

July 30, 2014

Rev. 1



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

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www.gel.com

July 28, 2014

Mr. Scot Fitzgerald
CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352

Re: CHPRC SAF I14-029
Work Order: 349214
SDG: GEL349214

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on May 22, 2014. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. This data package was revised per enclosed P&D: The EDD will be revised to report VOAs at the MDL.

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. 4505.

Sincerely,

Heather Shaffer
Project Manager

Purchase Order: 300071ES20
Chain of Custody: I14-029-009 and I14-029-025
Enclosures



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Case Narrative

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This data package was revised per enclosed P&D: The EDD will be revised to report VOAs at the MDL.

**General Narrative
for
Hanford MSA (51204)
CHPRC SAF I14-029
SDG: GEL349214**

July 28, 2014

Laboratory Identification:

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

Summary

Sample receipt

The sample(s) arrived at GEL Laboratories, LLC, Charleston, South Carolina on May 22, 2014, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Items of Note All efforts were made by the lab to meet any short hold times. Samples that were analyzed outside of the initial hold time but still within 2X hold time will be noted in the lab case narrative and DER..

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
349214001	B2WD39
349214002	B2WFN0

Case Narrative

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

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: GC/MS Volatile, General Chemistry and Radiochemistry. This package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Heather Shaffer

Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

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CH2MHill Plateau Remediation Company

319214

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #

114-029-009

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Collector	DAVE FLOYD	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	114-029	Sampling Origin	Hanford Site	Purchase Order/Charge Code	300071ES20
Project Title	2ZP1, MAY 2014	Logbook No.	HNF-N-506 65 / 40	Ice Chest No.	605-961
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.	770041016417
Protocol	CERCLA	Priority:	30 Days	Offsite Property No.	4810

POSSIBLE SAMPLE HAZARDS/REMARKS

**Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order-458.1

Sample No.	Filter	*	Date	Time	No./Type Container	Sample Analysis	Hold Time	Preservative
B2WD39	N	W	5/20/14	0842	4x40-mL aGs*	8260_VOA_GCMS_IX: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C
B2WD39	N	W	5/19/14	0842	1x20-mL P	Activity Scan	6 Months	None
B2WD39	N	W	5/20/14	0842	1x500-mL G/P	TC99_EIE_LSC: COMMON	6 Months	HNO3 to pH <2
B2WD39	N	W	5/20/14	0842	1x500-mL P	TRITIUM_DIST_LSC: COMMON	6 Months	None

SPECIAL INSTRUCTIONS

Hold Time

Total Activity Exemption: Yes No

Relinquished By	DAVE FLOYD	Print	100 ISO	Sign		Received By	L.D. Wall	Print	L.D. Wall	Sign		Date/Time	MAY 20 2014 1100
Relinquished By	L.D. Wall	Print	L.D. Wall	Sign		Received By	FEDEX	Print	FEDEX	Sign		Date/Time	MAY 20 2014 1400
Relinquished By		Print		Sign		Received By	P. Lent	Print	P. Lent	Sign		Date/Time	5-22-14 0855
Relinquished By		Print		Sign		Received By		Print		Sign		Date/Time	

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By

Date/Time

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CH2M Hill Plateau Remediation Company
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 C.O.C.# **I14-029-025**
 Page 1 of 1

Collector DAVE FLOYD
SAF No. I14-029
Project Title Z2P1, MAY 2014
Shipped To (Lab) GEL Laboratories, LLC
Protocol CERCLA
Contact/Requester Karen Waters-Husted
Sampling Origin Hanford Site
Logbook No. HNF-N-506 65 / 70
Method of Shipment Commercial Carrier
Priority: 30 Days **PRIORITY**
Telephone No. 509-376-4650
Purchase Order/Charge Code 300071ES20
Ice Chest No. GWS-961
Bill of Lading/Air Bill No. 77004016417
Offsite Property No. 4810

POSSIBLE SAMPLE HAZARDS/REMARKS
 * Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1

Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2WFN0	N	W 5/20/14	0842	1x250-mL G/P	9056_ANIONS_IC: COMMON; 9056_ANIONS_IC: GW 02	28 Days/48 Hours	Cool <=6C
B2WFN0	N	W 5/19/14		1x20-mL-P	Activity Scan	6 Months	None

SPECIAL INSTRUCTIONS Hold Time
 Total Activity Exemption: Yes No

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
DAVE FLOYD	[Signature]	[Signature]	MAY 20 2014 1100	LD. WALL	[Signature]	[Signature]	MAY 20 2014 1100	S = Soil DS = Drum Solids SE = Sediment DL = Drum Liquids SO = Solid T = Tissue SL = Sludge WL = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air X = Other
LD. WALL	[Signature]	[Signature]	MAY 20 2014 1400	FEDEX	[Signature]	[Signature]		
		[Signature]	Fedex	P. Arent	[Signature]	[Signature]	5/22/14 0855	

FINAL SAMPLE DISPOSITION
 Disposal Method (e.g., Return to customer, per lab procedure, used in process)
 Disposed By
 Date/Time

PRINTED ON 4/29/2014
 A-6004-842 (REV 2)

July 30, 2014

Client: HMSA		SDG/AR/COC/Work Order: 349214
Received By: P. Went		Date Received: 5/22/14
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"/>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>
Package, COC, and/or Samples marked as beryllium or asbestos containing?		<input checked="" type="checkbox"/>
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>
Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0CPM		If yes, Were swipes taken of sample containers < action levels?
Hazard Class Shipped:		UN#:

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) OC *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):
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? PO 5-22-14	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	Sample ID's, containers affected and observed pH: ALL Metals e' RAD TEST If Preservation added, Lot#: 59660 pH = 3. Lab PRESERVE Sample ID's and containers affected:
6 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>			
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"/>	clients
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 7700 4101 6417 7700 5658 4303 7700 5593 5674

Comments (Use Continuation Form if needed):

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Subject: Direction for missed short duration hold times (less than 48 hours)
From: "Fitzgerald, Scot L" <Scot_L_Fitzgerald@rl.gov>
Date: 6/10/2014 1:39 PM
To: "Heather Shaffer (Heather.Shaffer@gel.com)" <Heather.Shaffer@gel.com>
CC: "Douglas, James G (Jim)" <James_G_Jim_Douglas@rl.gov>, "Baechler, Michael A" <Michael_A_Baechler@rl.gov>, "Champoux, Sara J" <Sara_J_Champoux@rl.gov>, "Puckett, Susan" <Susan_Puckett@rl.gov>, "Waters-husted, Karen S" <Karen_S_Waters-husted@rl.gov>, "Ayres, Doris E" <Doris_E_Ayres@rl.gov>, "Fitzgerald, Scot L" <Scot_L_Fitzgerald@rl.gov>

Heather,

Please use the following guidance when dealing with short hold time methods.

It is expected that the laboratory will make every effort to meet regulatory hold times for all analysis performed for CHPRC. However, it is also recognized that shipping times can take up a significant portion of the time available for analyses having short (i.e. 48 hours or less) hold times. To this end, when the lab is unable to perform an analysis within the required hold time for methods having a hold time of 48 hours or less, the lab is directed to perform the analysis and note the missed hold time in the narrative. In addition, a statement summarizing the direction contained in this e-mail (or a copy of the e-mail itself) will be included in the narrative. This direction removes the need to initiate a SIR when the sample cannot be analyzed within the hold time but can be completed within 2X the hold time. For analysis performed outside 2X the hold time, the SIR process is still required.

Scot Fitzgerald
Analytical Support Group
Soil & Groundwater Remediation Project (S&GRP)
Phone: (509) 373-7495



Problem and Discrepancy Report

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Problem and Discrepancy Report**SDGs**

GEL349221 GEL348559 GEL349334 GEL349571 GEL348657 GEL348682
GEL349473 GEL349208 GEL349574 GEL348302 GEL349214 GEL348658

7/16/2014

1. The data package has the following issues:

- a) The listed SDGs need to have the VOAs re-reported as MDL not PQL.

Resolution: *Provide correction.*

Lab Response:

The lab will submit a revised EDD and send a revised data package to narrate the revision.

Provide a resolution to each issue noted on the report

Page 1 of 1

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: HMSA

Code	Status	Qualifier Definition	CofA	Department	Fraction	Additional Comments
U	Programmed	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.	Y			Includes MDA, TPU, count uncert.
J	Programmed	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	Y	Organics		Organics only
P	Programmed	Aroclor target analyte with greater than 25% difference between column analyses.	Y	Organics		PCB only
C	Manual	Analyte has been confirmed by GC/MS analysis	Y	Organics	Pesticide	IF GC/MS confirmation was attempted but unsuccessful do not qualify with C
B	Programmed	The analyte was detected in both the associated QC blank and in the sample.	Y	Organics		
E	Manual	Concentration exceeds the calibration range of the instrument	Y	Organics		Qualifier Uploaded
A	Manual	The TIC is a suspected aldol-condensation product	Y	Organics	Semi-Volatile	Uploaded with TIC
X	Programmed	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			Replaces H h flags. In RAD replaces UI. Same usage as standard X as well.
N	Programmed	Spike Sample recovery is outside control limits.	Y			
*	Programmed	Duplicate analysis not within control limits	Y	Inorganics		
>	Programmed	Result greater than quantifiable range or greater than upper limit of the analysis range	Y	General Chemistry		
Z	Manual	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			
B	Programmed	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).	Y	Inorganics	Metals	Replaces J
D	Programmed	Results are reported from a diluted aliquot of sample.	Y			Dilution
E	Programmed	Reported value is estimated due to interferences. See comment in narrative.	Y	Inorganics	Metals	GEL E
M	Manual	Duplicate precision not met.	Y	Inorganics	Metals	Replaces *
o	Programmed	Analyte failed to recover within LCS limits (Organics only)	Y	Organics		
S	Manual	Reported value determined by the Method of Standard Additions (MSA)	Y	Inorganics		Not coded B/C Rarely performed
T	Programmed	Spike and/or spike duplicate sample recovery is outside control limits.	Y	Organics		GC/MS only
W	Manual	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Y	Inorganics		No GFAA in house.
B	Programmed	The associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is \geq MDA for this sample	Y	Radiological		
Y	Manual	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier	Y			
+	Manual	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Y	Inorganics		
B	Programmed	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).	Y	General Chemistry		Replaces J
C	Programmed	Target analyte was detected in the sample and the associated blank, and the sample concentration was ≤ 5 times the blank concentration.	Y	Inorganics	Metals	Replaces B
C	Programmed	Target analyte was detected in the sample and the associated blank, and the sample concentration was ≤ 5 times the blank concentration.	Y	General Chemistry		Replaces B
<	Programmed	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	Y	General Chemistry		for Reactive CN/S

Laboratory Certifications

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List of current GEL Certifications as of 28 July 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	SC000122014-13
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12
Wisconsin	999887790

Volatile Analysis

Case Narrative

July 30, 2014
ChemStation Case Narrative
Hanford MSA (HMSA)
SDG GEL349214

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Method/Analysis Information

Procedure: Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer

Analytical Method: SW846 8260C

Analytical Batch Number: 1391711

Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

Sample ID	Client ID
349214001	B2WD39
1203099259	Method Blank (MB)
1203099260	Laboratory Control Sample (LCS)
1203099261	Laboratory Control Sample (LCS)
1203099262	349214001(B2WD39) Post Spike (PS)
1203099263	349214001(B2WD39) Post Spike Duplicate (PSD)
1203099264	349214001(B2WD39) Post Spike (PS)
1203099265	349214001(B2WD39) Post Spike Duplicate (PSD)

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

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

Preparation/Analytical Method Verification**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 21.

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) section 19.1.2. False positive analytes are designated on the quantitation report with a 'd' qualifier.

Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package.

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The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

Initial Calibration

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

Continuing Calibration Verification Requirements

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

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

The blanks analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

Surrogate recoveries in all client and quality control samples were within the acceptance limits.

Laboratory Control Sample (LCS) Recovery

The LCS 1203099261 (LCS) recoveries were not all within the acceptance limits. The unacceptable recoveries were less than 5% of the requested analyte list. This satisfies the client criteria. The results are reported. See the Data Exception Report in the miscellaneous section of the data package.

QC Sample Designation

Sample 349214001 (B2WD39) was designated for spike analysis.

Matrix Spike (PS) Recovery Statement

The spike 1203099262 (B2WD39) and 1203099264 (B2WD39) recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

Matrix Spike Duplicate (PSD) Recovery Statement

The spike duplicate 1203099263 (B2WD39) and 1203099265 (B2WD39) recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

Relative Percent Difference (RPD) Statement

The RPDs between the matrix spike pair met the acceptance limits.

Internal Standard (ISTD) Acceptance

The internal standard responses in all client and quality control samples met the required 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 or 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.

Sample Preservation and Integrity

All samples were pH 3 at the time of analysis. The following samples were not analyzed within seven days form collection: 349214001 (B2WD39).

Sample Dilutions/Methanol Dilutions

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Sample 349214001 (B2WD39) was diluted because target analyte concentrations exceeded the calibration range.

Sample Re-extraction/Re-analysis

Re-analyses were not required for samples in this SDG.

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

The following DER was generated for this SDG: 1300000.

Manual Integrations

Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

TIC Comment

Tentatively identified compounds (TIC) were not required for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Residual Chlorine

Residual Chlorine was not detected in any of the samples in this SDG.

System Configuration

The Volatile-GC/MS analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOA3.I	Agilent 6890/5973 GC/MS w/ OI 4560/Archon Autosampler	HP6890/HP5973	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

Certification Statement

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

July 30, 2014

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GEL LABORATORIES LLC

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

**Qualifier Definition Report
for**

HMSA001 Hanford MSA (51204)

Client SDG: GEL349214 GEL Work Order: 349214

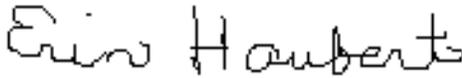
The Qualifiers in this report are defined as follows:

- 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
- 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: Erin Haubert

Date: 16 JUN 2014

Title: Data Validator

Sample Data Summary

~~JUL 30, 2014~~
GEL LABORATORIES LLC

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

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF I14-029**

Report Date: June 16, 2014

Client Sample ID: B2WD39
 Lab Sample ID: 349214001
 Matrix: WATER
 Collect Date: 20-MAY-14 08:42
 Receive Date: 22-MAY-14
 Collector: Client

Project: HMSA00146
 Client ID: HMSA001
 Client SDG: GEL349214

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
<i>8260_VOA_GCMS_IX: COMMON "As Received"</i>												
1,1,1,2-Tetrachloroethane	U	ND	0.300	2.00	2.00	ug/L	1	CDS1	05/29/14	19:02	1391711	1
1,1,1-Trichloroethane	U	ND	0.300	2.00	5.00	ug/L	1					
1,1,2,2-Tetrachloroethane	U	ND	0.300	2.00	2.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.300	2.00	5.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	2.00	10.0	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	2.00	10.0	ug/L	1					
1,2,3-Trichloropropane	U	ND	0.300	2.00	2.00	ug/L	1					
1,2-Dibromo-3-chloropropane	U	ND	0.500	2.00	2.00	ug/L	1					
1,2-Dibromoethane	U	ND	0.300	2.00	2.00	ug/L	1					
1,2-Dichloroethane	U	ND	0.300	2.00	5.00	ug/L	1					
1,2-Dichloropropane	U	ND	0.300	2.00	2.00	ug/L	1					
2-Butanone	TU	ND	3.00	10.0	10.0	ug/L	1					
2-Chloro-1,3-butadiene	TU	ND	0.300	2.00	2.00	ug/L	1					
2-Hexanone	TU	ND	3.00	10.0	10.0	ug/L	1					
4-Methyl-2-pentanone	U	ND	3.00	10.0	10.0	ug/L	1					
Acetone	TU	ND	3.00	10.0	20.0	ug/L	1					
Acetonitrile	U	ND	16.7	50.0	50.0	ug/L	1					
Acrolein	U	ND	3.00	10.0	10.0	ug/L	1					
Acrylonitrile	U	ND	3.00	10.0	10.0	ug/L	1					
Allyl chloride	U	ND	3.00	10.0	10.0	ug/L	1					
Benzene	U	ND	0.300	2.00	5.00	ug/L	1					
Bromoform	U	ND	0.300	2.00	2.00	ug/L	1					
Carbon disulfide	U	ND	1.60	10.0	5.00	ug/L	1					
Chlorobenzene	U	ND	0.300	2.00	5.00	ug/L	1					
Chloroethane	U	ND	0.300	2.00	2.00	ug/L	1					
Chloroform		7.66	0.300	2.00	5.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	2.00	2.00	ug/L	1					
Dibromomethane	U	ND	0.300	2.00	2.00	ug/L	1					
Dichlorodifluoromethane	U	ND	0.300	2.00	2.00	ug/L	1					
Ethyl methacrylate	U	ND	3.00	10.0	10.0	ug/L	1					
Ethylbenzene	U	ND	0.300	2.00	5.00	ug/L	1					
Iodomethane	U	ND	3.00	10.0	10.0	ug/L	1					
Isobutyl alcohol	TU	ND	33.0	100	100	ug/L	1					
Methacrylonitrile	U	ND	3.00	10.0	10.0	ug/L	1					
Methylene chloride	U	ND	1.60	5.00	5.00	ug/L	1					

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Rev. 1

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

Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF I14-029**

Report Date: June 16, 2014

Client Sample ID: B2WD39
 Lab Sample ID: 349214001

Project: HMSA00146
 Client ID: HMSA001

Client SDG: GEL349214

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
<i>8260_VOA_GCMS_IX: COMMON "As Received"</i>												
Styrene	U	ND	0.300	2.00	2.00	ug/L	1					
Tetrachloroethylene	J	0.760	0.300	2.00	5.00	ug/L	1					
Toluene	U	ND	0.300	2.00	5.00	ug/L	1					
Trichloroethene	J	3.41	0.300	2.00	5.00	ug/L	1					
Vinyl acetate	U	ND	1.60	5.00	5.00	ug/L	1					
Vinyl chloride	U	ND	0.300	2.00	10.0	ug/L	1					
Xylenes (total)	U	ND	0.300	6.00	10.0	ug/L	1					
cis-1,3-Dichloropropylene	U	ND	0.300	2.00	2.00	ug/L	1					
trans-1,2-Dichloroethylene	U	ND	0.300	2.00	2.00	ug/L	1					
trans-1,3-Dichloropropylene	U	ND	0.300	2.00	2.00	ug/L	1					
trans-1,4-Dichloro-2-butene	U	ND	1.50	10.0	10.0	ug/L	1					
Carbon tetrachloride	D	948	3.00	20.0	5.00	ug/L	10	CDS1	05/29/14	16:00	1391711	2

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 8260C	
2	SW846 8260C	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	8260_VOA_GCMS_IX: COMMON "As Received"	49.4 ug/L	50.0	98.8	(78%-124%)
Bromofluorobenzene	8260_VOA_GCMS_IX: COMMON "As Received"	46.3 ug/L	50.0	92.6	(80%-120%)
Toluene-d8	8260_VOA_GCMS_IX: COMMON "As Received"	50.3 ug/L	50.0	101	(80%-120%)
1,2-Dichloroethane-d4	8260_VOA_GCMS_IX: COMMON "As Received"	503 ug/L	50.0	101	(78%-124%)
Bromofluorobenzene	8260_VOA_GCMS_IX: COMMON "As Received"	500 ug/L	50.0	100	(80%-120%)
Toluene-d8	8260_VOA_GCMS_IX: COMMON "As Received"	503 ug/L	50.0	101	(80%-120%)

Miscellaneous

July 30, 2014

DER Report No.: 1300000
Revision No.: Rev. 1

DATA EXCEPTION REPORT

Mo.Day Yr. 03-JUN-14	Division: Federal	Quality Criteria: SOP	Type: Process
Instrument Type: VOA GC/MS	Test / Method: 8260C	Matrix Type: Liquid	Client Code: HMSA001
Batch ID: 1391711	Sample Numbers: all		
Potentially affected work order(s)(SDG): 349208(GEL349208),349214(GEL349214),349221(GEL349221),349326(GEL349326),349334(GEL349334),349571(GEL349571),349574(GEL349574),349685(GEL349685),349767(GEL349767)			
Application Issues: Failed Recovery for MS/PS Failed Recovery for LCS/LCSD Failed Recovery for MSD/PSD			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. The recovery for 2-Chloro-1,3-butadiene was outside of acceptance limits in LCS 1203099261 with a high bias. The compound was not detected in any of the associated samples.</p> <p>2-Chloro-1,3-butadiene 149% limits:70-130%</p> <p>2. The recoveries for several compounds were outside of acceptance limits in the matrix spikes and matrix spike duplicates performed on sample 349214001. The calculated relative percent differences between the MS and MSD samples for all spiked compounds were within acceptance limits.</p> <p>3. The recovery for 2-Chloro-1,3-butadiene was outside of acceptance limits in LCS 1203101411 with a high bias. The compound was not detected in any of the associated samples.</p> <p>2-Chloro-1,3-butadiene 148% limits:70-130%</p>		1,2,3. Narrate and report data.	

Originator's Name:

Crystal Stacey 03-JUN-14

Data Validator/Group Leader:

Erin Haubert 03-JUN-14

General Chem Analysis

Case Narrative

July 30, 2014

Rev. 1

**General Chemistry Narrative
Hanford MSA (HMSA)
SDG GEL349214**

Method/Analysis Information**Product:** Ion Chromatography**Analytical Batch:** 1390233 **Method:** 9056_ANIONS_IC:COMMON + GW 02**Sample Analysis**

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

Sample ID	Client ID
349214002	B2WFN0
1203094377	Method Blank (MB)
1203094378	349226005(B2WFT0) Sample Duplicate (DUP)
1203094379	349226005(B2WFT0) Post Spike (PS)
1203094380	Laboratory Control Sample (LCS)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 22.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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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: 349226005 (B2WFT0).

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

The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203094379 (B2WFT0).

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

The following samples were received with insufficient time to prep and/or analyze within the remaining method-specified holding time. The samples were analyzed as soon as possible by the analyst. 1203094378 (B2WFT0), 1203094379 (B2WFT0) and 349214002 (B2WFN0).

Sample Dilutions

The following samples in this sample group were diluted due to high concentration: 1203094378 (B2WFT0), 1203094379 (B2WFT0) and 349214002 (B2WFN0).

Sample Re-analysis

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

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

The following DER was generated for this SDG: 1297974. 1203094378 (B2WFT0), 1203094379 (B2WFT0) and 349214002 (B2WFN0).

Manual Integrations

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

Additional Comments

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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.

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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:

18Jun14

Sample Data Summary

July 30, 2014

Rev. 1

GEL LABORATORIES LLC

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

**Certificate of Analysis Report
for**

HMSA001 Hanford MSA (51204)

Client SDG: GEL349214 GEL Work Order: 349214

The Qualifiers in this report are defined as follows:

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

D Results are reported from a diluted aliquot of sample.

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

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

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, Heather Shaffer.

Reviewed by



~~JUL 30 2014~~
GEL LABORATORIES LLC

Rev. 1

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Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Company
 Address : MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: **CHPRC SAF I14-029**

Report Date: June 18, 2014

Client Sample ID: B2WFN0
 Lab Sample ID: 349214002
 Matrix: WATER
 Collect Date: 20-MAY-14 08:42
 Receive Date: 22-MAY-14
 Collector: Client

Project: HMSA00146
 Client ID: HMSA001
 Client SDG: GEL349214

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
<i>9056_ANIONS_IC:COMMON + GW 02 "As Received"</i>												
Bromide	B	100	67.0	200	200	ug/L	1	DM	05/22/14	15:02	1390233	1
Fluoride		577	33.0	100	500	ug/L	1					
Nitrite-N	UX	ND	38.0	100	250	ug/L	1					
Phosphorus in phosphate	UX	ND	67.0	200	200	ug/L	1					
Chloride	D	15600	670	2000	200	ug/L	10	MAR1	05/23/14	19:55	1390233	2
Nitrate-N	DX	20400	330	1000	250	ug/L	10					
Sulfate	D	35700	1330	4000	500	ug/L	10					

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 9056A	
2	SW846 9056A	

Quality Control Summary

July 30, 2014

Rev. 1

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 18, 2014

Page 1 of 2

CH2MHill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 349214

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1390233										
QC1203094378 349226005 DUP											
Bromide		521		564	ug/L	7.94 ^		(+/-250)	DM	05/22/14	20:30
Chloride	D	43400	D	42900	ug/L	1.27		(0%-20%)	MAR1	05/23/14	23:24
Fluoride	B	284	B	279	ug/L	1.85 ^		(+/-500)	DM	05/22/14	20:30
Nitrate-N	DX	54700	DX	54800	ug/L	0.175		(0%-20%)	MAR1	05/23/14	23:24
Nitrite-N	UX	ND	UX	ND	ug/L	N/A			DM	05/22/14	20:30
Phosphorus in phosphate	UX	ND	UX	ND	ug/L	N/A					
Sulfate	D	81000	D	82000	ug/L	1.23		(0%-20%)	MAR1	05/23/14	23:24
QC1203094380 LCS											
Bromide		1250		1220	ug/L		97.5	(90%-110%)	DM	05/22/14	22:00
Chloride		5000		4990	ug/L		99.7	(90%-110%)			
Fluoride		2500		2590	ug/L		103	(90%-110%)			
Nitrate-N		2500		2470	ug/L		98.9	(90%-110%)			
Nitrite-N		2500		2570	ug/L		103	(90%-110%)			
Phosphorus in phosphate		1250		1350	ug/L		108	(90%-110%)			
Sulfate		10000		10100	ug/L		101	(90%-110%)			
QC1203094377 MB											
Bromide			U	ND	ug/L					05/22/14	21:30
Chloride			U	ND	ug/L						
Fluoride			U	ND	ug/L						
Nitrate-N			U	ND	ug/L						
Nitrite-N			U	ND	ug/L						

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QC Summary

Workorder: 349214

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1390233										
Phosphorus in phosphate			U	ND	ug/L				DM	05/22/14	21:30
Sulfate			U	ND	ug/L						
QC1203094379 349226005 PS											
Bromide	1.25	0.521		1.80	mg/L		103 (90%-110%)			05/22/14	21:00
Chloride	5.00	D 2.17	D	7.41	mg/L		105 (90%-110%)	MAR1		05/23/14	23:54
Fluoride	2.50	B 0.284		2.83	mg/L		102 (90%-110%)	DM		05/22/14	21:00
Nitrate-N	2.50	DX 2.73	DX	5.52	mg/L		111 * (90%-110%)	MAR1		05/23/14	23:54
Nitrite-N	2.50	UX ND	X	2.57	mg/L		103 (90%-110%)	DM		05/22/14	21:00
Phosphorus in phosphate	1.25	UX ND	X	1.29	mg/L		103 (90%-110%)				
Sulfate	10.0	D 4.05	D	14.5	mg/L		104 (90%-110%)	MAR1		05/23/14	23:54

Notes:

The Qualifiers in this report are defined as follows:

- > Result greater than quantifiable range or greater than upper limit of the analysis range
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank, and the sample concentration was \leq 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.
- 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 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

July 30, 2014

DER Report No.: 1297974
Rev. 1

Revision No.: 1

DATA EXCEPTION REPORT

Mo.Day Yr. 28-MAY-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: IC	Test / Method: SW846 9056A	Matrix Type: Liquid	Client Code: HMSA
Batch ID: 1390233	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 349198(GEL349198),349208(GEL349208),349211(GEL349211),349214(GEL349214),349226(GEL349226)			
Application Issues: Failed Recovery for MS/PS Sample Analyzed out of Holding Sample Logged out of Holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Failed Recovery for MS/PS:</p> <p>QC 1203094379PS</p> <p>2. Sample Analyzed out of Holding:</p> <p>349198 001</p> <p>349208 001,007</p> <p>349214 002</p> <p>349226 001,003,004,005</p> <p>QC 1203094378DUP, 1203094379PS</p> <p>3. Sample Logged out of Holding:</p> <p>349226 002</p>		<p>1. The MS/PS mixture contains seven anions of interest. Of those, all requested anions except nitrate met normal acceptance criteria for recovery (90 - 110%). This failure is attributed to the matrix of the sample because the successful recovery of the other compounds indicate that the laboratory process was in control. This variance is judged to have no negative impact on the data. The deviation is noted in the Case Narrative and DER, and the data has been reported.</p> <p>2. The following samples were received with insufficient time to prep and/or analyze within the remaining method-specified holding time. The samples were analyzed as soon as possible by the analyst.</p> <p>3. Sample was logged in out holding time.</p>	

Originator's Name:

Dustin Miller 28-MAY-14

Data Validator/Group Leader:

Thomas Lewis 18-JUN-14

Radiological Analysis

July 30, 2014
Radiochemistry Case Narrative
Hanford MSA (HMSA)
SDG GEL349214
Work Order 349214

Rev. 1

"
"
"

Method/Analysis Information

"

Product: TC99_EIE_LSC: COMMON

Cpcn\vecri'O gjf <' VE; ; aGKaNUe

Cpcn\vecri'Dcvej 'P wo dgt<' 35; 326;

"

Sample ID "" Client ID

56; 436223" " D4Y F 5;

34252; 8623"" O gjf 'Drcpm'O D+

34252; 8624"" 56; 42: 225*D4Y DZ 3+"Uco r rg'F w rlecvg'F WR+

34252; 8625"" Ncdqtcvqt { 'Eqptqi'Uco r rg'NEU+

"

Vj g'uco r ngu'lp'yj ku'UF I 'y gtg'cpcn| gf "qp'cp'\$cu'tgegkxgf '\$'dcuku0"

"

SOP Reference

Rtqegf wtg'hqt'r tgr ctcvqp. 'cpcn\uku'cpf 'tgr qtvpki 'qh'cpcn\vecri'f cve'ctg'eqptqmgf 'd { 'I GN'Ncdqtcvqt'kgu'NNE'cu Ucpf ctf 'Qr gtcvki 'Rtqegf wtg'*UQR+0Vj g'f cve'f kuewuugf 'lp'yj ku'pcttcvkg'j cu'dggp'cpcn| gf 'lp'ceeqtfcpeg'y kj I N/TCF/C/27; 'TGX%40"

Calibration Information:

"

Calibration Information

Cmlpkkr'cpf 'eqpvkvpki 'ecrkdtevkp'tgs wkt go gpw'j cxg'dggp'o g0"

"

Standards Information

Ucpf ctf 'uqmwkpu'hqt'yj gug'cpcn\uku'ctg'P KUV'tcegcdrg'qt'xgt'kgf 'y kj 'c'P KUV'tcegcdrg'ucpf ctf 'cpf 'wugf dghqt'g'yj g'gzr ktcvqp'f cvgu0"

"

Sample Geometry

Cml'eqwvki 'uqtegu'y gtg'r tgr ctgf 'lp'yj g'uco g'i gqo gw { 'cu'yj g'ecrkdtevkp'ucpf ctf u0"

Quality Control (QC) Information:

"

Blank Information

Vj g'drcpniqxno g'ku'tgr tguvkvkg'qh'yj g'uco r rg'xqno g'lp'yj ku'dcvej 0"

"

Designated QC

Vj g'hqmy kpi 'uco r rg'y cu'wugf 'hqt'S E<56; 42: 225*D4Y DZ 3+0"

"

QC Information

Cml'qh'yj g'S E'uco r ngu'o gv'yj g'tgs wkt gf 'ceegr vpeg'rko ku0"

July 30, 2014

Rev. 1

Technical Information:

"

Holding Time

Cmluco r ng'r tqegf wtgu'ht'y ku'uco r ng'ugv'y gtg'r gthqto gf 'y kj lp'y g'tgs wktgf 'j qrf lpi 'lko g0"

"

Sample Re-prep/Re-analysis

P qpg'qh'y g'uco r ngu'lp'y ku'uco r ng'ugv'tgs wktgf 'tgr tgr 'qt'tgpcn{uku0"

"

Recounts

Uco r ngu'56; 436223*D4Y F 5; +y gtg'tgeqwpvgf 'v'xgtkh{ 'uco r ng'tguvnu0Tgeqwpv'ctg'tgr qtvgf 0"

Miscellaneous Information:

"

Data Exception (DER) Documentation

F cv'gzegr vqp'tgr qtu'ctg'i gpgtcvgf 'v'f qewo gpv'cp{ 'r tqegf wcn'cpqo crku'y cv'o c{ 'f gxlcvg'htqo 'tghgtpegf UQR'qt'eqptcewcnlf qewo gpw0C 'f cv'gzegr vqp'tgr qtv*F GT +y cu'pqi' gpgtcvgf 'ht'y ku'UF I 0"

"

Sample-Specific MDA/MDC

Vj g'OF C IO FE'tgr qtvgf 'qp'y g'egt'wlecvg'qh'cpcn{uku'ku'c'uco r ng/ur gekle'OF C IO FE0"

"

Additional Comments

Cf f kkpnc'eqo o gpw'y gtg'pqvt'gs wktgf 'ht'y ku'uco r ng'ugv0'

Qualifier Information

"

O cpwcn's wcn'htu'y gtg'pqvt'gs wktgf 0"

"

"

"

Method/Analysis Information

"

Product: TRITIUM_DIST_LSC: COMMON

Cpcn{ vccn'O gjv qf < VTK/KWO aF KUVaNUe

Cpcn{ vccn'Dcvej 'P wo dgt < 35; 328;

"

Sample ID *** Client ID**

56; 436223" " D4Y F 5;

34252; 86: 4"***** O gjv qf 'Drcpn{O D+

34252; 86: 5"***** 56; 548225*D4Y E62+'Uco r ng'F wr rlecvg'F WR+

34252; 86: 6"***** 56; 548225*D4Y E62+'O cvtkz'Ur knq'NO U+

34252; 86: 7"***** Ncdqtcvqt { 'Eqptqni'Uco r ng'NEU+

"

Vj g'uco r ngu'lp'y ku'UF I 'y gtg'cpcn{ | gf "qp'cp'\$cu'tgegkxgf '\$'dcuku0"

"

SOP Reference

Rtqegf wtg'ht'r tgr cte'vqp.'cpcn{uku'cpf 'tgr qt'vpi 'qh'cpcn{ vccn'f cv'ctg'eqptqmgf 'd{ 'I GN'Ncdqtcvqt'ku'NNE'cu Ucpf ctf 'Qr gtc'vpi 'Rtqegf wtg'UQR+0Vj g'f cv'f kucwugf 'lp'y ku'pcttc'vkg'j cu'dggp'cpcn{ | gf 'lp'ceeqt'f cpeg'y kj I N/TCF/C/224'TGX%430"

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Calibration Information:

"

Calibration Information

Cmlpkkcl'cpf "eqp'kwkpi "ecrkdcvkp'tgs wktgo gpw'j cxg'dggp"o g0"

"

Standards Information

Ucpcf ctf "uqmwkqpu'hqt"y gug'cpcn{ uku'ctg'P KUV"tcegcdng'qt'xgtkhgf "y kj "c'P KUV"tcegcdng'ucpcf ctf "cpf "wugf dghqtg'yj g"gzr kcvkpf'f cvu0"

"

Sample Geometry

Cml'eqwv'kpi "uqwegu'y gtg'r tgr ctgf "kp'yj g'uco g'i gqo gvt { "cu'yj g'ecrkdcvkp'ucpcf ctf u0"

Quality Control (QC) Information:

"

Blank Information

Vj g'drcpml'xqno g'ku'tgr t'gugpvc'xg'qh'yj g'uco r ng'xqno g'lp'yj ku'dcvej 0"

"

Designated QC

Vj g'hqmqy kpi "uco r ng'y cu'wugf 'hqt'S E<56; 548225*"D4Y E62+0"

"

QC Information

Cml'qh'yj g'S E'uco r ngu'o gv'yj g'tgs wktgf "ceegr v'peg'hko ku0"

Technical Information:

"

Holding Time

Cml'uco r ng'r tqegf wgu'hqt'yj ku'uco r ng'ugv'y gtg'r gthqto gf "y kj kp'yj g'tgs wktgf "j qrf kpi "ko g0"

"

Sample Re-prep/Re-analysis

P qpg'qh'yj g'uco r ngu'lp'yj ku'uco r ng'ugv'tgs wktgf "tgr tgr "qt'tgcpcn{ uku0"

"

Recounts

Uco r ng'56; 436223*"D4Y F 5; +y cu'tgeqwpv'f "v'xgtkh{ "uco r ng'tguwmu0Vj g'tgeqwpv'tguwmu'ctg'uko krc't"v'j g qtki kpcn'tguwmu0Qtki kpcn'tguwmu'ctg'tgr qtv'gf 0"

Miscellaneous Information:

"

Data Exception (DER) Documentation

F cvc"gzegr vkp'tgr qtu'ctg'i gpgtcv'gf "v'f qewo gpv'cp{ "r tqegf wcn'cpqo crkgu'yj cv'bo c{ "f gxlcvg'hqo "tghgtgpegf UQR'qt'eqp'tcewcn'f qewo gpw0C'f cvc"gzegr vkp'tgr qtu'F GT +y cu'p'qv'i gpgtcv'gf "hqt'yj ku'UF I 0"

"

Sample-Specific MDA/MDC

Vj g'O F C I O F E'tgr qtv'gf "qp'yj g'egt w'hecvg"qh'cpcn{ uku'ku'c'uco r ng/ur gekhe'O F C I O F E0"

"

Additional Comments

Cf f k'kqpcn'eqo o gpw'y gtg'pqv'tgs wktgf "hqt'yj ku'uco r ng'ugv0"

Qualifier Information

"

O cpwcn's wcn'k'gtu'y gtg'pqv'tgs wktgf 0"

"

"

"

Certification Statement

"

Y j gtg'yj g'cpcn{ wcn'bo gvj qf "j cu'dggp'r gthqto gf "w'pf gt'P GNCR'egt w'hecvg'v'j g'cpcn{ uku'j cu'bo gv'cm'qh'yj g

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tgs wkt go gpw"qh'j g'P GNCE'ucpf ctf "wprguu"qvj gty kug'p'qv'f 'lp'vj g'cpcn{ v'ecni'ecug'pctt'ev'xg0

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Qualifier Definition Report for

J O UC223"J cphqtf "O UC"*73426+

ErkpvUF I <I GN56; 436" I GN"Y qtmQtf gt<56; 436

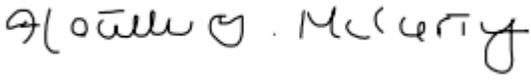
The Qualifiers in this report are defined as follows:

W""Cpcn{ | gf 'hqt'dw'pqv'f gvev'f'cdqxg'h'o k'kpi "etkgtlc0'k'pen'f gu'O FN."O FC.'RS N.'| gtq."eqwp'kpi "gttqt."cpf "qvcn
cpcn' v'ecr'gttqt0

Review/Validation

I GN'tgs w'k'gu'cm'cpcn' v'ecr'f'cvc"q'dg'xgt'h'gf "d{ "c's w'c'h'gf "f'cvc"t'gx'ky gt0" k'p"cf f'k'k'p."cm'ENR/r'ng"t'gr'k'g'cd'ngu
t'geg'k'g'c'v'j k'f "t'gx'gn't'gx'ky "q'h'v'j g'f'c'v'k'p'c'n'f'cvc"r'c'c'c'ni g0"

Vj g'hqmy kpi "f'cvc"x'c'n'f'c'v'q't'x'g't'h'gf "v'j g'k'p'q'to c'v'k'p'r't'g'g'p'v'g'f "k'p'v'j k'u'f'cvc"t'g'r'q't'v'

Signature: 

Name: Heather McCarty

Date: 13 JUN 2014

Title: Analyst II

Sample Data Summary

~~JUL 30, 2014~~
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Certificate of Analysis

Company : CH2MHill Plateau Remediation
 Address : Company
 MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352
 Contact: Mr. Scot Fitzgerald
 Project: CHPRC SAF I14-029

Report Date: June 13, 2014

Client Sample ID: B2WD39
 Sample ID: 349214001
 Matrix: WATER
 Collect Date: 20-MAY-14
 Receive Date: 22-MAY-14
 Collector: Client

Project: HMSA00146
 Client ID: HMSA001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	DF	Analyst	Date	Time	Batch	Mtd.
Rad Liquid Scintillation Analysis													
<i>TC99_EIE_LSC: COMMON "As Received"</i>													
Technetium-99		31.6	+/-7.80	11.5	+/-8.55	15.0	pCi/L		MYM	06/09/14	1420	1391049	1
<i>TRITIUM_DIST_LSC: COMMON "As Received"</i>													
Tritium		927	+/-92.5	77.8	+/-202	100	pCi/L		BYS1	06/05/14	0233	1391069	2

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, Tc-02-RC Modified
2	EPA 906.0 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Technetium-99m Tracer	TC99_EIE_LSC: COMMON "As Received"	1391049	96.2	(15%-125%)

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Quality Control Data

~~JUL 30, 2014~~
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QC Summary

Report Date: June 13, 2014

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Client : CH2MHill Plateau Remediation Company
 MSIN R3-50 CHPRC
 PO Box 1600
 Richland, Washington 99352

Contact: Mr. Scot Fitzgerald

Workorder: 349214

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date Time
Rad Liquid Scintillation									
Batch	1391049								
QC1203096401	MB								
Technetium-99			U	7.03	pCi/L			MYM1	06/08/1419:20
				Uncert: +/-6.81					
				TPU: +/-6.86					
QC1203096402	349208003	DUP							
Technetium-99		41.3		43.4	pCi/L				06/08/1419:46
				Uncert: +/-7.85		RPD: 5 (0% - 100%)			
				TPU: +/-9.09		RER: 0.324 (0-2)			
QC1203096403	LCS								
Technetium-99		290		289	pCi/L	REC: 100 (80%-120%)			06/08/1420:14
				Uncert: +/-14.4					
				TPU: +/-35.2					
Batch	1391069								
QC1203096482	MB								
Tritium			U	47.1	pCi/L			BYS1	06/05/1416:09
				Uncert: +/-47.9					
				TPU: +/-48.7					
QC1203096483	349326003	DUP							
Tritium		U	52.4	U	52.4	pCi/L			06/05/1417:42
				Uncert: +/-47.1		RPD: 0 N/A			
				TPU: +/-48.2		RER: 0.000112 (0-2)			
QC1203096484	349326003	MS							
Tritium		1790	U	52.4	1690	pCi/L	REC: 95 (75%-125%)		06/05/1419:14
				Uncert: +/-47.1					
				TPU: +/-48.2					
QC1203096485	LCS								
Tritium		1790		1570	pCi/L	REC: 88 (80%-120%)			06/05/1419:32
				Uncert: +/-274					
				TPU: +/-409					

Notes:

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

The Qualifiers in this report are defined as follows:

- > Result greater than quantifiable range or greater than upper limit of the analysis range
- A The TIC is a suspected aldol-condensation product
- 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).
- B The analyte was detected in both the associated QC blank and in the sample.
- B The associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is \geq MDA for this sample
- C Analyte has been confirmed by GC/MS analysis
- 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 Concentration exceeds the calibration range of the instrument

QC Summary

Workorder: 349214

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Parname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
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									
N	Spike Sample recovery is outside control limits.									
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.

** Indicates analyte is a surrogate compound.

^ 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.

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.