

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 3/19/14
INITIAL/DATE

COMMENTS:

SDG XP0057

SAF-RC-232

Rad only

Chem only

Rad & Chem

Complete

Partial

Sample Location: 600-384:5



March 18, 2014

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

Re: RC-232 Soil
Work Order: 344325
SDG: XP0057

Dear Joan Kessner:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 11, 2014. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 1616.

Sincerely,

Orlette Johnson
Project Manager

Purchase Order: 1510
Chain of Custody: RC-232-082
Enclosures



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Case Narrative

**Receipt Narrative
for
WC-HANFORD, INC.
SDG: XP0057
Work Order: 344325**

March 18, 2014

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 March 11, 2014 for analysis.

Sample Identification: The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
344325001	J1TFK0
344325002	J1TFK1
344325003	J1TFK2

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 and Metals.



Orlette Johnson
Project Manager

Chain of Custody and Supporting Documentation

SAMPLE RECEIPT & REVIEW FORM

Client: <u>WCHN</u>		SDG/AR/COC/Work Order: <u>344325</u>
Received By: <u>JP</u>		Date Received: <u>3-11-14</u>
Suspected Hazard Information	Yes <input type="checkbox"/> No <input type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	<input type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0cpm</u>
Classified Radioactive II or III by RSO?	<input type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?	<input type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	<input type="checkbox"/>	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>1304629101</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other <u>7981 6050 8330</u>

Comments (Use Continuation Form if needed):

Laboratory Certifications

List of current GEL Certifications as of 18 March 2014

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	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
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122014-1
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 GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-14-9
Utah NELAP	SC000122013-11
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 XP0057**

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: 1372315
Prep Batch Number: 1372314

Sample Analysis

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

Sample ID	Client ID
344325001	J1TFK0
344325002	J1TFK1
1203049823	Method Blank (MB)
1203049824	Laboratory Control Sample (LCS)
1203049825	344325001(J1TFK0) Matrix Spike (MS)
1203049826	344325001(J1TFK0) 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# 24.

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 344325001 (J1TFK0) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recovery was slightly below the acceptance limits possibly due to sample matrix interference as the MS and MSD displayed similar spike recovery.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD recovery was slightly below the acceptance limits possibly due to sample matrix interference as the MS and MSD displayed similar spike recovery.

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 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

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

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 #1275247 was generated for this SDG.

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. 18-MAR-14	Division: Federal	Quality Criteria: Specifications	Type: Process
Instrument Type: GC/FID	Test / Method: NWTPH-Dx in Soil	Matrix Type: Solid	Client Code: WCHN
Batch ID: 1372315	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 344325(XP0057)			
Application Issues: Failed Recovery for MS/PS Failed Recovery for MSD/PSD			
Specification and Requirements Exception Description:		DER Disposition:	
1. The MS(1203049825) and MSD(1203049826) recovered analytes slightly below their established acceptance limits.		1. 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 18-MAR-14

Data Validator/Group Leader:
Jimin Cao 18-MAR-14

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: XP0057 GEL Work Order: 344325 Project: RC-232 Soil

The Qualifiers in this report are defined as follows:

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.

DL Indicates that sample is diluted.

RA Indicates that sample is re-analyzed without re-extraction.

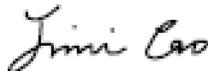
RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature:



Name: Jimin Cao

Date: 18 MAR 2014

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: March 18, 2014

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

Client SDG: XP0057

Client Sample ID: J1TFK0	Project: WCHN00213
Sample ID: 344325001	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 10–MAR–14 07:55	
Receive Date: 11–MAR–14	
Collector: Client	
Moisture: 1.89%	

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)	TU	2210	2210	6790	ug/kg	1	BYT1	03/17/14	2103	1372315	1
Motor Oil (C20–C36)	JT	2570	2210	6790	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	CXR2	03/13/14	1018	1372314

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH–Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o–Terphenyl	SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"	451 ug/kg	679	66.3	(50%–150%)

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: March 18, 2014

Page 1 of 1

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

Contact: Joan Kessner

Workorder: 344325

Client SDG: XP0057

Project Description: RC–232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Diesel Range Organics											
Batch	1372315										
QC1203049824	LCS										
Diesel Range Organics (C10–C20)	66500			49100	ug/kg		73.8	(70%–130%)	BYT1	03/17/14	20
Motor Oil (C20–C36)	66500			50100	ug/kg		75.3	(70%–130%)			
**o–Terphenyl	665			498	ug/kg		75	(50%–150%)			
QC1203049823	MB										
Diesel Range Organics (C10–C20)			U	2160	ug/kg					03/17/14	19
Motor Oil (C20–C36)			U	2160	ug/kg						
**o–Terphenyl	665			525	ug/kg		78.9	(50%–150%)			
QC1203049825	344325001 MS										
Diesel Range Organics (C10–C20)	67300	TU	2210 T	44700	ug/kg		66.3 *	(70%–130%)		03/17/14	21
Motor Oil (C20–C36)	67300	JT	2570 T	48200	ug/kg		67.7 *	(70%–130%)			
**o–Terphenyl	673		451	448	ug/kg		66.5	(50%–150%)			
QC1203049826	344325001 MSD										
Diesel Range Organics (C10–C20)	67700	TU	2210	47400	ug/kg	6.02	70.1	(0%–20%)		03/17/14	22
Motor Oil (C20–C36)	67700	JT	2570 T	49700	ug/kg	3.19	69.7 *	(0%–20%)			
**o–Terphenyl	677		451	475	ug/kg		70.2	(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

GEL LABORATORIES LLC

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

QC Summary

Workorder: 344325

Client SDG: XP0057

Project Description: RC-232 Soil

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Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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 (Organics 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: 1372314 **Verified by:** _____
Analyst: Courtney Robinson
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)
1203049823 MB	13-MAR-2014 10:18:00	30.06	1	0.03327
1203049824 LCS	13-MAR-2014 10:18:00	30.08	1	0.03324
344325001	13-MAR-2014 10:18:00	30.02	1	0.03331
1203049825 MS (344325001)	13-MAR-2014 10:18:00	30.29	1	0.03301
1203049826 MSD (344325001)	13-MAR-2014 10:18:00	30.13	1	0.03319
344325002	13-MAR-2014 10:18:00	30.03	1	0.0333

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
LCS	1203049824	AZDRO SPIKE LCS STD,4000ug/ml	WF1140304-52	1	mL	Final Solvent: Hexane Verified By: SJW
MS	1203049825	AZDRO SPIKE LCS STD,4000ug/ml	WF1140304-52	1	mL	
MSD	1203049826	AZDRO SPIKE LCS STD,4000ug/ml	WF1140304-52	1	mL	
SURR	All	20 ppm surrogate	WE140227-04	1	mL	
REGNT	All	Methylene Chloride	2057826-D	120	mL	
SOURC	All	SODIUM SULFATE	2051933	30	g	

Metals Analysis

Case Narrative

**Metals Fractional Narrative
WC-HANFORD, INC. (WCHN)
SDG XP0057**

Sample Analysis

Sample ID	Client ID
344325003	J1TFK2
1203048858	Method Blank (MB) ICP
1203048859	Laboratory Control Sample (LCS)
1203048862	344325003(J1TFK2L) Serial Dilution (SD)
1203048860	344325003(J1TFK2D) Sample Duplicate (DUP)
1203048861	344325003(J1TFK2S) Matrix Spike (MS)
1203052300	344325003(J1TFK2PS) Post Spike (PS)
1203048853	Method Blank (MB) ICP-MS
1203048854	Laboratory Control Sample (LCS)
1203048857	344325003(J1TFK2L) Serial Dilution (SD)
1203048855	344325003(J1TFK2D) Sample Duplicate (DUP)
1203048856	344325003(J1TFK2S) Matrix Spike (MS)
1203049181	Method Blank (MB) CVAA
1203049182	Laboratory Control Sample (LCS)
1203049188	344325003(J1TFK2L) Serial Dilution (SD)
1203049186	344325003(J1TFK2D) Sample Duplicate (DUP)
1203049187	344325003(J1TFK2S) Matrix Spike (MS)

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

Method/Analysis Information

Analytical Batch:	1371971, 1371969 and 1372087
Prep Batch :	1371970, 1371968 and 1372086
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# 27
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 PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

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

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

Calibration Information

Instrument Calibration

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

CRDL Requirements

The CRDL standard recoveries met the referenced advisory control limits.

ICSA/ICSAB Statement

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

Continuing Calibration Blank (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 344325003 (J1TFK2)-ICP, ICP-MS and CVAA.

Matrix Spike (MS) Recovery Statement

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MS did not meet all the recommended quality control acceptance criteria for percent recoveries for the applicable analytes. The recoveries for aluminum and iron were not within the acceptance limits in sample 1203048861 (J1TFK2). See data exception report (DER ID 1275324) behind the case narrative in this data package.

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 in the post-digested sample.

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 acceptance criteria.

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. The samples in this SDG were diluted the standard two times for solids analyzed 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. Data exception report (DER ID 1275324) was generated for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Certification Statement

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

Review Validation:

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

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

Reviewer: Pat Steel Date: 03/18/2014

DATA EXCEPTION REPORT

Mo.Day Yr. 18-MAR-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ICP	Test / Method: SW846 3050B/6010C	Matrix Type: Solid	Client Code: WCHN
Batch ID: 1371971	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 344325(XP0057)			
Application Issues: Failed Recovery for MS/PS			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Failed Recovery for MS/PS:</p> <p>QC 1203048861MS</p>		<p>1. The matrix spike recovery failed outside of the control limits for aluminum and iron. 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.</p>	

Originator's Name:

Helen Camello 18-MAR-14

Data Validator/Group Leader:

Jerry Wigfall 18-MAR-14

Sample Data Summary

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Qualifier Definition Report for

WCHN001 WC-HANFORD, INC.

Client SDG: XP0057 GEL Work Order: 344325 Project: RC-232 Soil

The Qualifiers in this report are defined as follows:

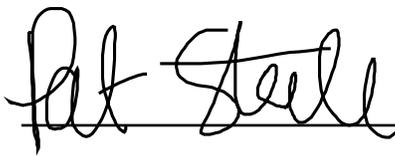
- * Duplicate analysis not within control limits
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank, and the sample concentration was ≤ 5 times the blank concentration.
- D Results are reported from a diluted aliquot of sample.
- 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

 03/18/2014

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Certificate of Analysis

Report Date: March 18, 2014

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

Client SDG: XP0057

Client Sample ID: J1TFK2
Sample ID: 344325003

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6020A	

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: March 18, 2014

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

Workorder: 344325

Client SDG: XP0057

Project Description: RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1371969										
QC1203048855	344325003	DUP									
Selenium		DU	0.319	DU	0.323	mg/kg	N/A ^		BAJ	03/15/14	06:42
QC1203048854	LCS										
Selenium	4.96		D	4.73	mg/kg		95.4	(80%-120%)		03/15/14	06:37
QC1203048853	MB										
Selenium			DU	0.327	mg/kg					03/15/14	06:35
QC1203048856	344325003	MS									
Selenium	4.84	DU	0.319	D	4.59	mg/kg		92.3	(75%-125%)	03/15/14	06:44
QC1203048857	344325003	SDILT									
Selenium		DU	0.634	DU	1.59	ug/L	N/A	(0%-10%)		03/15/14	06:48
Metals Analysis-ICP											
Batch	1371971										
QC1203048860	344325003	DUP									
Aluminum		N	130		126	mg/kg		3.22	(0%-20%)	HSC	03/13/14 16:22
Antimony		U	0.320	U	0.324	mg/kg	N/A ^				
Arsenic		BC	0.672	U	0.490	mg/kg	191 ^	(+/-2.94)			
Barium			1.79		1.74	mg/kg	3.35 ^	(+/-0.490)			
Beryllium		U	0.0969	U	0.0981	mg/kg	N/A ^				
Boron		U	0.969	U	0.981	mg/kg	N/A ^				
Cadmium		U	0.0969	U	0.0981	mg/kg	N/A ^				
Calcium			32.2		32.4	mg/kg	0.729 ^	(+/-24.5)			
Chromium		B	0.286	U	0.147	mg/kg	106 ^	(+/-0.490)			
Cobalt		U	0.145	U	0.147	mg/kg	N/A ^				
Copper		U	0.291	U	0.294	mg/kg	N/A ^				
Iron		N	232		202	mg/kg	13.7	(0%-20%)			

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QC Summary

Workorder: 344325

Client SDG: XP0057

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1371971										
Lead		U	0.320	U	0.324	mg/kg	N/A	^		HSC	03/13/14 16:22
Magnesium		B	18.8	B	15.8	mg/kg	17.7	^	(+/-29.4)		
Manganese			4.51		4.49	mg/kg	0.356	^	(+/-0.981)		
Molybdenum		B	0.212	U	0.196	mg/kg	106	^	(+/-0.981)		
Nickel		B	0.183	U	0.147	mg/kg	72.9	^	(+/-0.490)		
Potassium			38.3		34.8	mg/kg	9.41	^	(+/-24.5)		
Silicon			186		179	mg/kg	3.86		(0%-20%)		
Silver		U	0.0969	U	0.0981	mg/kg	N/A	^			
Sodium		U	6.79	U	6.87	mg/kg	N/A	^			
Vanadium		B	0.228	B	0.233	mg/kg	2.45	^	(+/-0.490)		
Zinc			1.21		1.09	mg/kg	10.3	^	(+/-0.981)		
QC1203048859	LCS										
Aluminum			482		457	mg/kg	94.9		(80%-120%)		03/13/14 16:15
Antimony			48.2		44.9	mg/kg	93.2		(80%-120%)		
Arsenic			48.2		46.6	mg/kg	96.7		(80%-120%)		
Barium			48.2		46.6	mg/kg	96.7		(80%-120%)		
Beryllium			48.2		50.5	mg/kg	105		(80%-120%)		
Boron			48.2		45.4	mg/kg	94.3		(80%-120%)		
Cadmium			48.2		47.3	mg/kg	98.3		(80%-120%)		
Calcium			482		455	mg/kg	94.5		(80%-120%)		
Chromium			48.2		46.0	mg/kg	95.5		(80%-120%)		
Cobalt			48.2		46.1	mg/kg	95.8		(80%-120%)		

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QC Summary

Workorder: 344325

Client SDG: XP0057

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1371971										
Copper	48.2			47.7	mg/kg		99.1	(80%-120%)	HSC	03/13/14	16:15
Iron	482			473	mg/kg		98.2	(80%-120%)			
Lead	48.2			46.8	mg/kg		97.2	(80%-120%)			
Magnesium	482			466	mg/kg		96.7	(80%-120%)			
Manganese	48.2			46.4	mg/kg		96.4	(80%-120%)			
Molybdenum	48.2			45.2	mg/kg		93.8	(80%-120%)			
Nickel	48.2			46.3	mg/kg		96.1	(80%-120%)			
Potassium	482			472	mg/kg		98	(80%-120%)			
Silicon	482			424	mg/kg		87.9	(80%-120%)			
Silver	48.2			46.8	mg/kg		97.2	(80%-120%)			
Sodium	482			457	mg/kg		94.8	(80%-120%)			
Vanadium	48.2			46.2	mg/kg		96	(80%-120%)			
Zinc	48.2			46.8	mg/kg		97.2	(80%-120%)			
QC1203048858	MB										
Aluminum			U	6.76	mg/kg					03/13/14	16:12
Antimony			U	0.328	mg/kg						
Arsenic			B	0.921	mg/kg						
Barium			U	0.0994	mg/kg						
Beryllium			U	0.0994	mg/kg						
Boron			U	0.994	mg/kg						
Cadmium			U	0.0994	mg/kg						
Calcium			U	7.95	mg/kg						

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QC Summary

Workorder: 344325

Client SDG: XP0057

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1371971										
Chromium			U	0.149	mg/kg				HSC	03/13/14	16:12
Cobalt			U	0.149	mg/kg						
Copper			U	0.298	mg/kg						
Iron			U	7.95	mg/kg						
Lead			U	0.328	mg/kg						
Magnesium			U	8.45	mg/kg						
Manganese			U	0.199	mg/kg						
Molybdenum			U	0.199	mg/kg						
Nickel			U	0.149	mg/kg						
Potassium			U	6.36	mg/kg						
Silicon			U	1.49	mg/kg						
Silver			U	0.0994	mg/kg						
Sodium			U	6.96	mg/kg						
Vanadium			U	0.0994	mg/kg						
Zinc			U	0.398	mg/kg						
QC1203048861 344325003 MS											
Aluminum	481	N	130	N	1030	mg/kg		187* (75%-125%)		03/13/14	16:26
Antimony	48.1	U	0.320		45.5	mg/kg		94.5 (75%-125%)			
Arsenic	48.1	BC	0.672		50.1	mg/kg		103 (75%-125%)			
Barium	48.1		1.79		50.4	mg/kg		101 (75%-125%)			
Beryllium	48.1	U	0.0969		50.9	mg/kg		106 (75%-125%)			
Boron	48.1	U	0.969		47.4	mg/kg		97.6 (75%-125%)			

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QC Summary

Workorder: 344325

Client SDG: XP0057

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1371971										
Cadmium	48.1	U	0.0969	48.2	mg/kg		100	(75%-125%)	HSC	03/13/14	16:26
Calcium	481		32.2	498	mg/kg		96.9	(75%-125%)			
Chromium	48.1	B	0.286	47.4	mg/kg		98	(75%-125%)			
Cobalt	48.1	U	0.145	48.1	mg/kg		99.7	(75%-125%)			
Copper	48.1	U	0.291	50.5	mg/kg		105	(75%-125%)			
Iron	481	N	232	N	3730	mg/kg	727*	(75%-125%)			
Lead	48.1	U	0.320	48.3	mg/kg		100	(75%-125%)			
Magnesium	481	B	18.8	563	mg/kg		113	(75%-125%)			
Manganese	48.1		4.51	59.0	mg/kg		113	(75%-125%)			
Molybdenum	48.1	B	0.212	45.7	mg/kg		94.7	(75%-125%)			
Nickel	48.1	B	0.183	48.6	mg/kg		101	(75%-125%)			
Potassium	481		38.3	613	mg/kg		119	(75%-125%)			
Silicon	481		186	786	mg/kg		125	(75%-125%)			
Silver	48.1	U	0.0969	47.8	mg/kg		99.3	(75%-125%)			
Sodium	481	U	6.79	464	mg/kg		95.6	(75%-125%)			
Vanadium	48.1	B	0.228	50.3	mg/kg		104	(75%-125%)			
Zinc	48.1		1.21	54.3	mg/kg		110	(75%-125%)			
QC1203052300 344325003 PS											
Aluminum	5000	N	1340	6460	ug/L		102	(80%-120%)		03/18/14	08:01
Iron	5000	N	2390	7560	ug/L		103	(80%-120%)			
QC1203048862 344325003 SDILT											
Aluminum		N	1340	D	277	ug/L	3.47	(0%-10%)		03/13/14	16:29
Antimony		U	0.0211	DU	1.60	ug/L	N/A	(0%-10%)			

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QC Summary

Workorder: 344325

Client SDG: XP0057

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1371971										
Arsenic	BC	6.93	DU	2.42	ug/L	N/A		(0%-10%)	HSC	03/13/14	16:29
Barium		18.5	D	3.90	ug/L	5.2		(0%-10%)			
Beryllium	U	0.339	DU	0.485	ug/L	N/A		(0%-10%)			
Boron	U	4.18	DU	4.85	ug/L	N/A		(0%-10%)			
Cadmium	U	0.384	DU	0.485	ug/L	N/A		(0%-10%)			
Calcium		332	DU	38.8	ug/L	N/A		(0%-10%)			
Chromium	B	2.95	DU	0.727	ug/L	N/A		(0%-10%)			
Cobalt	U	1.12	DU	0.727	ug/L	N/A		(0%-10%)			
Copper	U	0.756	DU	1.45	ug/L	N/A		(0%-10%)			
Iron	N	2390	D	475	ug/L	.831		(0%-10%)			
Lead	U	1.61	DU	1.60	ug/L	N/A		(0%-10%)			
Magnesium	B	194	DU	41.2	ug/L	N/A		(0%-10%)			
Manganese		46.5	D	9.40	ug/L	1.11		(0%-10%)			
Molybdenum	B	2.19	DU	0.969	ug/L	N/A		(0%-10%)			
Nickel	B	1.89	DU	0.727	ug/L	N/A		(0%-10%)			
Potassium		395	D	82.3	ug/L	4.2		(0%-10%)			
Silicon		1920	D	391	ug/L	1.79		(0%-10%)			
Silver	U	0.156	DU	0.485	ug/L	N/A		(0%-10%)			
Sodium	U	45.3	DU	33.9	ug/L	N/A		(0%-10%)			
Vanadium	B	2.35	DU	0.485	ug/L	N/A		(0%-10%)			
Zinc		12.4	DU	1.94	ug/L	N/A		(0%-10%)			

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QC Summary

Workorder: 344325

Client SDG: XP0057

Project Description: RC-232 Soil

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Parname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-Mercury											
Batch 1372087											
QC1203049186	344325003	DUP									
Mercury		U	0.00393	U	0.00402	mg/kg	N/A ^		NOR1	03/13/14	12:28
QC1203049182	LCS										
Mercury	0.120				0.116	mg/kg	97.2	(80%-120%)		03/13/14	11:56
QC1203049181	MB										
Mercury			U		0.00402	mg/kg				03/13/14	11:55
QC1203049187	344325003	MS									
Mercury	0.116	U	0.00393		0.116	mg/kg	99.9	(80%-120%)		03/13/14	12:36
QC1203049188	344325003	SDILT									
Mercury		U	-0.025	DU	0.0197	ug/L	N/A	(0%-10%)		03/13/14	12:38

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: 1371970	Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
Analyst: Anthony Green	LCS	1203048859	Metals Spike Mix I	UI2047539-01	.25	mL
Method: SW846 3050B	LCS	1203048859	Metals Spike Mix II	UI2047551-06	.25	mL
Lab SOP: GL-MA-E-009 REV# 22	MS	1203048861	Metals Spike Mix I	UI2047539-01	.25	mL
Instrument: BAL-001	MS	1203048861	Metals Spike Mix II	UI2047551-06	.25	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
1203048858 MB	13-MAR-2014 08:00:03	Soil	0.503	50	99.40358
1203048859 LCS	13-MAR-2014 08:00:03	Soil	0.519	50	96.33911
344325003	13-MAR-2014 08:00:03	Soil	0.516	50	96.89922
1203048860 DUP (344325003)	13-MAR-2014 08:00:03	Soil	0.51	50	98.03922
1203048861 MS (344325003)	13-MAR-2014 08:00:03	Soil	0.52	50	96.15385
1203048862 SDILT (344325003)	13-MAR-2014 08:00:03	Soil	0.516	50	96.89922

Reagent/Solvent Lot ID	Description	Amount	Comments:
2059610	Concentrated Nitric Acid	1.25 mL	Sample 344352003 consist of brown and tan granular sand-like substance with small rocks.
2078654	HYDROCHLORIC ACID	10 mL	

Prep Logbook

Acid Digestion of Sediments, Sludges, and Soils

Batch ID:	1371968	Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
Analyst:	Anthony Green	LCS	1203048854	ICP-MS spiking solution A	UI2065986-A	.25	mL
Method:	SW846 3050B	LCS	1203048854	ICP-MS spiking solution B	UI2065988-B	.25	mL
Lab SOP:	GL-MA-E-009 REV# 22	MS	1203048856	ICP-MS spiking solution A	UI2065986-A	.25	mL
Instrument:	BAL-001	MS	1203048856	ICP-MS spiking solution B	UI2065988-B	.25	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
1203048853 MB	13-MAR-2014 08:00:27	Soil	0.504	50	99.20635
1203048854 LCS	13-MAR-2014 08:00:27	Soil	0.504	50	99.20635
344325003	13-MAR-2014 08:00:27	Soil	0.518	50	96.5251
1203048855 DUP (344325003)	13-MAR-2014 08:00:27	Soil	0.511	50	97.84736
1203048856 MS (344325003)	13-MAR-2014 08:00:27	Soil	0.517	50	96.7118
1203048857 SDILT (344325003)	13-MAR-2014 08:00:27	Soil	0.518	50	96.5251

Reagent/Solvent Lot ID	Description	Amount	Comments:
1976094-02	Hydrogen Peroxide 30%	1.5 mL	Block Temperature: 93 C
2059610	Concentrated Nitric Acid	5 mL	Thermometer ID: 118840
			Hot Block ID: 9
			Sample 344325003 consist of brown/tan, granular sand-like substance with small rocks.

Prep Logbook

Mercury Analysis Using the Perkin Elmer Automated Mercury Analyzer

Batch ID:	1372086	Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
Analyst:	Alan Stanley	LCS	1203049182	MHGSOILMSSPIKE	WHG140312-14	.3	mL
Method:	SW846 7471B Prep	MS	1203049183	MHGSOILMSSPIKE	WHG140312-14	.3	mL
Lab SOP:	GL-MA-E-010 REV# 27	MS	1203049187	MHGSOILMSSPIKE	WHG140312-14	.3	mL
Instrument:	Metals Manual Instrument	MSD	1203049184	MHGSOILMSSPIKE	WHG140312-14	.3	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
1203049181 MB	12-MAR-2014 15:21:36	Misc Solid	0.5	30	60
1203049182 LCS	12-MAR-2014 15:21:36	Misc Solid	0.502	30	59.76096
344065003	12-MAR-2014 15:21:36	Misc Solid	0.502	30	59.76096
1203049183 MS (344065003)	12-MAR-2014 15:21:36	Misc Solid	0.501	30	59.88024
1203049184 MSD (344065003)	12-MAR-2014 15:21:36	Misc Solid	0.503	30	59.64215
1203049185 SDILT (344065003)	12-MAR-2014 15:21:36	Misc Solid	0.502	30	59.76096
344065004	12-MAR-2014 15:21:36	Misc Solid	0.511	30	58.70841
344065006	12-MAR-2014 15:21:36	Misc Solid	0.501	30	59.88024
344065008	12-MAR-2014 15:21:36	Misc Solid	0.503	30	59.64215
344065010	12-MAR-2014 15:21:36	Misc Solid	0.508	30	59.05512
344065012	12-MAR-2014 15:21:36	Misc Solid	0.531	30	56.49718
344065015	12-MAR-2014 15:21:36	Misc Solid	0.5	30	60
344106001	12-MAR-2014 15:21:36	Sludge	0.512	30	58.59375
344107001	12-MAR-2014 15:21:36	Sludge	0.506	30	59.28854
344301001	12-MAR-2014 15:21:36	Soil	0.5	30	60
344301002	12-MAR-2014 15:21:36	Soil	0.518	30	57.91506
344325003	12-MAR-2014 15:21:36	Soil	0.511	30	58.70841
1203049186 DUP (344325003)	12-MAR-2014 15:21:36	Soil	0.5	30	60
1203049187 MS (344325003)	12-MAR-2014 15:21:36	Soil	0.517	30	58.02708
1203049188 SDILT (344325003)	12-MAR-2014 15:21:36	Soil	0.511	30	58.70841

Reagent/Solvent Lot ID	Description	Amount	Comments:
2071784-C	5% KMnO4 solution	7.5 mL	Digestion Start Date: 12-MAR-2014 15:21
2072331-C	Hg reducing agent	2 mL	Digestion End Date: 12-MAR-2014 15:51
2077152-1	NITRIC ACID	.375 mL	Block Temperature: 95 C
2079494-A	Hydrochloric Acid Conc.	1.125 mL	Thermometer ID: 118533
			Hot Block ID: 12

Prep Logbook

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
WHG140312-07		Mercury Working Standard 1st Source CAL S 0.2/CRA	30 uL		
WHG140312-08		Mercury Working Standard 1st Source CAL S 0.5	75 uL		
WHG140312-09		Mercury Working 1st Source CAL S 2.0	300 uL		
WHG140312-10		Mercury Working 1st Source CAL S 5.0/CCV	750 uL		
WHG140312-11		Mercury Working 1st Source CAL S 10.0	1500 uL		
WHG140312-12		Mercury Working 2nd Source S 5.0/ICV	750 uL		