

July 10, 2017



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July 10, 2017

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

Re: CHPRC SAF X17-003
Work Order: 424519
SDG: GEL424519

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 02, 2017. 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,

B Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

Purchase Order: 300071ES20 - 7H
Chain of Custody: X17-003-340 and X17-003-343
Enclosures



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Case Narrative

July 10, 2017

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF X17-003
SDG: GEL424519

July 10, 2017

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 June 02, 2017, for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

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

Sample Identification

The laboratory received the following samples:

Laboratory Identification	Sample Description
424519001	B3B936
424519002	B3B935

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.

We certify that this package 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 Manager (or designee) and the laboratory's client services representative as verified by their signatures on this report.

July 10, 2017

B. Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

July 10, 2017

GC/MS Volatile

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL424519

Work Order #: 424519

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

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

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
1203806007 (Non SDG 424245003PS)	2-Butanone	62* (70%-130%)
	Acetone	40* (70%-130%)
1203806008 (Non SDG 424245003PSD)	2-Butanone	59* (70%-130%)
	Acetone	43* (70%-130%)

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.

Chain of Custody and Supporting Documentation

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

424519

Collector: Jeff Tucksen CHPRC
 SAF No. X17-003
 Project Title: Groundwater Background Study, October
 Shipped To (Lab): GEL Laboratories, LLC
 Protocol: SURV
 POSSIBLE SAMPLE HAZARDS/REMARKS: *Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

Contact/Requester: WATERS-HUSTED, K
 Sampling Origin: Hanford Site
 Logbook No. HNF-N-506 88/65
 Method of Shipment: Commercial Carrier
 Priority: 30 Days
 SPECIAL INSTRUCTIONS: Batch with A, I, S, and W SAFs.

Telephone No. 376-4650
 Purchase Order/Charge Code: 300071
 Ice Chest No. 6WS-615
 Bill of Lading/Air Bill No. 7792 81849336
 Offsite Property No. 7975
 Total Activity Exemption: Yes No

Sample No. B3E936
 Filter: N
 Date: JUN 01 2017 09:54
 Time: 5x40-mL aGs*
 No/Type Container: 8260_VOA_GCMS: COMMON
 Sample Analysis: COMMON
 Holding Time: 14 Days
 Preservative: HCl or H2SO4 to pH <2/Cool <=6C

July 10, 2017

Relinquished By: Jeff Tucksen CHPRC	Print: [Signature]	Sign:	Date/Time: JUN 01 2017 11:55	Received By: Janelle Zunker CHPRC	Print: [Signature]	Sign:	Date/Time: JUN 01 2017 11:55	Matrix *
Relinquished By: Janelle Zunker CHPRC	Print: [Signature]	Sign:	Date/Time: JUN 01 2017 14:00	Received By: FEDEX	Print: FEDEX	Sign:	Date/Time: 6-2-17 9:10	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:	Print:	Sign:	Date/Time: FED EX	Received By: STACY BOONE	Print: [Signature]	Sign:	Date/Time: 6/2/17 9:10	
Relinquished By:	Print:	Sign:	Date/Time:	Received By:	Print:	Sign:	Date/Time:	

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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C.#

X17-003-343

Page 1 of 1

424519

Contact/Requester WATERS-HUSTED, K

Telephone No. 376-4650

Sampling Origin Hanford Site

Purchase Order/Charge Code 300071

Project Title Groundwater Background Study, October

Logbook No. HNF-N-506 88164

Ice Chest No. GWS-6014

Shipped To (Lab) GEL Laboratories, LLC

Method of Shipment Commercial Carrier

Bill of Lading/Air Bill No. 7792 77505454

Protocol SURV

Priority: 30 Days

PRIORITY

Offsite Property No. 7969

POSSIBLE SAMPLE HAZARDS/REMARKS

SPECIAL INSTRUCTIONS

Hold Time

Total Activity Exemption: Yes No

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

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

Sample No.	Filter	* Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B3B935	N	5-31-17	1205	5x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool <=6C

July 10, 2017

Relinquished By	Print	Sign	Received By	Print	Sign	Date/Time	Matrix *
Roy Sheppard CHPRC			SSU-1			MAY 31 2017 1330	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			Janelle Zunker CHPRC			JUN 01 2017 0730	DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By			Janelle Zunker CHPRC			JUN 01 2017 1400	
Relinquished By							
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time	
		FED EX		STACY BOONE		6-2-17 9:10	

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: CPRC

Qualifier	Qualifier Definition	Department	Fraction
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.		
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	Organics	
P	Aroclor target analyte with greater than 25% difference between column analyses.	Organics	
C	Analyte has been confirmed by GC/MS analysis	Organics	Pesticide
B	The analyte was detected in both the associated QC blank and in the sample.	Organics	
E	Concentration exceeds the calibration range of the instrument	Organics	
A	The TIC is a suspected aldol-condensation product	Organics	Semi-Volatile
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
N	Spike Sample recovery is outside control limits.		
*	Duplicate analysis not within control limits	Inorganics	
>	Result greater than quantifiable range or greater than upper limit of the analysis range	General Chemistry	
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
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).	Inorganics	Metals
D	Results are reported from a diluted aliquot of sample.		
E	Reported value is estimated due to interferences. See comment in narrative.	Inorganics	Metals
M	Duplicate precision not met.	Inorganics	Metals
o	Analyte failed to recover within LCS limits (Organics only)	Organics	
S	Reported value determined by the Method of Standard Additions (MSA)	Inorganics	
T	Spike and/or spike duplicate sample recovery is outside control limits.	Organics	
W	Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.	Inorganics	
B	The associated QC sample blank has a result $\geq 2X$ the MDA and, after corrections, result is \geq MDA for this sample	Radiological	
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
+	Correlation coefficient for Method of Standard Additions (MSA) is < 0.995	Inorganics	
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).	General Chemistry	
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is > 5% of the measured concentration and/or decision level for associated samples.	Inorganics	Metals
C	Target analyte was detected in the sample and the associated blank. The associated blank concentration is \geq EQL or is > 5% of the measured concentration and/or decision level for associated samples.	General Chemistry	
<	Sample is below the EPA guidance level for Reactive Releasable Cyanide and/or Reactive Releasable Sulfide	General Chemistry	
UX	Gamma Spectroscopy--Uncertain identification	Radiological	

Laboratory Certifications

List of current GEL Certifications as of 10 July 2017

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
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	LA170010
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122017-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-17-12
Utah NELAP	SC000122017-22
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Volatile Analysis

Case Narrative

July 10, 2017

GC/MS Volatile

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL424519

Work Order #: 424519

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

Analytical Method: SW846 8260C

Analytical Procedure: GL-OA-E-038 REV# 26

Analytical Batch: 1671888

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
424519001	B3B936
424519002	B3B935
1203806005	Method Blank (MB)
1203806006	Laboratory Control Sample (LCS)
1203806007	424245003(NonSDG) Post Spike (PS)
1203806008	424245003(NonSDG) Post Spike Duplicate (PSD)

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

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

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
1203806007 (Non SDG 424245003PS)	2-Butanone	62* (70%-130%)
	Acetone	40* (70%-130%)
1203806008 (Non SDG 424245003PSD)	2-Butanone	59* (70%-130%)
	Acetone	43* (70%-130%)

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.

July 10, 2017

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: GEL424519 GEL Work Order: 424519

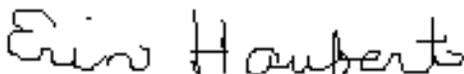
The Qualifiers in this report are defined as follows:

- 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: 10 JUL 2017

Title: Data Validator

Sample Data Summary

July 10, 2017

Volatile

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**Certificate of Analysis
Sample Summary**

SDG Number: GEL424519	Date Collected: 06/01/2017 09:54	Matrix: WATER
Lab Sample ID: 424519001	Date Received: 06/02/2017 09:10	
Client ID: B3B936	Client: CPCR001	Project: CPCR0X17003
Batch ID: 1671888	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/07/2017 17:35	Inst: VOA3.I	Dilution: 1
Prep Date: 06/07/2017 17:35	Analyst: VXY1	Purge Vol: 5 mL
Data File: 060717V3\3G316.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		30.9	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

July 10, 2017

Volatile

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**Certificate of Analysis
Sample Summary**

SDG Number: GEL424519	Date Collected: 05/31/2017 12:05	Matrix: WATER
Lab Sample ID: 424519002	Date Received: 06/02/2017 09:10	
Client ID: B3B935	Client: CPCR001	Project: CPCR0X17003
Batch ID: 1671888	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/07/2017 18:05	Inst: VOA3.I	Dilution: 1
Prep Date: 06/07/2017 18:05	Analyst: VXY1	Purge Vol: 5 mL
Data File: 060717V3\3G317.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		44.7	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

July 10, 2017

GEL LABORATORIES LLC

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

QC Summary

Report Date: July 10, 2017

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CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 424519

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1671888										
QC1203806006	LCS										
1,1,1-Trichloroethane	50.0			48.3	ug/L		97	(70%-130%)	VXY1	06/07/17	10:56
1,1,2-Trichloroethane	50.0			48.6	ug/L		97	(70%-130%)			
1,1-Dichloroethane	50.0			51.1	ug/L		102	(70%-130%)			
1,1-Dichloroethylene	50.0			46.5	ug/L		93	(70%-130%)			
1,2-Dichloroethane	50.0			46.9	ug/L		94	(70%-130%)			
2-Butanone	250			264	ug/L		106	(70%-130%)			
4-Methyl-2-pentanone	250			233	ug/L		93	(70%-130%)			
Acetone	250			273	ug/L		109	(70%-130%)			
Benzene	50.0			46.1	ug/L		92	(70%-130%)			
Carbon disulfide	250			231	ug/L		92	(70%-130%)			
Carbon tetrachloride	50.0			48.2	ug/L		96	(70%-130%)			
Chlorobenzene	50.0			47.4	ug/L		95	(70%-130%)			
Chloroform	50.0			46.2	ug/L		92	(70%-130%)			

July 10, 2017

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QC Summary

Workorder: 424519

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1671888										
Ethylbenzene	50.0			45.1	ug/L		90	(70%-130%)	VXY1	06/07/17	10:56
Methylene chloride	50.0			44.4	ug/L		89	(70%-130%)			
Tetrachloroethylene	50.0			46.0	ug/L		92	(70%-130%)			
Toluene	50.0			48.1	ug/L		96	(70%-130%)			
Trichloroethylene	50.0			49.1	ug/L		98	(70%-130%)			
Vinyl chloride	50.0			45.7	ug/L		91	(70%-130%)			
Xylenes (total)	150			141	ug/L		94	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			44.1	ug/L		88	(70%-130%)			
**Bromofluorobenzene	50.0			53.7	ug/L		107	(70%-130%)			
**Toluene-d8	50.0			46.9	ug/L		94	(70%-130%)			
QC1203806005 MB											
1,1,1-Trichloroethane			U	0.300	ug/L					06/07/17	12:28
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						

July 10, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424519

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1671888										
2-Butanone			U	3.00	ug/L				VXY1	06/07/17	12:28
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						
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						

July 10, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 424519

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1671888										
**1,2-Dichloroethane-d4	50.0			46.7	ug/L		93	(70%-130%)	VXY1	06/07/17	12:28
**Bromofluorobenzene	50.0			49.7	ug/L		99	(70%-130%)			
**Toluene-d8	50.0			50.9	ug/L		102	(70%-130%)			
QC1203806007 424245003 PS											
1,1,1-Trichloroethane	50.0	U	0.00	40.5	ug/L		81	(70%-130%)		06/07/17	20:08
1,1,2-Trichloroethane	50.0	U	0.00	49.5	ug/L		99	(70%-130%)			
1,1-Dichloroethane	50.0	U	0.00	46.8	ug/L		94	(70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00	41.6	ug/L		83	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00	44.5	ug/L		89	(70%-130%)			
2-Butanone	250	TU	0.00 T	154	ug/L		62*	(70%-130%)			
4-Methyl-2-pentanone	250	U	0.00	224	ug/L		89	(70%-130%)			
Acetone	250	TU	0.00 T	101	ug/L		40*	(70%-130%)			
Benzene	50.0	U	0.00	44.4	ug/L		89	(70%-130%)			
Carbon disulfide	250	U	0.00	224	ug/L		89	(70%-130%)			
Carbon tetrachloride	50.0	U	0.00	41.6	ug/L		83	(70%-130%)			
Chlorobenzene	50.0	U	0.00	46.6	ug/L		93	(70%-130%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1671888										
Chloroform	50.0	J	0.310	42.6	ug/L		85	(70%-130%)	VXY1	06/07/17	20:08
Ethylbenzene	50.0	U	0.00	47.1	ug/L		94	(70%-130%)			
Methylene chloride	50.0	U	0.00	43.1	ug/L		86	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00	42.9	ug/L		86	(70%-130%)			
Toluene	50.0	U	0.00	46.8	ug/L		94	(70%-130%)			
Trichloroethylene	50.0	J	3.88	47.4	ug/L		87	(70%-130%)			
Vinyl chloride	50.0	U	0.00	42.7	ug/L		85	(70%-130%)			
Xylenes (total)	150	U	0.00	136	ug/L		91	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		44.3	38.5	ug/L		77	(70%-130%)			
**Bromofluorobenzene	50.0		48.8	49.3	ug/L		99	(70%-130%)			
**Toluene-d8	50.0		46.7	47.2	ug/L		94	(70%-130%)			
QC1203806008 424245003 PSD											
1,1,1-Trichloroethane	50.0	U	0.00	43.7	ug/L	8	87	(0%-20%)		06/07/17	20:38
1,1,2-Trichloroethane	50.0	U	0.00	48.0	ug/L	3	96	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00	46.5	ug/L	1	93	(0%-20%)			
1,1-Dichloroethylene	50.0	U	0.00	42.9	ug/L	3	86	(0%-20%)			

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1671888											
1,2-Dichloroethane	50.0	U	0.00		45.0	ug/L	1	90	(0%-20%)	VXY1	06/07/17 20:38
2-Butanone	250	TU	0.00	T	148	ug/L	4	59*	(0%-20%)		
4-Methyl-2-pentanone	250	U	0.00		214	ug/L	4	86	(0%-20%)		
Acetone	250	TU	0.00	T	108	ug/L	7	43*	(0%-20%)		
Benzene	50.0	U	0.00		44.4	ug/L	0	89	(0%-20%)		
Carbon disulfide	250	U	0.00		218	ug/L	3	87	(0%-20%)		
Carbon tetrachloride	50.0	U	0.00		43.1	ug/L	4	86	(0%-20%)		
Chlorobenzene	50.0	U	0.00		44.4	ug/L	5	89	(0%-20%)		
Chloroform	50.0	J	0.310		44.6	ug/L	4	89	(0%-20%)		
Ethylbenzene	50.0	U	0.00		42.1	ug/L	11	84	(0%-20%)		
Methylene chloride	50.0	U	0.00		43.0	ug/L	0	86	(0%-20%)		
Tetrachloroethylene	50.0	U	0.00		42.0	ug/L	2	84	(0%-20%)		
Toluene	50.0	U	0.00		44.7	ug/L	4	89	(0%-20%)		
Trichloroethylene	50.0	J	3.88		47.3	ug/L	0	87	(0%-20%)		
Vinyl chloride	50.0	U	0.00		43.7	ug/L	2	87	(0%-20%)		

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Table with columns: Parmname, NOM, Sample, Qual, QC, Units, RPD%, REC%, Range, Anlst, Date, Time. Rows include Volatile-GC/MS, Xylenes (total), **1,2-Dichloroethane-d4, **Bromofluorobenzene, and **Toluene-d8.

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.
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.

July 10, 2017
 Volatile
 Surrogate Recovery Report

SDG Number: GEL424519

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203806006	LCS for batch 1671888	88	94	107
1203806005	MB for batch 1671888	93	102	99
424519001	B3B936	84	96	91
424519002	B3B935	84	95	94
1203806007	B39FH3PS	77	94	99
1203806008	B39FH3PSD	80	90	101

Surrogate**Acceptance Limits**

DCED4 = 1,2-Dichloroethane-d4

(70%-130%)

TOL = Toluene-d8

(70%-130%)

BFB = Bromofluorobenzene

(70%-130%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted