

SAF-RC-233
100-IU-2 & 100-IU-6 Remaining
Waste Sites – Soil In-Process
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt

H4-21

KW 9/18/14
INITIAL/DATE

COMMENTS:

SDG XP0116

SAF-RC-233

Rad only

Chem only

Rad & Chem

Complete

Partial

REVISED DATA PACKAGE INCLUDES DRO ANALYSES

**Sample Location: 100-B-35:1, Electrical switchyard,
In-Process**



September 15, 2014

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

Re: RC-233 Soil
Work Order: 354331
SDG: XP0116

Dear Joan Kessner:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 08, 2014. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. This data package is revised per client to add DRO analyses.

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-233-047
Enclosures



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Case Narrative

This data package is revised per client to add DRO analyses.

**Receipt Narrative
for
WC-HANFORD, INC.
SDG: XP0116
Work Order: 354331**

September 15, 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 August 08, 2014 for analysis.

Sample Identification: The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
354331001	J1TXF3
354331002	J1TXF4
354331003	J1TXF5
354331004	J1TXF6

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 GC Semivolatile PCB.



Orlette Johnson
Project Manager

Chain of Custody and Supporting Documentation



SAMPLE RECEIPT & REVIEW FORM

Client: WGHN		SDG/AR/COC/Work Order: 354331	
Received By: P. Dent		Date Received: 8/8/14	
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?		<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 cpm
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) 2c *all temperatures are recorded in Celsius
2a	Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): 130462966
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?		<input checked="" type="checkbox"/>		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7	Are Encore containers present?			<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?			<input checked="" type="checkbox"/>	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
14	Carrier and tracking number.				Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other 7707 8543 0832-2c

Comments (Use Continuation Form if needed):

Laboratory Certifications

List of current GEL Certifications as of 15 September 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	SC000122014-14
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 XP0116**

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: 1417756
Prep Batch Number: 1417755

Sample Analysis

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

Sample ID	Client ID
354331002	J1TXF4
1203164009	MB for batch 1417755
1203164010	Laboratory Control Sample (LCS)
1203164011	354331002(J1TXF4) Matrix Spike (MS)
1203164012	354331002(J1TXF4) 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; however, the MB contained low level (below the PQL) of hydrocarbons within Motor Oil range.

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 354331002 (J1TXF4) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS, 1203164011 (J1TXF4), recovered outside the acceptance limits due to sample matrix interference.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD, 1203164012 (J1TXF4), recovered outside the acceptance limits due to sample matrix interference.

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. Sample 354331002 (J1TXF4) was extracted out of holding.

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 #1333297 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. 12-SEP-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: 1417756	Sample Numbers: See Below		

Potentially affected work order(s)(SDG): 354331(XP0116),354539(XP0118),355294(XP0121),356299(XP0129),356303(XP0130)

Application Issues:

- Failed Recovery for MS/PS
- Failed RPD for MS/MSD, or PS/PSD
- Failed Yield for Surrogates
- Failed Recovery for MSD/PSD
- Sample Prepped out of Holding
- Sample Logged out of Holding

Specification and Requirements Exception Description:	DER Disposition:
<ol style="list-style-type: none"> 1. Samples 354331002, 354539002, 354539004, 355294004 and 355294005 were extracted out of holding. 2. Samples 356299001, 3356303001, 1203164019(MS) and 1203164020(MSD) recovered o-Terphenyl below its established acceptance limit (SPC Limit: 50%-150). 3. The MS and MSD, prepared on sample 354331002 did not meet spike recovery acceptance criteria. 4. The MS, prepared on sample 354539002 did not meet spike recovery acceptance criteria. The RPD between the MS and MSD did not met the acceptance criteria either. 5. The MS and MSD, prepared on sample 355294004, did not meet spike recovery acceptance criteria. 6. The MS, prepared on sample 356299001, did not meet spike recovery acceptance criteria. The RPD between the MS and MSD did not met the acceptance criteria either. 7. The MSD, prepared on sample 356303001, did not meet spike recovery acceptance criteria. The RPD between the MS and MSD did not met the acceptance criteria either. 	<ol style="list-style-type: none"> 1. The samples were logged for DRO analysis after the holding time expired. The data were reported with proper qualifier. 2. The results of sample 356299001 in this batch are reported as the preliminary results. The final result will be reported when the re-extraction/re-analysis results are available. 3. The failure was attributed to sample matrix interference as the MS and MSD failed in the same manner. The data were reported. 4. The failure was attributed to sample matrix interference and non-homogenous matrix of the sample as the MS, MSD and the parents sample all met surrogate recovery acceptance. The data were reported. 5. As the MS and MSD displayed similar recoveries, the failure was attributed to sample matrix interference and the data were reported. 6. The results of sample 356299001 and its MS/MSD in this batch are reported as the preliminary results. The final result will be reported when the re-extraction/re-analysis results are available. 7. The failure was attributed to dilution, sample matrix interference and high level of target analytes in the parent sample. The data were reported.

Originator's Name:

Benjamin Taft 12-SEP-14

Data Validator/Group Leader:

Jimin Cao 12-SEP-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: XP0116 GEL Work Order: 354331 Project: RC-233 Soil

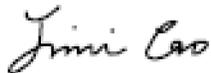
The Qualifiers in this report are defined as follows:

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

Name: Jimin Cao

Date: 12 SEP 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: September 12, 2014

Company : WC–Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4–21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC–233 Soil

Client SDG: XP0116

Client Sample ID: J1TXF4	Project: WCHN00313
Sample ID: 354331002	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 07–AUG–14 09:26	
Receive Date: 08–AUG–14	
Collector: Client	
Moisture: 6.64%	

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)	TX	7960	2310	7120	ug/kg	1	BYT1	09/10/14	1952	1417756	1
Motor Oil (C20–C36)	BTX	15400	2310	7120	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	MXD2	09/10/14	0953	1417755

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"	478 ug/kg	712	67.2	(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: September 12, 2014

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

Contact: Joan Kessner

Workorder: 354331

Client SDG: XP0116

Project Description: RC-233 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Diesel Range Organics											
Batch	1417756										
QC1203164010	LCS										
Diesel Range Organics (C10–C20)	66500			47900	ug/kg		72	(70%–130%)	BYT1	09/11/14	09:00
Motor Oil (C20–C36)	66500		B	53700	ug/kg		80.8	(70%–130%)			
**o–Terphenyl	665			512	ug/kg		77	(50%–150%)			
QC1203164009	MB										
Diesel Range Organics (C10–C20)			U	2160	ug/kg					09/10/14	18:00
Motor Oil (C20–C36)			J	3220	ug/kg						
**o–Terphenyl	666			430	ug/kg		64.6	(50%–150%)			
QC1203164011	354331002 MS										
Diesel Range Organics (C10–C20)	71200	TX	7960 TX	51200	ug/kg		60.7 *	(70%–130%)		09/10/14	20:00
Motor Oil (C20–C36)	71200	BTX	15400 BTX	58900	ug/kg		61.1 *	(70%–130%)			
**o–Terphenyl	712		478	458	ug/kg		64.4	(50%–150%)			
QC1203164012	354331002 MSD										
Diesel Range Organics (C10–C20)	71200	TX	7960 TX	50100	ug/kg	2.11	59.2 *	(0%–20%)		09/10/14	21:00
Motor Oil (C20–C36)	71200	BTX	15400 BTX	61600	ug/kg	4.48	64.9 *	(0%–20%)			
**o–Terphenyl	712		478	468	ug/kg		65.8	(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: 354331

Client SDG: XP0116

Project Description: RC-233 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 or %RPD not applicable.

^ 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: 1417755 **Verified by:** _____
Analyst: Mia DeLee
Method: SW846 3541

Lab SOP: GL-OA-E-010 REV# 22
Instrument: Semi-Volatiles Manual

Sample ID	Run Date	Aliquot (g)	Prepped Aliquot (mL)	Prepped Factor (mL/g)
1203164009 MB	10-SEP-2014 09:53:00	30.04	1	0.03329
1203164010 LCS	10-SEP-2014 09:53:00	30.07	1	0.03326
354331002	10-SEP-2014 09:53:00	30.08	1	0.03324
1203164011 MS (354331002)	10-SEP-2014 09:53:00	30.07	1	0.03326
1203164012 MSD (354331002)	10-SEP-2014 09:53:00	30.07	1	0.03326
354539002	10-SEP-2014 09:53:00	30.15	1	0.03317
1203164013 MS (354539002)	10-SEP-2014 09:53:00	30.06	1	0.03327
1203164014 MSD (354539002)	10-SEP-2014 09:53:00	30.06	1	0.03327
354539004	10-SEP-2014 09:53:00	30.04	1	0.03329
355294004	10-SEP-2014 09:53:00	30.23	1	0.03308
1203164015 MS (355294004)	10-SEP-2014 09:53:00	30.05	1	0.03328
1203164016 MSD (355294004)	10-SEP-2014 09:53:00	30.07	1	0.03326
355294005	10-SEP-2014 09:53:00	30.4	1	0.03289
356299001	10-SEP-2014 09:53:00	30.35	1	0.03295
1203164017 MS (356299001)	10-SEP-2014 09:53:00	30.38	1	0.03292
1203164018 MSD (356299001)	10-SEP-2014 09:53:00	30.39	1	0.03291
356299002	10-SEP-2014 09:53:00	30.09	1	0.03323
356299003	10-SEP-2014 09:53:00	30.26	1	0.03305
356299004	10-SEP-2014 09:53:00	30.22	1	0.03309
356299005	10-SEP-2014 09:53:00	30.25	1	0.03306
356303001	10-SEP-2014 09:53:00	30.33	1	0.03297
1203164019 MS (356303001)	10-SEP-2014 09:53:00	30.08	1	0.03324
1203164020 MSD (356303001)	10-SEP-2014 09:53:00	30.31	1	0.03299
356303002	10-SEP-2014 09:53:00	30.19	1	0.03312
356303003	10-SEP-2014 09:53:00	30.33	1	0.03297
356303004	10-SEP-2014 09:53:00	30.14	1	0.03318

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
LCS	1203164010	AZDRO SPIKE LCS STD,4000ug/ml	WF1140806-62	1	mL	Final Solvent: CH2Cl2

Prep Logbook

Batch ID: 1417755 **Verified by:** _____
Analyst: Mia DeLee
Method: SW846 3541

Lab SOP: GL-OA-E-010 REV# 22
Instrument: Semi-Volatiles Manual

Sample ID	Run Date	Aliquot (g)	Prepped Aliquot (mL)	Prepped Factor (mL/g)	
MS	1203164011	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MS	1203164013	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MS	1203164015	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MS	1203164017	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MS	1203164019	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MSD	1203164012	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MSD	1203164014	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MSD	1203164016	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MSD	1203164018	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MSD	1203164020	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
SURR	All	20 ppm surrogate		WE140819-04	1 mL
REGNT	All	Methylene Chloride		2149119-D	120 mL
SOURC	All	SODIUM SULFATE		2127169	30 g

Verified by: SG

Samples consisted of a mixture of soil and rocks (large and small)

PCB Analysis

Case Narrative

**PCB Case Narrative
WC-HANFORD, INC. (WCHN)
SDG XP0116**

Method/Analysis Information

Procedure: Analysis of Polychlorinated Biphenyls by ECD
Analytical Method: SW846 3541/8082A
Prep Method: SW846 3541
Analytical Batch Number: 1410003
Prep Batch Number: 1410002

Sample Analysis

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

Sample ID	Client ID
354331001	J1TXF3
354331002	J1TXF4
354331003	J1TXF5
354331004	J1TXF6
1203144392	MB for batch 1410002
1203144393	Laboratory Control Sample (LCS)
1203144394	354331001(J1TXF3) Matrix Spike (MS)
1203144395	354331001(J1TXF3) 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 the samples in this SDG in this batch.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 354331001 (J1TXF3) 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 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

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 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
ECD9A.I_1	Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler	7890A GC/ECD	Restek Rtx-CLPest 1	30m x 0.25mm, 0.25um
ECD9A.I_2	Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler	7890A GC/ECD	Restek Rtx-CLPest 2	30m x 0.25mm, 0.20um

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the

requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

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

Qualifier Definition Report for

WCHN001 WC-HANFORD, INC.

Client SDG: XP0116 GEL Work Order: 354331 Project: RC-233 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

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.

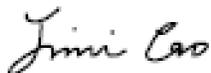
RA Indicates that sample is re-analyzed without re-extraction.

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: 11 AUG 2014

Title: Data Validator

Sample Data Summary

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: August 11, 2014

Page 1 of 1

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

Contact: Joan Kessner

Workorder: 354331

Client SDG: XP0116

Project Description: RC-233 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatiles-PCB											
Batch	1410003										
QC1203144393	LCS										
Aroclor-1016	33.3			25.8	ug/kg		77.4	(39%-120%)	JXM	08/08/14	19
Aroclor-1260	33.3			29.6	ug/kg		88.9	(50%-116%)			
**4cmx	6.66			4.80	ug/kg		72.1	(44%-106%)			
**Decachlorobiphenyl	6.66			5.15	ug/kg		77.4	(35%-119%)			
QC1203144392	MB										
Aroclor-1016			U	1.11	ug/kg					08/08/14	19
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						
Aroclor-1262			U	1.11	ug/kg						
Aroclor-1268			U	1.11	ug/kg						
**4cmx	6.65			4.93	ug/kg		74.1	(44%-106%)			
**Decachlorobiphenyl	6.65			5.19	ug/kg		78	(35%-119%)			
QC1203144394	354331001 MS										
Aroclor-1016	34.6	U	1.15	26.1	ug/kg		75.4	(25%-125%)		08/08/14	19
Aroclor-1260	34.6		4.41	30.3	ug/kg		74.8	(28%-127%)			
**4cmx	6.91		5.04	5.32	ug/kg		77	(44%-106%)			
**Decachlorobiphenyl	6.91		5.36	5.13	ug/kg		74.2	(35%-119%)			

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QC Summary

Workorder: 354331 Client SDG: XP0116 Project Description: RC-233 Soil Page 2 of 2

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatiles-PCB											
Batch	1410003										
QC1203144395	354331001	MSD									
Aroclor-1016	34.6	U	1.15	25.2	ug/kg	3.52	72.8	(0%-30%)	JXM	08/08/14	19
Aroclor-1260	34.6		4.41	31.1	ug/kg	2.55	77.1	(0%-30%)			
**4cmx	6.91		5.04	5.03	ug/kg		72.7	(44%-106%)			
**Decachlorobiphenyl	6.91		5.36	4.73	ug/kg		68.4	(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.
- 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 (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 or %RPD not applicable.

^ 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: 1410002
Analyst: Sirena White
Method: SW846 3541

Verified by: _____

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

Sample ID	Run Date	Aliquot (g)	Clean Up 1	Clean Up Amount 1 (mL)	Post Clean Up Amount 1 (mL)	Final Volume (mL)	Prepped Factor (mL/g)
1203144392 MB	08-AUG-2014 10:10:00	30.07	H2SO4/KM 2		9	1	0.03326
1203144393 LCS	08-AUG-2014 10:10:00	30.04	H2SO4/KM 2		9	1	0.03329
354331001	08-AUG-2014 10:10:00	30.12	H2SO4/KM 2		9	1	0.0332
1203144394 MS (354331001)	08-AUG-2014 10:10:00	30.09	H2SO4/KM 2		9	1	0.03323
1203144395 MSD (354331001)	08-AUG-2014 10:10:00	30.08	H2SO4/KM 2		9	1	0.03324
354331002	08-AUG-2014 10:10:00	30.08	H2SO4/KM 2		9	1	0.03324
354331003	08-AUG-2014 10:10:00	30.06	H2SO4/KM 2		9	1	0.03327
354331004	08-AUG-2014 10:10:00	30.06	H2SO4/KM 2		9	1	0.03327

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
LCS	1203144393	PCB Laboratory Control	WE140714-10	1	mL	Final Solvent: Hexane
MS	1203144394	PCB Laboratory Control	WE140714-10	1	mL	Verified by: MD
MSD	1203144395	PCB Laboratory Control	WE140714-10	1	mL	Clean-up: H2SO4/KMnO4
SURR	All	PEST LOW LEVEL SURROGATE 200 UG/L	WE140516-01	1	mL	Prior to clean-up: 2mL
REGNT	All	Hexane	2126073-B10	120	mL	Clean-up initials: SJW
REGNT	All	1:1 sulfuric acid	2130267	5	mL	Clean-up SOP: GL-OA-E-037 Rev.1
REGNT	All	5% Potassium Permanganate	2134734	5	mL	Clean-up date: 08/08/14
SOURC	All	SODIUM SULFATE	2127169	30	g	