

July 7, 2017



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July 07, 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: 425232
SDG: GEL425232

Dear Mr. Fitzgerald:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 10, 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: 300071 - 7H
Chain of Custody: X17-003-326
Enclosures



Table of Contents

Case Narrative.....1

Chain of Custody and Supporting Documentation.....5

Data Review Qualifier Definitions.....8

Laboratory Certifications.....10

Volatile Analysis.....12

 Case Narrative.....13

 Sample Data Summary.....16

 Quality Control Summary.....18

July 7, 2017

Case Narrative

July 7, 2017

General Narrative
for
CH2MHill Plateau Remediation Company
CHPRC SAF X17-003
SDG: GEL425232

July 07, 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 10, 2017, 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.

Sample Identification

The laboratory received the following sample:

Laboratory Identification	Sample Description
425232001	B3B940

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 7, 2017

B. Luthman
Brielle Luthman for
Heather Shaffer
Project Manager

July 7, 2017

GC/MS Volatile

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL425232

Work Order #: 425232

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
1203816752 (B3B940PS)	Acetone	53* (70%-130%)
1203816753 (B3B940PSD)	Acetone	53* (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

July 7, 2017

SAMPLE RECEIPT & REVIEW FORM

Client: CPRC SDG/AR/COC/Work Order: 425232
 Received By: STACY BOONE Date Received: JUNE 10, 2017
 Carrier and Tracking Number: _____
 Circle Applicable:
 FedEx Express FedEx Ground UPS Field Services Courier Other
7793 4221 5750 -13c 7793 4835 0752 -21c
7793 4221 5521 -13c 7793 4835 1119 -1c
7793 4835 1027 -1c 7793 4221 5543 -1c
7793 4835 0833 -1c 7793 4835 0925 -1c

Suspected Hazard Information Yes No
 *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.

Shipped as a DOT Hazardous? Yes No
 Hazard Class Shipped: _____ UN#: _____
 COC/Samples marked or classified as radioactive? Yes No
 Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 CPM / mR/Hr
 Classified as: Rad 1 Rad 2 Rad 3

Is package, COC, and/or Samples marked HAZ? Yes No
 *If yes, select Hazards below, and contact the GEL Safety Group.
 PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other: 1

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 checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3 Samples requiring cold preservation within (0 ≤ deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Wet Ice Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: _____
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>1R3-17</u> Secondary Temperature Device Serial # (If Applicable): _____
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: If Preservation added, Lot#:
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	If Yes, Are Encores or Soil Kits present? Yes ___ No <input checked="" type="checkbox"/> (If yes, take to VOA Freezer) Do VOA vials contain acid preservation? Yes <input checked="" type="checkbox"/> No ___ N/A (If unknown, select No) VOA vials free of headspace? Yes <input checked="" type="checkbox"/> No ___ N/A Sample ID's and containers affected:
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" 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 checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Comments (Use Continuation Form if needed):
7793 4835 0627 -1c
SAMPLE ID B3BIY6 10F3 BROKEN DURING HANDLING WO:425-235-027

PM (or PMA) review: Initials PL Date 10.13.17 Page 1 of 1

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 07 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 7, 2017

GC/MS Volatile

Technical Case Narrative

CH2MHill Plateau Remediation Company (CPRC)

SDG #: GEL425232

Work Order #: 425232

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

Analytical Method: SW846 8260C

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

Analytical Batch: 1676331

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

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
425232001	B3B940
1203816750	Method Blank (MB)
1203816751	Laboratory Control Sample (LCS)
1203816752	425232001(B3B940) Post Spike (PS)
1203816753	425232001(B3B940) 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
1203816752 (B3B940PS)	Acetone	53* (70%-130%)
1203816753 (B3B940PSD)	Acetone	53* (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 7, 2017

GEL LABORATORIES LLC

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**Qualifier Definition Report
for**

CPRC001 CH2MHill Plateau Remediation Company

Client SDG: GEL425232 GEL Work Order: 425232

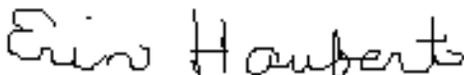
The Qualifiers in this report are defined as follows:

- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate). Value is estimated
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- DL Indicates that sample is diluted.
- RA Indicates that sample is re-analyzed without re-extraction.
- RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature: 

Name: Erin Haubert

Date: 07 JUL 2017

Title: Data Validator

Sample Data Summary

July 7 2017

Volatile

Page 1 of 1

**Certificate of Analysis
Sample Summary**

SDG Number: GEL425232	Date Collected: 06/09/2017 11:03	Matrix: WATER
Lab Sample ID: 425232001	Date Received: 06/10/2017 08:45	
Client ID: B3B940	Client: CPRC001	Project: CPRC0X17003
Batch ID: 1676331	Method: SW846 8260C	SOP Ref: GL-OA-E-038
Run Date: 06/22/2017 14:45	Inst: VOA3.I	Dilution: 1
Prep Date: 06/22/2017 14:45	Analyst: VXY1	Purge Vol: 5 mL
Data File: 062217V3\31410.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	3.08	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	U	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 7, 2017

GEL LABORATORIES LLC

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

QC Summary

Report Date: June 26, 2017

Page 1 of 7

CH2M Hill Plateau Remediation Company

MSIN R3-50 CHPRC

PO Box 1600

Richland, Washington

Contact: Mr. Scot Fitzgerald

Workorder: 425232

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1676331										
QC1203816751	LCS										
1,1,1-Trichloroethane	50.0			47.8	ug/L		96	(70%-130%)	VXY1	06/22/17	11:09
1,1,2-Trichloroethane	50.0			46.9	ug/L		94	(70%-130%)			
1,1-Dichloroethane	50.0			44.5	ug/L		89	(70%-130%)			
1,1-Dichloroethylene	50.0			45.6	ug/L		91	(70%-130%)			
1,2-Dichloroethane	50.0			43.9	ug/L		88	(70%-130%)			
2-Butanone	250			258	ug/L		103	(70%-130%)			
4-Methyl-2-pentanone	250			217	ug/L		87	(70%-130%)			
Acetone	250			253	ug/L		101	(70%-130%)			
Benzene	50.0			44.5	ug/L		89	(70%-130%)			
Carbon disulfide	250			219	ug/L		87	(70%-130%)			
Carbon tetrachloride	50.0			46.0	ug/L		92	(70%-130%)			
Chlorobenzene	50.0			46.3	ug/L		93	(70%-130%)			
Chloroform	50.0			44.0	ug/L		88	(70%-130%)			

July 7, 2017

GEL LABORATORIES LLC

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QC Summary

Workorder: 425232

Page 2 of 7

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1676331										
Ethylbenzene	50.0			45.3	ug/L		91	(70%-130%)	VXY1	06/22/17	11:09
Methylene chloride	50.0			43.3	ug/L		87	(70%-130%)			
Tetrachloroethylene	50.0			44.5	ug/L		89	(70%-130%)			
Toluene	50.0			47.0	ug/L		94	(70%-130%)			
Trichloroethylene	50.0			46.5	ug/L		93	(70%-130%)			
Vinyl chloride	50.0			50.6	ug/L		101	(70%-130%)			
Xylenes (total)	150			138	ug/L		92	(70%-130%)			
**1,2-Dichloroethane-d4	50.0			47.8	ug/L		96	(70%-130%)			
**Bromofluorobenzene	50.0			49.8	ug/L		100	(70%-130%)			
**Toluene-d8	50.0			48.6	ug/L		97	(70%-130%)			
QC1203816750 MB											
1,1,1-Trichloroethane			U	0.300	ug/L					06/22/17	12:41
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 7, 2017

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QC Summary

Workorder: 425232

Page 3 of 7

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1676331										
2-Butanone			U	3.00	ug/L				VXY1	06/22/17	12:41
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 7, 2017

GEL LABORATORIES LLC

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

QC Summary

Workorder: 425232

Page 4 of 7

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1676331										
**1,2-Dichloroethane-d4	50.0			51.8	ug/L		104	(70%-130%)	VXY1	06/22/17	12:41
**Bromofluorobenzene	50.0			47.8	ug/L		96	(70%-130%)			
**Toluene-d8	50.0			51.3	ug/L		103	(70%-130%)			
QC1203816752 425232001 PS											
1,1,1-Trichloroethane	50.0	U	0.00	45.5	ug/L		91	(70%-130%)		06/22/17	20:23
1,1,2-Trichloroethane	50.0	U	0.00	50.6	ug/L		101	(70%-130%)			
1,1-Dichloroethane	50.0	U	0.00	50.6	ug/L		101	(70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00	47.9	ug/L		96	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00	46.8	ug/L		94	(70%-130%)			
2-Butanone	250	U	0.00	183	ug/L		73	(70%-130%)			
4-Methyl-2-pentanone	250	U	0.00	245	ug/L		98	(70%-130%)			
Acetone	250	TU	0.00	T 132	ug/L		53 *	(70%-130%)			
Benzene	50.0	U	0.00	48.8	ug/L		98	(70%-130%)			
Carbon disulfide	250	U	0.00	249	ug/L		100	(70%-130%)			
Carbon tetrachloride	50.0	U	0.00	46.9	ug/L		94	(70%-130%)			
Chlorobenzene	50.0	U	0.00	49.5	ug/L		99	(70%-130%)			

July 7, 2017

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QC Summary

Workorder: 425232

Page 5 of 7

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1676331										
Chloroform	50.0	U	0.00	46.5	ug/L		93	(70%-130%)	VXY1	06/22/17	20:23
Ethylbenzene	50.0	U	0.00	49.5	ug/L		99	(70%-130%)			
Methylene chloride	50.0	J	3.08	50.0	ug/L		94	(70%-130%)			
Tetrachloroethylene	50.0	U	0.00	50.6	ug/L		101	(70%-130%)			
Toluene	50.0	U	0.00	51.6	ug/L		103	(70%-130%)			
Trichloroethylene	50.0	U	0.00	48.5	ug/L		97	(70%-130%)			
Vinyl chloride	50.0	U	0.00	58.3	ug/L		117	(70%-130%)			
Xylenes (total)	150	U	0.00	151	ug/L		101	(70%-130%)			
**1,2-Dichloroethane-d4	50.0		48.3	45.5	ug/L		91	(70%-130%)			
**Bromofluorobenzene	50.0		43.0	45.4	ug/L		91	(70%-130%)			
**Toluene-d8	50.0		50.1	48.8	ug/L		98	(70%-130%)			
QC1203816753 425232001 PSD											
1,1,1-Trichloroethane	50.0	U	0.00	49.5	ug/L	8	99	(0%-20%)		06/22/17	20:54
1,1,2-Trichloroethane	50.0	U	0.00	49.0	ug/L	3	98	(0%-20%)			
1,1-Dichloroethane	50.0	U	0.00	51.9	ug/L	2	104	(0%-20%)			
1,1-Dichloroethylene	50.0	U	0.00	48.6	ug/L	1	97	(0%-20%)			

July 7, 2017

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QC Summary

Workorder: 425232

Page 6 of 7

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch	1676331										
1,2-Dichloroethane	50.0	U	0.00		49.3	ug/L	5	99	(0%-20%)	VXY1	06/22/17 20:54
2-Butanone	250	U	0.00		189	ug/L	3	76	(0%-20%)		
4-Methyl-2-pentanone	250	U	0.00		241	ug/L	2	97	(0%-20%)		
Acetone	250	TU	0.00	T	133	ug/L	0	53*	(0%-20%)		
Benzene	50.0	U	0.00		50.3	ug/L	3	101	(0%-20%)		
Carbon disulfide	250	U	0.00		240	ug/L	4	96	(0%-20%)		
Carbon tetrachloride	50.0	U	0.00		48.8	ug/L	4	98	(0%-20%)		
Chlorobenzene	50.0	U	0.00		48.9	ug/L	1	98	(0%-20%)		
Chloroform	50.0	U	0.00		47.5	ug/L	2	95	(0%-20%)		
Ethylbenzene	50.0	U	0.00		47.0	ug/L	5	94	(0%-20%)		
Methylene chloride	50.0	J	3.08		49.8	ug/L	1	93	(0%-20%)		
Tetrachloroethylene	50.0	U	0.00		46.7	ug/L	8	93	(0%-20%)		
Toluene	50.0	U	0.00		50.5	ug/L	2	101	(0%-20%)		
Trichloroethylene	50.0	U	0.00		51.2	ug/L	5	102	(0%-20%)		
Vinyl chloride	50.0	U	0.00		56.8	ug/L	3	114	(0%-20%)		

July 7, 2017

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QC Summary

Workorder: 425232

Page 7 of 7

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 7, 2017
Volatiles

Surrogate Recovery Report

SDG Number: GEL425232

Matrix Type: LIQUID

Sample ID	Client ID	DCED4 %REC	TOL %REC	BFB %REC
1203816751	LCS for batch 1676331	96	97	100
1203816750	MB for batch 1676331	104	103	96
425232001	B3B940	97	100	86
1203816752	B3B940PS	91	98	91
1203816753	B3B940PSD	95	95	96

Surrogate

DCED4 = 1,2-Dichloroethane-d4

TOL = Toluene-d8

BFB = Bromofluorobenzene

Acceptance Limits

(70%-130%)

(70%-130%)

(70%-130%)

* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted