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 9/24/13
INITIAL/DATE

COMMENTS:

SDG X0020 SAF-RC-232

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location: 600-293

GEL Laboratories LLC

a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407

P 843.556.8171 F 843.766.1178

www.gel.com

September 23, 2013

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

Re: RC-232 Soil
Work Order: 332351
SDG: X0020

Dear Joan Kessner:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 28, 2013. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. The data package is reissued to correct the batch ID for the PCB matrix QC samples.

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-232-047
Enclosures

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Case Narrative

Receipt Narrative
for
WC-HANFORD, INC.
SDG: X0020
Work Order: 332351

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 August 28, 2013 for analysis.

Sample Identification: The laboratory received the following samples:

Laboratory ID	Client ID
332351001	J1RWL1
332351002	J1RWL2
332351003	J1RWL3
332351004	J1RWL4
332351005	J1RWL5
332351006	J1RWL6

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: Diesel Range Organics, GC Semivolatile PCB, General Chemistry and Metals.

Orlette Johnson
Project Manager

Chain of Custody and Supporting Documentation

DJL531

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-232-047

Collector: DUNNUM, AJ	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100-IU-2 & 100-IU-6 Remaining Waste Sites	Sampling Location: verification sampling of the 600-293 White Bluffs Service station #1 waste site (~~600-293~~ NMB 8-26-13)	SAF No.: RC-232	Price Code: 8C ~~B~~ D NMB 8-14-13 NMB 8-26-13 Data Turnaround: ~~15~~ 7 Days 21
Ice Chest No.: RC-007-002	Field Logbook No.: EL-1666-01	COA: 0602932000	Method of Shipment: fed EX
Shipped To: Eberline - GEL	Offsite Property No.: A120946		Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4 C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C							
Type of Container	G/P	G/P	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	125mL	125mL	125mL	125mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	TPH-Diesel Range - WTPH-D +	PCBs - 8082							
Sample No.	**Matrix**	**Sample Date**	**Sample Time**								
J1RWL1	SOIL	8-26-13	0815	X	X	X	X				
J1RWL2	SOIL	8-26-13	0820	X	X	X	X				
J1RWL3	SOIL	8-26-13	0825	X	X	X	X				
J1RWL4	SOIL	8-26-13	0836	X	X	X	X				
J1RWL5	SOIL	8-26-13	0815	X	X	X	X				

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible]	8-26-13 0815	MA Bamberger	8-26-13 0840
MA Bamberger	8-26-13 1636	Cindra Bingham	8-26-13 1636
Cindra Bingham	8-26-13 1640	1060 Battelle, fridge 1A	8-26-13 1640
1060 Battelle, fridge 1A, ~~2~~ CMB	8-27-13 1020	Cindra Bingham	8-27-13 1020
Cindra Bingham WCH	8-27-13 1025	fed EX	
		H. Taylor	082913 0855

FINAL SAMPLE DISPOSITION

Disposal Method	Disposed By	Date/Time

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}

REVIEWED BY Dowshea DATE 8/27/13

Generated Date/Time: 08/14/2013 05:40, PDT

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-232-047

Collector: DUNNUM, AJ	Company Contact: Joan Kessner	Telephone No.: 375-4688	Project Coordinator: KESSNER, JH
Project Designation: 100-IU-2 & 100-IU-6 Remaining Waste Sites	Sampling Location: verification sampling of the 600-293 white Bluffs Service Station #1 waste site. (~~600-293~~ MAB 8.26.13)		SAF No.: RC-232
Price Code: 8C (B, D)	Data Turnaround: ~~15 Days~~ MAB 8.14.13 21 7 MAB 8.26.13		
Ice Chest No.: RC-007-002	Field Logbook No.: EL-1666-01	COA: 0602932000	Method of Shipment: fed EX
Shipped To: Eberline - GEL	Offsite Property No.: A120946		Bill of Lading/Air Bill No.: See OSRC

POSSIBLE SAMPLE HAZARDS/REMARKS

None

Special Handling and/or Storage

Cool 4 C

Preservation	Cool 4C	Cool 4C	Cool 4C	Cool 4C							
Type of Container	G/P	G/P	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	125mL	125mL	125mL	125mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions	Chromium Hex - 7196	TPH-Diesel Range - WTPH-D +	PCBs - 8082 (MAB 8.26.13)							
Sample No.	**Matrix**	**Sample Date**	**Sample Time**								
J1RWL6	SOIL	8-26-13	0805	X							

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Aaron Dunnum	8-26-13 0840	MA Bamberger	8-26-13 0840
MA Bamberger	8-26-13 1636	Cinda Bingham	8-26-13 1636
Cinda Bingham	8.26.13 1640	1060 Battelle, fridge 1A	8.26.13 1640
1060 Battelle fridge 1A	8-27-13 1020	Cinda Bingham	8-27-13 1020
Cinda Bingham	8-27-13 1025	fed EX	
		H. Taylor	8/27/13 0855

Sign/Print Names

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}

REVIEWED BY DWShea DATE 8/27/13

FINAL SAMPLE DISPOSITION

Disposal Method | Disposed By | Date/Time

WCH-EE-011

Generated Date/Time: 08/14/2013 05:40, PDT

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: WCHN	**SDG/AR/COC/Work Order:** 332357
Received By: H. Taylor	**Date Received:** 082813

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0cpm
Classified Radioactive II or III by RSO?		✓	If yes, Were swipes taken of sample contatiners < action levels?
COC/Samples marked containing PCBs?		✓	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓	If yes, samples are to be segregeated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
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?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	✓			Preservation Method: (Ice bags) Blue ice Dry ice None Other (describe) 4 *all temperatures are recorded in Celsius
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: 310500cf Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?		✓		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		✓		Sample ID's and containers affected:
7	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	✓			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
11	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?			✓	
13	COC form is properly signed in relinquished/received sections?	✓			
14	Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 7965 5793 2373 -4

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials HH Date 082813 Page 1 of 1

Laboratory Certifications

List of current GEL Certifications as of 18 September 2013

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

FID Diesel Range Organics Analysis

Case Narrative

FID Diesel Range Organics
WC-HANFORD, INC. (WCHN)
SDG X0020

Method/Analysis Information

Procedure:	**Analysis of Diesel Range Organics by Flame Ionization Detector**
Analytical Method:	NWTPH-Dx in Soil
Prep Method:	SW846 3541
Analytical Batch Number:	1329428
Prep Batch Number:	1329427

Sample Analysis

The following samples were analyzed using the analytical protocol as established in NWTPH-Dx in Soil:

Sample ID	Client ID
332351001	J1RWL1
332351002	J1RWL2
332351003	J1RWL3
332351004	J1RWL4
332351005	J1RWL5
1202943393	Method Blank (MB)
1202943394	Laboratory Control Sample (LCS)
1202943395	332351001(J1RWL1) Matrix Spike (MS)
1202943396	332351001(J1RWL1) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-003 REV# 23.

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

Calibration Information

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

Continuing Calibration Verification (CCV) Requirements
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria. Analyte peaks eluted within the established retention time windows for this method.

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this batch did not meet the acceptance criteria. The MB was detected with oil range hydrocarbons. All associated samples were re-extracted and re-analyzed. Both sets of the data were reported in this data package.

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

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

QC Sample Designation
Sample 332351001 (J1RWL1) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement
The MS recovery was within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement
The MSD recovery was within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement
The RPD between the MS and MSD met the acceptance limits.

Technical Information

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

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP. Analyte peaks eluted within the established retention time windows for this method.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Samples 332351001 (J1RWL1), 332351002 (J1RWL2), 332351003 (J1RWL3), 332351004 (J1RWL4) and 332351005 (J1RWL5) were re-extracted and re-analyzed due to Method Blank contamination in the first analysis. Both sets of the data were reported.

Miscellaneous Information

Electronic Package Comment

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

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

Data Exception (DER) Documentation
Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. DER #1221170 was generated for this batch.

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

Additional Comments
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The additional comments were not required.

System Configuration

The Diesel Range Organics analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
FID7.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	DB-5MS	30m x 0.25mm, 0.25um(J&W)

Method/Analysis Information

Procedure:	**Analysis of Diesel Range Organics by Flame Ionization Detector**
Analytical Method:	NWTPH-Dx in Soil
Prep Method:	SW846 3541
Analytical Batch Number:	1330257
Prep Batch Number:	1330253

Sample Analysis

The following samples were analyzed using the analytical protocol as established in NWTPH-Dx in Soil:

Sample ID	Client ID
332351001	J1RWL1
332351002	J1RWL2
332351003	J1RWL3
332351004	J1RWL4
332351005	J1RWL5
1202945455	Method Blank (MB)
1202945456	Laboratory Control Sample (LCS)
1202945457	332351002(J1RWL2) Matrix Spike (MS)

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

Preparation/Analytical Method Verification

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-003 REV# 23.

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

Calibration Information

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

Continuing Calibration Verification (CCV) Requirements
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria. Analyte peaks eluted within the established retention time windows for this method.

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this SDG met the acceptance criteria.

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

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

QC Sample Designation
Sample 332351002 (J1RWL2) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement
The MS recovery was not within the established acceptance limits due to sample matrix interference as the MS and MSD displayed similar results.

Matrix Spike Duplicate (MSD) Recovery Statement
The MSD recovery was not within the established acceptance limits due to sample matrix interference as the MS and MSD displayed similar results.

MS/MSD Relative Percent Difference (RPD) Statement
The RPD between the MS and MSD met the acceptance limits.

Technical Information

Holding Time Specifications
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. Samples332351001 (J1RWL1), 332351002 (J1RWL2), 332351003 (J1RWL3), 332351004 (J1RWL4) and 332351005 (J1RWL5)

were re-extracted out of holding. The data were reported with X qualifier.

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP. Analyte peaks eluted within the established retention time windows for this method.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Samples 332351001 (J1RWL1), 332351002 (J1RWL2), 332351003 (J1RWL3), 332351004 (J1RWL4) and 332351005 (J1RWL5) were re-extracted due to MB contamination. Both sets of data are reported.

Miscellaneous Information

Electronic Package Comment

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

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

Data Exception (DER) Documentation
Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. DER #1221140 was generated for this batch.

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

Additional Comments
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The additional comments were not required.

System Configuration

The Diesel Range Organics analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
FID7.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	DB-5MS	30m x 0.25mm, 0.25um(J&W)

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.

DATA EXCEPTION REPORT

Mo.Day Yr.	**Division:**	**Quality Criteria:**	**Type:**
13-SEP-13	Federal	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
GC/FID	NWTPH-Dx in Soil	Solid	WCHN
Batch ID:	**Sample Numbers:**		
1330257	See Below		

Potentially affected work order(s)(SDG): 332351(X0020),332796(X0021),332930(XP0010)

Application Issues:

Failed Recovery for MS/PS

Failed Recovery for MSD/PSD

Sample Prepped out of Holding

Sample Logged out of Holding

Specification and Requirements Exception Description:	**DER Disposition:**
1. Samples 332351001, 332351002, 332351003, 332351004 and 332351005 were extracted out of holding	1. Samples were re-extracted due to MB contamination. Both sets of data were reported.
2. The MS(1202945457)/MSD(1202945458) and MS(1202945459)/MSD(1202945460) did not meet spike recovery acceptance limits. Please see the data report for specific failures.	2. As the MS and MSD displayed similar recoveries, the failures were attributed to sample matrix interference and the data have been reported.

Originator's Name:

Benjamin Taft 13-SEP-13

Data Validator/Group Leader:

Cameron Bearden 13-SEP-13

DATA EXCEPTION REPORT

Mo.Day Yr.	**Division:**	**Quality Criteria:**	**Type:**
13-SEP-13	Federal	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
GC/FID	NWTPH-Dx in Soil	Solid	WCHN
Batch ID:	**Sample Numbers:**		
1329428	See Below		

Potentially affected work order(s)(SDG): 332351(X0020)

Application Issues:

Method Blank contamination

Specification and Requirements Exception Description:	**DER Disposition:**
1. The MB (1202943393) recovered motor oil above the PQL.	1. Samples were re-extracted out of holding with a clean MB. Both sets of data were reported.

Originator's Name:

Benjamin Taft 13-SEP-13

Data Validator/Group Leader:

Cameron Bearden 13-SEP-13

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: X0020 GEL Work Order: 332351 Project: RC-232 Soil

The Qualifiers in this report are defined as follows:

B The analyte was detected in both the associated QC blank and in the sample.

D Results are reported from a diluted aliquot of sample.

J 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).Value is estimated

T Spike and/or spike duplicate 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.

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

DL Indicates that sample is diluted.
RA Indicates that sample is re-analyzed without re-extraction.
RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature: Jimin Cao **Name: Jimin Cao**

Date: 17 SEP 2013 **Title: Data Validator**

Sample Data Summary

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

Certificate of Analysis

Report Date: September 13, 2013

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

Client SDG: X0020

Client Sample ID: J1RWL1
Sample ID: 332351001
Matrix: SOIL
Collect Date: 26-AUG-13 08:15
Receive Date: 28-AUG-13
Collector: Client
Moisture: 3.2%

Project: WCHN00213
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10-C20)	U	2240	2240	6880	ug/kg	1	BYT1	09/11/13	0424	1329428	1
Motor Oil (C20-C36)	B	25100	2240	6880	ug/kg	1					
Diesel Range Organics (C10-C20)	JTX	2340	2230	6870	ug/kg	1	BYT1	09/12/13	1350	1330257	2
Motor Oil (C20-C36)	TX	14000	2230	6870	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/11/13	1805	1330253
SW846 3541	3541 DRO IN SOIL PREP	MXS4	09/07/13	0858	1329427

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Dx in Soil	
2	NWTPH-Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o-Terphenyl	SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"	593 ug/kg	688	86.1	(50%-150%)
o-Terphenyl	SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"	557 ug/kg	687	81.1	(50%-150%)

Notes:

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

Certificate of Analysis

Report Date: September 13, 2013

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

Client SDG: X0020

Client Sample ID: J1RWL2
Sample ID: 332351002
Matrix: SOIL
Collect Date: 26-AUG-13 08:20
Receive Date: 28-AUG-13
Collector: Client
Moisture: 3.02%

Project: WCHN00213
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10-C20)	J	2610	2230	6870	ug/kg	1	BYT1	09/11/13	0614	1329428	1
Motor Oil (C20-C36)	B	59200	2230	6870	ug/kg	1					
Diesel Range Organics (C10-C20)	JTX	5580	2230	6850	ug/kg	1	BYT1	09/12/13	1427	1330257	2
Motor Oil (C20-C36)	TX	80200	2230	6850	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/11/13	1805	1330253
SW846 3541	3541 DRO IN SOIL PREP	MXS4	09/07/13	0858	1329427

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Dx in Soil	
2	NWTPH-Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o-Terphenyl	SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"	561 ug/kg	687	81.5	(50%-150%)
o-Terphenyl	SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"	631 ug/kg	685	92.1	(50%-150%)

Notes:

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

Certificate of Analysis

Report Date: September 13, 2013

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

Client SDG: X0020

Client Sample ID:	J1RWL3	Project:	WCHN00213
Sample ID:	332351003	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	26-AUG-13 08:25		
Receive Date:	28-AUG-13		
Collector:	Client		
Moisture:	2.65%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10-C20)	J	3960	2220	6830	ug/kg	1	BYT1	09/11/13	0650	1329428	1
Motor Oil (C20-C36)	B	32500	2220	6830	ug/kg	1					
Diesel Range Organics (C10-C20)	JTX	4320	2220	6830	ug/kg	1	BYT1	09/12/13	1616	1330257	2
Motor Oil (C20-C36)	TX	21900	2220	6830	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/11/13	1805	1330253
SW846 3541	3541 DRO IN SOIL PREP	MXS4	09/07/13	0858	1329427

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Dx in Soil	
2	NWTPH-Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o-Terphenyl	SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"	573 ug/kg	683	83.9	(50%-150%)
o-Terphenyl	SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"	472 ug/kg	683	69.2	(50%-150%)

Notes:

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Certificate of Analysis

Report Date: September 13, 2013

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

Client SDG: X0020

Client Sample ID:	J1RWL4	Project:	WCHN00213
Sample ID:	332351004	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	26-AUG-13 08:30		
Receive Date:	28-AUG-13		
Collector:	Client		
Moisture:	1.95%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10-C20)	U	2210	2210	6790	ug/kg	1	BYT1	09/11/13	0727	1329428	1
Motor Oil (C20-C36)	B	25600	2210	6790	ug/kg	1					
Diesel Range Organics (C10-C20)	TUX	2200	2200	6750	ug/kg	1	BYT1	09/12/13	1653	1330257	2
Motor Oil (C20-C36)	TX	23300	2200	6750	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/11/13	1805	1330253
SW846 3541	3541 DRO IN SOIL PREP	MXS4	09/07/13	0858	1329427

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Dx in Soil	
2	NWTPH-Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o-Terphenyl	SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"	572 ug/kg	679	84.3	(50%-150%)
o-Terphenyl	SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"	493 ug/kg	675	73.1	(50%-150%)

Notes:

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

Certificate of Analysis

Report Date: September 13, 2013

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

Client SDG: X0020

Client Sample ID:	J1RWL5	Project:	WCHN00213
Sample ID:	332351005	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	26-AUG-13 08:15		
Receive Date:	28-AUG-13		
Collector:	Client		
Moisture:	2.98%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10-C20)	U	2230	2230	6860	ug/kg	1	BYT1	09/11/13	0804	1329428	1
Motor Oil (C20-C36)	B	20800	2230	6860	ug/kg	1					
Diesel Range Organics (C10-C20)	TUX	2220	2220	6830	ug/kg	1	BYT1	09/12/13	1730	1330257	2
Motor Oil (C20-C36)	TX	16900	2220	6830	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/11/13	1805	1330253
SW846 3541	3541 DRO IN SOIL PREP	MXS4	09/07/13	0858	1329427

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Dx in Soil	
2	NWTPH-Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o-Terphenyl	SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"	535 ug/kg	686	78.0	(50%-150%)
o-Terphenyl	SW 3541/NWTPH-Dx in Soil "Dry Weight Corrected"	594 ug/kg	683	87.0	(50%-150%)

Notes:

Quality Control Summary

QC Summary

Report Date: September 17, 2013

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

Contact: **Joan Kessner**

Workorder: **332351** **Client SDG:** X0020 **Project Description:** RC-232 Soil

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Diesel Range Organics											
Batch 1329428											
QC1202943394 LCS											
Diesel Range Organics (C10-C20)	66600				53100	ug/kg		79.8	(70%-130%)	BYT1	09/11/13 03:48
Motor Oil (C20-C36)	66600			B	64400	ug/kg		96.8	(70%-130%)		
**o-Terphenyl	666				598	ug/kg		89.9	(50%-150%)		
QC1202943393 MB											
Diesel Range Organics (C10-C20)				U	2160	ug/kg					09/11/13 03:11
Motor Oil (C20-C36)					7380	ug/kg					
**o-Terphenyl	665				545	ug/kg		81.8	(50%-150%)		
QC1202943395 332351001 MS											
Diesel Range Organics (C10-C20)	68800	U	2240		60100	ug/kg		87.3	(70%-130%)		09/11/13 05:01
Motor Oil (C20-C36)	68800	B	25100	B	90300	ug/kg		94.7	(70%-130%)		
**o-Terphenyl	688		593		671	ug/kg		97.4	(50%-150%)		
QC1202943396 332351001 MSD											
Diesel Range Organics (C10-C20)	68800	U	2240		57800	ug/kg	3.89	83.9	(0%-20%)		09/11/13 05:37
Motor Oil (C20-C36)	68800	B	25100	B	80700	ug/kg	11.3	80.7	(0%-20%)		
**o-Terphenyl	688		593		644	ug/kg		93.6	(50%-150%)		
Batch 1330257											
QC1202945456 LCS											
Diesel Range Organics (C10-C20)	66600				55800	ug/kg		83.7	(70%-130%)	BYT1	09/12/13 11:19
Motor Oil (C20-C36)	66600				59900	ug/kg		89.9	(70%-130%)		
**o-Terphenyl	666				612	ug/kg		91.8	(50%-150%)		
QC1202945455 MB											
Diesel Range Organics (C10-C20)				U	2160	ug/kg					09/12/13 10:42
Motor Oil (C20-C36)				U	2160	ug/kg					

QC Summary

Workorder: 332351 **Client SDG:** X0020 **Project Description:** RC-232 Soil

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Diesel Range Organics											
Batch 1330257											
**o-Terphenyl	665				477	ug/kg		71.7	(50%-150%)		
QC1202945457 332351002 MS											
Diesel Range Organics (C10-C20)	68600	JTX	5580	X	56700	ug/kg		74.4	(70%-130%)	BYT1	09/12/13 15:03
Motor Oil (C20-C36)	68600	TX	80200	TX	109000	ug/kg		42*	(70%-130%)		
**o-Terphenyl	686		631		592	ug/kg		86.3	(50%-150%)		
QC1202945458 332351002 MSD											
Diesel Range Organics (C10-C20)	68500	JTX	5580	X	55000	ug/kg	3.02	72.1	(0%-20%)		09/12/13 15:40
Motor Oil (C20-C36)	68500	TX	80200	TX	114000	ug/kg	4.65	49.7*	(0%-20%)		
**o-Terphenyl	685		631		488	ug/kg		71.3	(50%-150%)		

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J 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).Value is estimated
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate 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.
- 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
- o Analyte failed to recover within LCS limits (0rganics only)

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

Extraction of Semivolatile and Nonvolatile Organic Compounds from Soil, Sludge, and Other Miscellaneous Solid Samples

Batch ID: 1329427 **Verified by:** _____
Analyst: Matthew Selepack
Method: SW846 3541

Lab SOP: GL-OA-E-010 REV# 21
Instrument: Semi-Volatiles Manual

Sample ID	Run Date	Aliquot (g)	Prepped Aliquot (mL)	Prepped Factor (mL/g)
1202943393 MB	07-SEP-2013 08:58:00	30.06	1	0.03327
1202943394 LCS	07-SEP-2013 08:58:00	30.05	1	0.03328
332351001	07-SEP-2013 08:58:00	30.01	1	0.03332
1202943395 MS (332351001)	07-SEP-2013 08:58:00	30.02	1	0.03331
1202943396 MSD (332351001)	07-SEP-2013 08:58:00	30.01	1	0.03332
332351002	07-SEP-2013 08:58:00	30	1	0.03333
332351003	07-SEP-2013 08:58:00	30.06	1	0.03327
332351004	07-SEP-2013 08:58:00	30.05	1	0.03328
332351005	07-SEP-2013 08:58:00	30.03	1	0.0333

Type	Sample Id	Description	Serial Number	Spike Amt	Units
LCS	1202943394	AZDRO SPIKE LCS STD,4000ug/ml	WFI130905-52	1	mL
MS	1202943395	AZDRO SPIKE LCS STD,4000ug/ml	WFI130905-52	1	mL
MSD	1202943396	AZDRO SPIKE LCS STD,4000ug/ml	WFI130905-52	1	mL
SURR	All	20 ppm surrogate	WE130730-04	1	mL
REGNT	All	Methylene Chloride	1946152-D	120	mL
SOURC	All	SODIUM SULFATE	1948175	30	g

Comments:

Final Solvent: CH2Cl2
Verified by: AV

Prep Logbook

Extraction of Semivolatile and Nonvolatile Organic Compounds from Soil, Sludge, and Other Miscellaneous Solid Samples

Batch ID: 1330253 **Verified by:** _____
Analyst: Alberto Velasco
Method: SW846 3541

Lab SOP: GL-OA-E-010 REV# 21
Instrument: Semi-Volatiles Manual

Sample ID	Run Date	Aliquot (g)	Prepped Aliquot (mL)	Prepped Factor (mL/g)
1202945455 MB	11-SEP-2013 18:05:00	30.06	1	0.03327
1202945456 LCS	11-SEP-2013 18:05:00	30.02	1	0.03331
332351001 - 2	11-SEP-2013 18:05:00	30.07	1	0.03326
332351002 - 2	11-SEP-2013 18:05:00	30.12	1	0.0332
1202945457 - 2 MS (332351002)	11-SEP-2013 18:05:00	30.04	1	0.03329
1202945458 - 2 MSD (332351002)	11-SEP-2013 18:05:00	30.1	1	0.03322
332351003 - 2	11-SEP-2013 18:05:00	30.09	1	0.03323
332351004 - 2	11-SEP-2013 18:05:00	30.2	1	0.03311
332351005 - 2	11-SEP-2013 18:05:00	30.18	1	0.03313
332796001	11-SEP-2013 18:05:00	30.03	1	0.0333
1202945459 MS (332796001)	11-SEP-2013 18:05:00	30.14	1	0.03318
1202945460 MSD (332796001)	11-SEP-2013 18:05:00	30.08	1	0.03324
332796002	11-SEP-2013 18:05:00	30.2	1	0.03311
332796003	11-SEP-2013 18:05:00	30.1	1	0.03322
332796004	11-SEP-2013 18:05:00	30.04	1	0.03329
332796005	11-SEP-2013 18:05:00	30.01	1	0.03332
332930011 - 2	11-SEP-2013 18:05:00	30.23	1	0.03308
1202945461 - 2 MS (332930011)	11-SEP-2013 18:05:00	30.28	1	0.03303
1202945462 - 2 MSD (332930011)	11-SEP-2013 18:05:00	30.06	1	0.03327

Type	Sample Id	Description	Serial Number	Spike Amt	Units
LCS	1202945456	AZDRO SPIKE LCS STD,4000ug/ml	WFI130905-52	1	mL
MS	1202945457	AZDRO SPIKE LCS STD,4000ug/ml	WFI130905-52	1	mL
MS	1202945459	AZDRO SPIKE LCS STD,4000ug/ml	WFI130905-52	1	mL
MS	1202945461	AZDRO SPIKE LCS STD,4000ug/ml	WFI130905-52	1	mL
MSD	1202945458	AZDRO SPIKE LCS STD,4000ug/ml	WFI130905-52	1	mL
MSD	1202945460	AZDRO SPIKE LCS STD,4000ug/ml	WFI130905-52	1	mL
MSD	1202945462	AZDRO SPIKE LCS STD,4000ug/ml	WFI130905-52	1	mL
SURR	All	20 ppm surrogate	WE130910-04	1	mL
REGNT	All	Methylene Chloride	1961980-D	120	mL

Comments:

Final Solvent: CH2Cl2
Verified By: AAW

Prep Logbook

Batch ID: 1330253 **Verified by:** _____
Analyst: Alberto Velasco
Method: SW846 3541

Lab SOP: GL-OA-E-010 REV# 21
Instrument: Semi-Volatiles Manual

Sample ID	Run Date	Aliquot (g)	Prepped Aliquot (mL)	Prepped Factor (mL/g)		
SOURC All	SODIUM SULFATE		1948175	30	g	

PCB Analysis

Case Narrative

PCB Case Narrative
WC-HANFORD, INC. (WCHN)
SDG X0020

Method/Analysis Information

Procedure:	**Analysis of Polychlorinated Biphenyls by ECD**
Analytical Method:	SW846 3541/8082A
Prep Method:	SW846 3541
Analytical Batch Number:	1331145
Prep Batch Number:	1331144

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3541/8082A:

Sample ID	Client ID
332351002	J1RWL2
332351003	J1RWL3
332351004	J1RWL4
332351005	J1RWL5
1202947765	Method Blank (MB)
1202947766	Laboratory Control Sample (LCS)
1202947769	333295001(J1T0P1) Matrix Spike (MS)
1202947770	333295001(J1T0P1) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-040 REV# 20.

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

Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

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

Continuing Calibration Verification (CCV) Requirements

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

One of the five quantified peaks did not meet the acceptance criteria in Aroclor-1260 standard analyzed for this SDG; however, the average concentration of the five quantified peaks met the acceptance criteria.

Surrogate recovery did not meet the acceptance criteria in the standard analyzed for this SDG; however, this had no adverse effects on the data as all associated samples recovered well within the acceptance range for the surrogate.

All analytes were within the established retention time windows for this method.

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this SDG met the acceptance criteria.

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

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

QC Sample Designation
Sample 332351001 (J1RWL1) was originally selected for the matrix spike and matrix spike duplicate analysis for this SDG; however MS and MSD results were not reportable because the sample, MS and MSD results did not match well. Sample 332351001 (J1RWL1) was re-extracted and the results were reported in batch 1331373.

A WCHN sample of similar matrix in SDG 333295 was also selected for the matrix spike and matrix spike duplicate analysis in this batch. Sample 333295001 (J1T0P1) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement
The MS recoveries for SDG 333295 were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement
The MSD recoveries for SDG 333295 were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement
The RPD between the MS and MSD for SDG 333295 was within the established acceptance limits.

Technical Information

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

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported analyte concentrations were confirmed on dissimilar columns. All sample extracts were cleaned using alumina. Additionally, copper was added to all sample extracts to remove sulfur.

Sample Dilutions
Sample 332351002 (J1RWL2) was diluted due to the presence of over range target analytes.

Sample Re-extraction/Re-analysis
Re-extractions were not required for the samples reported in this batch.

Miscellaneous Information

Electronic Package Comment

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

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

Data Exception (DER) Documentation
Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for the samples in this SDG in this batch.

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

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

The higher results from either column have been chosen and reported in the data package for the client samples, MB and LCS. The data reported for the MS and MSD are from the same analytical column as the parent sample.

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

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

Aroclors quantitated on the raw data report by ChemStation data system do not necessarily represent positive Aroclor identification. In order for positive identification to be made, the Aroclor must match in pattern and retention time; as well as quantitate relatively close between the primary and confirmation columns, as specified in SW846 method 8000. When these conditions are not met, the Aroclor is reported as a non-detect on the data report.

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description

ECD8A.I_1	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series ECD	Rtx-CLP I	30m x 0.25mm, 0.25um (Rtx-CLPesticide I)
ECD8A.I_2	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series ECD	Rtx-CLP II	30m x 0.25mm, 0.20um (Rtx-CLPesticide II)

Method/Analysis Information

Procedure:	**Analysis of Polychlorinated Biphenyls by ECD**
Analytical Method:	SW846 3541/8082A
Prep Method:	SW846 3541
Analytical Batch Number:	1331373
Prep Batch Number:	1331356

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3541/8082A:

Sample ID	Client ID
332351001	J1RWL1
1202948343	Method Blank (MB)
1202948346	Laboratory Control Sample (LCS)
1202948672	332351001(J1RWL1) Matrix Spike (MS)
1202948673	332351001(J1RWL1) Matrix Spike Duplicate (MSD)

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

Preparation/Analytical Method Verification

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-040 REV# 20.

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

Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

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

Continuing Calibration Verification (CCV) Requirements
All associated calibration verification standards (ICV or CCV) met the acceptance criteria. All analytes were within the established retention time windows for this method.

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this SDG met the acceptance criteria.

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

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

QC Sample Designation
Sample 332351001 (J1RWL1) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement
The MS recoveries for this SDG were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement
The MSD recoveries for this SDG were within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement
The RPD between the MS and MSD met the acceptance limits.

Technical Information

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

Preparation/Analytical Method Verification
All sample extracts were cleaned using alumina. Additionally, copper was added to all sample extracts to remove sulfur.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Sample 332351001 (J1RWL1) was extracted and analyzed twice due to quality issue in the first analysis. The second analysis was reported.

Miscellaneous Information

Electronic Package Comment

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

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

Data Exception (DER) Documentation
Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for the samples in this SDG in this batch.

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

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

The higher results from either column have been chosen and reported in the data package for the client samples, MB and LCS. The data reported for the MS and MSD are from the same analytical column as the parent sample.

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

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

Aroclors quantitated on the raw data report by ChemStation data system do not necessarily represent positive Aroclor identification. In order for positive identification to be made, the Aroclor must match in pattern and retention time; as well as quantitate relatively close between the primary and confirmation columns, as specified in SW846 method 8000. When these conditions are not met, the Aroclor is reported as a non-detect on the data report.

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description
ECD8A.I_1	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series ECD	Rtx-CLP I	30m x 0.25mm, 0.25um (Rtx-CLPesticide I)
ECD8A.I_2	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series ECD	Rtx-CLP II	30m x 0.25mm, 0.20um (Rtx-CLPesticide II)

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.

Sample Data Summary

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: X0020

Client Sample ID: J1RWL1
Sample ID: 332351001
Matrix: SOIL
Collect Date: 26-AUG-13 08:15
Receive Date: 28-AUG-13
Collector: Client
Moisture: 3.2%

Project: WCHN00213
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB											
SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"											
Aroclor-1016	U	1.13	1.13	3.40	ug/kg	1	JXM	09/18/13	0929	1331373	1
Aroclor-1221	U	1.13	1.13	3.40	ug/kg	1					
Aroclor-1232	U	1.13	1.13	3.40	ug/kg	1					
Aroclor-1242	P	4.42	1.13	3.40	ug/kg	1					
Aroclor-1248	U	1.13	1.13	3.40	ug/kg	1					
Aroclor-1260		26.4	1.13	3.40	ug/kg	1					
Aroclor-1254		10.9	1.13	3.40	ug/kg	1	JXM	09/18/13	0929	1331373	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	AXV1	09/13/13	1725	1331144
SW846 3541	Prep Method 3541 PCB Prep Soil	SJW1	09/17/13	0830	1331356

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8082A	
2	SW846 3541/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Decachlorobiphenyl	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	5.40 ug/kg	6.79	79.5	(35%-119%)
4cmx	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	5.19 ug/kg	6.79	76.4	(44%-106%)

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: X0020

Client Sample ID:	J1RWL2	Project:	WCHN00213
Sample ID:	332351002	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	26-AUG-13 08:20		
Receive Date:	28-AUG-13		
Collector:	Client		
Moisture:	3.02%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB											
SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"											
Aroclor-1016	DU	22.8	22.8	68.5	ug/kg	20	JXM	09/16/13	1103	1331145	1
Aroclor-1221	DU	22.8	22.8	68.5	ug/kg	20					
Aroclor-1232	DU	22.8	22.8	68.5	ug/kg	20					
Aroclor-1242	D	136	22.8	68.5	ug/kg	20					
Aroclor-1248	DU	22.8	22.8	68.5	ug/kg	20					
Aroclor-1254	D	198	22.8	68.5	ug/kg	20	JXM	09/16/13	1103	1331145	2
Aroclor-1260	D	437	22.8	68.5	ug/kg	20					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	AXV1	09/13/13	1725	1331144

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8082A	
2	SW846 3541/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	5.26 ug/kg	6.85	76.7	(44%-106%)
Decachlorobiphenyl	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	5.96 ug/kg	6.85	87.0	(35%-119%)

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: X0020

Client Sample ID: J1RWL3
Sample ID: 332351003
Matrix: SOIL
Collect Date: 26-AUG-13 08:25
Receive Date: 28-AUG-13
Collector: Client
Moisture: 2.65%

Project: WCHN00213
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB											
SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"											
Aroclor-1016	U	1.14	1.14	3.41	ug/kg	1	JXM	09/16/13	1118	1331145	1
Aroclor-1221	U	1.14	1.14	3.41	ug/kg	1					
Aroclor-1232	U	1.14	1.14	3.41	ug/kg	1					
Aroclor-1248	U	1.14	1.14	3.41	ug/kg	1					
Aroclor-1260		24.3	1.14	3.41	ug/kg	1					
Aroclor-1242	J	2.41	1.14	3.41	ug/kg	1	JXM	09/16/13	1118	1331145	2
Aroclor-1254		8.20	1.14	3.41	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	AXV1	09/13/13	1725	1331144

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8082A	
2	SW846 3541/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	5.00 ug/kg	6.82	73.3	(44%-106%)
Decachlorobiphenyl	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	5.33 ug/kg	6.82	78.1	(35%-119%)

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: X0020

Client Sample ID: J1RWL4
Sample ID: 332351004
Matrix: SOIL
Collect Date: 26-AUG-13 08:30
Receive Date: 28-AUG-13
Collector: Client
Moisture: 1.95%

Project: WCHN00213
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB											
SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"											
Aroclor-1016	U	1.13	1.13	3.40	ug/kg	1	JXM	09/16/13	1132	1331145	1
Aroclor-1221	U	1.13	1.13	3.40	ug/kg	1					
Aroclor-1232	U	1.13	1.13	3.40	ug/kg	1					
Aroclor-1242	J	2.27	1.13	3.40	ug/kg	1					
Aroclor-1248	U	1.13	1.13	3.40	ug/kg	1					
Aroclor-1260		14.0	1.13	3.40	ug/kg	1					
Aroclor-1254		5.40	1.13	3.40	ug/kg	1	JXM	09/16/13	1132	1331145	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	AXV1	09/13/13	1725	1331144

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8082A	
2	SW846 3541/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Decachlorobiphenyl	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	6.05 ug/kg	6.79	89.1	(35%-119%)
4cmx	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	6.31 ug/kg	6.79	92.9	(44%-106%)

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: X0020

Client Sample ID: J1RWL5
Sample ID: 332351005
Matrix: SOIL
Collect Date: 26-AUG-13 08:15
Receive Date: 28-AUG-13
Collector: Client
Moisture: 2.98%

Project: WCHN00213
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB											
SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"											
Aroclor-1016	U	1.14	1.14	3.42	ug/kg	1	JXM	09/16/13	1146	1331145	1
Aroclor-1221	U	1.14	1.14	3.42	ug/kg	1					
Aroclor-1232	U	1.14	1.14	3.42	ug/kg	1					
Aroclor-1242		3.59	1.14	3.42	ug/kg	1					
Aroclor-1248	U	1.14	1.14	3.42	ug/kg	1					
Aroclor-1260		26.9	1.14	3.42	ug/kg	1					
Aroclor-1254		10.6	1.14	3.42	ug/kg	1	JXM	09/16/13	1146	1331145	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	AXV1	09/13/13	1725	1331144

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8082A	
2	SW846 3541/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Decachlorobiphenyl	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	5.04 ug/kg	6.83	73.8	(35%-119%)
4cmx	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	5.20 ug/kg	6.83	76.0	(44%-106%)

Notes:

Quality Control Summary

QC Summary

Report Date: September 18, 2013

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

Contact: **Joan Kessner**

Workorder: **332351** **Client SDG:** X0020 **Project Description:** RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Semi-Volatiles-PCB										
Batch 1331145										
QC1202947766 LCS										
Aroclor-1016	33.3			26.3	ug/kg		78.9	(39%-120%)	JXM	09/16/13 10:12
Aroclor-1260	33.3			23.0	ug/kg		69	(50%-116%)		
**4cmx	6.66			5.64	ug/kg		84.7	(44%-106%)		
**Decachlorobiphenyl	6.66			6.83	ug/kg		103	(35%-119%)		
QC1202947765 MB										
Aroclor-1016			U	1.11	ug/kg					09/16/13 10:00
Aroclor-1221			U	1.11	ug/kg					
Aroclor-1232			U	1.11	ug/kg					
Aroclor-1242			U	1.11	ug/kg					
Aroclor-1248			U	1.11	ug/kg					
Aroclor-1254			U	1.11	ug/kg					
Aroclor-1260			U	1.11	ug/kg					
**4cmx	6.65			5.34	ug/kg		80.3	(44%-106%)		
**Decachlorobiphenyl	6.65			6.17	ug/kg		92.8	(35%-119%)		
Batch 1331373										
QC1202948346 LCS										
Aroclor-1016	33.2			22.8	ug/kg		68.5	(39%-120%)	JXM	09/18/13 09:17
Aroclor-1260	33.2			23.3	ug/kg		70.1	(50%-116%)		
**4cmx	6.64			5.50	ug/kg		82.8	(44%-106%)		
**Decachlorobiphenyl	6.64			7.48	ug/kg		113	(35%-119%)		
QC1202948343 MB										
Aroclor-1016			U	1.10	ug/kg					09/18/13 09:05

QC Summary

Workorder: 332351 **Client SDG:** X0020 **Project Description:** RC-232 Soil

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Semi-Volatiles-PCB											
Batch 1331373											
Aroclor-1221				U	1.10	ug/kg				JXM	09/18/13 09:05
Aroclor-1232				U	1.10	ug/kg					
Aroclor-1242				U	1.10	ug/kg					
Aroclor-1248				U	1.10	ug/kg					
Aroclor-1254				U	1.10	ug/kg					
Aroclor-1260				U	1.10	ug/kg					
**4cmx	6.61				5.20	ug/kg		78.7	(44%-106%)		
**Decachlorobiphenyl	6.61				6.43	ug/kg		97.3	(35%-119%)		
QC1202948672 332351001 MS											
Aroclor-1016	34.3	U	1.13		26.8	ug/kg		78.1	(25%-125%)		09/18/13 09:44
Aroclor-1260	34.3		26.4		52.6	ug/kg		76.2	(28%-127%)		
**4cmx	6.86		5.19		5.70	ug/kg		83	(44%-106%)		
**Decachlorobiphenyl	6.86		5.40		6.86	ug/kg		100	(35%-119%)		
QC1202948673 332351001 MSD											
Aroclor-1016	33.9	U	1.13		25.1	ug/kg	6.69	74.1	(0%-30%)		09/18/13 09:58
Aroclor-1260	33.9		26.4		51.9	ug/kg	1.39	75	(0%-30%)		
**4cmx	6.77		5.19		5.61	ug/kg		82.8	(44%-106%)		
**Decachlorobiphenyl	6.77		5.40		6.30	ug/kg		93	(35%-119%)		

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.

QC Summary

Workorder: 332351 **Client SDG:** X0020 **Project Description:** RC-232 Soil

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

E Concentration exceeds the calibration range of the instrument

J 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).Value is estimated

P Aroclor target analyte with greater than 25% difference between column analyses.

T Spike and/or spike duplicate 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.

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

o Analyte failed to recover within LCS limits (0rganics only)

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

Automated Soxhlet Extraction

Batch ID: 1331144 **Verified by:** _____
Analyst: Alberto Velasco
Method: SW846 3541

Lab SOP: GL-OA-E-066 REV# 5
Instrument: Semi-Volatiles Manual

Sample ID	Run Date	Aliquot (g)	Clean Up	Amount 1 (mL)	Amount 2 (mL)	Amount 3 (mL)	Prepped Aliquot (mL)	Prepped Factor (mL/g)
1202947765 MB	13-SEP-2013 17:25:00	30.07	H2SO4/KMnO4	2	2	9	1	0.03326
1202947766 LCS	13-SEP-2013 17:25:00	30.03	H2SO4/KMnO4	2	2	9	1	0.0333
332351001	13-SEP-2013 17:25:00	30.14	H2SO4/KMnO4	2	2	9	1	0.03318
1202947767 MS (332351001)	13-SEP-2013 17:25:00	30.04	H2SO4/KMnO4	2	2	9	1	0.03329
1202947768 MSD (332351001)	13-SEP-2013 17:25:00	30.06	H2SO4/KMnO4	2	2	9	1	0.03327
332351002	13-SEP-2013 17:25:00	30.09	H2SO4/KMnO4	2	2	9	1	0.03323
332351003	13-SEP-2013 17:25:00	30.11	H2SO4/KMnO4	2	2	9	1	0.03321
332351004	13-SEP-2013 17:25:00	30.03	H2SO4/KMnO4	2	2	9	1	0.0333
332351005	13-SEP-2013 17:25:00	30.16	H2SO4/KMnO4	2	2	9	1	0.03316
333295001	13-SEP-2013 17:25:00	30.09	H2SO4/KMnO4	2	2	9	1	0.03323
1202947769 MS (333295001)	13-SEP-2013 17:25:00	30.14	H2SO4/KMnO4	2	2	9	1	0.03318
1202947770 MSD (333295001)	13-SEP-2013 17:25:00	30.2	H2SO4/KMnO4	2	2	9	1	0.03311

Type	Sample Id	Description	Serial Number	Spike Amt	Units
LCS	1202947766	PCB Laboratory Control	WE130819-04	1	mL
MS	1202947767	PCB Laboratory Control	WE130819-04	1	mL
MS	1202947769	PCB Laboratory Control	WE130819-04	1	mL
MSD	1202947768	PCB Laboratory Control	WE130819-04	1	mL
MSD	1202947770	PCB Laboratory Control	WE130819-04	1	mL
SURR	All	PEST LOW LEVEL SURROGATE 200 UG/L	WE130807-01	1	mL
REGNT	All	Hexane	130906-B4	120	mL
REGNT	All	50g KMnO4 per 1L DI H2O	1961551	5	mL
REGNT	All	1:1 sulfuric acid	1961995	5	mL
SOURC	All	SODIUM SULFATE	1948175	30	g

Comments:

Final Solvent: Hexane
Clean up Initials: AV
Verified: MJS
Clean up SOP: GL-OA-E-037
Clean up Date: 9-13-13

Prep Logbook

Automated Soxhlet Extraction

Batch ID: 1331356 **Verified by:** _____
Analyst: Sirena White
Method: SW846 3541

Lab SOP: GL-OA-E-066 REV# 5
Instrument: Semi-Volatiles Manual

Sample ID	Run Date	Aliquot (g)	Clean Up	Amount 1 (mL)	Amount 2 (mL)	Amount 3 (mL)	Prepped Aliquot (mL)	Prepped Factor (mL/g)
1202948343 MB	17-SEP-2013 08:30:00	30.28	H2SO4/KMNO4	2	2	9	1	0.03303
1202948346 LCS	17-SEP-2013 08:30:00	30.1	H2SO4/KMNO4	2	2	9	1	0.03322
332351001 - 2	17-SEP-2013 08:30:00	30.42	H2SO4/KMNO4	2	2	9	1	0.03287
1202948672 - 2 MS (332351001)	17-SEP-2013 08:30:00	30.1	H2SO4/KMNO4	2	2	9	1	0.03322
1202948673 - 2 MSD (332351001)	17-SEP-2013 08:30:00	30.5	H2SO4/KMNO4	2	2	9	1	0.03279
332953001	17-SEP-2013 08:30:00	10.06	H2SO4/KMNO4	2	2	9	1	0.0994
333202001	17-SEP-2013 08:30:00	10.31	H2SO4/KMNO4	2	2	9	1	0.09699
333203001	17-SEP-2013 08:30:00	10.1	H2SO4/KMNO4	2	2	9	1	0.09901
333204001	17-SEP-2013 08:30:00	10.3	H2SO4/KMNO4	2	2	9	1	0.09709
333403002	17-SEP-2013 08:30:00	10.13	H2SO4/KMNO4	2	2	9	1	0.09872
333408002	17-SEP-2013 08:30:00	10.35	H2SO4/KMNO4	2	2	9	1	0.09662

Type	Sample Id	Description	Serial Number	Spike Amt	Units
LCS	1202948346	PCB Laboratory Control	WE130819-04	1	mL
MS	1202948672	PCB Laboratory Control	WE130819-04	1	mL
MSD	1202948673	PCB Laboratory Control	WE130819-04	1	mL
SURR	All	PEST LOW LEVEL SURROGATE 200 UG/L	WE130912-01	1	mL
REGNT	All	Hexane	130906-B4	120	mL
REGNT	All	50g KMnO4 per 1L DI H2O	1961551	5	mL
REGNT	All	1:1 sulfuric acid	1961995	5	mL
SOURC	All	SODIUM SULFATE	1948175	30	g

Comments:

Final Solvent: Hexane
Verified by:SG
Clean-up Initials:SJW
Clean-up SOP:GL-OA-E-037 REV.1
Clean-up date:09-17-13

Metals Analysis

Case Narrative

Metals Fractional Narrative
WC-HANFORD, INC. (WCHN)
SDG X0020

Sample Analysis

Sample ID	Client ID
332351001	J1RWL1
332351002	J1RWL2
332351003	J1RWL3
332351004	J1RWL4
332351005	J1RWL5
332351006	J1RWL6
1202937849	Method Blank (MB) **ICP**
1202937850	Laboratory Control Sample (LCS)
1202937853	332351001(J1RWL1L) Serial Dilution (SD)
1202937851	332351001(J1RWL1D) Sample Duplicate (DUP)
1202937852	332351001(J1RWL1S) Matrix Spike (MS)
1202947650	332351001(J1RWL1PS) Post Spike (PS)
1202937844	Method Blank (MB) **ICP-MS**
1202937845	Laboratory Control Sample (LCS)
1202937848	332351001(J1RWL1L) Serial Dilution (SD)
1202937846	332351001(J1RWL1D) Sample Duplicate (DUP)
1202937847	332351001(J1RWL1S) Matrix Spike (MS)
1202946387	Method Blank (MB) **CVAA**
1202946388	Laboratory Control Sample (LCS)
1202946391	332351001(J1RWL1L) Serial Dilution (SD)
1202946389	332351001(J1RWL1S) Matrix Spike (MS)
1202946390	332351001(J1RWL1SD) Matrix Spike Duplicate (MSD)

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

Method/Analysis Information

Analytical Batch: 1327000, 1326998 and 1330613
Prep Batch : 1326999, 1326997 and 1330611

Standard Operating Procedures:	GL-MA-E-013 REV# 22, GL-MA-E-009 REV# 22, GL-MA-E-014 REV# 25 and GL-MA-E-010 REV# 26
Analytical Method:	SW846 3050B/6010C, SW846 3050B/6020A and SW846 7471B
Prep Method :	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 - 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.

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

Calibration Information

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

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

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

Continuing Calibration Blank (CCB) Requirements
All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements
All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement
The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement
The following sample was selected as the quality control (QC) sample for this SDG: 332351001 (J1RWL1).

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. The MS met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes with the exception of silicon.

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.

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 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the established criteria of less than 10% difference (%D) with the exception of silicon.

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 332351001, 332351002, 332351003, 332351004, and 332351005 required dilutions in order to bring raw values of titanium within the linear range of the instrument, and for the analytes antimony, cobalt, lead, vanadium, and zinc that titanium interferes with, in order to ensure that the inter-element correction factors were valid on the ICP. 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 are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following DER was generated for this SDG: 1222640. A copy is included in the Miscellaneous Data section of this package.

Additional Comments
Additional comments were not required for this SDG.

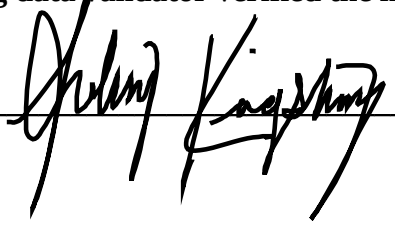
Certification Statement

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:_____09/18/2013_____**

DATA EXCEPTION REPORT

Mo.Day Yr.	**Division:**	**Quality Criteria:**	**Type:**
18-SEP-13	Industrial	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
ICP	SW846 3050B/6010C	Solid	WCHN
Batch ID:	**Sample Numbers:**		
1327000	See Below		

Potentially affected work order(s)(SDG): 332351(X0020)

Application Issues:

Failed Recovery for MS/PS

Specification and Requirements Exception Description:	**DER Disposition:**
1. Failed Recovery for MS/PS: QC 1202937852MS	1. The matrix spike recovery failed outside of the control limits for silicon. The post spike passed the required control limits for all analytes. This verifies the absence of a matrix interference. Per GEL's accredited methods and SOPs, a corrective action is not required and the data is qualified and reported.

Originator's Name:

Helen Camello 18-SEP-13

Data Validator/Group Leader:

Jerry Wigfall 18-SEP-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: X0020 GEL Work Order: 332351 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).

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.

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

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: X0020

Client Sample ID:	J1RWL1	Project:	WCHN00213
Sample ID:	332351001	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	26-AUG-13 08:15		
Receive Date:	28-AUG-13		
Collector:	Client		
Moisture:	3.2%		

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	0.00412	0.00412	0.0123	mg/kg	1	NOR1	09/13/13	1206	1330613	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Silicon	MN	302	1.47	9.80	mg/kg	1	HSC	09/13/13	2041	1327000	2
Aluminum		6090	6.66	19.6	mg/kg	1	HSC	09/16/13	1542	1327000	3
Arsenic	B	2.31	0.490	2.94	mg/kg	1					
Barium		60.0	0.098	0.490	mg/kg	1					
Beryllium		0.575	0.098	0.490	mg/kg	1					
Boron	B	1.35	0.980	4.90	mg/kg	1					
Cadmium	B	0.246	0.098	0.490	mg/kg	1					
Calcium		3380	7.84	24.5	mg/kg	1					
Chromium		11.2	0.147	0.490	mg/kg	1					
Copper		13.1	0.294	0.980	mg/kg	1					
Iron		19000	7.84	24.5	mg/kg	1					
Magnesium		4280	8.33	29.4	mg/kg	1					
Manganese		274	0.196	0.980	mg/kg	1					
Molybdenum	B	0.461	0.196	0.980	mg/kg	1					
Nickel		10.8	0.147	0.490	mg/kg	1					
Potassium		1300	6.27	24.5	mg/kg	1					
Silver	U	0.098	0.098	0.490	mg/kg	1					
Sodium		157	6.86	24.5	mg/kg	1					
Antimony	DU	1.62	1.62	4.90	mg/kg	5	HSC	09/18/13	1011	1327000	4
Cobalt	D	7.07	0.735	2.45	mg/kg	5					
Lead	D	7.84	1.62	4.90	mg/kg	5					
Vanadium	D	51.5	0.490	2.45	mg/kg	5					
Zinc	D	46.2	1.96	4.90	mg/kg	5					
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.316	0.316	1.00	mg/kg	2	SKJ	09/13/13	1954	1326998	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/13/13	0820	1326997
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1326999
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/12/13	1659	1330611

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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	Client SDG:	X0020
Project:	RC-232 Soil		

Client Sample ID:	J1RWL1	Project:	WCHN00213
Sample ID:	332351001	Client ID:	WCHN001

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/6020A	

Notes:

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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: X0020

Client Sample ID:	J1RWL2	Project:	WCHN00213
Sample ID:	332351002	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	26-AUG-13 08:20		
Receive Date:	28-AUG-13		
Collector:	Client		
Moisture:	3.02%		

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	0.00385	0.00385	0.0115	mg/kg	1	NOR1	09/13/13	1218	1330613	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Silicon	MN	355	1.41	9.41	mg/kg	1	HSC	09/13/13	2101	1327000	2
Aluminum		6100	6.40	18.8	mg/kg	1	HSC	09/16/13	1603	1327000	3
Arsenic	B	2.25	0.470	2.82	mg/kg	1					
Barium		58.3	0.0941	0.470	mg/kg	1					
Beryllium		0.557	0.0941	0.470	mg/kg	1					
Boron	B	1.13	0.941	4.70	mg/kg	1					
Cadmium	B	0.340	0.0941	0.470	mg/kg	1					
Calcium		3940	7.53	23.5	mg/kg	1					
Chromium		12.0	0.141	0.470	mg/kg	1					
Copper		14.1	0.282	0.941	mg/kg	1					
Iron		18300	7.53	23.5	mg/kg	1					
Magnesium		4280	8.00	28.2	mg/kg	1					
Manganese		264	0.188	0.941	mg/kg	1					
Molybdenum	B	0.406	0.188	0.941	mg/kg	1					
Nickel		10.9	0.141	0.470	mg/kg	1					
Potassium		1320	6.02	23.5	mg/kg	1					
Silver	U	0.0941	0.0941	0.470	mg/kg	1					
Sodium		171	6.59	23.5	mg/kg	1					
Antimony	DU	1.55	1.55	4.70	mg/kg	5	HSC	09/18/13	1029	1327000	4
Cobalt	D	7.33	0.706	2.35	mg/kg	5					
Lead	D	14.3	1.55	4.70	mg/kg	5					
Vanadium	D	52.8	0.470	2.35	mg/kg	5					
Zinc	D	47.4	1.88	4.70	mg/kg	5					
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.301	0.301	1.00	mg/kg	2	SKJ	09/13/13	2041	1326998	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/13/13	0820	1326997
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1326999
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/12/13	1659	1330611

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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	Client SDG:	X0020
Project:	RC-232 Soil		

Client Sample ID:	J1RWL2	Project:	WCHN00213
Sample ID:	332351002	Client ID:	WCHN001

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/6020A	

Notes:

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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: X0020

Client Sample ID:	J1RWL3	Project:	WCHN00213
Sample ID:	332351003	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	26-AUG-13 08:25		
Receive Date:	28-AUG-13		
Collector:	Client		
Moisture:	2.65%		

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	0.00382	0.00382	0.0114	mg/kg	1	NOR1	09/13/13	1220	1330613	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Silicon	MN	338	1.40	9.32	mg/kg	1	HSC	09/13/13	2104	1327000	2
Aluminum		5510	6.34	18.6	mg/kg	1	HSC	09/16/13	1605	1327000	3
Arsenic	B	2.14	0.466	2.80	mg/kg	1					
Barium		59.3	0.0932	0.466	mg/kg	1					
Beryllium		0.540	0.0932	0.466	mg/kg	1					
Boron	U	0.932	0.932	4.66	mg/kg	1					
Cadmium	B	0.258	0.0932	0.466	mg/kg	1					
Calcium		3970	7.46	23.3	mg/kg	1					
Chromium		11.4	0.140	0.466	mg/kg	1					
Copper		12.0	0.280	0.932	mg/kg	1					
Iron		17700	7.46	23.3	mg/kg	1					
Magnesium		3930	7.92	28.0	mg/kg	1					
Manganese		251	0.186	0.932	mg/kg	1					
Molybdenum	B	0.493	0.186	0.932	mg/kg	1					
Nickel		9.74	0.140	0.466	mg/kg	1					
Potassium		1150	5.97	23.3	mg/kg	1					
Silver	U	0.0932	0.0932	0.466	mg/kg	1					
Sodium		150	6.53	23.3	mg/kg	1					
Antimony	DU	1.54	1.54	4.66	mg/kg	5	HSC	09/18/13	1031	1327000	4
Cobalt	D	7.47	0.699	2.33	mg/kg	5					
Lead	D	5.56	1.54	4.66	mg/kg	5					
Vanadium	D	52.7	0.466	2.33	mg/kg	5					
Zinc	D	54.2	1.86	4.66	mg/kg	5					
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.312	0.312	1.00	mg/kg	2	SKJ	09/13/13	2047	1326998	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/13/13	0820	1326997
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1326999
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/12/13	1659	1330611

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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	Client SDG:	X0020
Project:	RC-232 Soil		

Client Sample ID:	J1RWL3	Project:	WCHN00213
Sample ID:	332351003	Client ID:	WCHN001

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/6020A	

Notes:

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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: X0020

Client Sample ID: J1RWL4
Sample ID: 332351004
Matrix: SOIL
Collect Date: 26-AUG-13 08:30
Receive Date: 28-AUG-13
Collector: Client
Moisture: 1.95%

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	0.00398	0.00398	0.0119	mg/kg	1	NOR1	09/13/13	1222	1330613	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Silicon	MN	349	1.42	9.48	mg/kg	1	HSC	09/13/13	2106	1327000	2
Aluminum		5620	6.45	19.0	mg/kg	1	HSC	09/16/13	1608	1327000	3
Arsenic	B	1.80	0.474	2.84	mg/kg	1					
Barium		54.8	0.0948	0.474	mg/kg	1					
Beryllium		0.533	0.0948	0.474	mg/kg	1					
Boron	B	1.12	0.948	4.74	mg/kg	1					
Cadmium	B	0.277	0.0948	0.474	mg/kg	1					
Calcium		4140	7.58	23.7	mg/kg	1					
Chromium		10.3	0.142	0.474	mg/kg	1					
Copper		12.9	0.284	0.948	mg/kg	1					
Iron		17700	7.58	23.7	mg/kg	1					
Magnesium		4140	8.06	28.4	mg/kg	1					
Manganese		255	0.190	0.948	mg/kg	1					
Molybdenum	B	0.353	0.190	0.948	mg/kg	1					
Nickel		10.2	0.142	0.474	mg/kg	1					
Potassium		1200	6.07	23.7	mg/kg	1					
Silver	U	0.0948	0.0948	0.474	mg/kg	1					
Sodium		196	6.64	23.7	mg/kg	1					
Antimony	DU	1.56	1.56	4.74	mg/kg	5	HSC	09/18/13	1033	1327000	4
Cobalt	D	7.10	0.711	2.37	mg/kg	5					
Lead	D	5.37	1.56	4.74	mg/kg	5					
Vanadium	D	50.5	0.474	2.37	mg/kg	5					
Zinc	D	41.9	1.90	4.74	mg/kg	5					
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.323	0.323	1.00	mg/kg	2	SKJ	09/13/13	2053	1326998	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/13/13	0820	1326997
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1326999
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/12/13	1659	1330611

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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	Client SDG:	X0020
Project:	RC-232 Soil		

Client Sample ID:	J1RWL4	Project:	WCHN00213
Sample ID:	332351004	Client ID:	WCHN001

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/6020A	

Notes:

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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: X0020

Client Sample ID:	J1RWL5	Project:	WCHN00213
Sample ID:	332351005	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	26-AUG-13 08:15		
Receive Date:	28-AUG-13		
Collector:	Client		
Moisture:	2.98%		

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	0.00395	0.00395	0.0118	mg/kg	1	NOR1	09/13/13	1223	1330613	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Silicon	MN	384	1.51	10.1	mg/kg	1	HSC	09/13/13	2109	1327000	2
Aluminum		6090	6.86	20.2	mg/kg	1	HSC	09/16/13	1611	1327000	3
Arsenic	B	2.44	0.504	3.03	mg/kg	1					
Barium		59.9	0.101	0.504	mg/kg	1					
Beryllium		0.605	0.101	0.504	mg/kg	1					
Boron	B	1.46	1.01	5.04	mg/kg	1					
Cadmium	B	0.268	0.101	0.504	mg/kg	1					
Calcium		3420	8.07	25.2	mg/kg	1					
Chromium		10.9	0.151	0.504	mg/kg	1					
Copper		13.2	0.303	1.01	mg/kg	1					
Iron		19100	8.07	25.2	mg/kg	1					
Magnesium		4210	8.57	30.3	mg/kg	1					
Manganese		278	0.202	1.01	mg/kg	1					
Molybdenum	B	0.459	0.202	1.01	mg/kg	1					
Nickel		10.4	0.151	0.504	mg/kg	1					
Potassium		1320	6.45	25.2	mg/kg	1					
Silver	U	0.101	0.101	0.504	mg/kg	1					
Sodium		160	7.06	25.2	mg/kg	1					
Antimony	DU	1.66	1.66	5.04	mg/kg	5	HSC	09/18/13	1035	1327000	4
Cobalt	D	7.38	0.756	2.52	mg/kg	5					
Lead	D	8.35	1.66	5.04	mg/kg	5					
Vanadium	D	54.1	0.504	2.52	mg/kg	5					
Zinc	D	49.0	2.02	5.04	mg/kg	5					
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.334	0.334	1.01	mg/kg	2	SKJ	09/13/13	2059	1326998	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/13/13	0820	1326997
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1326999
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/12/13	1659	1330611

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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	Client SDG:	X0020
Project:	RC-232 Soil		

Client Sample ID:	J1RWL5	Project:	WCHN00213
Sample ID:	332351005	Client ID:	WCHN001

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/6020A	

Notes:

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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:	X0020

Client Sample ID:	J1RWL6	Project:	WCHN00213
Sample ID:	332351006	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	26-AUG-13 08:05		
Receive Date:	28-AUG-13		
Collector:	Client		
Moisture:	<0.1%		

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	0.00393	0.00393	0.0117	mg/kg	1	NOR1	09/13/13	1225	1330613	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Silicon	MN	142	1.39	9.30	mg/kg	1	HSC	09/13/13	2112	1327000	2
Aluminum		165	6.32	18.6	mg/kg	1	HSC	09/16/13	1613	1327000	3
Arsenic	U	0.465	0.465	2.79	mg/kg	1					
Barium		1.98	0.093	0.465	mg/kg	1					
Beryllium	B	0.0969	0.093	0.465	mg/kg	1					
Boron	U	0.930	0.930	4.65	mg/kg	1					
Cadmium	U	0.093	0.093	0.465	mg/kg	1					
Calcium		37.4	7.44	23.2	mg/kg	1					
Chromium	B	0.241	0.139	0.465	mg/kg	1					
Copper	U	0.279	0.279	0.930	mg/kg	1					
Iron		1050	7.44	23.2	mg/kg	1					
Magnesium		39.4	7.90	27.9	mg/kg	1					
Manganese		7.51	0.186	0.930	mg/kg	1					
Molybdenum	U	0.186	0.186	0.930	mg/kg	1					
Nickel		0.628	0.139	0.465	mg/kg	1					
Potassium		62.3	5.95	23.2	mg/kg	1					
Silver	U	0.093	0.093	0.465	mg/kg	1					
Sodium	U	6.51	6.51	23.2	mg/kg	1					
Antimony	U	0.307	0.307	0.930	mg/kg	1	HSC	09/18/13	1037	1327000	4
Cobalt	B	0.200	0.139	0.465	mg/kg	1					
Lead	BC	0.598	0.307	0.930	mg/kg	1					
Vanadium		1.26	0.093	0.465	mg/kg	1					
Zinc	C	1.82	0.372	0.930	mg/kg	1					
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.290	0.290	1.00	mg/kg	2	SKJ	09/13/13	2105	1326998	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/13/13	0820	1326997
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1326999
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/12/13	1659	1330611

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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	Client SDG:	X0020
Project:	RC-232 Soil		

Client Sample ID:	J1RWL6	Project:	WCHN00213
Sample ID:	332351006	Client ID:	WCHN001

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/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

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

Contact: **Joan Kessner**

Workorder: **332351** **Client SDG:** X0020 **Project Description:** RC-232 Soil

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis - ICPMS											
Batch 1326998											
QC1202937846 332351001 DUP											
Selenium		DU	0.316	DU	0.305	mg/kg	N/A ^			SKJ	09/13/13 20:00
QC1202937845 LCS											
Selenium	4.89			D	4.51	mg/kg		92.1	(80%-120%)		09/13/13 19:36
QC1202937844 MB											
Selenium				DU	0.327	mg/kg					09/13/13 19:30
QC1202937847 332351001 MS											
Selenium	4.87	DU	0.316	D	4.02	mg/kg		82.6	(75%-125%)		09/13/13 20:06
QC1202937848 332351001 SDILT											
Selenium		DU	-0.70	DU	1.58	ug/L	N/A		(0%-10%)		09/13/13 20:18
Metals Analysis-ICP											
Batch 1327000											
QC1202937851 332351001 DUP											
Aluminum			6090		6270	mg/kg	2.93		(0%-20%)	HSC	09/16/13 15:45
Antimony		DU	1.62	DU	1.56	mg/kg	N/A ^				09/18/13 10:13
Arsenic		B	2.31	B	2.33	mg/kg	0.959 ^		(+/-2.84)		09/16/13 15:45
Barium			60.0		61.5	mg/kg	2.51		(0%-20%)		
Beryllium			0.575		0.601	mg/kg	4.53 ^		(+/-0.473)		
Boron		B	1.35	B	1.48	mg/kg	8.98 ^		(+/-4.73)		
Cadmium		B	0.246	B	0.268	mg/kg	8.79 ^		(+/-0.473)		
Calcium			3380		3840	mg/kg	12.7		(0%-20%)		
Chromium			11.2		11.6	mg/kg	3.23		(0%-20%)		
Cobalt		D	7.07	D	7.76	mg/kg	9.36 ^		(+/-2.37)		09/18/13 10:13
Copper			13.1		13.3	mg/kg	1.14		(0%-20%)		09/16/13 15:45
Iron			19000		20100	mg/kg	5.72		(0%-20%)		

QC Summary

Workorder: 332351 **Client SDG:** X0020 **Project Description:** RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP										
Batch 1327000										
Lead	D	7.84	D	7.01	mg/kg	11.2 ^		(+/-4.73)	HSC	09/18/13 10:13
Magnesium		4280		4460	mg/kg	4.08		(0%-20%)		09/16/13 15:45
Manganese		274		291	mg/kg	6.01		(0%-20%)		
Molybdenum	B	0.461	B	0.529	mg/kg	13.7 ^		(+/-0.946)		
Nickel		10.8		10.9	mg/kg	1.24		(0%-20%)		
Potassium		1300		1380	mg/kg	5.86		(0%-20%)		
Silicon	MN	302		354	mg/kg	16.1		(0%-20%)		09/13/13 20:43
Silver	U	0.098	U	0.0946	mg/kg	N/A ^				09/16/13 15:45
Sodium		157		162	mg/kg	3.13		(0%-20%)		
Vanadium	D	51.5	D	56.8	mg/kg	9.91		(0%-20%)		09/18/13 10:13
Zinc	D	46.2	D	49.4	mg/kg	6.83		(0%-20%)		
QC1202937850 LCS										
Aluminum	465			472	mg/kg		102	(80%-120%)		09/16/13 15:39
Antimony	46.5			47.5	mg/kg		102	(80%-120%)		09/18/13 10:08
Arsenic	46.5			45.5	mg/kg		97.9	(80%-120%)		09/16/13 15:39
Barium	46.5			45.3	mg/kg		97.5	(80%-120%)		
Beryllium	46.5			46.2	mg/kg		99.4	(80%-120%)		
Boron	46.5			44.5	mg/kg		95.8	(80%-120%)		
Cadmium	46.5			46.7	mg/kg		101	(80%-120%)		
Calcium	465			464	mg/kg		99.8	(80%-120%)		
Chromium	46.5			44.2	mg/kg		95.1	(80%-120%)		
Cobalt	46.5			49.4	mg/kg		106	(80%-120%)		09/18/13 10:08

QC Summary

Workorder: 332351 **Client SDG:** X0020 **Project Description:** RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP										
Batch 1327000										
Copper	46.5			45.4	mg/kg		97.8	(80%-120%)	HSC	09/16/13 15:39
Iron	465			467	mg/kg		100	(80%-120%)		
Lead	46.5			50.0	mg/kg		107	(80%-120%)		09/18/13 10:08
Magnesium	465			473	mg/kg		102	(80%-120%)		09/16/13 15:39
Manganese	46.5			44.2	mg/kg		95.2	(80%-120%)		
Molybdenum	46.5			44.0	mg/kg		94.7	(80%-120%)		
Nickel	46.5			46.5	mg/kg		100	(80%-120%)		
Potassium	465			464	mg/kg		99.9	(80%-120%)		
Silicon	465			414	mg/kg		89.1	(80%-120%)		09/13/13 20:37
Silver	46.5			46.1	mg/kg		99.3	(80%-120%)		09/16/13 15:39
Sodium	465			498	mg/kg		107	(80%-120%)		
Vanadium	46.5			47.9	mg/kg		103	(80%-120%)		09/18/13 10:08
Zinc	46.5			48.7	mg/kg		105	(80%-120%)		
QC1202937849 MB										
Aluminum			U	6.80	mg/kg					09/16/13 15:35
Antimony			U	0.330	mg/kg					09/18/13 10:05
Arsenic			U	0.500	mg/kg					09/16/13 15:35
Barium			U	0.100	mg/kg					
Beryllium			U	0.100	mg/kg					
Boron			U	1.00	mg/kg					
Cadmium			U	0.100	mg/kg					
Calcium			U	8.00	mg/kg					

QC Summary

Workorder: 332351 **Client SDG:** X0020 **Project Description:** RC-232 Soil

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP											
Batch 1327000											
Chromium				U	0.150	mg/kg				HSC	09/16/13 15:35
Cobalt				U	0.150	mg/kg					09/18/13 10:05
Copper				U	0.300	mg/kg					09/16/13 15:35
Iron				U	8.00	mg/kg					
Lead				B	0.358	mg/kg					09/18/13 10:05
Magnesium				U	8.50	mg/kg					09/16/13 15:35
Manganese				U	0.200	mg/kg					
Molybdenum				U	0.200	mg/kg					
Nickel				U	0.150	mg/kg					
Potassium				U	6.40	mg/kg					
Silicon				U	1.50	mg/kg					09/13/13 20:34
Silver				U	0.100	mg/kg					09/16/13 15:35
Sodium				U	7.00	mg/kg					
Vanadium				B	0.137	mg/kg					09/18/13 10:05
Zinc				B	0.458	mg/kg					
QC1202937852 332351001 MS											
Aluminum	488		6090		7540	mg/kg		N/A	(75%-125%)		09/16/13 15:47
Antimony	48.8	DU	1.62	D	45.0	mg/kg		92.2	(75%-125%)		09/18/13 10:15
Arsenic	48.8	B	2.31		48.1	mg/kg		93.8	(75%-125%)		09/16/13 15:47
Barium	48.8		60.0		108	mg/kg		97.5	(75%-125%)		
Beryllium	48.8		0.575		46.3	mg/kg		93.6	(75%-125%)		
Boron	48.8	B	1.35		46.1	mg/kg		91.6	(75%-125%)		

QC Summary

Workorder: 332351 **Client SDG:** X0020 **Project Description:** RC-232 Soil

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP											
Batch 1327000											
Cadmium	48.8	B	0.246		45.9	mg/kg		93.6	(75%-125%)	HSC	09/16/13 15:47
Calcium	488		3380		4190	mg/kg		N/A	(75%-125%)		
Chromium	48.8		11.2		56.2	mg/kg		92.3	(75%-125%)		
Cobalt	48.8	D	7.07	D	58.3	mg/kg		105	(75%-125%)		09/18/13 10:15
Copper	48.8		13.1		63.1	mg/kg		103	(75%-125%)		09/16/13 15:47
Iron	488		19000		20200	mg/kg		N/A	(75%-125%)		
Lead	48.8	D	7.84	D	59.6	mg/kg		106	(75%-125%)		09/18/13 10:15
Magnesium	488		4280		4870	mg/kg		N/A	(75%-125%)		09/16/13 15:47
Manganese	48.8		274		327	mg/kg		N/A	(75%-125%)		
Molybdenum	48.8	B	0.461		45.0	mg/kg		91.3	(75%-125%)		
Nickel	48.8		10.8		55.5	mg/kg		91.5	(75%-125%)		
Potassium	488		1300		1830	mg/kg		109	(75%-125%)		
Silicon	488	MN	302	N	328	mg/kg		5.32 *	(75%-125%)		09/13/13 20:46
Silver	48.8	U	0.098		47.0	mg/kg		96.4	(75%-125%)		09/16/13 15:47
Sodium	488		157		667	mg/kg		104	(75%-125%)		
Vanadium	48.8	D	51.5	D	106	mg/kg		112	(75%-125%)		09/18/13 10:15
Zinc	48.8	D	46.2	D	98.0	mg/kg		106	(75%-125%)		
QC1202947650 332351001 PS											
Silicon	5000	MN	3080		8470	ug/L		108	(80%-120%)		09/13/13 20:58
QC1202937853 332351001 SDILT											
Aluminum			62200	D	13200	ug/L	6.56		(0%-10%)		09/16/13 15:50
Antimony		DU	-0.807	DU	8.09	ug/L	N/A		(0%-10%)		09/18/13 10:17
Arsenic		B	23.5	DU	2.45	ug/L	N/A		(0%-10%)		09/16/13 15:50

QC Summary

Workorder: 332351 **Client SDG:** X0020 **Project Description:** RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP										
Batch 1327000										
Barium		612	D	128	ug/L	4.62		(0%-10%)	HSC	09/16/13 15:50
Beryllium		5.87	D	1.33	ug/L	13.2		(0%-10%)		
Boron	B	13.8	DU	4.90	ug/L	N/A		(0%-10%)		
Cadmium	B	2.51	DU	0.490	ug/L	N/A		(0%-10%)		
Calcium		34500	D	7160	ug/L	3.84		(0%-10%)		
Chromium		114	D	22.4	ug/L	2.05		(0%-10%)		
Cobalt	D	14.4	D	3.19	ug/L	10.6		(0%-10%)		09/18/13 10:17
Copper		134	D	24.8	ug/L	7.14		(0%-10%)		09/16/13 15:50
Iron		194000	D	39900	ug/L	2.93		(0%-10%)		
Lead	D	16.0	CD	5.88	ug/L	83.7		(0%-10%)		09/18/13 10:17
Magnesium		43700	D	8990	ug/L	2.97		(0%-10%)		09/16/13 15:50
Manganese		2800	D	571	ug/L	2.05		(0%-10%)		
Molybdenum	B	4.70	DU	0.980	ug/L	N/A		(0%-10%)		
Nickel		110	D	23.1	ug/L	4.75		(0%-10%)		
Potassium		13300	D	2690	ug/L	1.13		(0%-10%)		
Silicon	MN	3080	DM	689	ug/L	11.9*		(0%-10%)		09/13/13 20:49
Silver	U	-0.844	DU	0.490	ug/L	N/A		(0%-10%)		09/16/13 15:50
Sodium		1610	D	400	ug/L	24.7		(0%-10%)		
Vanadium	D	105	CD	21.9	ug/L	4.49		(0%-10%)		09/18/13 10:17
Zinc	D	94.2	CD	19.7	ug/L	4.69		(0%-10%)		
Metals Analysis-Mercury										
Batch 1330613										

QC Summary

Workorder: 332351 **Client SDG:** X0020 **Project Description:** RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-Mercury										
Batch 1330613										
QC1202946388 LCS										
Mercury	0.116			0.116	mg/kg		100	(80%-120%)	NOR1	09/13/13 12:05
QC1202946387 MB										
Mercury			U	0.00384	mg/kg					09/13/13 12:03
QC1202946389 332351001 MS										
Mercury	0.124	U 0.00412		0.127	mg/kg		102	(80%-120%)		09/13/13 12:08
QC1202946390 332351001 MSD										
Mercury	0.121	U 0.00412		0.124	mg/kg	2.27	102	(0%-20%)		09/13/13 12:13
QC1202946391 332351001 SDILT										
Mercury		U -0.004	DU	0.0206	ug/L	N/A		(0%-10%)		09/13/13 12:16

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.

Miscellaneous

Prep Logbook

Acid Digestion of Sediments, Sludges, and Soils

Batch ID: **1326999.0**
Analyst: Anthony Green
Method: SW846 3050B
Lab SOP: GL-MA-E-009 REV# 22
Instrument: BAL-001

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1202937850	Metals Spike Mix I	UI1943364-01	.25	mL
LCS	1202937850	Metals Spike Mix II	UI1943367-06	.25	mL
MS	1202937852	Metals Spike Mix I	UI1943364-01	.25	mL
MS	1202937852	Metals Spike Mix II	UI1943367-06	.25	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
1202937849 MB	13-SEP-2013 08:25:08	Soil	0.5	50	100
1202937850 LCS	13-SEP-2013 08:25:08	Soil	0.538	50	92.9368
332351001	13-SEP-2013 08:25:08	Soil	0.527	50	94.87666
1202937851 DUP (332351001)	13-SEP-2013 08:25:08	Soil	0.546	50	91.57509
1202937852 MS (332351001)	13-SEP-2013 08:25:08	Soil	0.529	50	94.51796
1202937853 SDILT (332351001)	13-SEP-2013 08:25:08	Soil	0.527	50	94.87666
332351002	13-SEP-2013 08:25:08	Soil	0.548	50	91.24088
332351003	13-SEP-2013 08:25:08	Soil	0.551	50	90.7441
332351004	13-SEP-2013 08:25:08	Soil	0.538	50	92.9368
332351005	13-SEP-2013 08:25:08	Soil	0.511	50	97.84736
332351006	13-SEP-2013 08:25:08	Soil	0.538	50	92.9368

Reagent/Solvent Lot ID	Description	Amount
1924940	Concentrated Nitric Acid	1.25 mL
1949994	HYDROCHLORIC ACID	10 mL

Comments:

Block Temperature: 93 C
Thermometer ID: 118840
Hot Block ID: 9

Prep Logbook

Acid Digestion of Sediments, Sludges, and Soils

Batch ID: **1326997.0**
Analyst: Anthony Green
Method: SW846 3050B
Lab SOP: GL-MA-E-009 REV# 22
Instrument: BAL-001

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1202937845	ICP-MS spiking soluiton A	UI1936142-A	.25	mL
LCS	1202937845	ICP-MS spiking solution B	UI1936146-B	.25	mL
MS	1202937847	ICP-MS spiking soluiton A	UI1936142-A	.25	mL
MS	1202937847	ICP-MS spiking solution B	UI1936146-B	.25	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)	pH Check
1202937844 MB	13-SEP-2013 08:20:35	Soil	0.504	50	99.20635	<2
1202937845 LCS	13-SEP-2013 08:20:35	Soil	0.511	50	97.84736	<2
332351001	13-SEP-2013 08:20:35	Soil	0.539	50	92.76438	<2
1202937846 DUP (332351001)	13-SEP-2013 08:20:35	Soil	0.558	50	89.60573	<2
1202937847 MS (332351001)	13-SEP-2013 08:20:35	Soil	0.53	50	94.33962	<2
1202937848 SDILT (332351001)	13-SEP-2013 08:20:35	Soil	0.539	50	92.76438	<2
332351002	13-SEP-2013 08:20:35	Soil	0.566	50	88.33922	<2
332351003	13-SEP-2013 08:20:35	Soil	0.543	50	92.08103	<2
332351004	13-SEP-2013 08:20:35	Soil	0.521	50	95.96929	<2
332351005	13-SEP-2013 08:20:35	Soil	0.509	50	98.23183	<2
332351006	13-SEP-2013 08:20:35	Soil	0.57	50	87.7193	<2

Reagent/Solvent Lot ID	Description	Amount
1904936-02	Hydrogen Peroxide 30%	1.5 mL
1924940	Concentrated Nitric Acid	5 mL

Comments:

Block Temperature: 93 C

Thermometer ID: 118840

Hot Block ID: 9

Sample 332351001 consist of brown, moist sand.

Prep Logbook

Mercury Analysis Using the Perkin Elmer Automated Mercury Analyzer

Batch ID: **1330611.0**
Analyst: Alan Stanley
Method: SW846 7471B Prep
Lab SOP: GL-MA-E-010 REV# 26
Instrument: Metals Manual Instrument

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1202946388	MHGSOILMSSPIKE	WHG130912-14	.3	mL
MS	1202946389	MHGSOILMSSPIKE	WHG130912-14	.3	mL
MS	1202946394	MHGSOILMSSPIKE	WHG130912-14	.3	mL
MSD	1202946390	MHGSOILMSSPIKE	WHG130912-14	.3	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
1202946387 MB	12-SEP-2013 16:59:54	Soil	0.524	30	57.25191
1202946388 LCS	12-SEP-2013 16:59:54	Soil	0.519	30	57.80347
332351001	12-SEP-2013 16:59:54	Soil	0.504	30	59.52381
1202946389 MS (332351001)	12-SEP-2013 16:59:54	Soil	0.501	30	59.88024
1202946390 MSD (332351001)	12-SEP-2013 16:59:54	Soil	0.511	30	58.70841
1202946391 SDILT (332351001)	12-SEP-2013 16:59:54	Soil	0.504	30	59.52381
1202946392 DUP (332351001)	12-SEP-2013 16:59:54	Soil	0.52	30	57.69231
332351002	12-SEP-2013 16:59:54	Soil	0.538	30	55.76208
332351003	12-SEP-2013 16:59:54	Soil	0.54	30	55.55556
332351004	12-SEP-2013 16:59:54	Soil	0.515	30	58.25243
332351005	12-SEP-2013 16:59:54	Soil	0.525	30	57.14286
332351006	12-SEP-2013 16:59:54	Soil	0.511	30	58.70841
333151001	12-SEP-2013 16:59:54	Soil	0.515	30	58.25243
1202946393 DUP (333151001)	12-SEP-2013 16:59:54	Soil	0.502	30	59.76096
1202946394 MS (333151001)	12-SEP-2013 16:59:54	Soil	0.508	30	59.05512
1202946395 SDILT (333151001)	12-SEP-2013 16:59:54	Soil	0.515	30	58.25243
333179003	12-SEP-2013 16:59:54	Soil	0.502	30	59.76096
333179006	12-SEP-2013 16:59:54	Soil	0.535	30	56.07477

Reagent/Solvent Lot ID	Description	Amount
130712-A	Hydrochloric Acid Conc.	1.125 mL
130717-1	NITRIC ACID	.375 mL
1895265-C	Hg reducing agent	2 mL
1952486-C	5% KMnO4 solution	7.5 mL
WHG130912-07	Mercury Working Standard 1st Source CAL S 0.2/CRA	30 uL

Comments:

Digestion Start Date: 12-SEP-2013 16:21
Digestion End Date: 12-SEP-2013 16:51
Block Temperature: 95 C
Thermometer ID: 118629
Hot Block ID: 7
Both QC's were sand like material.

Prep Logbook

Batch ID: **1330611.0**
Analyst: Alan Stanley
Method: SW846 7471B Prep
Lab SOP: GL-MA-E-010 REV# 26
Instrument: Metals Manual Instrument

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1202946388	MHGSOILMSSPIKE	WHG130912-14	.3	mL
MS	1202946389	MHGSOILMSSPIKE	WHG130912-14	.3	mL
MS	1202946394	MHGSOILMSSPIKE	WHG130912-14	.3	mL
MSD	1202946390	MHGSOILMSSPIKE	WHG130912-14	.3	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)

Reagent/Solvent Lot ID	Description	Amount
WHG130912-08	Mercury Working Standard 1st Source CAL S 0.5	75 uL
WHG130912-09	Mercury Working 1st Source CAL S 2.0	300 uL
WHG130912-10	Mercury Working 1st Source CAL S 5.0/CCV	750 uL
WHG130912-11	Mercury Working 1st Source CAL S 10.0	1500 uL
WHG130912-12	Mercury Working 2nd Source S 5.0/ICV	750 uL

Comments:

General Chem Analysis

Case Narrative

General Chemistry Narrative
WC-HANFORD, INC. (WCHN)
SDG X0020

Method/Analysis Information

Product:	**Hexavalent Chromium**		
Analytical Batch:	1327588	**Method:**	SW846_7196A Hexavalent Chromium
Prep Batch :	1327587	**Method:**	SW846 3060A

Sample Analysis

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

Sample ID	Client ID
332351001	J1RWL1
332351002	J1RWL2
332351003	J1RWL3
332351004	J1RWL4
332351005	J1RWL5
1202938969	Method Blank (MB)
1202938970	332351001(J1RWL1) Sample Duplicate (DUP)
1202938972	332351001(J1RWL1) Matrix Spike (MS)
1202938976	332351001(J1RWL1) Matrix Spike Duplicate (MSD)
1202938980	Laboratory Control Sample (LCS)
1202938981	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: 332351001 (J1RWL1).

Matrix Spike (MS)/Post Spike (PS) Recovery Statement
The MS/PS recoveries for this sample set were within the required acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement
The MSD recoveries for this sample set were 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. 1202938970 (J1RWL1).

Technical Information

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

Holding Times
All samples in this SDG met the specified holding time.

Sample Dilutions
The samples in this SDG did not require dilutions.

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

Miscellaneous Information

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

Additional Comments
Additional comments were not required for this SDG.

Electronic Packaging Comment
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

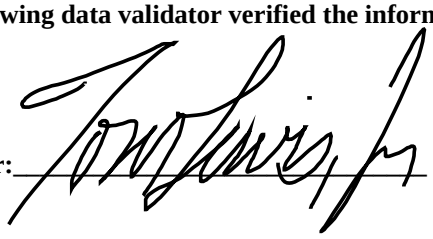
Certification Statement

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

Review Validation:

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

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

Reviewer:  **Date:** 17Sept13

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: X0020 GEL Work Order: 332351 Project: RC-232 Soil

The Qualifiers in this report are defined as follows:

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

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

Certificate of Analysis

Report Date: September 16, 2013

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

Client SDG: X0020

Client Sample ID:	J1RWL1	Project:	WCHN00213
Sample ID:	332351001	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	26-AUG-13 08:15		
Receive Date:	28-AUG-13		
Collector:	Client		
Moisture:	3.2%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis											
SW846_7196A Hexavalent Chromium "Dry Weight Corrected"											
Hexavalent Chromium	U	0.165	0.165	0.413	mg/kg	1	TXT1	09/03/13	1522	1327588	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3060A	SW846_7196A Hexavalent Chromium in Soil	TXT1	08/30/13	0920	1327587

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7196A	

Notes:

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

Certificate of Analysis

Report Date: September 16, 2013

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

Client SDG: X0020

Client Sample ID:	J1RWL2	Project:	WCHN00213
Sample ID:	332351002	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	26-AUG-13 08:20		
Receive Date:	28-AUG-13		
Collector:	Client		
Moisture:	3.02%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis											
SW846_7196A Hexavalent Chromium "Dry Weight Corrected"											
Hexavalent Chromium	U	0.163	0.163	0.408	mg/kg	1	TXT1	09/03/13	1535	1327588	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3060A	SW846_7196A Hexavalent Chromium in Soil	TXT1	08/30/13	0920	1327587

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7196A	

Notes:

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

Certificate of Analysis

Report Date: September 16, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-232 Soil
Client SDG:	X0020

Client Sample ID:	J1RWL3	Project:	WCHN00213
Sample ID:	332351003	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	26-AUG-13 08:25		
Receive Date:	28-AUG-13		
Collector:	Client		
Moisture:	2.65%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis											
SW846_7196A Hexavalent Chromium "Dry Weight Corrected"											
Hexavalent Chromium	U	0.161	0.161	0.402	mg/kg	1	TXT1	09/03/13	1537	1327588	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3060A	SW846_7196A Hexavalent Chromium in Soil	TXT1	08/30/13	0920	1327587

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7196A	

Notes:

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

Certificate of Analysis

Report Date: September 16, 2013

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

Client SDG: X0020

Client Sample ID:	J1RWL4	Project:	WCHN00213
Sample ID:	332351004	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	26-AUG-13 08:30		
Receive Date:	28-AUG-13		
Collector:	Client		
Moisture:	1.95%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis											
SW846_7196A Hexavalent Chromium "Dry Weight Corrected"											
Hexavalent Chromium	U	0.162	0.162	0.405	mg/kg	1	TXT1	09/03/13	1538	1327588	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3060A	SW846_7196A Hexavalent Chromium in Soil	TXT1	08/30/13	0920	1327587

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7196A	

Notes:

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

Certificate of Analysis

Report Date: September 16, 2013

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

Client SDG: X0020

Client Sample ID:	J1RWL5	Project:	WCHN00213
Sample ID:	332351005	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	26-AUG-13 08:15		
Receive Date:	28-AUG-13		
Collector:	Client		
Moisture:	2.98%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Spectrometric Analysis											
SW846_7196A Hexavalent Chromium "Dry Weight Corrected"											
Hexavalent Chromium	U	0.159	0.159	0.397	mg/kg	1	TXT1	09/03/13	1539	1327588	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3060A	SW846_7196A Hexavalent Chromium in Soil	TXT1	08/30/13	0920	1327587

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	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: September 16, 2013

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

Contact: **Joan Kessner**

Workorder: **332351** **Client SDG:** X0020 **Project Description:** RC-232 Soil

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Spectrometric Analysis												
Batch 1327588												
QC1202938970 332351001 DUP												
Hexavalent Chromium		U	0.165	U	0.160	mg/kg	N/A ^			TXT1	09/03/13	15:28
QC1202938981 ILCS												
Hexavalent Chromium	7.88				7.03	mg/kg		89.2	(80%-120%)		09/03/13	14:08
QC1202938980 LCS												
Hexavalent Chromium	3.98				3.77	mg/kg		94.9	(80%-120%)		09/03/13	14:07
QC1202938969 MB												
Hexavalent Chromium				U	0.155	mg/kg					09/03/13	14:06
QC1202938972 332351001 MS												
Hexavalent Chromium	4.12	U	0.165		3.17	mg/kg		75.2	(75%-125%)		09/03/13	15:29
QC1202938976 332351001 MSD												
Hexavalent Chromium	4.11	U	0.165		3.22	mg/kg	1.56	76.6	(0%-30%)		09/03/13	15:30

Notes:

The Qualifiers in this report are defined as follows:

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: 1326908
Analyst: LYT1
Date/Time: 28-AUG-2013
Procedure Code DRY WEIGHT
Procedure Description Dry Weight-Percent Moisture
Lab Sop: GL-OA-E-020

Sample St	Sample Id	Rpd(%)
DUP	1202937682	**4.827**

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 (%)
332351001	SAMPLE		BALHD2000D	14:40	7.254	33.261	32.429	26.007	25.175	3.2
332351002	SAMPLE		BALHD2000D	14:40	7.239	41.52	40.486	34.281	33.247	3.02
332351003	SAMPLE		BALHD2000D	14:40	7.195	31.797	31.144	24.602	23.949	2.65
332351004	SAMPLE		BALHD2000D	14:40	7.321	36.828	36.252	29.507	28.931	1.95
332351005	SAMPLE		BALHD2000D	14:40	7.209	27.603	26.996	20.394	19.787	2.98
332351006	SAMPLE		BALHD2000D	14:40	7.296	39.115	39.105	31.819	31.809	.031
332361001	SAMPLE		BALHD2000D	14:40	7.042	37.43	35.591	30.388	28.549	6.05
1202937682	DUP	332351001	BALHD2000D	14:40	7.055	32.249	31.481	25.194	24.426	3.05

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