GEL Laboratories LLC
a member of The GEL Group INC

October 8, 2015

PO Box 30712 Charleston, SC 29417
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October 05, 2015

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

Re: CHPRC SAF X15-004
Work Order: 380996
SDG: GEL380996

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on September 11, 2015. 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,

Sarah Edwards for
Heather Shaffer
Project Manager

Purchase Order: 300071ES20 - 7H
Chain of Custody: X15-004-257
Enclosures

October 8, 2015

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Case Narrative

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF X15-004
SDG: GEL380996

October 05, 2015

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 September 11, 2015, for analysis. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

Sample Identification
The laboratory received the following sample:

Laboratory Identification	Sample Description
380996001	B32KK1

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.

This package, to the best of my knowledge, is in compliance with the SOW, both technically and for completeness, including a full description of, explanation of, and corrective actions for, any and all deviations, from either the analyses requested or the case narrative requested. Release of the data contained in this hard copy data package has been authorized by the Laboratory Analytical Manger (or designee) and the laboratory's client services representative as verified by their signatures on this report.

October 8, 2015

Sarah Edwards for
Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

380996

C.O.C. # X15-004-257

Page 1 of 1

Collector	S.W. King/CHPRC	**Contact/Requester**	WATERS-HUSTED, K	**Telephone No.**	376-4650
SAF No.	X15-004	**Sampling Origin**	Hanford Site	**Purchase Order/Charge Code**	303064
Project Title	GW Sitewide Surv, FY15	**Logbook No.**	HNF-N-506 791 2	**Ice Chest No.**	GWS-305
Shipped To (Lab)	GEL Laboratories, LLC	**Method of Shipment**	Commercial Carrier	**Bill of Lading/Air Bill No.**	7744 8301 5755
Protocol	SURV	**Priority:**	30 Days **PRIORITY**	**Offsite Property No.**	5953

POSSIBLE SAMPLE HAZARDS/REMARKS

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

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

Batch with A, I, S, and W SAFs.

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B32KK1	N	W	SEP 10 2015	1017	4x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C

October 8, 2015

Relinquished By: S.W. King/CHPRC — Print / Sign — Date/Time: SEP 10 2015 1115	Received By: CHRIS FULTON CHPRC — Print / Sign — Date/Time: SEP 10 2015 1115	Matrix *	
Relinquished By: CHRIS FULTON CHPRC — Date/Time: SEP 10 2015 1400	Received By: FEDEX — Date/Time	S = Soil; SE = Sediment; SO = Solid; SL = Sludge; W = Water; O = Oil; A = Air	DS = Drum Solids; DL = Drum Liquids; T = Tissue; WI = Wipe; L = Liquid; V = Vegetation; X = Other
Relinquished By: FedEx — Date/Time	Received By: Chelsea Seagle (Chelsea Seagle) 09/11/15 0900 — Date/Time		
Relinquished By — Date/Time	Received By — Date/Time		

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

GEL Laboratories LLC

October 8, 2015

SAMPLE RECEIPT & REVIEW FORM

Client: CPRC	**SDG/AR/COC/Work Order:**
Received By: CAS	**Date Received:** 09/11/15

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

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	✓			Preservation Method: (Ice bags) Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius 1.8°C, 1.9°C, 2.3°C
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: E40921021932 Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?	✓			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	Do Low Level Perchlorate samples have headspace as required?			✓	Sample ID's and containers affected:
7	VOA vials contain acid preservation?	✓			(If unknown, select No)
8	VOA vials free of headspace (defined as < 6mm bubble)?	✓			Sample ID's and containers affected:
9	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
10	Samples received within holding time?	✓			ID's and tests affected:
11	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
12	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
13	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
14	Are sample containers identifiable as GEL provided?			✓	
15	COC form is properly signed in relinquished/received sections?	✓			
16	Carrier and tracking number.	✓			Circle Applicable: (FedEx Air) FedEx Ground UPS Field Services Courier Other 7744 7973 9288 – 1.8°C 7744 8301 5755 – 1.9°C 7744 7900 2330 – 2.3°C

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials 45 Date 9/11/15 Page 1 of 1 GL-CHL-SR-001 Rev 2

Data Review Qualifier Definitions

GEL LABORATORIES LLC
2040 Savage Road Charleston, SC 29407 (843) 556−8171

Report Date: 05−OCT−15

Project Specific Qualifier Definitions for GEL Client Code: CPRC

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 Hold Date 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 Estimated Value
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 (0rganics only)	Y	Organics		
S	Manual	Reported value determined by the Method of Standard Additions (MSA)	Y	Inorganics		Not coded B/C Rarely preformed
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 Estimated Value
C	Programmed	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Y	Inorganics	Metals	Replaces B Blank Detection
C	Programmed	Target analyte was detected in the sample and the associated blank. The associated blank concentration is >= EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Y	General Chemistry		Replaces B Blank Detection
<	Programmed	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	Y	General Chemistry		for Reactive CN/S

GEL LABORATORIES LLC

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

Report Date: 05−OCT−15

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Code	Status	Qualifier Definition	CofA	Department	Fraction	Additional Comments
UX	Manual	Gamma Spectroscopy−−Uncertain identification	Y	Radiological		

Laboratory Certifications

List of current GEL Certifications as of 05 October 2015

State	Certification
Alaska	UST−110
Arkansas	88−0651
CLIA	42D0904046
California	2940 Interim
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 SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA150001
Maryland	270
Massachusetts	M−SC012
Michigan	9976
Mississippi	SC000122013−10
Nebraska	NE−OS−26−13
Nevada	SC000122016−1
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
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235−15−10
Utah NELAP	SC000122015−18
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Volatile Analysis

Case Narrative

October 8, 2015

GC/MS Volatile
Technical Case Narrative
CH2MHill Plateau Remediation Company (CPRC)
SDG #: GEL380996
Work Order #: 380996

Method/Analysis Information

Procedure:	**Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer**
Analytical Method:	SW846 8260C
Analytical Batch Number:	1508045

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
380996001	B32KK1
1203394326	Method Blank (MB)
1203394327	Laboratory Control Sample (LCS)
1203394329	380763004(B32971) Post Spike (PS)
1203394331	380763004(B32971) Post Spike Duplicate (PSD)
1203396881	Method Blank (MB)
1203396882	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 data results reported met all SOP and method criteria, unless otherwise discussed below.

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.

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 standards (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
Sample 380763004 (B32971) was designated for spike analysis.

Matrix Spike/Matrix Spike Duplicate Recovery Statement
The spike and/or spike duplicate (See Below) recoveries were not all within the acceptance limits. The recoveries were similar. It is believed possible matrix interference has been demonstrated.

Sample	Analyte	Value
1203394329 (Non SDG 380763004PS)	2-Butanone	60* (70%-130%)
	Acetone	45* (70%-130%)
1203394331 (Non SDG 380763004PSD)	2-Butanone	59* (70%-130%)
	Acetone	44* (70%-130%)

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

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

Miscellaneous Information

Data Exception (DER) Documentation
A data exception report (DER) 1449932 was generated for samples 1203394329 (Non SDG 380763004PS) and 1203394331 (Non SDG 380763004PSD) in this SDG/batch.

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

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

Additional Comments
Additional comments were not required for this SDG.

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

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOA2.I	Agilent 7890/5975 GC/MS w/ OI Eclipse/Archon Autosampler	HP7890N/HP5975C	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

Certification Statement

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

GEL LABORATORIES LLC

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

Qualifier Definition Report
for

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL380996 GEL Work Order: 380996

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: Erin Haubert **Name: Erin Haubert**

Date: 07 OCT 2015 **Title: Data Validator**

Sample Data Summary

Volatile

Certificate of Analysis
Sample Summary

SDG Number:	**GEL380996**	**Date Collected:**	**09/10/2015 10:17**	**Matrix:**	**WATER**
Lab Sample ID:	**380996001**	**Date Received:**	**09/11/2015 09:00**		
		Client:	**CPRC001**	**Project:**	**CPRC0X15004**
Client ID:	**B32KK1**	**Method:**	**SW846 8260C**	**SOP Ref:**	**GL-OA-E-038**
Batch ID:	**1508045**	**Inst:**	**VOA2.I**	**Dilution:**	**1**
Run Date:	**09/17/2015 12:21**	**Analyst:**	**CDS1**	**Purge Vol:**	**5 mL**
Prep Date:	**09/17/2015 12:21**				
Data File:	**091715V2.b\2A410.D**	**Column:**	**DB-624**		

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
71-55-6	1,1,1-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
79-00-5	1,1,2-Trichloroethane	U	0.300	ug/L	0.300	2.00	5.00
107-06-2	1,2-Dichloroethane	U	0.300	ug/L	0.300	2.00	5.00
71-43-2	Benzene	U	0.300	ug/L	0.300	2.00	5.00
75-15-0	Carbon disulfide	U	1.60	ug/L	1.60	10.0	5.00
56-23-5	Carbon tetrachloride	U	0.300	ug/L	0.300	2.00	5.00
108-90-7	Chlorobenzene	U	0.300	ug/L	0.300	2.00	5.00
67-66-3	Chloroform	U	0.300	ug/L	0.300	2.00	5.00
100-41-4	Ethylbenzene	U	0.300	ug/L	0.300	2.00	5.00
75-09-2	Methylene chloride	J	3.81	ug/L	1.60	5.00	5.00
127-18-4	Tetrachloroethylene	U	0.300	ug/L	0.300	2.00	5.00
108-88-3	Toluene	U	0.300	ug/L	0.300	2.00	5.00
79-01-6	Trichloroethylene	U	0.300	ug/L	0.300	2.00	5.00
75-34-3	1,1-Dichloroethane	U	0.300	ug/L	0.300	2.00	10.0
75-35-4	1,1-Dichloroethylene	U	0.300	ug/L	0.300	2.00	10.0
78-93-3	2-Butanone	TU	3.00	ug/L	3.00	10.0	10.0
108-10-1	4-Methyl-2-pentanone	U	3.00	ug/L	3.00	10.0	10.0
75-01-4	Vinyl chloride	U	0.300	ug/L	0.300	2.00	10.0
1330-20-7	Xylenes (total)	U	0.300	ug/L	0.300	6.00	10.0
67-64-1	Acetone	TU	3.00	ug/L	3.00	10.0	20.0

Quality Control Summary

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

QC Summary

Report Date: October 6, 2015

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

Contact: **Mr. Scot Fitzgerald**

Workorder: **380996**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1508045										
QC1203394327 LCS										
1,1,1-Trichloroethane	50.0			57.3	ug/L		115	(70%-130%)	CDS1	09/16/15 07:48
1,1,2-Trichloroethane	50.0			52.2	ug/L		104	(70%-130%)		
1,1-Dichloroethane	50.0			53.5	ug/L		107	(70%-130%)		
1,1-Dichloroethylene	50.0			54.0	ug/L		108	(70%-130%)		
1,2-Dichloroethane	50.0			51.2	ug/L		102	(70%-130%)		
2-Butanone	250			269	ug/L		107	(70%-130%)		
4-Methyl-2-pentanone	250			266	ug/L		107	(70%-130%)		
Acetone	250			274	ug/L		110	(70%-130%)		
Benzene	50.0			53.0	ug/L		106	(70%-130%)		
Carbon disulfide	250			294	ug/L		117	(70%-130%)		
Carbon tetrachloride	50.0			56.7	ug/L		113	(70%-130%)		
Chlorobenzene	50.0			52.3	ug/L		105	(70%-130%)		
Chloroform	50.0			53.2	ug/L		106	(70%-130%)		
Ethylbenzene	50.0			54.3	ug/L		109	(70%-130%)		
Methylene chloride	50.0			48.0	ug/L		96	(70%-130%)		
Tetrachloroethylene	50.0			55.6	ug/L		111	(70%-130%)		
Toluene	50.0			52.7	ug/L		105	(70%-130%)		
Trichloroethylene	50.0			54.5	ug/L		109	(70%-130%)		
Vinyl chloride	50.0			48.2	ug/L		96	(70%-130%)		
Xylenes (total)	150			162	ug/L		108	(70%-130%)		

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

QC Summary

Workorder: **380996**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1508045										
**1,2-Dichloroethane-d4	50.0			50.9	ug/L		102	(71%-134%)	CDS1	09/16/15 07:48
**Bromofluorobenzene	50.0			50.8	ug/L		102	(70%-131%)		
**Toluene-d8	50.0			50.0	ug/L		100	(74%-124%)		
QC1203396882 LCS										
1,1,1-Trichloroethane	50.0			58.8	ug/L		118	(70%-130%)		09/17/15 08:52
1,1,2-Trichloroethane	50.0			52.4	ug/L		105	(70%-130%)		
1,1-Dichloroethane	50.0			55.4	ug/L		111	(70%-130%)		
1,1-Dichloroethylene	50.0			56.0	ug/L		112	(70%-130%)		
1,2-Dichloroethane	50.0			52.9	ug/L		106	(70%-130%)		
2-Butanone	250			244	ug/L		98	(70%-130%)		
4-Methyl-2-pentanone	250			258	ug/L		103	(70%-130%)		
Acetone	250			246	ug/L		98	(70%-130%)		
Benzene	50.0			53.9	ug/L		108	(70%-130%)		
Carbon disulfide	250			296	ug/L		118	(70%-130%)		
Carbon tetrachloride	50.0			57.5	ug/L		115	(70%-130%)		
Chlorobenzene	50.0			53.3	ug/L		107	(70%-130%)		
Chloroform	50.0			55.0	ug/L		110	(70%-130%)		
Ethylbenzene	50.0			55.7	ug/L		111	(70%-130%)		
Methylene chloride	50.0			48.7	ug/L		97	(70%-130%)		
Tetrachloroethylene	50.0			55.5	ug/L		111	(70%-130%)		
Toluene	50.0			53.9	ug/L		108	(70%-130%)		
Trichloroethylene	50.0			55.3	ug/L		111	(70%-130%)		

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QC Summary

Workorder: **380996**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1508045										
Vinyl chloride	50.0			55.5	ug/L		111	(70%-130%)	CDS1	09/17/15 08:52
Xylenes (total)	150			165	ug/L		110	(70%-130%)		
**1,2-Dichloroethane-d4	50.0			53.5	ug/L		107	(71%-134%)		
**Bromofluorobenzene	50.0			51.4	ug/L		103	(70%-131%)		
**Toluene-d8	50.0			51.9	ug/L		104	(74%-124%)		
QC1203394326 MB										
1,1,1-Trichloroethane			U	0.300	ug/L					09/16/15 10:46
1,1,2-Trichloroethane			U	0.300	ug/L					
1,1-Dichloroethane			U	0.300	ug/L					
1,1-Dichloroethylene			U	0.300	ug/L					
1,2-Dichloroethane			U	0.300	ug/L					
2-Butanone			U	3.00	ug/L					
4-Methyl-2-pentanone			U	3.00	ug/L					
Acetone			U	3.00	ug/L					
Benzene			U	0.300	ug/L					
Carbon disulfide			U	1.60	ug/L					
Carbon tetrachloride			U	0.300	ug/L					
Chlorobenzene			U	0.300	ug/L					
Chloroform			U	0.300	ug/L					
Ethylbenzene			U	0.300	ug/L					
Methylene chloride			U	1.60	ug/L					
Tetrachloroethylene			U	0.300	ug/L					

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QC Summary

Workorder: **380996**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1508045										
Toluene			U	0.300	ug/L				CDS1	09/16/15 10:46
Trichloroethylene			U	0.300	ug/L					
Vinyl chloride			U	0.300	ug/L					
Xylenes (total)			U	0.300	ug/L					
**1,2-Dichloroethane-d4	50.0			50.0	ug/L		100	(71%-134%)		
**Bromofluorobenzene	50.0			50.3	ug/L		101	(70%-131%)		
**Toluene-d8	50.0			49.5	ug/L		99	(74%-124%)		
QC1203396881 MB										
1,1,1-Trichloroethane			U	0.300	ug/L					09/17/15 09:52
1,1,2-Trichloroethane			U	0.300	ug/L					
1,1-Dichloroethane			U	0.300	ug/L					
1,1-Dichloroethylene			U	0.300	ug/L					
1,2-Dichloroethane			U	0.300	ug/L					
2-Butanone			U	3.00	ug/L					
4-Methyl-2-pentanone			U	3.00	ug/L					
Acetone			U	3.00	ug/L					
Benzene			U	0.300	ug/L					
Carbon disulfide			U	1.60	ug/L					
Carbon tetrachloride			U	0.300	ug/L					
Chlorobenzene			U	0.300	ug/L					
Chloroform			U	0.300	ug/L					
Ethylbenzene			U	0.300	ug/L					

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QC Summary

Workorder: **380996**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1508045											
Methylene chloride				U	1.60	ug/L				CDS1	09/17/15 09:52
Tetrachloroethylene				U	0.300	ug/L					
Toluene				U	0.300	ug/L					
Trichloroethylene				U	0.300	ug/L					
Vinyl chloride				U	0.300	ug/L					
Xylenes (total)				U	0.300	ug/L					
**1,2-Dichloroethane-d4	50.0				52.1	ug/L		104	(71%-134%)		
**Bromofluorobenzene	50.0				52.2	ug/L		104	(70%-131%)		
**Toluene-d8	50.0				51.2	ug/L		102	(74%-124%)		
QC1203394329 380763004 PS											
1,1,1-Trichloroethane	50.0	U	0.00		60.1	ug/L		120	(70%-130%)		09/16/15 14:14
1,1,2-Trichloroethane	50.0	U	0.00		50.7	ug/L		101	(70%-130%)		
1,1-Dichloroethane	50.0	U	0.00		54.5	ug/L		109	(70%-130%)		
1,1-Dichloroethylene	50.0	U	0.00		56.0	ug/L		112	(70%-130%)		
1,2-Dichloroethane	50.0	U	0.00		50.6	ug/L		101	(70%-130%)		
2-Butanone	250	TU	0.00	T	149	ug/L		60*	(70%-130%)		
4-Methyl-2-pentanone	250	U	0.00		233	ug/L		93	(70%-130%)		
Acetone	250	TU	0.00	T	113	ug/L		45*	(70%-130%)		
Benzene	50.0	U	0.00		53.9	ug/L		108	(70%-130%)		
Carbon disulfide	250	U	0.00		304	ug/L		122	(70%-130%)		
Carbon tetrachloride	50.0	U	0.00		59.2	ug/L		118	(70%-130%)		
Chlorobenzene	50.0	U	0.00		53.6	ug/L		107	(70%-130%)		

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QC Summary

Workorder: **380996**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1508045											
Chloroform	50.0	J	3.95		58.0	ug/L		108	(70%-130%)	CDS1	09/16/15 14:14
Ethylbenzene	50.0	U	0.00		56.8	ug/L		114	(70%-130%)		
Methylene chloride	50.0	U	0.00		48.2	ug/L		96	(70%-130%)		
Tetrachloroethylene	50.0	U	0.00		58.4	ug/L		117	(70%-130%)		
Toluene	50.0	U	0.00		54.7	ug/L		109	(70%-130%)		
Trichloroethylene	50.0	U	0.00		56.3	ug/L		113	(70%-130%)		
Vinyl chloride	50.0	U	0.00		57.0	ug/L		114	(70%-130%)		
Xylenes (total)	150	U	0.00		168	ug/L		112	(70%-130%)		
**1,2-Dichloroethane-d4	50.0		52.7		49.4	ug/L		99	(71%-134%)		
**Bromofluorobenzene	50.0		52.3		49.2	ug/L		98	(70%-131%)		
**Toluene-d8	50.0		50.6		50.1	ug/L		100	(74%-124%)		
QC1203394331 380763004 PSD											
1,1,1-Trichloroethane	50.0	U	0.00		57.5	ug/L	4	115	(0%-20%)		09/16/15 14:44
1,1,2-Trichloroethane	50.0	U	0.00		50.3	ug/L	1	101	(0%-20%)		
1,1-Dichloroethane	50.0	U	0.00		53.0	ug/L	3	106	(0%-20%)		
1,1-Dichloroethylene	50.0	U	0.00		53.2	ug/L	5	106	(0%-20%)		
1,2-Dichloroethane	50.0	U	0.00		49.9	ug/L	1	100	(0%-20%)		
2-Butanone	250	TU	0.00	T	148	ug/L	0	59*	(0%-20%)		
4-Methyl-2-pentanone	250	U	0.00		231	ug/L	1	93	(0%-20%)		
Acetone	250	TU	0.00	T	111	ug/L	2	44*	(0%-20%)		
Benzene	50.0	U	0.00		52.1	ug/L	3	104	(0%-20%)		
Carbon disulfide	250	U	0.00		291	ug/L	4	116	(0%-20%)		

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QC Summary

Workorder: **380996**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS												
Batch 1508045												
Carbon tetrachloride	50.0	U	0.00		56.1	ug/L	5	112	(0%-20%)	CDS1	09/16/15	14:44
Chlorobenzene	50.0	U	0.00		51.9	ug/L	3	104	(0%-20%)			
Chloroform	50.0	J	3.95		56.9	ug/L	2	106	(0%-20%)			
Ethylbenzene	50.0	U	0.00		53.9	ug/L	5	108	(0%-20%)			
Methylene chloride	50.0	U	0.00		47.4	ug/L	2	95	(0%-20%)			
Tetrachloroethylene	50.0	U	0.00		55.3	ug/L	6	111	(0%-20%)			
Toluene	50.0	U	0.00		52.2	ug/L	5	104	(0%-20%)			
Trichloroethylene	50.0	U	0.00		54.1	ug/L	4	108	(0%-20%)			
Vinyl chloride	50.0	U	0.00		55.0	ug/L	4	110	(0%-20%)			
Xylenes (total)	150	U	0.00		161	ug/L	4	108	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		52.7		50.0	ug/L		100	(71%-134%)			
**Bromofluorobenzene	50.0		52.3		49.4	ug/L		99	(70%-131%)			
**Toluene-d8	50.0		50.6		50.0	ug/L		100	(74%-124%)			

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.
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.

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QC Summary

Workorder: **380996**

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

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

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

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

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

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

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

Surrogate Recovery Report

SDG Number: GEL380996

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203394327	LCS for batch 1508045	102	100	102
1203394326	MB for batch 1508045	100	99	101
1203394329	B32971PS	99	100	98
1203394331	B32971PSD	100	100	99
1203396882	LCS for batch 1508045	107	104	103
1203396881	MB for batch 1508045	104	102	104
380996001	B32KK1	108	103	107

Surrogate		Acceptance Limits
DCED4	= 1,2-Dichloroethane-d4	(71%-134%)
TOL	= Toluene-d8	(74%-124%)
BFB	= Bromofluorobenzene	(70%-131%)

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

Miscellaneous

GEL Laboratories LLC
Form GEL-DER

DER Report No.: 1449932
Revision No.: 1

DATA EXCEPTION REPORT

Mo.Day Yr.	Division:	Quality Criteria:	Type:
21-SEP-15	Industrial	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
VOA GC/MS	SW846 8260C	Liquid	CPRC
Batch ID:	**Sample Numbers:**		
1508045	See Below		

Potentially affected work order(s)(SDG): **380763(GEL380763),380794(GEL380794),380924(GEL380924),380927(GEL380927),380995(GEL380995),380996(GEL380996),381093(GEL381093),381094(GEL381094),381150(GEL381150),381166(GEL381166),381291(GEL381291),381301(GEL381301)**

Application Issues:

Failed Recovery for MS/MSD, or PS/PSD

Other

Specification and Requirements Exception Description:	DER Disposition:
1. Failed Recovery for MS/MSD, or PS/PSD: QC 1203394329PS,1203394331PSD 2. The percent drift for 2-Chloro-1,3-butadiene was outside of the acceptance limits in the calibration verification sample with a high bias. The compound was not detected in the associated sample. The associated SDG was GEL381291	1. The spike and/or spike duplicate (See Below) recoveries were not all within the acceptance limits. The recoveries were similar. It is believed possible matrix interference has been demonstrated. 1203394329 (B32971PS) 2-Butanone [60* (70%-130%)], Acetone [45* (70%-130%)]. 1203394331 (B32971PSD) 2-Butanone [59* (70%-130%)], 2-Hexanone [69* (70%-130%)] and Acetone [44* (70%-130%)]. 2. The data results are reported.

Originator's Name:
Crystal Stacey 21-SEP-15

Data Validator/Group Leader:
Erin Haubert 06-OCT-15