

July 21, 2014

REVISION 1



PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178

www.gel.com

June 23, 2014

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

Re: CHPRC F14-003
Work Order: 349685
SDG: GEL349685

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on May 30, 2014. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4505.

Sincerely,

A handwritten signature in cursive script that reads "Heather Shaffer".

Heather Shaffer
Project Manager

Purchase Order: 300071ES20
Chain of Custody: F14-003-168, F14-003-169, F14-003-170 and F14-003-203
Enclosures



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Case Narrative

**General Narrative
for
Hanford MSA (51204)
CHPRC F14-003
SDG: GEL349685**

June 23, 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 30, 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 samples were received and analyzed within hold time.

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
349685001	B2W344
349685002	B2W379
349685003	B2W345
349685004	B2W346

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, Metals and Radiochemistry. This package, to the best of my knowledge, is in compliance with technical and administrative requirements.



Heather Shaffer
Project Manager

SAMPLE ISSUE RESOLUTION

SIR NUM SDR14-247
REV NUM 0
DATE INITIATED 7/10/2014

SAMPLE EVENT INFORMATION

SAF NUM(S) F14-003
OPERABLE UNIT(S)
PROJECT(S) 200 AREA SGRP
SAMPLE EVENT TITLE(S) 200-ZP-1 Remedial Action Wells
LABORATORY GEL Laboratories, LLC

SAMPLING INFORMATION

NUMBER OF SAMPLES 1
SAMPLE NUMBERS B2W379
SAMPLE MATRIX WATER
COLLECTION DATE 5/29/2014 - 5/29/2014
SDG NUM GEL349685

ISSUE BACKGROUND

CLASS Chain of Custody Issue (Field)
TYPE Crossed-out Information not Dated/Initialed
DESCRIPTION Chain of Custody F14-003-203 p. 6/84 a cross out is initialed but not dated.

DISPOSITION

DESCRIPTION PROPOSED DISPOSITION: Document the excursion, insert the SIR into the data package and close the SIR.

JUSTIFICATION ACCEPTED DISPOSITION: Accept proposed resolution.

SUBMITTED BY: Kira Murray/CHPRC DATE: 7/10/14
 ACCEPTED BY: Susan Puckett/CHPRC DATE: 7/14/14

Chain of Custody and Supporting Documentation

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F14-003-168	PAGE 1 OF 1
COLLECTOR M.A. White CHPRC		COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 7H
SAMPLING LOCATION C8786, I-001		PROJECT DESIGNATION FY2014 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO. F14-003	AIR QUALITY <input type="checkbox"/>
ICE CHEST NO. GWS-182		FIELD LOGBOOK NO. HW-1507-28 p24	ACTUAL SAMPLE DEPTH 285.0	COA 302938E510	METHOD OF SHIPMENT FEDERAL EXPRESS
SHIPPED TO GEL Laboratories, LLC		OFFSITE PROPERTY NO. -SEE PTR- KCS 5/29/14 4827	BILL OF LADING/AIR BILL NO. 770131975170		
MATRIX* A=Air DL=Drum L=Liquids DS=Drum S=Solids O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	PRESERVATION HCl or H2SO4 to pH <2/ Cool 14 Days	HOLDING TIME	TYPE OF CONTAINER	NO. OF CONTAINER(S)
		ags*			4
		VOLUME			40mL
		SAMPLE ANALYSIS			8260_VOA_GCM; S: COMMON; 8260_VOA_GCM; S: CH 01;
SPECIAL HANDLING AND/OR STORAGE					
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B2W344	WATER	5-29-14	0900	✓	

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM M.A. White CHPRC	DATE/TIME MAY 29 2014 0940	RECEIVED BY/STORED IN J.C. FURFORTH CHPRC	DATE/TIME MAY 29 2014 0940	** The CACN for all analytical work at WSCF laboratory is 403857.** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.** VOA analysis will be conducted with a 24 hour turnaround time on preliminary data. The VOA samples will be placed on a separate COC.** Cr VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem.** The laboratory is to report all TICs for Method 8260. TRVL-14-063	
RELINQUISHED BY/REMOVED FROM CHPRC	DATE/TIME 5-29-14 1400	RECEIVED BY/STORED IN FedEx	DATE/TIME 5-30-14 0915	TRVL-14-063	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME	
PRINTED ON 5/5/2014	A-6003-618 (REV 2)				

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F14-003-203	PAGE 1 OF 1
COLLECTOR M.A. White CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 7H	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION C8786, FXR-1	PROJECT DESIGNATION FY2014 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	FIELD LOGBOOK NO. HWF-W-507-28 p 24	SAF NO. F14-003	AIR QUALITY <input type="checkbox"/>	METHOD OF SHIPMENT FEDERAL EXPRESS
ICE CHEST NO. GWS-182	ACTUAL SAMPLE DEPTH 12/4	OFFSITE PROPERTY NO. SEE PRR 4827	COA 302938ES10	BILL OF LADING/AIR BILL NO. SEE PRR 770131975170	
GEL Laboratories, LLC					
MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WF=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	PRESERVATION HCl or H2SO4 to pH <2/ Cool 14 Days	HOLDING TIME	TYPE OF CONTAINER 86S*	NO. OF CONTAINER(S) 4
SPECIAL HANDLING AND/OR STORAGE		VOLUME 40ml	SAMPLE ANALYSIS 8260_VOA_GOM S. COMMON; 8260_VOA_GOM S. CH 01;		
SAMPLE NO. B2W379	MATRIX* WATER	SAMPLE DATE 5-29-14	SAMPLE TIME 0900	✓	

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	** The CACN for all analytical work at WSCF laboratory is 403857.** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.** VOA analysis will be conducted with a 24 hour turnaround time on preliminary data. The VOA samples will be placed on a separate COC.** Cr VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem.** The laboratory is to report all TICs for Method 8260. TRVL-14-063	
W.A. White CHPRC	MAY 29 2014 0940	J.C. Puffinberger CHPRC	MAY 29 2014 0940		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
CHPRC	5-29-14 1400	J. Pellegrini	5-30-14 0915		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME	
TRVL-14-063					

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F14-003-169	PAGE 1 OF 1
COLLECTOR M.A. White CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 7H	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION C8786, I-001	PROJECT DESIGNATION FY2014 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	SAF NO. F14-003	COA 302938ES10	AIR QUALITY <input type="checkbox"/>	METHOD OF SHIPMENT FEDERAL EXPRESS
ICE CHEST NO. <i>GWS-142</i>	FIELD LOGBOOK NO. <i>Inf-N-507-28 p 24</i>	ACTUAL SAMPLE DEPTH <i>285.0</i>	BILL OF LADING/AIR BILL NO. <i>770131975170</i>		ORIGINAL
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. <i>5/29/14</i>	<i>4827</i>	<i>50</i>	<i>5-29-14</i>	
MATRIX* A=Air DL=Drum L=Liquids DS=Drum S=Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WF=Wipe X=Other	PRESERVATION Cool <=6C	HOLDING TIME 24 Hours	TYPE OF CONTAINER aG	NO. OF CONTAINER(S) 1	VOLUME 500mL
POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	SAMPLE ANALYSIS 7195.C86: COMMON;				
SPECIAL HANDLING AND/OR STORAGE					
SAMPLE NO. B2W345	MATRIX* WATER	SAMPLE DATE <i>5-29-14</i>	SAMPLE TIME <i>0900</i>		

CHAIN OF POSSESSION		SIGN / PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM <i>M.A. White</i>	DATE/TIME <i>MAY 29 2014 0940</i>	RECEIVED BY/STORED IN <i>J.B. Fulton</i>	DATE/TIME <i>MAY 29 2014 0940</i>	** The CACN for all analytical work at WSCF laboratory is 403857.** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.** VOA analysis will be conducted with a 24 hour turnaround time on preliminary data. The VOA samples will be placed on a separate COC.** Cr VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem.** The laboratory is to report all TICs for Method 8260. TRVL-14-063	
RELINQUISHED BY/REMOVED FROM <i>J.B. Fulton</i>	DATE/TIME <i>MAY 29 2014 0940</i>	RECEIVED BY/STORED IN <i>CHPRC</i>	DATE/TIME <i>MAY 29 2014 0940</i>		
RELINQUISHED BY/REMOVED FROM <i>CHPRC</i>	DATE/TIME <i>5-30-14 1400</i>	RECEIVED BY/STORED IN <i>FedEx</i>	DATE/TIME <i>5-30-14 0815</i>		
RELINQUISHED BY/REMOVED FROM <i>FedEx</i>	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME		
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME		
PRINTED ON 5/5/2014					

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F14-003-170	PAGE 1 OF 2
COLLECTOR M.A. White CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 7H	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION C8786, I-001	PROJECT DESIGNATION FY2014 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water	FIELD LOGBOOK NO. 285.0	SAF NO. F14-003	AIR QUALITY	METHOD OF SHIPMENT FEDERAL EXPRESS
ICE CHEST NO. GWS-182	FIELD LOGBOOK NO. 285.0	ACTUAL SAMPLE DEPTH	COA 302938ES10		ORIGINAL
SHIPPED TO GWS-182	OFFSITE PROPERTY NO. -SEE PTR KE 5/29/14		BILL OF LADING/AIR BILL NO. SEE PTR KE 5-29-14		170131975170
GEL Laboratories, LLC					
MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS *Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/DATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	PRESERVATION HNO3 to pH <2 Cool <=6C	HNO3 to pH <2 6 Months	HNO3 to pH <2 6 Months	None 6 Months
		HOLDING TIME 28 Days	6 Months	6 Months	6 Months
		TYPE OF CONTAINER G	G/P	G/P	P
		NO. OF CONTAINER(S) 1	1	1	1
		VOLUME 500mL	500mL	500mL	500mL
		SAMPLE ANALYSIS 7470_MERCURY (AQUEOUS); 9056_ANTONS. IC: COMMON INSTRUCTIONS (Nitrogen in Nitrate); TC99_EIE_LSC: COMMON;	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	TC99_EIE_LSC: COMMON;	TRITIUM_DIST LSC: COMMON;
SPECIAL HANDLING AND/OR STORAGE					
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B2W346	WATER	5-29-14	0900		

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
MAINTAINED BY/REMOVED FROM CHPRC DATE/TIME MAY 29 2014 0940	RECEIVED BY/STORED IN CHPRC DATE/TIME MAY 29 2014 0940	RECEIVED BY/STORED IN J. Pellegrini DATE/TIME 5-30-14 0915		SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM CHPRC DATE/TIME 5-29-14 1400	RECEIVED BY/STORED IN Fed Ex DATE/TIME	RECEIVED BY/STORED IN		TRVL-14-063	
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	RECEIVED BY/STORED IN			
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	RECEIVED BY/STORED IN			
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	RECEIVED BY/STORED IN			
RELINQUISHED BY/REMOVED FROM	RECEIVED BY/STORED IN	RECEIVED BY/STORED IN			
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME	
PRINTED ON 5/5/2014				A-6003-618 (REV 2)	

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F14-003-170	PAGE 2 OF 2
COLLECTOR White CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 7H	DATA TURNAROUND 30 Days / 30 Days	
SAMPLING LOCATION C8786, I-001	PROJECT DESIGNATION FY2014 200-ZP-1 Remedial Action Wells Sampling and Analysis - Water		SAF NO. F14-003	AIR QUALITY <input type="checkbox"/>		
ICE CHEST NO. CWS-182	FIELD LOGBOOK NO. 405-N-507-28 p 24	ACTUAL SAMPLE DEPTH 285	COA 302938ES10	METHOD OF SHIPMENT FEDERAL EXPRESS		ORIGINAL
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. SEE PFR-PC 5/29/14		BILL OF LADING/AIR BILL NO. SECRET OF 5-29-14			770131975170
<p>SPECIAL INSTRUCTIONS</p> <p>** The CACN for all analytical work at WSCF laboratory is 403857. ** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF. ** VOA analysis will be conducted with a 24 hour turnaround time on preliminary data. The VOA samples will be placed on a separate COC. ** Cr VI holding times MUST BE MET. Sample Management Project Coordinator must be contacted immediately if there is a problem. ** The laboratory is to report all TICs for Method 8260. TRVL-14-063 (1) 6020_METALS_ICPMS: COMMON {Aluminum, Barium, Cadmium, Chromium, Cobalt, Copper, Lead}; 6020_METALS_ICPMS: COMMON (Add-on) {Arsenic, Manganese, Nickel, Strontium, Uranium}; 6010_METALS_ICP: COMMON {Calcium, Iron, Vanadium};</p>						

TRVL-14-063

SAMPLE RECEIPT & REVIEW FORM

Client: <u>HMSA</u>		SDG/AR/COC/Work Order: <u>349685/349690/349694</u>	
Received By: <u>JP</u>		Date Received: <u>5-30-14</u>	
Suspected Hazard Information		Yes	No
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Package, COC, and/or Samples marked as beryllium or asbestos containing?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	<input type="checkbox"/>

*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.

Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 cpm

If yes, Were swipes taken of sample containers < action levels?

If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.

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"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) <small>*all temperatures are recorded in Celsius</small>
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>130411296</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: <u>Samples w/ HNO3 reading at pH of 3</u> If Preservation added, Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 Are Encore containers present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected: <u>Circle out of holding</u>
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other <u>7701 3559 6919</u> <u>11 3197 5170</u>

Comments (Use Continuation Form if needed):

Data Review Qualifier Definitions

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 (843) 556-8171

Report Date: 23-JUN-14

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 >= 2X the MDA and, after corrections, result is >= 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

List of current GEL Certifications as of 23 June 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 (A133904)
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	SC000122014-12
Vermont	VT87156
Virginia NELAP	460202
Washington	C780-12
Wisconsin	999887790

Volatile Analysis

Case Narrative

**ChemStation Case Narrative
Hanford MSA (HMSA)
SDG GEL349685**

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
349685001	B2W344
349685002	B2W379
1203099259	Method Blank (MB)
1203099260	Laboratory Control Sample (LCS)
1203099264	349214001(B2WD39) Post Spike (PS)
1203099265	349214001(B2WD39) Post Spike Duplicate (PSD)
1203100623	Method Blank (MB)
1203100624	Laboratory Control Sample (LCS)
1203101195	349685001(B2W344) Post Spike (PS)
1203101196	349685001(B2W344) Post Spike Duplicate (PSD)
1203101343	Method Blank (MB)
1203101344	Laboratory Control Sample (LCS)

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.

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 spike recoveries met the acceptance limits.

QC Sample Designation

Samples 349214001 (B2WD39) and 349685001 (B2W344) were designated for spike analysis.

Matrix Spike (PS) Recovery Statement

The spike 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 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 met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

The following samples were re-analyzed for Chloromethane because the original instrument for analysis did not meet method criteria for this compound: 349685001 (B2W344) and 349685002 (B2W379).

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 requested for this sample delivery group/work order. Please note that non-requested target analytes that are reported on the quantitation reports will be present on the Form I. These detected analytes are included in the calibrated method and as a result will be reported on the Sample Data Summary (Form I) or Certificate of Analysis (C of A). TIC data are included on the Sample Data Summary (Form I).

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:

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

VOAA.I	Agilent 7890/5975 GC/MS w/ OI Eclipse/Archon Autosampler	HP7890A/HP5975C	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10
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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.

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: GEL349685 GEL Work Order: 349685

The Qualifiers in this report are defined as follows:

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

T Spike and/or spike duplicate sample recovery is outside control limits.

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

DL Indicates that sample is diluted.

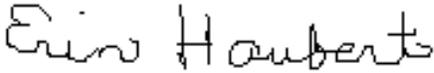
RA Indicates that sample is re-analyzed without re-extraction.

RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature: 

Name: Erin Haubert

Date: 17 JUN 2014

Title: Data Validator

Sample Data Summary

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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 F14-003**

Report Date: June 16, 2014

Client Sample ID: B2W344
 Sample ID: 349685001
 Matrix: WATER
 Collect Date: 29-MAY-14 09:00
 Receive Date: 30-MAY-14
 Collector: Client
 Project: HMSA00152
 Client ID: HMSA001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
<i>8260VOA_GCMS: COMMON + CH 01 "As Received"</i>											
1,1,1-Trichloroethane	U	ND	0.300	5.00	ug/L	1	CDS1	06/03/14	1108	1391711	1
1,1,2,2-Tetrachloroethane	U	ND	0.300	5.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.300	5.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	10.0	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	10.0	ug/L	1					
1,2-Dichloroethane	U	ND	0.300	5.00	ug/L	1					
1,2-Dichloroethylene (total)	U	ND	0.300	10.0	ug/L	1					
1,2-Dichloropropane	U	ND	0.300	5.00	ug/L	1					
2-Butanone	TU	ND	3.00	10.0	ug/L	1					
2-Hexanone	TU	ND	3.00	20.0	ug/L	1					
4-Methyl-2-pentanone	U	ND	3.00	10.0	ug/L	1					
Acetone	TU	ND	3.00	20.0	ug/L	1					
Benzene	U	ND	0.300	5.00	ug/L	1					
Bromodichloromethane	U	ND	0.300	5.00	ug/L	1					
Bromoform	U	ND	0.300	5.00	ug/L	1					
Bromomethane	U	ND	0.300	10.0	ug/L	1					
Carbon disulfide	U	ND	1.60	10.0	ug/L	1					
Carbon tetrachloride		12.8	0.300	5.00	ug/L	1					
Chlorobenzene	U	ND	0.300	5.00	ug/L	1					
Chloroethane	U	ND	0.300	10.0	ug/L	1					
Chloroform	J	2.22	0.300	5.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	5.00	ug/L	1					
Ethylbenzene	U	ND	0.300	5.00	ug/L	1					
Methylene chloride	U	ND	1.60	5.00	ug/L	1					
Styrene	U	ND	0.300	5.00	ug/L	1					
Tetrachloroethylene	U	ND	0.300	5.00	ug/L	1					
Toluene		6.80	0.300	5.00	ug/L	1					
Trichloroethene	U	ND	0.300	5.00	ug/L	1					
Vinyl chloride	U	ND	0.300	10.0	ug/L	1					
Xylenes (total)	U	ND	0.300	10.0	ug/L	1					
cis-1,3-Dichloropropylene	U	ND	0.300	5.00	ug/L	1					
trans-1,3-Dichloropropylene	U	ND	0.300	5.00	ug/L	1					
Chloromethane	U	ND	0.300	10.0	ug/L	1	JEB	06/03/14	0919	1391711	2

GEL LABORATORIES LLC

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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 F14-003**

Report Date: June 16, 2014

Client Sample ID: B2W344 Project: HMSA00152
 Sample ID: 349685001 Client ID: HMSA001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
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Volatile Organics

8260VOA_GCMS: COMMON + CH 01 "As Received"

Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits	Date Time:
Bromofluorobenzene	47.1 ug/L	50.0	94.2	(80%-120%)	06/03/14 11 08
1,2-Dichloroethane-d4	49.0 ug/L	50.0	98.1	(78%-124%)	
Toluene-d8	50.3 ug/L	50.0	101	(80%-120%)	

Tentatively Identified Compound (TIC)	CAS No.	RT	Est. Concentration	Fit	Qual	Date Time:
Surrogate/Tracer recovery	Result	Nominal	Recovery%	Acceptable Limits		06/03/14 09 19
Bromofluorobenzene	48.7 ug/L	50.0	97.4	(80%-120%)		
Toluene-d8	50.4 ug/L	50.0	101	(80%-120%)		
1,2-Dichloroethane-d4	53.6 ug/L	50.0	107	(78%-124%)		

Tentatively Identified Compound (TIC)	CAS No.	RT	Est. Concentration	Fit	Qual	Date Time:
						06/03/14 09 19

The following Analytical Methods were performed

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

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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 F14-003**

Report Date: June 16, 2014

Client Sample ID: B2W379
 Sample ID: 349685002
 Matrix: WATER
 Collect Date: 29-MAY-14 09:00
 Receive Date: 30-MAY-14
 Collector: Client
 Project: HMSA00152
 Client ID: HMSA001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatiles Organics											
<i>8260VOA_GCMS: COMMON + CH 01 "As Received"</i>											
1,1,1-Trichloroethane	U	ND	0.300	5.00	ug/L	1	CDS1	06/03/14	1139	1391711	1
1,1,2,2-Tetrachloroethane	U	ND	0.300	5.00	ug/L	1					
1,1,2-Trichloroethane	U	ND	0.300	5.00	ug/L	1					
1,1-Dichloroethane	U	ND	0.300	10.0	ug/L	1					
1,1-Dichloroethylene	U	ND	0.300	10.0	ug/L	1					
1,2-Dichloroethane	U	ND	0.300	5.00	ug/L	1					
1,2-Dichloroethylene (total)	U	ND	0.300	10.0	ug/L	1					
1,2-Dichloropropane	U	ND	0.300	5.00	ug/L	1					
2-Butanone	TU	ND	3.00	10.0	ug/L	1					
2-Hexanone	TU	ND	3.00	20.0	ug/L	1					
4-Methyl-2-pentanone	U	ND	3.00	10.0	ug/L	1					
Acetone	TU	ND	3.00	20.0	ug/L	1					
Benzene	U	ND	0.300	5.00	ug/L	1					
Bromodichloromethane	U	ND	0.300	5.00	ug/L	1					
Bromoform	U	ND	0.300	5.00	ug/L	1					
Bromomethane	U	ND	0.300	10.0	ug/L	1					
Carbon disulfide	U	ND	1.60	10.0	ug/L	1					
Carbon tetrachloride	U	ND	0.300	5.00	ug/L	1					
Chlorobenzene	U	ND	0.300	5.00	ug/L	1					
Chloroethane	U	ND	0.300	10.0	ug/L	1					
Chloroform	U	ND	0.300	5.00	ug/L	1					
Dibromochloromethane	U	ND	0.300	5.00	ug/L	1					
Ethylbenzene	U	ND	0.300	5.00	ug/L	1					
Methylene chloride		22.8	1.60	5.00	ug/L	1					
Styrene	U	ND	0.300	5.00	ug/L	1					
Tetrachloroethylene	U	ND	0.300	5.00	ug/L	1					
Toluene	U	ND	0.300	5.00	ug/L	1					
Trichloroethene	U	ND	0.300	5.00	ug/L	1					
Vinyl chloride	U	ND	0.300	10.0	ug/L	1					
Xylenes (total)	U	ND	0.300	10.0	ug/L	1					
cis-1,3-Dichloropropylene	U	ND	0.300	5.00	ug/L	1					
trans-1,3-Dichloropropylene	U	ND	0.300	5.00	ug/L	1					
Chloromethane	U	ND	0.300	10.0	ug/L	1	JEB	06/03/14	0944	1391711	2

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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 F14-003**

Report Date: June 16, 2014

Client Sample ID: B2W379 Project: HMSA00152
 Sample ID: 349685002 Client ID: HMSA001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
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Volatile Organics

8260VOA_GCMS: COMMON + CH 01 "As Received"

<i>Surrogate/Tracer recovery</i>	<i>Result</i>	<i>Nominal</i>	<i>Recovery%</i>	<i>Acceptable Limits</i>	<i>Date Time:</i>
Bromofluorobenzene	46.1 ug/L	50.0	92.2	(80%-120%)	06/03/14 11 39
1,2-Dichloroethane-d4	51.5 ug/L	50.0	103	(78%-124%)	
Toluene-d8	51.5 ug/L	50.0	103	(80%-120%)	

<i>Tentatively Identified Compound (TIC)</i>	<i>CAS No.</i>	<i>RT</i>	<i>Est. Concentration</i>	<i>Fit</i>	<i>Qual</i>	<i>Date Time:</i>
<i>Surrogate/Tracer recovery</i>						06/03/14 11 39
Bromofluorobenzene		48.5 ug/L	50.0	97.0	(80%-120%)	06/03/14 09 44
Toluene-d8		50.1 ug/L	50.0	100	(80%-120%)	
1,2-Dichloroethane-d4		53.5 ug/L	50.0	107	(78%-124%)	

<i>Tentatively Identified Compound (TIC)</i>	<i>CAS No.</i>	<i>RT</i>	<i>Est. Concentration</i>	<i>Fit</i>	<i>Qual</i>	<i>Date Time:</i>
						06/03/14 09 44

The following Analytical Methods were performed

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

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 16, 2014

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CH2M Hill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 349685

Parname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS										
Batch	1391711									
QC1203099260	LCS									
1,1,1-Trichloroethane	50.0		54.9	ug/L		110	(70%-130%)	CDS1	05/29/14	09:23
1,1,2,2-Tetrachloroethane	50.0		56.3	ug/L		113	(70%-130%)			
1,1,2-Trichloroethane	50.0		53.1	ug/L		106	(70%-130%)			
1,1-Dichloroethane	50.0		53.1	ug/L		106	(70%-130%)			
1,1-Dichloroethylene	50.0		53.9	ug/L		108	(70%-130%)			
1,2-Dichloroethane	50.0		49.0	ug/L		98.1	(70%-130%)			
1,2-Dichloroethylene (total)	100		101	ug/L		101	(70%-130%)			
1,2-Dichloropropane	50.0		50.9	ug/L		102	(70%-130%)			
2-Butanone	250		266	ug/L		107	(70%-130%)			
2-Hexanone	250		252	ug/L		101	(70%-130%)			
4-Methyl-2-pentanone	250		248	ug/L		99	(70%-130%)			
Acetone	250		269	ug/L		108	(70%-130%)			
Benzene	50.0		51.6	ug/L		103	(70%-130%)			
Bromodichloromethane	50.0		53.5	ug/L		107	(70%-130%)			
Bromoform	50.0		58.6	ug/L		117	(70%-130%)			
Bromomethane	50.0		49.8	ug/L		99.5	(70%-130%)			
Carbon disulfide	250		272	ug/L		109	(70%-130%)			
Carbon tetrachloride	50.0		53.4	ug/L		107	(70%-130%)			
Chlorobenzene	50.0		52.2	ug/L		104	(70%-130%)			
Chloroethane	50.0		49.9	ug/L		99.8	(70%-130%)			

GEL LABORATORIES LLC

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QC Summary

Workorder: 349685

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1391711										
Chloroform	50.0			51.0	ug/L		102	(70%-130%)	CDS1	05/29/14	09:23
Dibromochloromethane	50.0			56.4	ug/L		113	(70%-130%)			
Ethylbenzene	50.0			51.4	ug/L		103	(70%-130%)			
Methylene chloride	50.0			47.7	ug/L		95.5	(70%-130%)			
Styrene	50.0			49.7	ug/L		99.5	(70%-130%)			
Tetrachloroethylene	50.0			51.2	ug/L		102	(70%-130%)			
Toluene	50.0			52.6	ug/L		105	(70%-130%)			
Trichloroethene	50.0			54.5	ug/L		109	(70%-130%)			
Vinyl chloride	50.0			48.7	ug/L		97.5	(70%-130%)			
Xylenes (total)	150			152	ug/L		102	(70%-130%)			
cis-1,3-Dichloropropylene	50.0			55.4	ug/L		111	(70%-130%)			
trans-1,3-Dichloropropylene	50.0			54.5	ug/L		109	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			50.6	ug/L		101	(78%-124%)			
**Bromofluorobenzene	50.0			52.1	ug/L		104	(80%-120%)			
**Toluene-d8	50.0			49.5	ug/L		98.9	(80%-120%)			
QC1203100624	LCS										
Chloromethane	50.0			37.4	ug/L		74.8	(70%-130%)	JEB	06/03/14	02:26
**1,2-Dichloroethane-d4	50.0			52.3	ug/L		105	(78%-124%)			
**Bromofluorobenzene	50.0			48.8	ug/L		97.6	(80%-120%)			
**Toluene-d8	50.0			50.1	ug/L		100	(80%-120%)			
QC1203101344	LCS										
1,1,1-Trichloroethane	50.0			55.3	ug/L		111	(70%-130%)	CDS1	06/03/14	07:35
1,1,2,2-Tetrachloroethane	50.0			58.9	ug/L		118	(70%-130%)			

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QC Summary

Workorder: 349685

Page 3 of 9

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1391711										
1,1,2-Trichloroethane	50.0			54.0	ug/L		108	(70%-130%)	CDS1	06/03/14	07:35
1,1-Dichloroethane	50.0			52.8	ug/L		106	(70%-130%)			
1,1-Dichloroethylene	50.0			54.2	ug/L		108	(70%-130%)			
1,2-Dichloroethane	50.0			49.2	ug/L		98.4	(70%-130%)			
1,2-Dichloroethylene (total)	100			104	ug/L		104	(70%-130%)			
1,2-Dichloropropane	50.0			52.8	ug/L		106	(70%-130%)			
2-Butanone	250			276	ug/L		110	(70%-130%)			
2-Hexanone	250			261	ug/L		104	(70%-130%)			
4-Methyl-2-pentanone	250			254	ug/L		102	(70%-130%)			
Acetone	250			274	ug/L		110	(70%-130%)			
Benzene	50.0			54.2	ug/L		108	(70%-130%)			
Bromodichloromethane	50.0			52.3	ug/L		105	(70%-130%)			
Bromoform	50.0			58.8	ug/L		118	(70%-130%)			
Bromomethane	50.0			47.2	ug/L		94.3	(70%-130%)			
Carbon disulfide	250			278	ug/L		111	(70%-130%)			
Carbon tetrachloride	50.0			52.7	ug/L		105	(70%-130%)			
Chlorobenzene	50.0			55.0	ug/L		110	(70%-130%)			
Chloroethane	50.0			48.3	ug/L		96.6	(70%-130%)			
Chloroform	50.0			53.2	ug/L		106	(70%-130%)			
Dibromochloromethane	50.0			56.7	ug/L		113	(70%-130%)			
Ethylbenzene	50.0			52.2	ug/L		104	(70%-130%)			

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QC Summary

Workorder: 349685

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1391711										
Methylene chloride	50.0			49.4	ug/L		98.9	(70%-130%)			
Styrene	50.0			52.1	ug/L		104	(70%-130%)	CDS1	06/03/14	07:35
Tetrachloroethylene	50.0			53.7	ug/L		107	(70%-130%)			
Toluene	50.0			53.6	ug/L		107	(70%-130%)			
Trichloroethene	50.0			55.6	ug/L		111	(70%-130%)			
Vinyl chloride	50.0			46.5	ug/L		93	(70%-130%)			
Xylenes (total)	150			157	ug/L		105	(70%-130%)			
cis-1,3-Dichloropropylene	50.0			55.3	ug/L		111	(70%-130%)			
trans-1,3-Dichloropropylene	50.0			53.6	ug/L		107	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			50.1	ug/L		100	(78%-124%)			
**Bromofluorobenzene	50.0			53.1	ug/L		106	(80%-120%)			
**Toluene-d8	50.0			51.4	ug/L		103	(80%-120%)			
QC1203099259	MB										
1,1,1-Trichloroethane			U	ND	ug/L					05/29/14	10:54
1,1,2,2-Tetrachloroethane			U	ND	ug/L						
1,1,2-Trichloroethane			U	ND	ug/L						
1,1-Dichloroethane			U	ND	ug/L						
1,1-Dichloroethylene			U	ND	ug/L						
1,2-Dichloroethane			U	ND	ug/L						
1,2-Dichloroethylene (total)			U	ND	ug/L						
1,2-Dichloropropane			U	ND	ug/L						
2-Butanone			U	ND	ug/L						
2-Hexanone			U	ND	ug/L						

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QC Summary

Workorder: 349685

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1391711										
4-Methyl-2-pentanone			U	ND	ug/L				CDS1	05/29/14	10:54
Acetone			U	ND	ug/L						
Benzene			U	ND	ug/L						
Bromodichloromethane			U	ND	ug/L						
Bromoform			U	ND	ug/L						
Bromomethane			U	ND	ug/L						
Carbon disulfide			U	ND	ug/L						
Carbon tetrachloride			U	ND	ug/L						
Chlorobenzene			U	ND	ug/L						
Chloroethane			U	ND	ug/L						
Chloroform			U	ND	ug/L						
Dibromochloromethane			U	ND	ug/L						
Ethylbenzene			U	ND	ug/L						
Methylene chloride			U	ND	ug/L						
Styrene			U	ND	ug/L						
Tetrachloroethylene			U	ND	ug/L						
Toluene			U	ND	ug/L						
Trichloroethene			U	ND	ug/L						
Vinyl chloride			U	ND	ug/L						
Xylenes (total)			U	ND	ug/L						
cis-1,3-Dichloropropylene			U	ND	ug/L						

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1391711										
trans-1,3-Dichloropropylene			U	ND	ug/L						
**1,2-Dichloroethane-d4	50.0			54.1	ug/L		108	(78%-124%)	CDS1	05/29/14	10:54
**Bromofluorobenzene	50.0			48.0	ug/L		96.1	(80%-120%)			
**Toluene-d8	50.0			53.2	ug/L		106	(80%-120%)			
QC1203100623		MB									
Chloromethane			U	ND	ug/L				JEB	06/03/14	03:39
**1,2-Dichloroethane-d4	50.0			47.5	ug/L		94.9	(78%-124%)			
**Bromofluorobenzene	50.0			47.9	ug/L		95.7	(80%-120%)			
**Toluene-d8	50.0			49.2	ug/L		98.4	(80%-120%)			
QC1203101343		MB									
1,1,1-Trichloroethane			U	ND	ug/L				CDS1	06/03/14	08:36
1,1,2,2-Tetrachloroethane			U	ND	ug/L						
1,1,2-Trichloroethane			U	ND	ug/L						
1,1-Dichloroethane			U	ND	ug/L						
1,1-Dichloroethylene			U	ND	ug/L						
1,2-Dichloroethane			U	ND	ug/L						
1,2-Dichloroethylene (total)			U	ND	ug/L						
1,2-Dichloropropane			U	ND	ug/L						
2-Butanone			U	ND	ug/L						
2-Hexanone			U	ND	ug/L						
4-Methyl-2-pentanone			U	ND	ug/L						
Acetone			U	ND	ug/L						
Benzene			U	ND	ug/L						
Bromodichloromethane			U	ND	ug/L						

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1391711										
Bromoform			U	ND	ug/L				CDS1	06/03/14	08:36
Bromomethane			U	ND	ug/L						
Carbon disulfide			U	ND	ug/L						
Carbon tetrachloride			U	ND	ug/L						
Chlorobenzene			U	ND	ug/L						
Chloroethane			U	ND	ug/L						
Chloroform			U	ND	ug/L						
Dibromochloromethane			U	ND	ug/L						
Ethylbenzene			U	ND	ug/L						
Methylene chloride			U	ND	ug/L						
Styrene			U	ND	ug/L						
Tetrachloroethylene			U	ND	ug/L						
Toluene			U	ND	ug/L						
Trichloroethene			U	ND	ug/L						
Vinyl chloride			U	ND	ug/L						
Xylenes (total)			U	ND	ug/L						
cis-1,3-Dichloropropylene			U	ND	ug/L						
trans-1,3-Dichloropropylene			U	ND	ug/L						
**1,2-Dichloroethane-d4	50.0			50.7	ug/L		101	(78%-124%)			
**Bromofluorobenzene	50.0			47.8	ug/L		95.5	(80%-120%)			
**Toluene-d8	50.0			52.9	ug/L		106	(80%-120%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1391711										
QC1203099264	349214001 PS										
**1,2-Dichloroethane-d4	50.0	49.4		48.3	ug/L		96.7	(78%-124%)	CDS1	05/29/14	14:28
**Bromofluorobenzene	50.0	46.3		44.7	ug/L		89.4	(80%-120%)			
**Toluene-d8	50.0	50.3		50.1	ug/L		100	(80%-120%)			
QC1203101195	349685001 PS										
Chloromethane	50.0	U	ND	45.8	ug/L		91.6	(70%-130%)	JEB	06/03/14	10:58
**1,2-Dichloroethane-d4	50.0	53.6		53.9	ug/L		108	(78%-124%)			
**Bromofluorobenzene	50.0	48.7		48.3	ug/L		96.7	(80%-120%)			
**Toluene-d8	50.0	50.4		50.5	ug/L		101	(80%-120%)			
QC1203099265	349214001 PSD										
**1,2-Dichloroethane-d4	50.0	49.4		48.2	ug/L		96.4	(78%-124%)	CDS1	05/29/14	14:58
**Bromofluorobenzene	50.0	46.3		44.7	ug/L		89.4	(80%-120%)			
**Toluene-d8	50.0	50.3		49.8	ug/L		99.6	(80%-120%)			
QC1203101196	349685001 PSD										
Chloromethane	50.0	U	ND	49.5	ug/L	7.83	99	(0%-20%)	JEB	06/03/14	11:22
**1,2-Dichloroethane-d4	50.0	53.6		54.7	ug/L		109	(78%-124%)			
**Bromofluorobenzene	50.0	48.7		48.4	ug/L		96.7	(80%-120%)			
**Toluene-d8	50.0	50.4		50.2	ug/L		100	(80%-120%)			

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
- N Spike Sample recovery is outside control limits.

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QC Summary

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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

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		
<p>Potentially affected work order(s)(SDG): 349208(GEL349208),349214(GEL349214),349221(GEL349221),349326(GEL349326),349334(GEL349334),349571(GEL349571),349574(GEL349574),349685(GEL349685),349767(GEL349767)</p> <p>Application Issues:</p> <p>Failed Recovery for MS/PS Failed Recovery for LCS/LCSD Failed Recovery for MSD/PSD</p>			
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>		<p>1,2,3. Narrate and report data.</p>	

Originator's Name:
Crystal Stacey 03-JUN-14

Data Validator/Group Leader:
Erin Haubert 03-JUN-14

Metals Analysis

Case Narrative

**Metals Fractional Narrative
Hanford MSA (HMSA)
SDG GEL349685**

Sample Analysis

Sample ID	Client ID
349685004	B2W346
1203107503	349473001(B2WBD0D) Sample Duplicate (DUP)
1203107504	349473001(B2WBD0S) Matrix Spike (MS)
1203107505	349473001(B2WBD0L) Serial Dilution (SD)
1203107492	Laboratory Control Sample (LCS)
1203107491	Method Blank (MB) CVAA
1203099967	349767004(B2W350S) Matrix Spike (MS)
1203099968	349767004(B2W350SD) Matrix Spike Duplicate (MSD)
1203099969	349767004(B2W350L) Serial Dilution (SD)
1203099966	Laboratory Control Sample (LCS)
1203099965	Method Blank (MB) ICP
1203099784	349767004(B2W350S) Matrix Spike (MS)
1203099785	349767004(B2W350SD) Matrix Spike Duplicate (MSD)
1203099786	349767004(B2W350L) Serial Dilution (SD)
1203099783	Laboratory Control Sample (LCS)
1203099782	Method Blank (MB) ICP-MS

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

Method/Analysis Information

Analytical Batch:	1392441, 1392364 and 1395292
Prep Batch :	1392440, 1392363 and 1395290
Standard Operating Procedures:	GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 10, GL-MA-E-014 REV# 25 and GL-MA-E-010 REV# 27
Analytical Method:	6010_METALS_ICP, 6020_METALS_ICPMS and 7470_HG_CVAA
Prep Method :	SW846 3005A and SW846 7470A Prep

Preparation/Analytical Method Verification

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

System Configuration

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with an ESI SC-FAST introduction, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 0.4L/min, argon gas flows of 13 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

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

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

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

Calibration Information

Instrument Calibration

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

CRDL/PQL Requirements

The CRDL/PQL standard recoveries met the referenced advisory control limits.

ICSA/ICSAB Statement

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

Continuing Calibration Blanks (CCB) Requirements

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

Continuing Calibration Verification (CCV) Requirements

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

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

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 349767004 (B2W350)-ICP and ICP-MS and 349473001 (B2WBD0)-CVAA.

Matrix Spike (MS) Recovery Statement

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

Matrix Spike Duplicate (MSD) Recovery Statement

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

MS/MSD Relative Percent Difference (RPD) Statement

The relative percent difference (RPD) obtained from the designated matrix spike duplicate (MSD) is evaluated based on acceptance criteria of 20%. The RPD values between qualifying analyte results in the MS and MSD were within the acceptance limits.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations 25x the IDL/MDL for CVAA, 50X the IDL/MDL for ICP and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. Strontium did not meet the established percent difference criteria. 1203099786 (B2W350)-ICP-MS.

Duplicate Relative Percent Difference (RPD) Statement

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

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.

Sample Dilutions

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. The samples in this SDG did not require dilutions.

Preparation Information

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

Miscellaneous Information**Electronic Packaging Comment**

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted: Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. Data exception reports were included behind the Case Narrative or in the Miscellaneous Data section of this data package. A data exception report was not required for this SDG.

Additional Comments

Additional comments were not required for this SDG.

Certification Statement

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

Review Validation:

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

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

Reviewer: Nikhil A. Elmore Date: 6-26-14

Sample Data Summary

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: GEL349685 GEL Work Order: 349685

The Qualifiers in this report are defined as follows:

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

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Heather Shaffer.

Reviewed by

Nick-Cole A. Elmore 6-26-14

GEL LABORATORIES LLC

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 F14-003**

Report Date: June 25, 2014

Client Sample ID: B2W346
 Lab Sample ID: 349685004
 Matrix: WATER
 Collect Date: 29-MAY-14 09:00
 Receive Date: 30-MAY-14
 Collector: Client
 Project: HMSA00152
 Client ID: HMSA001
 Client SDG: GEL349685

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA												
<i>7470_MERCURY_CV: COMMON "As Received"</i>												
Mercury	U	ND	0.067	0.200	0.200	ug/L	1	NOR1	06/13/14	10:45	1395292	1
Metals Analysis-ICP												
<i>6010_METALS_ICP: COMMON (Ca, Fe, V) "As Received"</i>												
Calcium		60300	50.0	200	200	ug/L	1	HSC	06/17/14	20:47	1392441	2
Iron		3620	30.0	100	100	ug/L	1					
Vanadium		29.8	1.00	5.00	5.00	ug/L	1					
Metals Analysis-ICP-MS												
<i>6020_METALS_ICPMS: COMMON + (add-on) "As Received"</i>												
Aluminum		1130	15.0	50.0	50.0	ug/L	1	BAJ	06/20/14	09:28	1392364	3
Arsenic	B	2.83	1.70	5.00	5.00	ug/L	1					
Barium		53.0	0.600	2.00	2.00	ug/L	1					
Cadmium	U	ND	0.110	1.00	1.00	ug/L	1					
Chromium		17.9	2.00	10.0	10.0	ug/L	1					
Cobalt		1.08	0.100	1.00	1.00	ug/L	1					
Copper		1.84	0.350	1.00	1.00	ug/L	1					
Lead	U	ND	0.500	2.00	2.00	ug/L	1					
Manganese		69.5	1.00	5.00	5.00	ug/L	1					
Nickel		2.43	0.500	2.00	2.00	ug/L	1					
Uranium		1.44	0.067	0.200	0.200	ug/L	1					
Strontium	M	239	2.00	10.0	10.0	ug/L	1	BAJ	06/20/14	17:24	1392364	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	ICP-MS 3005A PREP	JXM5	06/04/14	0730	1392363
SW846 3005A	SW846 3005A for 6010C	JXM5	06/04/14	0730	1392440
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	06/12/14	1317	1395290

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	7470_HG_CVAA	
2	6010_METALS_ICP	
3	6020_METALS_ICPMS	

July 21, 2014

REVISION 1

GEL LABORATORIES LLC

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 F14-003**

Report Date: June 25, 2014

Client Sample ID: B2W346
Lab Sample ID: 349685004

Project: HMSA00152
Client ID: HMSA001
Client SDG: GEL349685

Parameter	Qualifier	Result	MDL	RL	CRDL	Units	DF	Analyst	Date	Time	Batch	Method
4		6020_METALS_ICPMS										

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 25, 2014

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

Contact: Mr. Scot Fitzgerald

Workorder: 349685

Parname	NOM	Sample Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS										
Batch	1392364									
QC1203099783	LCS									
Aluminum	2000		2040	ug/L		102	(80%-120%)	BAJ	06/20/14	08:21
Arsenic	50.0		48.0	ug/L		96.1	(80%-120%)			
Barium	50.0		47.5	ug/L		95	(80%-120%)			
Cadmium	50.0		48.8	ug/L		97.7	(80%-120%)			
Chromium	50.0		47.9	ug/L		95.8	(80%-120%)			
Cobalt	50.0		49.0	ug/L		98	(80%-120%)			
Copper	50.0		51.7	ug/L		103	(80%-120%)			
Lead	50.0		49.3	ug/L		98.6	(80%-120%)			
Manganese	50.0		49.4	ug/L		98.9	(80%-120%)			
Nickel	50.0		50.3	ug/L		101	(80%-120%)			
Strontium	50.0		52.5	ug/L		105	(80%-120%)		06/20/14	16:58
Uranium	50.0		51.8	ug/L		104	(80%-120%)		06/20/14	08:21
QC1203099782	MB									
Aluminum		U	ND	ug/L					06/20/14	08:15
Arsenic		U	ND	ug/L						
Barium		U	ND	ug/L						
Cadmium		U	ND	ug/L						
Chromium		U	ND	ug/L						
Cobalt		U	ND	ug/L						
Copper		U	ND	ug/L						

GEL LABORATORIES LLC

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

QC Summary

Workorder: 349685

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1392364										
Lead			U	ND	ug/L						
Manganese			U	ND	ug/L				BAJ	06/20/14	08:15
Nickel			U	ND	ug/L						
Strontium			U	ND	ug/L					06/20/14	16:55
Uranium			U	ND	ug/L					06/20/14	08:15
QC1203099784 349767004 MS											
Aluminum	2000	U	ND	1930	ug/L		96.2	(75%-125%)		06/20/14	09:55
Arsenic	50.0	U	ND	47.7	ug/L		93.1	(75%-125%)			
Barium	50.0		34.0	79.9	ug/L		91.7	(75%-125%)			
Cadmium	50.0	U	ND	47.8	ug/L		95.7	(75%-125%)			
Chromium	50.0	U	ND	46.5	ug/L		93	(75%-125%)			
Cobalt	50.0	B	0.626	46.5	ug/L		91.7	(75%-125%)			
Copper	50.0	B	0.566	47.8	ug/L		94.4	(75%-125%)			
Lead	50.0	U	ND	48.0	ug/L		96	(75%-125%)			
Manganese	50.0		65.8	111	ug/L		90.3	(75%-125%)			
Nickel	50.0		3.10	49.4	ug/L		92.6	(75%-125%)			
Strontium	50.0	M	242	299	ug/L		N/A	(75%-125%)		06/20/14	17:34
Uranium	50.0		1.09	52.3	ug/L		102	(75%-125%)		06/20/14	09:55
QC1203099785 349767004 MSD											
Aluminum	2000	U	ND	1900	ug/L	1.60	94.7	(0%-20%)		06/20/14	10:01
Arsenic	50.0	U	ND	46.4	ug/L	2.77	90.4	(0%-20%)			
Barium	50.0		34.0	78.0	ug/L	2.38	87.9	(0%-20%)			
Cadmium	50.0	U	ND	47.7	ug/L	0.346	95.3	(0%-20%)			
Chromium	50.0	U	ND	45.5	ug/L	2.21	91	(0%-20%)			

GEL LABORATORIES LLC

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

QC Summary

Workorder: 349685

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1392364										
Cobalt	50.0	B	0.626	45.4	ug/L	2.29	89.6	(0%-20%)	BAJ	06/20/14	10:01
Copper	50.0	B	0.566	45.9	ug/L	4.10	90.6	(0%-20%)			
Lead	50.0	U	ND	46.5	ug/L	3.03	93.1	(0%-20%)			
Manganese	50.0		65.8	109	ug/L	1.33	87.3	(0%-20%)			
Nickel	50.0		3.10	48.2	ug/L	2.50	90.1	(0%-20%)			
Strontium	50.0	M	242	300	ug/L	0.265	N/A	(0%-20%)		06/20/14	17:37
Uranium	50.0		1.09	50.7	ug/L	2.93	99.3	(0%-20%)		06/20/14	10:01
QC1203099786 349767004 SDILT											
Aluminum		U	ND DU	ND	ug/L	N/A		(0%-10%)		06/20/14	10:15
Arsenic		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Barium			34.0 D	6.63	ug/L	2.65		(0%-10%)			
Cadmium		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Chromium		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Cobalt		B	0.626 D	0.105	ug/L	16.1		(0%-10%)			
Copper		B	0.566 DU	ND	ug/L	N/A		(0%-10%)			
Lead		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Manganese			65.8 D	13.5	ug/L	2.78		(0%-10%)			
Nickel			3.10 D	0.607	ug/L	2.07		(0%-10%)			
Strontium		M	242 DM	53.7	ug/L	11*		(0%-10%)		06/20/14	17:42
Uranium			1.09 D	0.198	ug/L	8.76		(0%-10%)		06/20/14	10:15
Metals Analysis-ICP											
Batch	1392441										
QC1203099966 LCS											

GEL LABORATORIES LLC

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

QC Summary

Workorder: 349685

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1392441										
Calcium	5000			5200	ug/L		104	(80%-120%)	HSC	06/17/14	20:18
Iron	5000			5290	ug/L		106	(80%-120%)			
Vanadium	500			545	ug/L		109	(80%-120%)			
QC1203099965	MB										
Calcium			U	ND	ug/L					06/17/14	20:14
Iron			U	ND	ug/L						
Vanadium			U	ND	ug/L						
QC1203099967	349767004 MS										
Calcium	5000	59700		65400	ug/L		N/A	(75%-125%)		06/17/14	21:31
Iron	5000	U	ND	5240	ug/L		105	(75%-125%)			
Vanadium	500	B	3.92	557	ug/L		111	(75%-125%)			
QC1203099968	349767004 MSD										
Calcium	5000	59700		65900	ug/L	0.810	N/A	(0%-20%)		06/17/14	21:35
Iron	5000	U	ND	5240	ug/L	0.0955	105	(0%-20%)			
Vanadium	500	B	3.92	558	ug/L	0.179	111	(0%-20%)			
QC1203099969	349767004 SDILT										
Calcium		59700	D	11500	ug/L	3.66		(0%-10%)		06/17/14	21:38
Iron		U	ND DU	ND	ug/L	N/A		(0%-10%)			
Vanadium		B	3.92 DU	ND	ug/L	N/A		(0%-10%)			
Metals Analysis-Mercury											
Batch	1395292										
QC1203107503	349473001 DUP										
Mercury		U	ND U	ND	ug/L	N/A			NOR1	06/13/14	09:38
QC1203107492	LCS										
Mercury	2.00			1.80	ug/L		89.9	(80%-120%)		06/13/14	09:24
QC1203107491	MB										
Mercury			U	ND	ug/L					06/13/14	09:22
QC1203107504	349473001 MS										

GEL LABORATORIES LLC

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QC Summary

Workorder: 349685

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-Mercury											
Batch	1395292										
Mercury	2.00	U	ND	2.05	ug/L		102	(75%-125%)		06/13/14	10:38
QC1203107505 349473001 SDILT											
Mercury		U	ND DU	ND	ug/L	N/A		(0%-10%)	NOR1	06/13/14	10:40

Notes:

The Qualifiers in this report are defined as follows:

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

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more 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.

General Chem Analysis

Case Narrative

**General Chemistry Narrative
Hanford MSA (HMSA)
SDG GEL349685**

Method/Analysis Information

Product: Ion Chromatography

Analytical Batch: 1392117

Method: 9056_ANIONS_IC: COMMON (nitrate only)

Sample Analysis

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

Sample ID	Client ID
349685004	B2W346
1203099149	Method Blank (MB)
1203099150	349694006(B2WFJ3) Sample Duplicate (DUP)
1203099151	349694006(B2WFJ3) Post Spike (PS)
1203099152	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-5000 Ion Chromatograph.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The 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: 349694006 (B2WFJ3).

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

The spike recovery falls outside of the established acceptance limits due to matrix interference: 1203099151 (B2WFJ3).

Duplicate Relative Percent Difference (RPD) Statement

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

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following samples in this sample group were diluted due to high concentration: 1203099150 (B2WFJ3), 1203099151 (B2WFJ3) and 349685004 (B2W346).

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: 1299450. 1203099151 (B2WFJ3).

Manual Integrations

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

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

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

Method/Analysis Information

Product: Hexavalent Chromium
Analytical Batch: 1392105 **Method:** 7196_CR6: COMMON

Sample Analysis

The following samples were analyzed using the analytical protocol as established in 7196_CR6 :

Sample ID	Client ID
349685003	B2W345
1203099100	Method Blank (MB)
1203099101	Laboratory Control Sample (LCS)
1203099102	349685003(B2W345) Sample Duplicate (DUP)
1203099103	349685003(B2W345) Post Spike (PS)

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-044 REV# 19.

Preparation/Analytical Method Verification

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

Calibration Information

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

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

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

Calibration Verification Information (CCV)

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

Y Intercept Rule

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

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

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 349685003 (B2W345).

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

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

Duplicate Relative Percent Difference (RPD) Statement

The values for the sample and duplicate are less than the Practical Quantitation Limit (PQL); therefore, the RPD is not applicable. 1203099102 (B2W345).

Technical Information

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

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

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

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

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

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted: Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will

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

Certification Statement

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

Review Validation:

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

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

Reviewer:  Date: 26Jun14

Sample Data Summary

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: GEL349685 GEL Work Order: 349685

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.

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 _____



July 21, 2014

REVISION 1

GEL LABORATORIES LLC

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 F14-003

Report Date: June 26, 2014

Client Sample ID: B2W345
Lab Sample ID: 349685003
Matrix: WATER
Collect Date: 29-MAY-14 09:00
Receive Date: 30-MAY-14
Collector: Client
Project: HMSA00152
Client ID: HMSA001
Client SDG: GEL349685

Table with 12 columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch, Method. Row 1: Spectrometric Analysis, 7196_CR6: COMMON "As Received", Hexavalent Chromium, U, ND, 0.003, 0.010, 0.010, mg/L, 1, LXA1, 05/30/14, 11:28, 1392105, 1.

The following Analytical Methods were performed

Table with 3 columns: Method, Description, Analyst Comments. Row 1: 1, 7196_CR6, (empty).

July 21, 2014

REVISION 1

GEL LABORATORIES LLC

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 F14-003

Report Date: June 26, 2014

Client Sample ID: B2W346
Lab Sample ID: 349685004
Matrix: WATER
Collect Date: 29-MAY-14 09:00
Receive Date: 30-MAY-14
Collector: Client
Project: HMSA00152
Client ID: HMSA001
Client SDG: GEL349685

Table with 12 columns: Parameter, Qualifier, Result, MDL, RL, CRDL, Units, DF, Analyst, Date, Time, Batch Method. Row 1: Nitrate-N, D, 37200, 660, 2000, 250, ug/L, 20, DM, 05/30/14, 17:53, 1392117, 1.

The following Analytical Methods were performed

Table with 3 columns: Method, Description, Analyst Comments. Row 1: 1, SW846 9056A

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 26, 2014

Page 1 of 2

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

Contact: Mr. Scot Fitzgerald

Workorder: 349685

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1392117										
QC1203099150	349694006	DUP									
Nitrate-N		D	6660	D	6700	ug/L	0.666	(0%-20%)	DM	05/30/14	15:48
QC1203099152	LCS										
Nitrate-N	2500				2600	ug/L		104 (90%-110%)		05/30/14	18:56
QC1203099149	MB										
Nitrate-N				U	ND	ug/L				05/30/14	18:25
QC1203099151	349694006	PS									
Nitrate-N	2.50	D	1.33	D	4.03	mg/L		108 (90%-110%)		05/30/14	16:19
Spectrometric Analysis											
Batch	1392105										
QC1203099102	349685003	DUP									
Hexavalent Chromium		U	ND	U	ND	mg/L	N/A		LXA1	05/30/14	11:29
QC1203099101	LCS										
Hexavalent Chromium	0.050				0.0508	mg/L		102 (85%-115%)		05/30/14	11:28
QC1203099100	MB										
Hexavalent Chromium				U	ND	mg/L				05/30/14	11:28
QC1203099103	349685003	PS									
Hexavalent Chromium	0.050	U	ND		0.0549	mg/L		110 (85%-115%)		05/30/14	11:29

Notes:

The Qualifiers in this report are defined as follows:

- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > Result greater than quantifiable range or greater than upper limit of the analysis range
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.
- D Results are reported from a diluted aliquot of sample.
- 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

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QC Summary

Workorder: 349685

Page 2 of 2

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

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

DATA EXCEPTION REPORT			
Mo.Day Yr. 02-JUN-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: IC	Test / Method: SW846 9056A	Matrix Type: Liquid	Client Code: HMSA
Batch ID: 1392117	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 349685(GEL349685),349690(GEL349690),349694(GEL349694)			
Application Issues: Failed Recovery for MS/PS Container scanning event for custody missed			
Specification and Requirements Exception Description:		DER Disposition:	
1. Failed Recovery for MS/PS: QC 1203099151PS 2. Container scanning event for custody missed		1. The MS/PS mixture contains seven anions of interest. Of those, all requested anions except chloride 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. 2. Samples were not scanned to batch prior to initial run. However, samples were in the custody of analyst during analysis.	

Originator's Name:
Dustin Miller 02-JUN-14

Data Validator/Group Leader:
Thomas Lewis 26-JUN-14

Radiological Analysis

Radiochemistry Case Narrative
Hanford MSA (HMSA)
SDG GEL349685
Work Order 349685

"
"
"

Method/Analysis Information

"

Product: TC99_EIE_LSC: COMMON

Cpcn\vecn'O gj qf < VE; ; aGKaNUE

Cpcn\vecn'Dcevej 'P wo dgt< 35; 326;

"

Sample ID ** Client ID**

56; 8: 7226"" D4Y 568

34252; 8623"" O gj qf 'Drcpmi'O D+

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

34252; 8625"" Ncdqtevt { 'Eqptqnl'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 ctvklp.'cpcn\uku'cpf 'tgr qt vpi 'qh'cpcn\vecn'f cve'ctg'eqptqmgf 'd { 'I GN'Ncdqtevtkgu'NNE'cu Ucpf ctf 'Qr gtevpki '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

Cmlpk\kcn'cpf 'eqpvpvpi 'ecrkdtevkp'tgs wktgo gpw'j cxg'dggp'o gv0"

"

Standards Information

Ucpf ctf 'uqnwkp'u'hqt'yj gug'cpcn\uku'ctg'P RUV'tcegedrg'qt'xgtkkgf 'y kj 'c'P RUV'tcegedrg'u'cpf ctf 'cpf 'wugf dghqt'g'yj g'g'zr kcvkqp'f cvgu0"

"

Sample Geometry

Cml'eqvpvpi 'uqwtegu'y gtg'r tgr ctgf 'lp'yj g'uco g'i gqo gvt { 'cu'yj g'ecrkdtevkp'u'cpf ctf u0"

Quality Control (QC) Information:

"

Blank Information

Vj g'drcpmixqno g'ku'tgr t'gugpvcvkg'qh'yj g'uco r rg'xqno g'lp'yj ku'dcevej 0"

"

Designated QC

Vj g'hqmy lpi '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 wktgf 'ceegr vpeg'rko ku0"

Technical Information:"

"

Holding Time"

Cml'uco r ng'r tqegf wtgu'hqt"vj ku'uco r ng'ugv'y gtg'r gthqto gf"y kj kp"vj g'tgs wktgf"j qrf lpi "ko g0"

"

Sample Re-prep/Re-analysis"

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

"

Recounts"

Uco r ng'56; 8: 7226*D4Y 568+y cu'tgeqwpvgf"q'xgthk('uco r ng'tguwuu0Tgeqwpw'ctg'tgr qtvgf 0"

Miscellaneous Information:"

"

Data Exception (DER) Documentation"

F cv'gzegr vqp'tgr qt w'ctg'i gpgtcvgf"q"t qewo gpv'cp{ 'r tqegf wcn'cpqo cnku"vj cv'bo c{ 'f gxlcvg'htqo 'tghgtgpegf UQR'qt'eqpvtcewcnf qewo gpw0C'f cv'gzegr vqp'tgr qt v*F GT+y cu'pqv'i gpgtcvgf"ht"vj ku'UFI 0"

"

Sample-Specific MDA/MDC"

Vj g'O F C I O F E'tgr qtvgf"qp"vj g'egt wkecvg'qh'cpcn(uku'ku'c'uco r ng'ur gekhe'O F C I O F E0"

"

Additional Comments"

Cf f kkpncn'eqo o gpw'y gtg'pqv'tgs wktgf"ht"vj ku'uco r ng'ugv'0'

Qualifier Information"

"

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

"

"

"

Method/Analysis Information"

"

Product: TRITIUM_DIST_LSC: COMMON

Cpcn(v'ecniO gvj qf < VT K/WO aF KUVaNUe

Cpcn(v'ecniDvej 'P wo dgt< 35; 4774

"

Sample ID *** Client ID**

56; 8: 7226" " D4Y 568

3425322478***** O gvj qf 'Drcpni*O D+

3425322479***** 56; 989226*D4Y 572+'Uco r ng'F w rkecvg*F WR+

342532247: ***** 56; 989226*D4Y 572+'O cvtkz'Ur knq*O U+

342532247; ***** Ncdqtcvqt { 'Eqpvtqri'Uco r ng'*NE U+

"

Vj g'uco r ngu'lp"vj ku'UFI "y gtg'cpcn(| gf"qp'cp'\$cu'tgegkxgf '\$'dcuku0"

"

SOP Reference"

Rtqegf wtg'htq'r tgr ctcv'qp.'cpcn(uku'cpf"tgr qt v'pi"qh'cpcn(v'ecnf cv'ctg'eqpvtqmgf" d{ 'I GN'Ncdqtcvqt'ku'NNE'cu Ucpf ctf 'Qr gtcv'pi 'Rtqegf wtg'*UQR+0Vj g'f cv'f ku'ewungf"lp"vj ku'pcttcv'xg'j cu'dggp'cpcn(| gf"lp'ceeqtf cpeg'y kj I N/TCF/C/224'TGX%430"

Calibration Information:

"

Calibration Information

Cmlpklcn'cpf "eqp'v'w'kpi "ecrld'cv'kqp't'gs'w'k'go'gpw'j'cxg'dggp'o'g'0"

"

Standards Information

Ucpf'ctf "uqnw'k'p'u'ht' 'y'gug'c'pcn' uku'ctg'P'KUV't'cegcdng'qt'x'gt'k'kgf'y'kj "c'P'KUV't'cegcdng'ucpf'ctf "cpf "wugf' dgh'qt'g'y'g'g'zr'k'c'v'k'p'f'c'v'g'u'0"

"

Sample Geometry

Cml'eq'w'v'kpi "uq'w'eg'u'y'gt'g'r't'gr'ct'gf' 'lp'y'g'uc'o'g'i'g'q'o'g't'{"cu'y'g'ecrld'cv'kqp'ucpf'ctf'u'0"

Quality Control (QC) Information:

"

Blank Information

Vj'g'd'nc'p'lx'q'no'g'ku't'gr't'g'ug'p'c'v'k'g'q'h'y'g'uc'o'r'g'x'q'no'g'lp'y'ku'd'c'v'ej'0"

"

Designated QC

Vj'g'f'q'm'y'kpi'uc'o'r'g'y'cu'w'ugf'ht'S'E<56;989226*%D4Y'572-0"

"

QC Information

Cml'q'h'y'g'S'E'uc'o'r'g'u'o'g'v'y'g't'gs'w'k'gf'c'ee'gr'v'peg'it'o'ku'0"

Technical Information:

"

Holding Time

Cml'uc'o'r'g'r't'q'eg'f'w'gu'f'q't'y'ku'uc'o'r'g'ug'v'y'gt'g'r'g'h'q't'o'gf'y'kj'lp'y'g't'gs'w'k'gf'j'q'f'kpi'w'o'g'0"

"

Sample Re-prep/Re-analysis

P'q'p'g'q'h'y'g'uc'o'r'g'u'lp'y'ku'uc'o'r'g'ug'v't'gs'w'k'gf't'gr't'gr'qt't'g'c'p'cn'uku'0"

"

Recounts

Uc'o'r'g'56;8:7226*%D4Y'568+y'cu't'g'eq'w'p'v'g'f'v'q'x'g't'k'h'{"uc'o'r'g't'g'u'w'u'0'Vj'g't'g'eq'w'p'v't'g'u'w'u'c't'g'ulo'k'ct'v'q'y'g'q't'ki'k'p'cn't'g'u'w'u'0'Q't'ki'k'p'cn't'g'u'w'u'c't'g't'gr'q't'v'g'f'0"

Miscellaneous Information:

"

Data Exception (DER) Documentation

F'c'v'c'g'z'eg'r'v'k'p't'gr'q't'u'c't'g'i'g'p'g't'c'v'g'f'v'q'f'q'ew'o'g'p'v'c'p'{"r't'q'eg'f'w'c'n'c'p'q'o'c'k'g'u'y'c'v'o'c'{"f'g'x'k'c'g'f'it'q'o' 't'g'h'g't'g'p'eg'f' UQR'qt'eq'p't'c'ew'c'n'f'q'ew'o'g'p'u'0'c'f'c'v'c'g'z'eg'r'v'k'p't'gr'q't'v'F'G'I'+y'cu'p'q'v'i'g'p'g't'c'v'g'f'ht'y'ku'UF'I'0"

"

Sample-Specific MDA/MDC

Vj'g'O'F'C'I'O'F'E't'gr'q't'v'g'f'qp'y'g'eg't'w'k'c'v'g'q'h'c'p'cn'uku'ku'c'uc'o'r'g'ur'g'ek'k'le'O'F'C'I'O'F'E'0"

"

Additional Comments

C'f'f'k'k'p'c'n'f'eq'o'o'g'p'u'y'gt'g'p'q'v't'gs'w'k'gf'ht'y'ku'uc'o'r'g'ug'v'0"

Qualifier Information

"

O'c'p'w'c'n's'w'c'n'k'g't'u'y'gt'g'p'q'v't'gs'w'k'gf'0"

"

"

"

Certification Statement

"

Y'j'g't'g'y'g'c'p'cn'v'c'c'n'b'g'j'q'f'j'cu'd'ggp'r'g'h'q't'o'gf'w'p'f'g't'P'G'N'C'R'eg't'w'k'c'v'k'p'.'y'g'c'p'cn'uku'j'cu'o'g'v'c'm'q'h'y'g'

tgs wlt go gpw'qh'yj g'P GINCE"urpf ctf "wprgu'qyj gty lug'pqvf "lp'yj g'cpcn(vlcrl'ecug'pctt'vkg0'

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**Qualifier Definition Report
for**

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

Erkpv'UFI <I GN56; 8: 7" I GN"Y qtmQtf gt<56; 8: 7

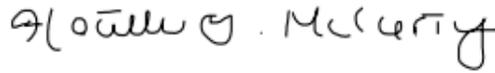
The Qualifiers in this report are defined as follows:

W""Cpcn{| gf "hqt'dw/pqv'f gvev'f "cdqxg'h'o k'kpi 'etkgtk0'kpenf gu'O FN.'O FC.'RS N.'] gtq.'eqwp'kpi "gttqt."cpf "vqcn
cpcn' v'ecr'gttqt0

Review/Validation

I GN'tgs w'k'gu'cm'cpcn' v'ecr'f c'v'q'dg'xgt'h'gf "d{' 'c's w'k'gf 'f'c'v'tgx'gy gt0" k'p'c'f'f'k'k'p.'cm'ENR'rkng'f'grk'gtcdrgu
tgeg'x'g'c'v'j'kf "h'x'gn't'gx'gy "qh'v'j'g'f'c'v'k'p'c'n'f'c'v'r'c'c'ni'g0"

Vj'g'h'q'm'y'k'p'i'f'c'v'x'c'r'f'c'v't'x'g't'h'gf "j'g'l'p'h't'o'c'v'k'p'r't'g'u'p'v'g'f'k'p'v'j'k'u'f'c'v't'g'r'q't'v'<

Signature: 

Name: Heather McCarty

Date: 18 JUN 2014

Title: Analyst II

Sample Data Summary

July 21, 2014

REVISION 1

GEL LABORATORIES LLC

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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 F14-003

Report Date: June 18, 2014

Client Sample ID: B2W346
Sample ID: 349685004
Matrix: WATER
Collect Date: 29-MAY-14
Receive Date: 30-MAY-14
Collector: Client

Project: HMSA00152
Client ID: HMSA001

Table with 13 columns: Parameter, Qualifier, Result, Uncertainty, MDC, TPU, RL, Units, DF, Analyst, Date, Time, Batch, Mtd. Rows include Technetium-99 and Tritium data.

The following Analytical Methods were performed

Table with 2 columns: Method, Description. Rows 1: DOE EML HASL-300, Tc-02-RC Modified; 2: EPA 906.0 Modified

Table with 4 columns: Surrogate/Tracer Recovery, Test, Batch ID, Recovery%, Acceptable Limits. Row: Technetium-99m Tracer, TC99_EIE_LSC: COMMON "As Received", 1391049, 93.9, (15%-125%)

Notes:

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

Quality Control Data

GEL LABORATORIES LLC

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QC Summary

Report Date: June 18, 2014
Page 1 of 2

Client : CH2MHill Plateau Remediation Company
MSIN R3-50 CHPRC
PO Box 1600
Richland, Washington 99352
Contact: Mr. Scot Fitzgerald
Workorder: 349685

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	1392552									
QC1203100256	MB									
Tritium			U	-21	pCi/L			TYJ1	06/13/1400:46	
				Uncert: +/-50.1						
				TPU: +/-50.1						
QC1203100257	349767004	DUP								
Tritium			435	363	pCi/L				06/13/1401:50	
				Uncert: +/-88.7		RPD: 18	(0% - 100%)			
				TPU: +/-122		RER: 0.859	(0-2)			
QC1203100258	349767004	MS								
Tritium		1790	435	2100	pCi/L	REC: 93	(75%-125%)		06/13/1402:52	
				Uncert: +/-88.7						
				TPU: +/-122						
QC1203100259	LCS									
Tritium		1780		1690	pCi/L	REC: 95	(80%-120%)		06/13/1403:10	
				Uncert: +/-285						
				TPU: +/-434						

Notes:

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

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- < Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide
- > 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 >= 2X the MDA and, after corrections, result is >= MDA for this sample
- C Analyte has been confirmed by GC/MS analysis

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QC Summary

Workorder: 349685

Page 2 of 2

Parmname	NOM	Sample	Qual	QC	Units	QC Criteria	Range	Analyst	Date	Time
C										
D										
E										
E										
J										
M										
N										
P										
S										
T										
U										
W										
X										
Y										
Z										
o										

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.