

**SAF-RC-232**  
**100-IU-2 & 100-IU-6 Remaining**  
**Waste Sites – Soil Full Protocol**  
**FINAL DATA PACKAGE**

**COMPLETE COPY OF DATA PACKAGE TO:**

Kathy Wendt

H4-21

KW 9/25/13  
INITIAL/DATE

**COMMENTS:**

**SDG X0011**

**SAF-RC-232**

Rad only

Chem only

Rad & Chem

Complete

Partial

**REVISED TO INCLUDE METALS BY ICP-MS**

**Sample Location: 100-D-105 – Confirmatory Test Pits**  
**Underlying Soils**



August 12, 2013

Joan Kessner  
WC-Hanford, Inc.  
2620 Fermi Avenue  
MSIN H4-21  
Richland, Washington 99354

Re: RC-232 Soil  
Work Order: 330317  
SDG: X0011

Dear Joan Kessner:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on July 26, 2013. 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. 1616.

Sincerely,

Orlette Johnson  
Project Manager

Purchase Order: 1510  
Chain of Custody: RC-232-039  
Enclosures



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# Case Narrative

**Receipt Narrative  
for  
WC-HANFORD, INC.  
SDG: X0011  
Work Order: 330317**

**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 26, 2013 for analysis.

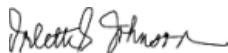
**Sample Identification:** The laboratory received the following samples:

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
330317001	J1RV16
330317002	J1RV17
330317003	J1RV18
330317004	J1RV19
330317005	J1RV20
330317006	J1RV21

**Case Narrative:**

Sample analyses were conducted using methodology as outlined in GEL's 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.

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 and Metals.



Orlette Johnson  
Project Manager

# **Chain of Custody and Supporting Documentation**

Washington Closure Hanford  
 Collector: **W.F. Jackson**  
 Project Designation: 100-IU-2 & 100-IU-6 Remaining Waste Sites  
 Ice Chest No.: **WCH-12-020**

Company Contact: **Joan Kessner**  
 Telephone No.: 375-4688  
 Sampling Location: 100-D-105 - Confirmatory Test Pits Underlying Soils  
 Field Logbook No.: **EL-1667**

Project Coordinator: **KESSNER, JH**  
 SAF No.: **RC-232**  
 Method of Shipment: **led EX**

Price Code: **8C**  
 RC-232-039  
 Data Turnaround: **15 Days**

Bill of Lading/Air Bill No.: **Sec 05PC**

Offsite Property No.: **A120894**

Shipped To: **Eberline - GEL**

POSSIBLE SAMPLE HAZARDS/REMARKS  
 None  
 Special Handling and/or Storage: **3303171.**

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Freeze
J1RV16	SOIL	7-24-13	1315		GIP	GIP	aG	aG	aG	aG	
J1RV17	SOIL	7-24-13	1315		GIP	GIP	aG	aG	aG	aG	
J1RV18	SOIL	7-24-13	1208		GIP	GIP	aG	aG	aG	aG	
J1RV19	SOIL	7-24-13	1408		GIP	GIP	aG	aG	aG	aG	
J1RV20	SOIL	7-24-13	1355		GIP	GIP	aG	aG	aG	aG	

**SPECIAL INSTRUCTIONS**  
 (1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)  
 (2) IC Anions - 9056 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Nitrogen in Nitrate, Phosphate, Sulfate); NO2/NO3 - 353.1 (Nitrogen in Nitrite and Nitrate); pH (Soil) - 9045 (pH Measurement)

\* Re-added analysis. Any questions, please contact Joan Kessner. 7-25-13 CMB

**CHAIN OF POSSESSION**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MAF Sp. W. (B) Jackson	7-24-13 1435	MA Bamberger	7-24-13
MA Bamberger	7-24-13 1505	R. Fehlbauer	7-24-13
R. Fehlbauer	7-24-13 1605	MA Bamberger	7-24-13
MA Bamberger	7-25-13 1100	MA Bamberger	7-25-13
MA Bamberger	7-25-13 1105	MA Bamberger	7-25-13

**FINAL SAMPLE DISPOSITION**

Received By/Stored In	Date/Time	Disposal Method
MA Bamberger	7-24-13 1435	
R. Fehlbauer	7-24-13 1505	
MA Bamberger	7-24-13 1605	
MA Bamberger	7-25-13 1100	
MA Bamberger	7-25-13 1105	

**REVIEWED BY**  
 JH  
**DATE**  
 7-25-13





SAMPLE RECEIPT & REVIEW FORM

Client: <u>WJHN</u>		SDG/AR/COC/Work Order: <u>X0011 330317</u>	
Received By: <u>JP</u>		Date Received: <u>7-20-13</u>	
Suspected Hazard Information		Yes	No
COC/Samples marked as radioactive?			
Classified Radioactive II or III by RSO?			
COC/Samples marked containing PCBs?			
Package, COC, and/or Samples marked as beryllium or asbestos containing?			
Shipped as a DOT Hazardous?			
Samples identified as Foreign Soil?			

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: <u>41502209</u> Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's, containers affected and observed pH: <del>IF Preservation added, Lot#:</del>
6	VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
7	Are Encore containers present?	<input checked="" type="checkbox"/>			(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>			
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
14	Carrier and tracking number.				Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other  <u>7963 2052 3700</u> <u>" 1692 5755</u>

Comments (Use Continuation Form if needed):

# **Laboratory Certifications**

**List of current GEL Certifications as of 12 August 2013**

<b>State</b>	<b>Certification</b>
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

# **Metals Analysis**

# Case Narrative

**Metals Fractional Narrative  
WC-HANFORD, INC. (WCHN)  
SDG X0011**

**Sample Analysis**

<b>Sample ID</b>	<b>Client ID</b>
330317001	J1RV16
330317002	J1RV17
330317003	J1RV18
330317004	J1RV19
330317005	J1RV20
330317006	J1RV21
1202919069	Method Blank (MB) <b>ICP</b>
1202919070	Laboratory Control Sample (LCS)
1202919073	330317001(J1RV16L) Serial Dilution (SD)
1202919071	330317001(J1RV16D) Sample Duplicate (DUP)
1202919072	330317001(J1RV16S) Matrix Spike (MS)
1202919681	Method Blank (MB) <b>CVAA</b>
1202919682	Laboratory Control Sample (LCS)
1202919688	330317001(J1RV16L) Serial Dilution (SD)
1202919686	330317001(J1RV16D) Sample Duplicate (DUP)
1202919687	330317001(J1RV16S) Matrix Spike (MS)

The samples in this SDG were analyzed on a "dry weight" basis.

**Method/Analysis Information**

<b>Analytical Batch:</b>	1319032 and 1319303
<b>Prep Batch :</b>	1319031 and 1319295
<b>Standard Operating Procedures:</b>	GL-MA-E-013 REV# 22, GL-MA-E-009 REV# 22 and GL-MA-E-010 REV# 26
<b>Analytical Method:</b>	SW846 3050B/6010C and SW846 7471B
<b>Prep Method :</b>	SW846 3050B and SW846 7471B 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 Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

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

The Metals analysis-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 standards met the advisory control limits with the exception of potassium and iron. PQL01 (analyzed at 14:05 on 08/07/13) recovered high for potassium while PQL04 (analyzed at 20:17 on 08/07/13) and PQL05 (analyzed at 20:44 on 08/07/13) recovered low for potassium; however, the sample results were 2x greater than the PQL, therefore the data is reported. PQL06 (analyzed at 21:07 on 08/07/13) recovered high for iron; however, the sample results were 2x greater than the PQL, therefore the data is reported.

#### **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: 330317001 (J1RV16).

**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 relative percent difference (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 contract required detection limit (RL), a control of +/-RL is used to evaluate the DUP results. All applicable analytes met these requirements with the exception of nickel and silicon.

**Post Spike (PS) Recovery Statement**

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

**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) with the exception of copper.

## **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. Method SW-846 3050B is not a total digestion technique for most samples. It is a very strong acid digestion that will dissolve almost all elements that could become environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

### **Sample Dilutions**

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instruments. Samples 330317001, 330317002, 330317004, 330317005, and 330317006 required dilutions for selenium in order to minimize suppression due to matrix interferences. Samples 330317001, 330317002, 330317004, 330317005, and 330317006 required dilutions required dilutions in order to bring raw values of titanium within the linear range of the instrument, and for the analytes antimony, cobalt, vanadium, and zinc that titanium interferes with, in order to ensure that the inter-element correction factors were valid on the ICP.

### **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 REPORT**

<b>Mo.Day Yr.</b> 12-AUG-13	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> ICP	<b>Test / Method:</b> SW846 3050B/6010C	<b>Matrix Type:</b> Solid	<b>Client Code:</b> WCHN
<b>Batch ID:</b> 1319032	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 330317(X0011)</b>			
<b>Application Issues:</b> Failed RPD for DUP			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
<p>1. Failed RPD for DUP: QC 1202919071DUP</p>		<p>1. The sample and sample duplicate % RPD failed outside the control limits for nickel and silicon due to possible sample non-homogeneity and/or matrix interference. Per GEL's accredited methods and SOPs, a corrective action is not required and the data is qualified and reported.</p>	

**Originator's Name:**  
Helen Camello 12-AUG-13

**Data Validator/Group Leader:**  
Jerry Wigfall 12-AUG-13

# **Sample Data Summary**

# GEL LABORATORIES LLC

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

## Qualifier Definition Report for

WCHN001 WC-HANFORD, INC.

Client SDG: X0011 GEL Work Order: 330317 Project: RC-232 Soil

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

- \* Duplicate analysis not within control limits
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

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, Orlette Johnson.

Reviewed by



08/12/13

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: August 12, 2013

Company : WC-Hanford, Inc.  
 Address : 2620 Fermi Avenue  
 MSIN H4-21  
 Richland, Washington 99354  
 Contact: Joan Kessner  
 Project: RC-232 Soil

Client SDG: X0011

Client Sample ID: J1RV16  
 Sample ID: 330317001  
 Matrix: SOIL  
 Collect Date: 24-JUL-13 13:15  
 Receive Date: 26-JUL-13  
 Collector: Client  
 Moisture: 5.73%

Project: WCHN00213  
 Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Mercury Analysis-CVAA</b>											
<b>SW846 7471B Mercury in Solid "Dry Weight Corrected"</b>											
Mercury	U	4.18	4.18	12.5	ug/kg	1	NOR1	08/02/13	1308	1319303	1
<b>Metals Analysis-ICP</b>											
<b>ICP METALS 6010TR Close-out List "Dry Weight Corrected"</b>											
Aluminum		5160000	6950	20400	ug/kg	1	HSC	08/07/13	2030	1319032	2
Arsenic	B	1380	511	3070	ug/kg	1					
Barium		60300	102	511	ug/kg	1					
Beryllium		922	102	511	ug/kg	1					
Boron	B	1550	1020	5110	ug/kg	1					
Cadmium		561	102	511	ug/kg	1					
Calcium		6770000	8180	25500	ug/kg	1					
Chromium		8460	153	511	ug/kg	1					
Copper	M	17100	307	1020	ug/kg	1					
Iron		26300000	8180	25500	ug/kg	1					
Magnesium		5250000	8690	30700	ug/kg	1					
Manganese		333000	204	1020	ug/kg	1					
Molybdenum	U	204	204	1020	ug/kg	1					
Nickel	*	15700	153	511	ug/kg	1					
Potassium		867000	6540	25500	ug/kg	1					
Silicon	*	456000	1530	10200	ug/kg	1					
Silver	U	102	102	511	ug/kg	1					
Antimony	BD	3780	1690	5110	ug/kg	5	HSC	08/09/13	1113	1319032	3
Cobalt	D	10800	766	2550	ug/kg	5					
Vanadium	D	79000	511	2550	ug/kg	5					
Zinc	D	61700	2040	5110	ug/kg	5					
Lead		3650	337	1020	ug/kg	1	JWJ	08/09/13	1457	1319032	4
Sodium		217000	7150	25500	ug/kg	1					
Selenium	DU	2550	2550	15300	ug/kg	5	JWJ	08/09/13	1614	1319032	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	08/06/13	0800	1319031
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	08/01/13	1632	1319295

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: August 12, 2013

Company : WC-Hanford, Inc.  
Address : 2620 Fermi Avenue  
MSIN H4-21  
Richland, Washington 99354  
Contact: Joan Kessner  
Project: RC-232 Soil

Client SDG: X0011

Client Sample ID: J1RV16  
Sample ID: 330317001

Project: WCHN00213  
Client ID: WCHN001

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The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	
5	SW846 3050B/6010C	

**Notes:**

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: August 12, 2013

Company : WC-Hanford, Inc.  
 Address : 2620 Fermi Avenue  
 MSIN H4-21  
 Richland, Washington 99354  
 Contact: Joan Kessner  
 Project: RC-232 Soil

Client SDG: X0011

Client Sample ID: J1RV17	Project: WCHN00213
Sample ID: 330317002	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 24-JUL-13 13:15	
Receive Date: 26-JUL-13	
Collector: Client	
Moisture: 5.78%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Mercury Analysis-CVAA</b>											
<b>SW846 7471B Mercury in Solid "Dry Weight Corrected"</b>											
Mercury	U	4.11	4.11	12.3	ug/kg	1	NOR1	08/02/13	1315	1319303	1
<b>Metals Analysis-ICP</b>											
<b>ICP METALS 6010TR Close-out List "Dry Weight Corrected"</b>											
Aluminum		5350000	7090	20900	ug/kg	1	HSC	08/07/13	2050	1319032	2
Arsenic	B	584	521	3130	ug/kg	1					
Barium		57200	104	521	ug/kg	1					
Beryllium		899	104	521	ug/kg	1					
Boron	B	1160	1040	5210	ug/kg	1					
Cadmium	B	290	104	521	ug/kg	1					
Calcium		7270000	8340	26100	ug/kg	1					
Chromium		7720	156	521	ug/kg	1					
Copper	M	17000	313	1040	ug/kg	1					
Iron		25500000	8340	26100	ug/kg	1					
Magnesium		4370000	8860	31300	ug/kg	1					
Manganese		327000	209	1040	ug/kg	1					
Molybdenum	U	209	209	1040	ug/kg	1					
Nickel	*	8660	156	521	ug/kg	1					
Potassium		862000	6670	26100	ug/kg	1					
Silicon	*	620000	1560	10400	ug/kg	1					
Silver	B	371	104	521	ug/kg	1					
Antimony	BD	3030	1720	5210	ug/kg	5	HSC	08/09/13	1138	1319032	3
Cobalt	D	9460	782	2610	ug/kg	5					
Vanadium	D	75400	521	2610	ug/kg	5					
Zinc	D	64800	2090	5210	ug/kg	5					
Lead		3530	344	1040	ug/kg	1	JWJ	08/09/13	1517	1319032	4
Sodium		216000	7300	26100	ug/kg	1					
Selenium	DU	2610	2610	15600	ug/kg	5	JWJ	08/09/13	1636	1319032	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	08/06/13	0800	1319031
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	08/01/13	1632	1319295

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: August 12, 2013

Company : WC-Hanford, Inc.  
Address : 2620 Fermi Avenue  
MSIN H4-21  
Richland, Washington 99354  
Contact: Joan Kessner  
Project: RC-232 Soil

Client SDG: X0011

Client Sample ID: J1RV17  
Sample ID: 330317002

Project: WCHN00213  
Client ID: WCHN001

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The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	
5	SW846 3050B/6010C	

Notes:

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: August 12, 2013

Company : WC-Hanford, Inc.  
Address : 2620 Fermi Avenue  
MSIN H4-21  
Richland, Washington 99354  
Contact: Joan Kessner  
Project: RC-232 Soil

Client SDG: X0011

Client Sample ID: J1RV18  
Sample ID: 330317003  
Matrix: SOIL  
Collect Date: 24-JUL-13 12:08  
Receive Date: 26-JUL-13  
Collector: Client  
Moisture: <0.1%

Project: WCHN00213  
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
SW846 7471B Mercury in Solid "Dry Weight Corrected"											
Mercury	U	3.84	3.84	11.5	ug/kg	1	NOR1	08/02/13	1316	1319303	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Aluminum		139000	6790	20000	ug/kg	1	HSC	08/07/13	2053	1319032	2
Arsenic	B	511	499	2990	ug/kg	1					
Barium		2180	99.8	499	ug/kg	1					
Beryllium	B	112	99.8	499	ug/kg	1					
Boron	U	998	998	4990	ug/kg	1					
Cadmium	U	99.8	99.8	499	ug/kg	1					
Calcium		37800	7980	25000	ug/kg	1					
Chromium	B	180	150	499	ug/kg	1					
Copper	MU	299	299	998	ug/kg	1					
Iron		3010000	7980	25000	ug/kg	1					
Magnesium	B	15400	8480	29900	ug/kg	1					
Manganese		58600	200	998	ug/kg	1					
Molybdenum	U	200	200	998	ug/kg	1					
Nickel	*B	224	150	499	ug/kg	1					
Potassium		34100	6390	25000	ug/kg	1					
Silicon	*	159000	1500	9980	ug/kg	1					
Silver	B	122	99.8	499	ug/kg	1					
Antimony	U	329	329	998	ug/kg	1	HSC	08/09/13	1141	1319032	3
Cobalt	U	150	150	499	ug/kg	1					
Vanadium	B	412	99.8	499	ug/kg	1					
Zinc		3310	399	998	ug/kg	1					
Lead	B	656	329	998	ug/kg	1	JWJ	08/09/13	1520	1319032	4
Selenium	U	499	499	2990	ug/kg	1					
Sodium	U	6990	6990	25000	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	08/06/13	0800	1319031
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	08/01/13	1632	1319295

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## Certificate of Analysis

Report Date: August 12, 2013

Company : WC-Hanford, Inc.  
Address : 2620 Fermi Avenue  
MSIN H4-21  
Richland, Washington 99354  
Contact: Joan Kessner  
Project: RC-232 Soil

Client SDG: X0011

Client Sample ID: J1RV18  
Sample ID: 330317003

Project: WCHN00213  
Client ID: WCHN001

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The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	

Notes:

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## Certificate of Analysis

Report Date: August 12, 2013

Company : WC-Hanford, Inc.  
 Address : 2620 Fermi Avenue  
 MSIN H4-21  
 Richland, Washington 99354  
 Contact: Joan Kessner  
 Project: RC-232 Soil

Client SDG: X0011

Client Sample ID: J1RV19	Project: WCHN00213
Sample ID: 330317004	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 24-JUL-13 14:08	
Receive Date: 26-JUL-13	
Collector: Client	
Moisture: 4.27%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Mercury Analysis-CVAA</b>											
<b>SW846 7471B Mercury in Solid "Dry Weight Corrected"</b>											
Mercury	U	4.18	4.18	12.5	ug/kg	1	NOR1	08/02/13	1318	1319303	1
<b>Metals Analysis-ICP</b>											
<b>ICP METALS 6010TR Close-out List "Dry Weight Corrected"</b>											
Aluminum		3790000	6800	20000	ug/kg	1	HSC	08/07/13	2056	1319032	2
Arsenic	U	500	500	3000	ug/kg	1					
Barium		55700	100	500	ug/kg	1					
Beryllium		1160	100	500	ug/kg	1					
Boron	B	1030	1000	5000	ug/kg	1					
Cadmium		563	100	500	ug/kg	1					
Calcium		6790000	8000	25000	ug/kg	1					
Chromium		4740	150	500	ug/kg	1					
Copper	M	16300	300	1000	ug/kg	1					
Iron		31700000	8000	25000	ug/kg	1					
Magnesium		4710000	8510	30000	ug/kg	1					
Manganese		352000	200	1000	ug/kg	1					
Molybdenum	U	200	200	1000	ug/kg	1					
Nickel	*	7780	150	500	ug/kg	1					
Potassium		515000	6400	25000	ug/kg	1					
Silicon	*	405000	1500	10000	ug/kg	1					
Silver	B	345	100	500	ug/kg	1					
Antimony	BD	3440	1650	5000	ug/kg	5	HSC	08/09/13	1144	1319032	3
Cobalt	D	12300	750	2500	ug/kg	5					
Vanadium	D	106000	500	2500	ug/kg	5					
Zinc	D	77000	2000	5000	ug/kg	5					
Lead		2340	330	1000	ug/kg	1	JWJ	08/09/13	1522	1319032	4
Sodium		288000	7000	25000	ug/kg	1					
Selenium	DU	2500	2500	15000	ug/kg	5	JWJ	08/09/13	1639	1319032	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	08/06/13	0800	1319031
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	08/01/13	1632	1319295

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## Certificate of Analysis

Report Date: August 12, 2013

Company : WC-Hanford, Inc.  
Address : 2620 Fermi Avenue  
MSIN H4-21  
Richland, Washington 99354  
Contact: Joan Kessner  
Project: RC-232 Soil

Client SDG: X0011

Client Sample ID: J1RV19  
Sample ID: 330317004

Project: WCHN00213  
Client ID: WCHN001

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The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	
5	SW846 3050B/6010C	

Notes:



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## Certificate of Analysis

Report Date: August 12, 2013

Company : WC-Hanford, Inc.  
Address : 2620 Fermi Avenue  
MSIN H4-21  
Richland, Washington 99354  
Contact: Joan Kessner  
Project: RC-232 Soil

Client SDG: X0011

Client Sample ID: J1RV20  
Sample ID: 330317005

Project: WCHN00213  
Client ID: WCHN001

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The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	
5	SW846 3050B/6010C	

Notes:

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## Certificate of Analysis

Report Date: August 12, 2013

Company : WC-Hanford, Inc.  
 Address : 2620 Fermi Avenue  
 MSIN H4-21  
 Richland, Washington 99354  
 Contact: Joan Kessner  
 Project: RC-232 Soil

Client SDG: X0011

Client Sample ID: J1RV21  
 Sample ID: 330317006  
 Matrix: SOIL  
 Collect Date: 24-JUL-13 14:25  
 Receive Date: 26-JUL-13  
 Collector: Client  
 Moisture: 9.73%

Project: WCHN00213  
 Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Mercury Analysis-CVAA</b>											
<b>SW846 7471B Mercury in Solid "Dry Weight Corrected"</b>											
Mercury	B	4.17	4.17	12.4	ug/kg	1	NOR1	08/02/13	1321	1319303	1
<b>Metals Analysis-ICP</b>											
<b>ICP METALS 6010TR Close-out List "Dry Weight Corrected"</b>											
Aluminum		5360000	7300	21500	ug/kg	1	HSC	08/07/13	2101	1319032	2
Arsenic	B	1700	537	3220	ug/kg	1					
Barium		67100	107	537	ug/kg	1					
Beryllium		824	107	537	ug/kg	1					
Boron	U	1070	1070	5370	ug/kg	1					
Cadmium	B	283	107	537	ug/kg	1					
Calcium		6410000	8590	26800	ug/kg	1					
Chromium		9040	161	537	ug/kg	1					
Copper	M	16700	322	1070	ug/kg	1					
Iron		24900000	8590	26800	ug/kg	1					
Magnesium		4610000	9120	32200	ug/kg	1					
Manganese		334000	215	1070	ug/kg	1					
Molybdenum	U	215	215	1070	ug/kg	1					
Nickel	*	10000	161	537	ug/kg	1					
Potassium		1010000	6870	26800	ug/kg	1					
Silicon	*	690000	1610	10700	ug/kg	1					
Silver	B	246	107	537	ug/kg	1					
Antimony	BD	1890	1770	5370	ug/kg	5	HSC	08/09/13	1151	1319032	3
Cobalt	D	9140	805	2680	ug/kg	5					
Vanadium	D	67300	537	2680	ug/kg	5					
Zinc	D	128000	2150	5370	ug/kg	5					
Lead		3960	354	1070	ug/kg	1	JWJ	08/09/13	1527	1319032	4
Sodium		212000	7510	26800	ug/kg	1					
Selenium	DU	2680	2680	16100	ug/kg	5	JWJ	08/09/13	1645	1319032	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	08/06/13	0800	1319031
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	08/01/13	1632	1319295

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: August 12, 2013

Company : WC-Hanford, Inc.  
Address : 2620 Fermi Avenue  
MSIN H4-21  
Richland, Washington 99354  
Contact: Joan Kessner  
Project: RC-232 Soil

Client SDG: X0011

Client Sample ID: J1RV21  
Sample ID: 330317006

Project: WCHN00213  
Client ID: WCHN001

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The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	
5	SW846 3050B/6010C	

**Notes:**

# **Quality Control Summary**

# GEL LABORATORIES LLC

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

## QC Summary

Report Date: August 12, 2013

Page 1 of 7

**WC-Hanford, Inc.**  
**2620 Fermi Avenue**  
**MSIN H4-21**  
**Richland, Washington**  
**Contact: Joan Kessner**

**Workorder: 330317**

**Client SDG: X0011**

**Project Description: RC-232 Soil**

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1319032										
QC1202919071	330317001 DUP										
Aluminum		5160000		5360000	ug/kg	3.83		(0%-20%)	HSC	08/07/13	20:32
Antimony	BD	3780	BD	4390	ug/kg	14.8	^	(+/-5190)		08/09/13	11:16
Arsenic	B	1380	B	1930	ug/kg	33.3	^	(+/-3110)		08/07/13	20:32
Barium		60300		61200	ug/kg	1.52		(0%-20%)			
Beryllium		922		930	ug/kg	0.847	^	(+/-519)			
Boron	B	1550	B	1200	ug/kg	25.4	^	(+/-5190)			
Cadmium		561	B	364	ug/kg	42.5	^	(+/-519)			
Calcium		6770000		6540000	ug/kg	3.56		(0%-20%)			
Chromium		8460		7930	ug/kg	6.42		(0%-20%)			
Cobalt	D	10800	D	10400	ug/kg	3.87	^	(+/-2590)		08/09/13	11:16
Copper	M	17100		17500	ug/kg	2.07		(0%-20%)		08/07/13	20:32
Iron		26300000		26200000	ug/kg	0.431		(0%-20%)			
Lead		3650		3560	ug/kg	2.57	^	(+/-1040)	JWJ	08/09/13	14:59
Magnesium		5250000		4670000	ug/kg	11.8		(0%-20%)	HSC	08/07/13	20:32
Manganese		333000		325000	ug/kg	2.48		(0%-20%)			
Molybdenum	U	204	U	208	ug/kg	N/A	^				
Nickel	*	15700	*	9460	ug/kg	49.5*		(0%-20%)			
Potassium		867000		861000	ug/kg	0.746		(0%-20%)			
Selenium	DU	2550	DU	2590	ug/kg	N/A	^		JWJ	08/09/13	16:17
Silicon	*	456000	*	577000	ug/kg	23.5*		(0%-20%)	HSC	08/07/13	20:32

# GEL LABORATORIES LLC

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## QC Summary

Workorder: 330317

Client SDG: X0011

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1319032										
Silver		U	102 B	226	ug/kg	361	^	(+/-519)	HSC	08/07/13	20:32
Sodium			217000	215000	ug/kg	0.656		(0%-20%)	JWJ	08/09/13	14:59
Vanadium		D	79000 D	78300	ug/kg	0.927		(0%-20%)	HSC	08/09/13	11:16
Zinc		D	61700 D	59600	ug/kg	3.50		(0%-20%)			
QC1202919070	LCS										
Aluminum	468000			464000	ug/kg		99	(80%-120%)		08/07/13	20:26
Antimony	46800			47400	ug/kg		101	(80%-120%)		08/09/13	11:10
Arsenic	46800			48300	ug/kg		103	(80%-120%)		08/07/13	20:26
Barium	46800			47000	ug/kg		100	(80%-120%)			
Beryllium	46800			48300	ug/kg		103	(80%-120%)			
Boron	46800			46500	ug/kg		99.4	(80%-120%)			
Cadmium	46800			48600	ug/kg		104	(80%-120%)			
Calcium	468000			485000	ug/kg		104	(80%-120%)			
Chromium	46800			46600	ug/kg		99.6	(80%-120%)			
Cobalt	46800			45400	ug/kg		97	(80%-120%)		08/09/13	11:10
Copper	46800			48700	ug/kg		104	(80%-120%)		08/07/13	20:26
Iron	468000			490000	ug/kg		105	(80%-120%)			
Lead	46800			49800	ug/kg		106	(80%-120%)	JWJ	08/09/13	14:54
Magnesium	468000			493000	ug/kg		105	(80%-120%)	HSC	08/07/13	20:26
Manganese	46800			47800	ug/kg		102	(80%-120%)			
Molybdenum	46800			47500	ug/kg		101	(80%-120%)			
Nickel	46800			47300	ug/kg		101	(80%-120%)			

# GEL LABORATORIES LLC

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## QC Summary

Workorder: 330317

Client SDG: X0011

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1319032										
Potassium	468000			462000	ug/kg		98.6	(80%-120%)	HSC	08/07/13	20:26
Selenium	46800			52300	ug/kg		112	(80%-120%)	JWJ	08/09/13	14:54
Silicon	468000			418000	ug/kg		89.4	(80%-120%)	HSC	08/07/13	20:26
Silver	46800			47400	ug/kg		101	(80%-120%)			
Sodium	468000			475000	ug/kg		101	(80%-120%)	JWJ	08/09/13	14:54
Vanadium	46800			47300	ug/kg		101	(80%-120%)	HSC	08/09/13	11:10
Zinc	46800			47400	ug/kg		101	(80%-120%)			
QC1202919069	MB										
Aluminum			U	6500	ug/kg					08/07/13	20:23
Antimony			U	315	ug/kg					08/09/13	11:07
Arsenic			U	478	ug/kg					08/07/13	20:23
Barium			U	95.6	ug/kg						
Beryllium			U	95.6	ug/kg						
Boron			U	956	ug/kg						
Cadmium			U	95.6	ug/kg						
Calcium			U	7650	ug/kg						
Chromium			U	143	ug/kg						
Cobalt			U	143	ug/kg					08/09/13	11:07
Copper			U	287	ug/kg					08/07/13	20:23
Iron			U	7650	ug/kg						
Lead			U	315	ug/kg				JWJ	08/09/13	14:51
Magnesium			U	8130	ug/kg				HSC	08/07/13	20:23

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## QC Summary

Workorder: 330317

Client SDG: X0011

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1319032										
Manganese			U	191	ug/kg				HSC	08/07/13	20:23
Molybdenum			U	191	ug/kg						
Nickel			U	143	ug/kg						
Potassium			U	6120	ug/kg						
Selenium			U	478	ug/kg				JWJ	08/09/13	14:51
Silicon			U	1430	ug/kg				HSC	08/07/13	20:23
Silver			U	95.6	ug/kg						
Sodium			U	6690	ug/kg				JWJ	08/09/13	14:51
Vanadium			U	95.6	ug/kg				HSC	08/09/13	11:07
Zinc			U	382	ug/kg						
QC1202919072 330317001 MS											
Aluminum	515000	5160000		6780000	ug/kg		N/A	(75%-125%)		08/07/13	20:35
Antimony	51500	BD 3780	D	50900	ug/kg		91.5	(75%-125%)		08/09/13	11:19
Arsenic	51500	B 1380		50500	ug/kg		95.4	(75%-125%)		08/07/13	20:35
Barium	51500	60300		110000	ug/kg		97.4	(75%-125%)			
Beryllium	51500	922		51800	ug/kg		98.8	(75%-125%)			
Boron	51500	B 1550		50400	ug/kg		94.9	(75%-125%)			
Cadmium	51500	561		49500	ug/kg		95.1	(75%-125%)			
Calcium	515000	6770000		7200000	ug/kg		N/A	(75%-125%)			
Chromium	51500	8460		56500	ug/kg		93.3	(75%-125%)			
Cobalt	51500	D 10800	D	60600	ug/kg		96.7	(75%-125%)		08/09/13	11:19
Copper	51500	M 17100		72700	ug/kg		108	(75%-125%)		08/07/13	20:35

# GEL LABORATORIES LLC

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## QC Summary

Workorder: 330317

Client SDG: X0011

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1319032										
Iron	515000	26300000		27600000	ug/kg		N/A	(75%-125%)	HSC	08/07/13	20:35
Lead	51500	3650		54500	ug/kg		98.8	(75%-125%)	JWJ	08/09/13	15:02
Magnesium	515000	5250000		5470000	ug/kg		N/A	(75%-125%)	HSC	08/07/13	20:35
Manganese	51500	333000		388000	ug/kg		N/A	(75%-125%)			
Molybdenum	51500	U	204	48700	ug/kg		94.5	(75%-125%)			
Nickel	51500	*	15700	59300	ug/kg		84.8	(75%-125%)			
Potassium	515000		867000	1460000	ug/kg		116	(75%-125%)			
Selenium	51500	DU	2550	D	42300	ug/kg	82.1	(75%-125%)	JWJ	08/09/13	16:20
Silicon	515000	*	456000		932000	ug/kg	92.4	(75%-125%)	HSC	08/07/13	20:35
Silver	51500	U	102		51800	ug/kg	100	(75%-125%)			
Sodium	515000		217000		845000	ug/kg	122	(75%-125%)	JWJ	08/09/13	15:02
Vanadium	51500	D	79000	D	135000	ug/kg	108	(75%-125%)	HSC	08/09/13	11:19
Zinc	51500	D	61700	D	116000	ug/kg	105	(75%-125%)			
QC1202919073 330317001 SDILT											
Aluminum			50500	D	10200	ug/L	.976	(0%-10%)		08/07/13	20:37
Antimony		BD	7.40	D	4.10	ug/L	177	(0%-10%)		08/09/13	11:22
Arsenic		B	13.5	DU	2550	ug/L	N/A	(0%-10%)		08/07/13	20:37
Barium			590	D	112	ug/L	5.48	(0%-10%)			
Beryllium			9.02	D	2.03	ug/L	12.2	(0%-10%)			
Boron		B	15.2	DU	5110	ug/L	N/A	(0%-10%)			
Cadmium			5.49	DU	511	ug/L	N/A	(0%-10%)			
Calcium			66300	D	13100	ug/L	.83	(0%-10%)			

# GEL LABORATORIES LLC

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## QC Summary

Workorder: 330317

Client SDG: X0011

Project Description: RC-232 Soil

Page 6 of 7

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-ICP</b>											
Batch	1319032										
Chromium		82.8	D	16.4	ug/L	.732		(0%-10%)	HSC	08/07/13	20:37
Cobalt	D	21.1	D	3.89	ug/L	7.93		(0%-10%)		08/09/13	11:22
Copper	M	167	DM	27.5	ug/L	17.8*		(0%-10%)		08/07/13	20:37
Iron		258000	D	51400	ug/L	.252		(0%-10%)			
Lead		35.7	D	6.22	ug/L	12.8		(0%-10%)	JWJ	08/09/13	15:06
Magnesium		51400	D	10200	ug/L	.294		(0%-10%)	HSC	08/07/13	20:37
Manganese		3260	D	653	ug/L	.203		(0%-10%)			
Molybdenum	U	-1.69	DU	1020	ug/L	N/A		(0%-10%)			
Nickel	*	154	D	29.9	ug/L	2.56		(0%-10%)			
Potassium		8490	D	1530	ug/L	9.87		(0%-10%)			
Selenium	DU	-9.69	DU	12800	ug/L	N/A		(0%-10%)	JWJ	08/09/13	16:49
Silicon	*	4460	D	848	ug/L	5.04		(0%-10%)	HSC	08/07/13	20:37
Silver	U	-0.635	DU	511	ug/L	N/A		(0%-10%)			
Sodium		2120	D	318	ug/L	25.1		(0%-10%)	JWJ	08/09/13	15:06
Vanadium	D	155	D	29.9	ug/L	3.32		(0%-10%)	HSC	08/09/13	11:22
Zinc	D	121	D	23.8	ug/L	1.23		(0%-10%)			
<b>Metals Analysis-Mercury</b>											
Batch	1319303										
QC1202919686	330317001	DUP									
Mercury	U	4.18	U	4.21	ug/kg	N/A ^			NOR1	08/02/13	13:10
QC1202919682	LCS										
Mercury		119		119	ug/kg		100	(80%-120%)		08/02/13	13:00
QC1202919681	MB										
Mercury			U	3.92	ug/kg					08/02/13	12:58

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## QC Summary

**Workorder:** 330317

**Client SDG:** X0011

**Project Description:** RC-232 Soil

**Page 7 of 7**

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis-Mercury</b>											
Batch	1319303										
QC1202919687	330317001	MS									
Mercury	123	U	4.18	132	ug/kg		105	(80%-120%)	NOR1	08/02/13	13:11
QC1202919688	330317001	SDILT									
Mercury		U	0.040	DU	20.9	ug/L	N/A	(0%-10%)		08/02/13	13:13

**Notes:**

The Qualifiers in this report are defined as follows:

- \* Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- S Reported value determined by the Method of Standard Additions (MSA)
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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.

# **General Chem Analysis**

# Case Narrative

**General Chemistry Narrative  
WC-HANFORD, INC. (WCHN)  
SDG X0011**

**Method/Analysis Information**

**Product:** pH  
**Analytical Batch:** 1318645    **Method:** SW9045D pH

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW846 9045D:

<b>Sample ID</b>	<b>Client ID</b>
330317001	J1RV16
330317002	J1RV17
330317004	J1RV19
330317005	J1RV20
330317006	J1RV21
1202918161	Laboratory Control Sample (LCS)
1202918164	330317001(J1RV16) Sample Duplicate (DUP)

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

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-008 REV# 21.

**Preparation/Analytical Method Verification**

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

**Calibration Information**

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

**Initial Calibration**

All initial calibration requirements have been met for this SDG.

**Calibration Verification Information (CCV)**

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

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

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

The LCS spike recovery met the acceptance limits.

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

The following sample was selected for QC analysis: 330317001 (J1RV16).

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

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

### **Technical Information**

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

#### **Holding Times**

The following samples from this sample group were received by the lab outside of the method specified holding time: 330317001 (J1RV16), 330317002 (J1RV17), 330317004 (J1RV19), 330317005 (J1RV20) and 330317006 (J1RV21).

#### **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: 1206846 330317001 (J1RV16), 330317002 (J1RV17), 330317004 (J1RV19), 330317005 (J1RV20) and 330317006 (J1RV21).

#### **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:** 1319592                      **Method:** SW846 9056A Anions  
**Prep Batch :** 1319591                      **Method:** SW846 9056A

**Sample Analysis**

The following samples were analyzed using the analytical protocol as established in SW846 9056A:

<b>Sample ID</b>	<b>Client ID</b>
330317001	JIRV16
330317002	JIRV17
330317004	JIRV19
330317005	JIRV20
330317006	JIRV21
1202920495	Method Blank (MB)
1202920496	330317001(JIRV16) Sample Duplicate (DUP)
1202920497	330317001(JIRV16) Matrix Spike (MS)
1202920498	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" 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-5000 Ion Chromatograph.

**Initial Calibration**

All initial calibration requirements have been met for this SDG.

**Continuing Calibration Blanks**

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

**Calibration Verification Information (CCV)**

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

**Y Intercept Rule**

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

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

The 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) Designation**

The following sample was selected for QC analysis: 330317001 (J1RV16).

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

The following samples were re-analyzed due to CCV failure: 1202920495 (MB), 1202920496 (J1RV16), 1202920497 (J1RV16), 1202920498 (LCS), 330317001 (J1RV16), 330317002 (J1RV17), 330317004 (J1RV19), 330317005 (J1RV20) and 330317006 (J1RV21).

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

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

**Manual Integrations**

Manual integrations were not required for the samples in this SDG.

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

**Method/Analysis Information**

**Product:** Nitrate + Nitrite  
**Analytical Batch:** 1318211      **Method:** EPA 353.2 Nitrogen and Nitrate/Nitrite  
**Prep Batch :** 1318208      **Method:** EEPA 353.2 Modified

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
330317001	J1RV16
330317002	J1RV17
330317004	J1RV19
330317005	J1RV20
330317006	J1RV21
1202917040	Method Blank (MB)
1202917042	330317001(J1RV16) Sample Duplicate (DUP)
1202917044	330317001(J1RV16) Matrix Spike (MS)
1202917045	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" 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+ 8000 Series.

**Calibration Verification Information**

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

**Continuing Calibration Blanks**

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

**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: 330317001 (J1RV16).

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

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

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

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

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

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

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

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

### Method/Analysis Information

**Product:** Hexavalent Chromium  
**Analytical Batch:** 1319557 **Method:** SW846\_7196A Hexavalent Chromium  
**Prep Batch :** 1319556 **Method:** SW846 3060A

### Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 7196A:

<b>Sample ID</b>	<b>Client ID</b>
330317001	J1RV16
330317002	J1RV17
330317004	J1RV19
330317005	J1RV20
330317006	J1RV21
1202920390	Method Blank (MB)
1202920391	Laboratory Control Sample (LCS)
1202920398	330317001(J1RV16) Sample Duplicate (DUP)
1202920399	330317001(J1RV16) Matrix Spike (MS)
1202920400	330317001(J1RV16) Matrix Spike Duplicate (MSD)
1202920404	Insoluble Lab Control Sample (ILCS)

The samples in this SDG were analyzed on a "dry weight" 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-044 REV# 18.

### **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 Spectrometric analysis was performed on a Spectronic 20D + Digital Spectrophotometer.

### **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: 330317001 (J1RV16).

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

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

**Matrix Spike Duplicate (MSD) Recovery Statement**

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

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

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

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

The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1202920398 (J1RV16).

**Technical Information**

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

**Holding Times**

All samples in this SDG met the specified holding time.

**Sample Dilutions**

The samples in this SDG did not require dilutions.

**Sample Re-analysis**

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

**Miscellaneous Information**

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

**Electronic Packaging Comment**

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

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

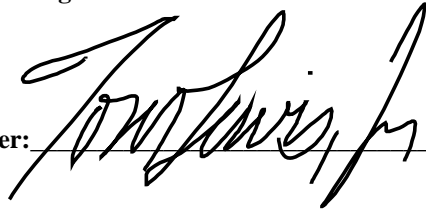
**Certification Statement**

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

**Review Validation:**

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

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

Reviewer:  Date: 09Aug13

**DATA EXCEPTION REPORT**

<b>Mo.Day Yr.</b> 31-JUL-13	<b>Division:</b> Industrial	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> ELECTRODE	<b>Test / Method:</b> SW846 9045C/9045D, SW846 9045D	<b>Matrix Type:</b> Solid	<b>Client Code:</b> ERMC, LANL, SOOP, WCHN
<b>Batch ID:</b> 1318645	<b>Sample Numbers:</b> See below.		
<b>Potentially affected work order(s)(SDG): 330300(2013-1332),330317(X0011),330319,330385</b>			
<b>Application Issues:</b> Container scanning event for custody missed Sample received out of holding			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
<p>1. Sample received out of holding:</p> <p>330300 001,002,003,004,005,006,007</p> <p>330317 001,002,004,005,006</p> <p>330319 001,002,003</p> <p>2. Container scanning event for custody missed:</p> <p>330300 001,002,003,004,005,006,007</p> <p>330317 001,002,004,005,006</p> <p>330319 001,002,003</p>		<p>1. Samples were received out of holding.</p> <p>2. Samples were not scanned to the analytical batch prior to analysis; however, they were in the analyst's custody at the time of analysis.</p>	

**Originator's Name:**

Lindsey Jensen 31-JUL-13

**Data Validator/Group Leader:**

Julia Hamilton 02-AUG-13

# **Sample Data Summary**

# GEL LABORATORIES LLC

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

## Certificate of Analysis Report for

WCHN001 WC-HANFORD, INC.

Client SDG: X0011 GEL Work Order: 330317 Project: RC-232 Soil

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

B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).

C Target analyte was detected in the sample and the associated blank, and the sample concentration was  $\leq 5$  times the blank concentration.

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

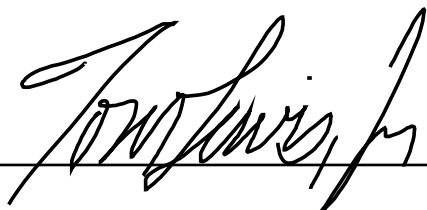
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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, Orlette Johnson.

Reviewed by



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# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: August 9, 2013

Company : WC-Hanford, Inc.  
 Address : 2620 Fermi Avenue  
 MSIN H4-21  
 Richland, Washington 99354  
 Contact: Joan Kessner  
 Project: RC-232 Soil

Client SDG: X0011

Client Sample ID: J1RV16	Project: WCHN00213
Sample ID: 330317001	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 24-JUL-13 13:15	
Receive Date: 26-JUL-13	
Collector: Client	
Moisture: 5.73%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Electrode Analysis											
SW9045D pH "As Received"											
pH at Temp 20.9C		8.64	0.010	0.100	pH	1	LXA1	07/31/13	1050	1318645	1
Ion Chromatography											
SW846 9056A Anions "Dry Weight Corrected"											
Bromide	U	0.709	0.709	2.12	mg/kg	1	DM	08/06/13	0514	1319592	2
Chloride	B	1.96	0.709	2.12	mg/kg	1					
Fluoride		1.08	0.349	1.06	mg/kg	1					
Nitrate-N		1.14	0.349	1.06	mg/kg	1					
Nitrite-N	U	0.349	0.349	1.06	mg/kg	1					
O-Phosphate as P	U	0.709	0.709	2.12	mg/kg	1					
Sulfate		7.72	1.41	4.23	mg/kg	1	DM	08/08/13	0307	1319592	3
Nutrient Analysis											
EPA 353.2 Nitrogen, Nitrate/Nitrite "Dry Weight Corrected"											
Nitrogen, Nitrate/Nitrite		0.772	0.166	0.489	mg/kg	1	KLP1	08/01/13	1143	1318211	4
Spectrometric Analysis											
SW846_7196A Hexavalent Chromium "Dry Weight Corrected"											
Hexavalent Chromium	U	0.169	0.169	0.423	mg/kg	1	LXA1	08/06/13	1427	1319557	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 353.2 Modified	EPA 353.2 Modified Nitrate/Nitrite	KLP1	08/01/13	1000	1318208
SW846 3060A	SW846_7196A Hexavalent Chromium in Soil	LXA1	08/02/13	1125	1319556
SW846 9056A	SW846 9056A Total Anions in Soil	DM	08/05/13	1714	1319591

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9045D	
2	SW846 9056A	
3	SW846 9056A	
4	EPA 353.2 Modified	
5	SW846 7196A	

Notes:





# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: August 9, 2013

Company : WC-Hanford, Inc.  
 Address : 2620 Fermi Avenue  
 MSIN H4-21  
 Richland, Washington 99354  
 Contact: Joan Kessner  
 Project: RC-232 Soil

Client SDG: X0011

Client Sample ID: J1RV20	Project: WCHN00213
Sample ID: 330317005	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 24-JUL-13 13:55	
Receive Date: 26-JUL-13	
Collector: Client	
Moisture: 5.13%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Electrode Analysis</b>											
<b>SW9045D pH "As Received"</b>											
pH at Temp 21.0C		8.88	0.010	0.100	pH	1	LXA1	07/31/13	1056	1318645	1
<b>Ion Chromatography</b>											
<b>SW846 9056A Anions "Dry Weight Corrected"</b>											
Bromide	U	0.698	0.698	2.08	mg/kg	1	DM	08/06/13	0751	1319592	2
Chloride	B	1.35	0.698	2.08	mg/kg	1					
Fluoride	U	0.344	0.344	1.04	mg/kg	1					
Nitrate-N	B	0.470	0.344	1.04	mg/kg	1					
Nitrite-N	U	0.344	0.344	1.04	mg/kg	1					
O-Phosphate as P	U	0.698	0.698	2.08	mg/kg	1					
Sulfate		5.99	1.38	4.16	mg/kg	1	DM	08/08/13	0544	1319592	3
<b>Nutrient Analysis</b>											
<b>EPA 353.2 Nitrogen, Nitrate/Nitrite "Dry Weight Corrected"</b>											
Nitrogen, Nitrate/Nitrite	B	0.392	0.178	0.524	mg/kg	1	KLP1	08/01/13	1149	1318211	4
<b>Spectrometric Analysis</b>											
<b>SW846_7196A Hexavalent Chromium "Dry Weight Corrected"</b>											
Hexavalent Chromium	U	0.165	0.165	0.413	mg/kg	1	LXA1	08/06/13	1434	1319557	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 353.2 Modified	EPA 353.2 Modified Nitrate/Nitrite	KLP1	08/01/13	1000	1318208
SW846 3060A	SW846_7196A Hexavalent Chromium in Soil	LXA1	08/02/13	1125	1319556
SW846 9056A	SW846 9056A Total Anions in Soil	DM	08/05/13	1714	1319591

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9045D	
2	SW846 9056A	
3	SW846 9056A	
4	EPA 353.2 Modified	
5	SW846 7196A	

**Notes:**

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: August 9, 2013

Company : WC-Hanford, Inc.  
Address : 2620 Fermi Avenue  
MSIN H4-21  
Richland, Washington 99354  
Contact: Joan Kessner  
Project: RC-232 Soil

Client SDG: X0011

Client Sample ID: J1RV21  
Sample ID: 330317006  
Matrix: SOIL  
Collect Date: 24-JUL-13 14:25  
Receive Date: 26-JUL-13  
Collector: Client  
Moisture: 9.73%

Project: WCHN00213  
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Electrode Analysis											
SW9045D pH "As Received"											
pH at Temp 20.9C		8.60	0.010	0.100	pH	1	LXA1	07/31/13	1058	1318645	1
Ion Chromatography											
SW846 9056A Anions "Dry Weight Corrected"											
Bromide	U	0.742	0.742	2.22	mg/kg	1	DM	08/06/13	0822	1319592	2
Chloride	B	1.41	0.742	2.22	mg/kg	1					
Fluoride	B	0.959	0.366	1.11	mg/kg	1					
Nitrate-N	B	0.995	0.366	1.11	mg/kg	1					
Nitrite-N	U	0.366	0.366	1.11	mg/kg	1					
O-Phosphate as P	U	0.742	0.742	2.22	mg/kg	1					
Sulfate		6.26	1.47	4.43	mg/kg	1	DM	08/08/13	0616	1319592	3
Nutrient Analysis											
EPA 353.2 Nitrogen, Nitrate/Nitrite "Dry Weight Corrected"											
Nitrogen, Nitrate/Nitrite		0.868	0.189	0.555	mg/kg	1	KLP1	08/01/13	1150	1318211	4
Spectrometric Analysis											
SW846_7196A Hexavalent Chromium "Dry Weight Corrected"											
Hexavalent Chromium	BC	0.181	0.168	0.420	mg/kg	1	LXA1	08/06/13	1434	1319557	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 353.2 Modified	EPA 353.2 Modified Nitrate/Nitrite	KLP1	08/01/13	1000	1318208
SW846 3060A	SW846_7196A Hexavalent Chromium in Soil	LXA1	08/02/13	1125	1319556
SW846 9056A	SW846 9056A Total Anions in Soil	DM	08/05/13	1714	1319591

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9045D	
2	SW846 9056A	
3	SW846 9056A	
4	EPA 353.2 Modified	
5	SW846 7196A	

Notes:

# **Quality Control Summary**

# GEL LABORATORIES LLC

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

## QC Summary

Report Date: August 9, 2013

Page 1 of 3

**WC-Hanford, Inc.**  
**2620 Fermi Avenue**  
**MSIN H4-21**  
**Richland, Washington**  
**Contact: Joan Kessner**

**Workorder: 330317**

**Client SDG: X0011**

**Project Description: RC-232 Soil**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Electrode Analysis</b>											
Batch	1318645										
QC1202918164	330317001	DUP									
pH		8.64		8.65	pH	0.116		(0%-10%)	LXA1	07/31/13	10:52
QC1202918161	LCS										
pH	7.00			7.01	pH		100	(99%-101%)		07/31/13	10:24
<b>Ion Chromatography</b>											
Batch	1319592										
QC1202920496	330317001	DUP									
Bromide	U	0.709	U	0.709	mg/kg	N/A	^		DM	08/06/13	05:45
Chloride	B	1.96	B	1.70	mg/kg	14.2	^	(+/-2.12)			
Fluoride		1.08	B	1.05	mg/kg	2.58	^	(+/-1.06)			
Nitrate-N		1.14		1.09	mg/kg	5.13	^	(+/-1.06)			
Nitrite-N	U	0.349	U	0.349	mg/kg	N/A	^				
O-Phosphate as P	U	0.709	U	0.709	mg/kg	N/A	^				
Sulfate		7.72		7.68	mg/kg	0.605	^	(+/-4.23)		08/08/13	03:39
QC1202920498	LCS										
Bromide	12.5			13.0	mg/kg		104	(90%-110%)		08/06/13	04:42
Chloride	50.0			50.4	mg/kg		101	(90%-110%)			
Fluoride	25.0			25.7	mg/kg		103	(90%-110%)			
Nitrate-N	25.0			25.6	mg/kg		102	(90%-110%)			
Nitrite-N	25.0			26.0	mg/kg		104	(90%-110%)			
O-Phosphate as P	12.5			13.0	mg/kg		104	(90%-110%)			
Sulfate	100			102	mg/kg		102	(90%-110%)		08/08/13	02:36
QC1202920495	MB										
Bromide			U	0.670	mg/kg					08/06/13	04:11

# GEL LABORATORIES LLC

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

## QC Summary

Workorder: 330317

Client SDG: X0011

Project Description: RC-232 Soil

Page 2 of 3

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Ion Chromatography</b>											
Batch 1319592											
Chloride			U	0.670	mg/kg				DM	08/06/13	04:11
Fluoride			U	0.330	mg/kg						
Nitrate-N			U	0.330	mg/kg						
Nitrite-N			U	0.330	mg/kg						
O-Phosphate as P			U	0.670	mg/kg						
Sulfate			U	1.33	mg/kg					08/08/13	02:04
QC1202920497 330317001 MS											
Bromide	13.2	U	0.709	14.2	mg/kg		107	(70%-134%)		08/06/13	06:16
Chloride	52.8	B	1.96	55.2	mg/kg		101	(46%-150%)			
Fluoride	26.4		1.08	27.4	mg/kg		99.7	(34%-134%)			
Nitrate-N	26.4		1.14	28.5	mg/kg		104	(68%-129%)			
Nitrite-N	26.4	U	0.349	27.8	mg/kg		105	(68%-130%)			
O-Phosphate as P	13.2	U	0.709	13.7	mg/kg		103	(26%-124%)			
Sulfate	106		7.72	118	mg/kg		105	(50%-151%)		08/08/13	04:10
<b>Nutrient Analysis</b>											
Batch 1318211											
QC1202917042 330317001 DUP											
Nitrogen, Nitrate/Nitrite			0.772	0.857	mg/kg	10.3	^	(+/-0.499)	KLP1	08/01/13	11:44
QC1202917045 LCS											
Nitrogen, Nitrate/Nitrite	10.0			9.78	mg/kg		97.8	(90%-110%)		08/01/13	11:26
QC1202917040 MB											
Nitrogen, Nitrate/Nitrite			U	0.170	mg/kg					08/01/13	11:25
QC1202917044 330317001 MS											
Nitrogen, Nitrate/Nitrite	9.51		0.772	9.61	mg/kg		92.9	(75%-125%)		08/01/13	11:45

**Spectrometric Analysis**

Batch 1319557

# GEL LABORATORIES LLC

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

## QC Summary

**Workorder:** 330317

**Client SDG:** X0011

**Project Description:** RC-232 Soil

**Page 3 of 3**

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Spectrometric Analysis</b>											
Batch	1319557										
QC1202920398	330317001	DUP									
Hexavalent Chromium		U	0.169	U	0.168	mg/kg	N/A ^		LXA1	08/06/13	14:27
QC1202920404	ILCS										
Hexavalent Chromium	7.98				8.23	mg/kg		103 (80%-120%)		08/06/13	11:44
QC1202920391	LCS										
Hexavalent Chromium	3.99				4.18	mg/kg		105 (80%-120%)		08/06/13	11:44
QC1202920390	MB										
Hexavalent Chromium			B		0.172	mg/kg				08/06/13	11:44
QC1202920399	330317001	MS									
Hexavalent Chromium	4.12	U	0.169		3.89	mg/kg		94.3 (75%-125%)		08/06/13	14:27
QC1202920400	330317001	MSD									
Hexavalent Chromium	4.12	U	0.169		3.89	mg/kg	0.107	94.3 (0%-30%)		08/06/13	14:27

**Notes:**

The Qualifiers in this report are defined as follows:

- > Result greater than quantifiable range or greater than upper limit of the analysis range
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.
- D Results are reported from a diluted aliquot of sample.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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

# Moisture LogBook

**Batch:** 1317946

**Analyst:** DRS1

**Date/Time:** 28-JUL-2013

**Procedure Code** DRY WEIGHT

**Procedure Description** Dry Weight-Percent Moisture

**Lab Sop:** GL-OA-E-020

Sample St	Sample Id	Rpd(%)
DUP	1202916380	3.998

Sample Id	Sample Type	Original Hsn	Instrument	Run Time	Container Wt	Initial Wt	Final Wt (g)	Net Initial Wt (g)	Net Final Wt (g)	Moisture (%)
330317001	SAMPLE		BALHD2000D	18:27	7.195	39.016	37.192	31.821	29.997	5.73
330317002	SAMPLE		BALHD2000D	18:27	7.285	38.292	36.5	31.007	29.215	5.78
330317003	SAMPLE		BALHD2000D	18:27	7.153	43.198	43.198	36.045	36.045	0
330317004	SAMPLE		BALHD2000D	18:27	7.26	42.261	40.765	35.001	33.505	4.27
330317005	SAMPLE		BALHD2000D	18:27	7.251	46.147	44.15	38.896	36.899	5.13
330317006	SAMPLE		BALHD2000D	18:27	7.252	52.612	48.198	45.36	40.946	9.73
330322001	SAMPLE		BALHD2000D	18:27	7.061	34.771	33.214	27.71	26.153	5.62
330377002	SAMPLE		BALHD2000D	18:27	7.19	36.208	30.736	29.018	23.546	18.9
330385001	SAMPLE		BALHD2000D	18:27	7.351	30.028	9.919	22.677	2.568	88.7
330385002	SAMPLE		BALHD2000D	18:27	7.272	36.321	10.647	29.049	3.375	88.4
1202916380	DUP	330322001	BALHD2000D	18:27	7.101	33.663	32.229	26.562	25.128	5.4

**Comments:**

A) Result = (Net Initial - Net Final) / Net Initial \* 100

**Note: Aliquot is used for the determination of the effective MDL and PQL in LIMS**



September 18, 2013

Joan Kessner  
WC-Hanford, Inc.  
2620 Fermi Avenue  
MSIN H4-21  
Richland, Washington 99354

Re: RC-232 Soil  
Work Order: 333338  
SDG: X0011A

Dear Joan Kessner:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on July 26, 2013. 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. 1616.

Sincerely,

Orlette Johnson  
Project Manager

Purchase Order: 1510  
Chain of Custody: RC-232-039  
Enclosures



## Table of Contents

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# Case Narrative

**Receipt Narrative  
for  
WC-HANFORD, INC.  
SDG: X0011A  
Work Order: 333338**

**September 18, 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 26, 2013 for analysis.

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

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
333338001	J1RV16
333338002	J1RV17
333338003	J1RV18
333338004	J1RV19
333338005	J1RV20
333338006	J1RV21

**Case Narrative:**

Sample analyses were conducted using methodology as outlined in GEL's 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.

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: Metals.



Orlette Johnson  
Project Manager

# **Chain of Custody and Supporting Documentation**

Company Contact: Joan Kessner  
 Telephone No.: 375-4688  
 Sampling Location: 100-D-105 - Confirmatory Test Pits Underlying Soils  
 Field Logbook No.: EL-1667  
 Offsite Property No.: A120894  
 Project Coordinator: KESSNER, JH  
 Price Code: 8C  
 Data Turnaround: 15 Days  
 Method of Shipment: Fed Ex  
 Bill of Lading/Air Bill No.: Sec OSPC

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Freeze
J1RV16	SOIL	7-24-13	1315	Type of Container	GIP	GIP	aG	aG	aG	aG	aG*	
J1RV17	SOIL	7-24-13	1315	No. of Container(s)	1	1	1	1	1	1	5	
J1RV18	SOIL	7-24-13	1208	Volume	125mL	125mL	125mL	125mL	125mL	125mL	40mL	
J1RV19	SOIL	7-24-13	1408									
J1RV20	SOIL	7-24-13	1355									

**SPECIAL INSTRUCTIONS**

(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)  
 (2) IC Anions - 9056 (Bromide, Chloride, Fluoride, Nitrite and Nitrate); pH (Soil) - 9045 (pH Measurement)  
 NO2/NO3 - 353.1 (Nitrogen in Nitrite and Nitrate); pH (Soil) - 9045 (pH Measurement)

\* Re-added analysis. Any questions, please contact Joan Kessner. 7-25-13 cmh

**CHAIN OF POSSESSION**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MAJ Sp. W. (B) Jackson	7-24-13 1435	MA Bamberger	7-24-13
MAJ Sp. W. (B) Jackson	7-24-13 1505	MA Bamberger	7-24-13
MAJ Sp. W. (B) Jackson	7-24-13 1600	R. Fehlbauer	7-24-13
MAJ Sp. W. (B) Jackson	7-24-13 1605	MA Bamberger	7-24-13
MAJ Sp. W. (B) Jackson	7-25-13 1100	MA Bamberger	7-25-13
MAJ Sp. W. (B) Jackson	7-25-13 1105	MA Bamberger	7-25-13
MAJ Sp. W. (B) Jackson	7-25-13	Fed Ex	
MAJ Sp. W. (B) Jackson	7-26-13	JJ Jennifer Pellegrini	0850

Disposal Method: Fed Ex

**REVIEWED BY**  
 JH  
**DATE**  
 7-25-13

RC-232-039  
 Price Code 8C  
 Data Turnaround  
 15 Days

Project Coordinator  
 KESSNER, JH  
 SAF No.  
 RC-232

Method of Shipment  
 fcd ex

Bill of Lading/Air Bill No.  
 See O5PC

Telephone No.  
 375-4688  
 Project Designation  
 100-IU-2 & 100-IU-6 Remaining Waste Sites  
 Field Logbook No.  
 EL-1667

Company Contact  
 Joan Kessner  
 Sampling Location  
 100-D-105 - Confirmatory Test Pits Underlying Soils  
 Offsite Property No.  
 A120894

Collector  
 W F Jackson  
 Project Designation  
 100-IU-2 & 100-IU-6 Remaining Waste Sites  
 Ice Chest No.  
 WCH-12-020  
 Shipped To  
 Eberline - GEL

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C
J1RV21	SOIL	7-24-13	1425	None	1	1	1	1	1	1	1	1	1
J1RV22	SOIL			Type of Container	G/P	G/P	aG	aG	aG	aG	aG	aG	aG
J1RV23	SOIL	7-24-13		No. of Container(s)	1	1	1	1	1	1	1	1	1
J1RV24	SOIL			Volume	125mL	125mL	125mL	125mL	125mL	125mL	125mL	125mL	40mL
J1RV25	SOIL												

POSSIBLE SAMPLE HAZARDS/REMARKS  
 None

Special Handling and/or Storage  
 Cool 4 C

SAMPLE ANALYSIS  
 See item (1) in Chromium Hex - 7196 Special Instructions  
 See item (2) in TPH-Diesel Range - WTPH-D + Special Instructions  
 PAHs - 8319  
 PCBs - 8082  
 VOA - 5035/6260 (TCL)

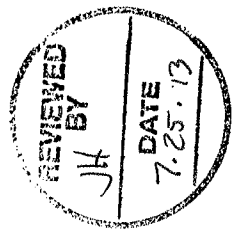
Sample No.	Matrix	Sample Date	Sample Time	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C
J1RV21	SOIL	7-24-13	1425	None	1	1	1	1	1	1	1	1	1
J1RV22	SOIL			Type of Container	G/P	G/P	aG	aG	aG	aG	aG	aG	aG
J1RV23	SOIL	7-24-13		No. of Container(s)	1	1	1	1	1	1	1	1	1
J1RV24	SOIL			Volume	125mL	125mL	125mL	125mL	125mL	125mL	125mL	125mL	40mL
J1RV25	SOIL												

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
JW Jackson	7-24-13 1435	MA Bamberger	7-24-13 1435
MA Bamberger	7-24-13 1505	R. Fehler	7-24-13 1505
R. Fehler	7-24-13 1600	MA Bamberger	7-24-13 1600
MA Bamberger	7-24-13 1100	MA Bamberger	7-24-13 1100
MA Bamberger	7-25-13 1105	MA Bamberger	7-25-13 1105

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
MA Bamberger	7-24-13 1435	MA Bamberger	7-24-13 1435
R. Fehler	7-24-13 1505	R. Fehler	7-24-13 1505
MA Bamberger	7-24-13 1600	MA Bamberger	7-24-13 1600
MA Bamberger	7-25-13 1100	MA Bamberger	7-25-13 1100
MA Bamberger	7-25-13 1105	MA Bamberger	7-25-13 1105

FINAL SAMPLE DISPOSITION  
 Disposal Method  
 Disposed By  
 J. Jennifer Pellegrini  
 Date/Time  
 7-26-13  
 Date/Time  
 0856





SAMPLE RECEIPT & REVIEW FORM

Client: <u>WJHN</u>		SDG/AR/COC/Work Order: <u>X0011 330317</u>	
Received By: <u>JP</u>		Date Received: <u>7-20-13</u>	
Suspected Hazard Information		Yes	No
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Package, COC, and/or Samples marked as beryllium or asbestos containing?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	<input 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: <u>Ice bags</u> Blue ice 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>41502209</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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: <del>IF Preservation added, Lot#:</del>
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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input 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:
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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other  <u>7963 2052 3700</u> <u>" 1692 5755</u>

Comments (Use Continuation Form if needed):

# **Laboratory Certifications**

**List of current GEL Certifications as of 18 September 2013**

<b>State</b>	<b>Certification</b>
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

# **Metals Analysis**

# Case Narrative

**Metals Fractional Narrative  
WC-HANFORD, INC. (WCHN)  
SDG X0011A**

**Sample Analysis**

<b>Sample ID</b>	<b>Client ID</b>
333338001	J1RV16
333338002	J1RV17
333338003	J1RV18
333338004	J1RV19
333338005	J1RV20
333338006	J1RV21
1202947414	Method Blank (MB) <b>ICP-MS</b>
1202947415	Laboratory Control Sample (LCS)
1202947418	333338001(J1RV16L) Serial Dilution (SD)
1202947416	333338001(J1RV16D) Sample Duplicate (DUP)
1202947417	333338001(J1RV16S) Matrix Spike (MS)

The samples in this SDG were analyzed on a "dry weight" basis.

**Method/Analysis Information**

<b>Analytical Batch:</b>	1330997
<b>Prep Batch :</b>	1330996
<b>Standard Operating Procedures:</b>	GL-MA-E-014 REV# 25 and GL-MA-E-009 REV# 22
<b>Analytical Method:</b>	SW846 3050B/6020A
<b>Prep Method :</b>	SW846 3050B

**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 Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 6100E inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadruple 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.

## **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 MB 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: 333338001 (J1RV16).

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

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

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

The RPD obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control of +/-RL is used to evaluate the DUP results. All applicable analytes met these requirements.

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

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 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. Method SW-846 3050B is not a total digestion technique for most samples. It is a very strong acid digestion that will dissolve almost all elements that could become environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

#### **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. Samples in this SDG were diluted the standard 2x for solids on the ICPMS.

#### **Preparation Information**

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

### **Miscellaneous Information**

#### **Electronic Packaging Comment**

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

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

**Data Exception (DER) Documentation**

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

**Additional Comments**

Additional comments were not required for this SDG.

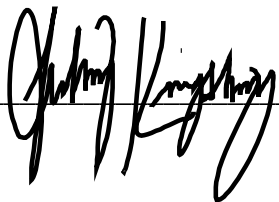
**Certification Statement**

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: 09/18/13

# **Sample Data Summary**

# GEL LABORATORIES LLC

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

## Qualifier Definition Report for

WCHN001 WC-HANFORD, INC.

Client SDG: X0011A GEL Work Order: 333338 Project: RC-232 Soil

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

\* Duplicate analysis not within control limits

D Results are reported from a diluted aliquot of sample.

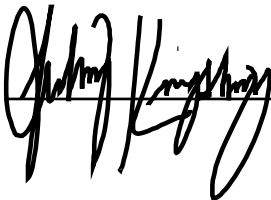
U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

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, Orlette Johnson.

Reviewed by



09/18/13

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: September 18, 2013

Company : WC-Hanford, Inc.  
Address : 2620 Fermi Avenue  
MSIN H4-21  
Richland, Washington 99354  
Contact: Joan Kessner  
Project: RC-232 Soil

Client SDG: X0011A

Client Sample ID: J1RV16  
Sample ID: 333338001  
Matrix: SOIL  
Collect Date: 24-JUL-13 13:15  
Receive Date: 26-JUL-13  
Collector: Client  
Moisture: 5.73%

Project: WCHN00213  
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.344	0.344	1.04	mg/kg	2	SKJ	09/17/13	1859	1330997	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/17/13	0820	1330996

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3050B/6020A	

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: September 18, 2013

Company : WC-Hanford, Inc.  
Address : 2620 Fermi Avenue  
MSIN H4-21  
Richland, Washington 99354  
Contact: Joan Kessner  
Project: RC-232 Soil

Client SDG: X0011A

Client Sample ID: J1RV17  
Sample ID: 333338002  
Matrix: SOIL  
Collect Date: 24-JUL-13 13:15  
Receive Date: 26-JUL-13  
Collector: Client  
Moisture: 5.78%

Project: WCHN00213  
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.332	0.332	1.01	mg/kg	2	SKJ	09/17/13	1946	1330997	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/17/13	0820	1330996

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3050B/6020A	

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: September 18, 2013

Company : WC-Hanford, Inc.  
Address : 2620 Fermi Avenue  
MSIN H4-21  
Richland, Washington 99354  
Contact: Joan Kessner  
Project: RC-232 Soil

Client SDG: X0011A

Client Sample ID: J1RV18  
Sample ID: 333338003  
Matrix: SOIL  
Collect Date: 24-JUL-13 12:08  
Receive Date: 26-JUL-13  
Collector: Client  
Moisture: <0.1%

Project: WCHN00213  
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.321	0.321	1.00	mg/kg	2	SKJ	09/17/13	1952	1330997	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/17/13	0820	1330996

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3050B/6020A	

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: September 18, 2013

Company : WC-Hanford, Inc.  
Address : 2620 Fermi Avenue  
MSIN H4-21  
Richland, Washington 99354  
Contact: Joan Kessner  
Project: RC-232 Soil

Client SDG: X0011A

Client Sample ID: J1RV19  
Sample ID: 333338004  
Matrix: SOIL  
Collect Date: 24-JUL-13 14:08  
Receive Date: 26-JUL-13  
Collector: Client  
Moisture: 4.27%

Project: WCHN00213  
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.343	0.343	1.04	mg/kg	2	SKJ	09/17/13	1958	1330997	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/17/13	0820	1330996

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3050B/6020A	

Notes:

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: September 18, 2013

Company : WC-Hanford, Inc.  
Address : 2620 Fermi Avenue  
MSIN H4-21  
Richland, Washington 99354  
Contact: Joan Kessner  
Project: RC-232 Soil

Client SDG: X0011A

Client Sample ID: J1RV20  
Sample ID: 333338005  
Matrix: SOIL  
Collect Date: 24-JUL-13 13:55  
Receive Date: 26-JUL-13  
Collector: Client  
Moisture: 5.13%

Project: WCHN00213  
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.340	0.340	1.03	mg/kg	2	SKJ	09/17/13	2004	1330997	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/17/13	0820	1330996

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3050B/6020A	

Notes:

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: September 18, 2013

Company : WC-Hanford, Inc.  
Address : 2620 Fermi Avenue  
MSIN H4-21  
Richland, Washington 99354  
Contact: Joan Kessner  
Project: RC-232 Soil

Client SDG: X0011A

Client Sample ID: J1RV21  
Sample ID: 333338006  
Matrix: SOIL  
Collect Date: 24-JUL-13 14:25  
Receive Date: 26-JUL-13  
Collector: Client  
Moisture: 9.73%

Project: WCHN00213  
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.324	0.324	1.00	mg/kg	2	SKJ	09/17/13	2010	1330997	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/17/13	0820	1330996

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3050B/6020A	

Notes:

# **Quality Control Summary**

# GEL LABORATORIES LLC

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

## QC Summary

Report Date: September 18, 2013

Page 1 of 2

**WC-Hanford, Inc.**  
**2620 Fermi Avenue**  
**MSIN H4-21**  
**Richland, Washington**  
**Contact: Joan Kessner**

**Workorder: 333338**      **Client SDG: X0011A**      **Project Description: RC-232 Soil**

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
<b>Metals Analysis - ICPMS</b>											
Batch	1330997										
QC1202947416	333338001	DUP									
Selenium		DU	0.344	DU	0.324	mg/kg	N/A ^		SKJ	09/17/13	19:05
QC1202947415	LCS										
Selenium	4.72		D	4.83	mg/kg		102	(80%-120%)		09/17/13	18:41
QC1202947414	MB										
Selenium			DU	0.327	mg/kg					09/17/13	18:35
QC1202947417	333338001	MS									
Selenium	5.03	DU	0.344	D	4.32	mg/kg	85.8	(75%-125%)		09/17/13	19:11
QC1202947418	333338001	SDILT									
Selenium		DU	-0.653	DU	1.72	ug/L	N/A	(0%-10%)		09/17/13	19:22

**Notes:**

The Qualifiers in this report are defined as follows:

- \* Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- S Reported value determined by the Method of Standard Additions (MSA)
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

# GEL LABORATORIES LLC

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## QC Summary

Workorder: 333338

Client SDG: X0011A

Project Description: RC-232 Soil

Page 2 of 2

<u>Parmname</u>	<u>NOM</u>	<u>Sample Qual</u>	<u>QC</u>	<u>Units</u>	<u>RPD/D%</u>	<u>REC%</u>	<u>Range</u>	<u>Anlst</u>	<u>Date</u>	<u>Time</u>
-----------------	------------	--------------------	-----------	--------------	---------------	-------------	--------------	--------------	-------------	-------------

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

# Prep Logbook

## Acid Digestion of Sediments, Sludges, and Soils

Batch ID:	1330996.0	Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
Analyst:	Anthony Green	LCS	1202947415	ICP-MS spiking solution A	UI1960544-A	.25	mL
Method:	SW846 3050B	LCS	1202947415	ICP-MS spiking solution B	UI1960549-B	.25	mL
Lab SOP:	GL-MA-E-009 REV# 22	MS	1202947417	ICP-MS spiking solution A	UI1960544-A	.25	mL
Instrument:	BAL-001	MS	1202947417	ICP-MS spiking solution B	UI1960549-B	.25	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
1202947414 MB	17-SEP-2013 08:20:30	Soil	0.505	50	99.0099
1202947415 LCS	17-SEP-2013 08:20:30	Soil	0.53	50	94.33962
333338001	17-SEP-2013 08:20:30	Soil	0.509	50	98.23183
1202947416 DUP (333338001)	17-SEP-2013 08:20:30	Soil	0.54	50	92.59259
1202947417 MS (333338001)	17-SEP-2013 08:20:30	Soil	0.527	50	94.87666
1202947418 SDILT (333338001)	17-SEP-2013 08:20:30	Soil	0.509	50	98.23183
333338002	17-SEP-2013 08:20:30	Soil	0.527	50	94.87666
333338003	17-SEP-2013 08:20:30	Soil	0.514	50	97.27626
333338004	17-SEP-2013 08:20:30	Soil	0.502	50	99.60159
333338005	17-SEP-2013 08:20:30	Soil	0.511	50	97.84736
333338006	17-SEP-2013 08:20:30	Soil	0.565	50	88.49558

Reagent/Solvent Lot ID	Description	Amount	Comments:
1904936-02	Hydrogen Peroxide 30%	1.5 mL	Block Temperature: 92 C
1924940	Concentrated Nitric Acid	5 mL	Thermometer ID: 118840
			Hot Block ID: 9
			Sample 333338001 consist of brown, granular solid with rocks.