-13

Data Validator/Group Leader:

Julia Hamilton 23-JUL-13

DATA EXCEPTION REPORT

Mo.Day Yr. 06-AUG-13	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: LACHAT Flow Injection Analyzer	Test / Method: EPA 351.2	Matrix Type: Liquid	Client Code: ESHL
Batch ID: 1315708	Sample Numbers: See below.		
<p>Potentially affected work order(s)(SDG): 329377(2013-1101),329545(2013-1128),329546(2013-1129),329653(2013-1150),329718(2013-1172),329767(2013-1181),329854(2013-1217),329862(2013-1223),329865(2013-1224),329903,329960(2013-1238),330006(2013-1260),330074,330087(2013-1292),330089(2013-1293),330090(2013-1294),330453(2013-1370)</p> <p>Application Issues:</p> <p>Failed Recovery for MS/PS</p>			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Failed Recovery for MS:</p> <p>QC 1202910857MS</p>		<p>1. The spike recovery falls outside of the established acceptance limits due to matrix interference.</p>	

Originator's Name:

Kristen Parson 06-AUG-13

Data Validator/Group Leader:

Julia Hamilton 06-AUG-13