

March 07, 2018

Bob Walker  
H2GO Brunswick Regional Water & Sewer  
PO BOX 2230  
Leland, North Carolina 28451

Re: Sample Analysis  
Work Order: 444169

Dear Bob Walker:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on February 21, 2018. 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. 4778.

Sincerely,



Taylor Cannon for  
Hope Taylor  
Project Manager

Purchase Order: signed quote  
Enclosures

## GEL LABORATORIES LLC

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

### Certificate of Analysis Report for

H2GO001 H2GO Brunswick Regional Water & Sewer

Client SDG: 444169 GEL Work Order: 444169

**The Qualifiers in this report are defined as follows:**

- \* A quality control analyte recovery is outside of specified acceptance criteria
- \*\* Analyte is a Tracer compound
- \*\* Analyte is a surrogate compound
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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

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

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

Reviewed by



# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: March 7, 2018

Company : H2GO Brunswick Regional Water & Sewer  
Address : PO BOX 2230

Leland, North Carolina 28451

Contact: Bob Walker  
Project: Sample Analysis

Client Sample ID: GST/BPS  
Sample ID: 444169001  
Matrix: Water  
Collect Date: 15-FEB-18 14:39  
Receive Date: 21-FEB-18  
Collector: Client

Project: H2GO00117  
Client ID: H2GO001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
LCMSMS PFCs												
NC 6 PFCs by LC-MS/MS "As Received"												
Nafion Byproduct 1	UX	ND			ng/L	0.0197	1	JLS	03/02/18	1537	1742223	1
Nafion Byproduct 2	UX	ND			ng/L	0.0197	1					
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	UX	ND			ng/L	0.0197	1					
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	UX	ND			ng/L	0.0197	1					
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	UX	ND			ng/L	0.0197	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	UX	ND			ng/L	0.0197	1					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	UX	ND			ng/L	0.0197	1					
Perfluoro-4-methoxybutanic acid (PFMOBA)	UX	ND			ng/L	0.0197	1					
PFOA, PFOS by LC-MS/MS "As Received"												
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)	U	ND	0.650	1.97	ng/L	0.0197	1	JLS	03/02/18	1537	1742223	2
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.30	3.70	ng/L	0.0197	1					
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.30	3.74	ng/L	0.0197	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.30	3.78	ng/L	0.0197	1					
Perfluorobutanesulfonate (PFBS)	U	ND	0.650	1.75	ng/L	0.0197	1					
Perfluorobutyric acid (PFBA)	U	ND	0.650	1.97	ng/L	0.0197	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.650	1.91	ng/L	0.0197	1					
Perfluorodecanoic acid (PFDA)	U	ND	0.650	1.97	ng/L	0.0197	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.650	1.97	ng/L	0.0197	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.650	1.87	ng/L	0.0197	1					
Perfluoroheptanoic acid (PFHpA)	U	ND	0.650	1.97	ng/L	0.0197	1					
Perfluorohexanesulfonate (PFHxS)	U	ND	0.650	1.79	ng/L	0.0197	1					
Perfluorohexanoic acid (PFHxA)	U	ND	0.650	1.97	ng/L	0.0197	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.650	1.89	ng/L	0.0197	1					
Perfluorononanoic acid (PFNA)	U	ND	0.650	1.97	ng/L	0.0197	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.650	1.83	ng/L	0.0197	1					
Perfluorooctanesulfonate (PFOS)	U	ND	0.650	1.97	ng/L	0.0197	1					
Perfluorooctanoic acid (PFOA)	U	ND	0.650	1.97	ng/L	0.0197	1					

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Company : H2GO Brunswick Regional Water & Sewer  
Address : PO BOX 2230

Leland, North Carolina 28451

Contact: Bob Walker  
Project: Sample Analysis

Client Sample ID: GST/BPS

Sample ID: 444169001

Project: H2GO00117

Client ID: H2GO001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
LCMSMS PFCs												
PFOA, PFOS by LC-MS/MS "As Received"												
Perfluoropentanesulfonate (PFPeS)	U	ND	0.650	1.85	ng/L	0.0197	1					
Perfluoropentanoic acid (PFPeA)	U	ND	0.650	1.97	ng/L	0.0197	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.650	1.97	ng/L	0.0197	1					
Perfluorotridecanoic acid (PFTTrDA)	U	ND	0.650	1.97	ng/L	0.0197	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.650	1.97	ng/L	0.0197	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 537	PFCs Extraction in Drinking Water	MXD2	02/26/18	1000	1742222

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	

### Notes:

Column headers are defined as follows:

DF: Dilution Factor

DL: Detection Limit

MDA: Minimum Detectable Activity

MDC: Minimum Detectable Concentration

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

SQL: Sample Quantitation Limit

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## Certificate of Analysis

Report Date: March 7, 2018

Company : H2GO Brunswick Regional Water & Sewer  
Address : PO BOX 2230

Leland, North Carolina 28451

Contact: Bob Walker  
Project: Sample Analysis

Client Sample ID: GST/BPS  
Sample ID: 444169002  
Matrix: Water  
Collect Date: 15-FEB-18 14:39  
Receive Date: 21-FEB-18  
Collector: Client

Project: H2GO00117  
Client ID: H2GO001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
LCMSMS PFCs												
NC 6 PFCs by LC-MS/MS "As Received"												
Nafion Byproduct 1	X	1.11			ng/L	0.0191	1	JLS	03/02/18	1554	1742223	1
Nafion Byproduct 2	X	1.80			ng/L	0.0191	1					
Perfluoro(3,5,7,9-tetraoxadecanoic acid (PFO4DA)	X	0.741			ng/L	0.0191	1					
Perfluoro(3,5,7-trioxaoctanoic acid (PFO3OA)	X	1.54			ng/L	0.0191	1					
Perfluoro(3,5-dioxahexanoic acid (PFO2HxA)	X	4.11			ng/L	0.0191	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	UX	ND			ng/L	0.0191	1					
Perfluoro-3-methoxypropanoic acid (PFMOPrA)	X	4.14			ng/L	0.0191	1					
Perfluoro-4-methoxybutanic acid (PFMOBA)	X	1.39			ng/L	0.0191	1					
PFOA, PFOS by LC-MS/MS "As Received"												
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)		15.9	0.631	1.91	ng/L	0.0191	1	JLS	03/02/18	1554	1742223	2
Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.26	3.59	ng/L	0.0191	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.26	3.67	ng/L	0.0191	1					
Perfluorobutanesulfonate (PFBS)		1.94	0.631	1.70	ng/L	0.0191	1					
Perfluorodecanesulfonate (PFDS)	U	ND	0.631	1.85	ng/L	0.0191	1					
Perfluorodecanoic acid (PFDA)	J	0.897	0.631	1.91	ng/L	0.0191	1					
Perfluorododecanoic acid (PFDoA)	U	ND	0.631	1.91	ng/L	0.0191	1					
Perfluoroheptanesulfonate (PFHpS)	U	ND	0.631	1.82	ng/L	0.0191	1					
Perfluoroheptanoic acid (PFHpA)		3.50	0.631	1.91	ng/L	0.0191	1					
Perfluorohexanesulfonate (PFHxS)		4.03	0.631	1.74	ng/L	0.0191	1					
Perfluorohexanoic acid (PFHxA)		5.11	0.631	1.91	ng/L	0.0191	1					
Perfluorononanesulfonate (PFNS)	U	ND	0.631	1.84	ng/L	0.0191	1					
Perfluorononanoic acid (PFNA)	J	0.762	0.631	1.91	ng/L	0.0191	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.631	1.78	ng/L	0.0191	1					
Perfluorooctanesulfonate (PFOS)		7.88	0.631	1.91	ng/L	0.0191	1					
Perfluorooctanoic acid (PFOA)		3.94	0.631	1.91	ng/L	0.0191	1					
Perfluoropentanesulfonate (PFPeS)	U	ND	0.631	1.80	ng/L	0.0191	1					
Perfluoropentanoic acid (PFPeA)		6.33	0.631	1.91	ng/L	0.0191	1					
Perfluorotetradecanoic acid	U	ND	0.631	1.91	ng/L	0.0191	1					

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Address : PO BOX 2230

Leland, North Carolina 28451

Contact: Bob Walker  
Project: Sample Analysis

Client Sample ID: GST/BPS  
Sample ID: 444169002

Project: H2GO00117  
Client ID: H2GO001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
LCMSMS PFCs												
PFOA, PFOS by LC-MS/MS "As Received"												
(PFTeDA)												
Perfluorotridecanoic acid (PFTrDA)	U	ND	0.631	1.91	ng/L	0.0191	1					
Perfluoroundecanoic acid (PFUdA)	U	ND	0.631	1.91	ng/L	0.0191	1					
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	6.31	18.2	ng/L	0.0191	5	JLS	03/06/18	1437	1742223	3
Perfluorobutyric acid (PFBA)	J	4.19	3.15	9.56	ng/L	0.0191	5					
Semi-Volatile-GC/MS												
EPA 522 1,4-Dioxane in Liquid "As Received"												
1,4-Dioxane		2.58	0.100	0.200	ug/L	0.020	1	JMB3	03/01/18	2128	1742447	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 522	EPA 522 Prep 1,4-Dioxane	SJ	03/01/18	1120	1742446
EPA 537	PFCs Extraction in Drinking Water	MXD2	02/26/18	1000	1742222

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 537	
2	EPA 537	
3	EPA 537	
4	EPA 522	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,4-Dioxane-d8	EPA 522 1,4-Dioxane in Liquid "As Received"	3.88 ug/L	4.00	97	(70%-130%)

### Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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## QC Summary

Report Date: March 7, 2018

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H2GO Brunswick Regional Water & Sewer

PO BOX 2230

Leland, North Carolina

Contact: Bob Walker

Workorder: 444169

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1742223										
QC1203978813	LCS										
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)	19.9			20.6	ng/L		104	(70%-130%)	JLS	03/02/18	19:22
Fluorotelomer sulfonate 4:2 (4:2 FTS)	18.6			21.1	ng/L		114	(70%-130%)			
Fluorotelomer sulfonate 6:2 (6:2 FTS)	18.9			18.9	ng/L		100	(70%-130%)			
Fluorotelomer sulfonate 8:2 (8:2 FTS)	19.1			19.3	ng/L		101	(70%-130%)			
Perfluorobutanesulfonate (PFBS)	17.6			21.5	ng/L		122	(70%-130%)			
Perfluorobutyric acid (PFBA)	19.9			23.3	ng/L		117	(70%-130%)			
Perfluorodecanesulfonate (PFDS)	19.2			20.5	ng/L		107	(70%-130%)			
Perfluorodecanoic acid (PFDA)	19.9			21.9	ng/L		110	(70%-130%)			
Perfluorododecanoic acid (PFDoA)	19.9			20.2	ng/L		102	(70%-130%)			
Perfluoroheptanesulfonate (PFHpS)	18.9			20.8	ng/L		110	(70%-130%)			
Perfluoroheptanoic acid (PFHpA)	19.9			18.4	ng/L		93	(70%-130%)			
Perfluorohexanesulfonate (PFHxS)	18.1			20.6	ng/L		114	(70%-130%)			
Perfluorohexanoic acid (PFHxA)	19.9			22.7	ng/L		114	(70%-130%)			

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## QC Summary

Workorder: 444169

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch 1742223											
Perfluorononanesulfonate (PFNS)	19.1			20.2	ng/L		106	(70%-130%)	JLS	03/02/18	19:22
Perfluorononanoic acid (PFNA)	19.9			24.8	ng/L		125	(70%-130%)			
Perfluorooctanesulfonamide (PFOSA)	18.4			19.7	ng/L		107	(70%-130%)			
Perfluorooctanesulfonate (PFOS)	19.9			21.4	ng/L		108	(70%-130%)			
Perfluorooctanoic acid (PFOA)	19.9			21.6	ng/L		109	(70%-130%)			
Perfluoropentanesulfonate (PFPeS)	18.7			20.2	ng/L		108	(70%-130%)			
Perfluoropentanoic acid (PFPeA)	19.9			21.6	ng/L		109	(70%-130%)			
Perfluorotetradecanoic acid (PFTeDA)	19.9			22.2	ng/L		112	(70%-130%)			
Perfluorotridecanoic acid (PFTrDA)	19.9			21.1	ng/L		106	(70%-130%)			
Perfluoroundecanoic acid (PFUdA)	19.9			19.9	ng/L		100	(70%-130%)			
QC1203978814 LCSD											
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)	19.8			18.8	ng/L	9	95	(0%-30%)		03/02/18	15:20
Fluorotelomer sulfonate 4:2 (4:2 FTS)	18.5			18.7	ng/L	12	101	(0%-30%)			
Fluorotelomer sulfonate 6:2 (6:2 FTS)	18.8			14.5	ng/L	26	77	(0%-30%)			
Fluorotelomer sulfonate 8:2 (8:2 FTS)	19.0			18.6	ng/L	4	98	(0%-30%)			
Perfluorobutanesulfonate (PFBS)	17.5			21.3	ng/L	1	122	(0%-30%)			



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## QC Summary

Workorder: 444169

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1742223										
Perfluorobutyric acid (PFBA)	19.8			22.2	ng/L	5	112	(0%-30%)	JLS	03/02/18	15:20
Perfluorodecanesulfonate (PFDS)	19.1			19.0	ng/L	7	100	(0%-30%)			
Perfluorodecanoic acid (PFDA)	19.8			19.5	ng/L	12	99	(0%-30%)			
Perfluorododecanoic acid (PFDoA)	19.8			19.3	ng/L	5	98	(0%-30%)			
Perfluoroheptanesulfonate (PFHpS)	18.8			19.9	ng/L	4	106	(0%-30%)			
Perfluoroheptanoic acid (PFHpA)	19.8			22.6	ng/L	20	114	(0%-30%)			
Perfluorohexanesulfonate (PFHxS)	18.0			19.3	ng/L	7	107	(0%-30%)			
Perfluorohexanoic acid (PFHxA)	19.8			20.5	ng/L	10	104	(0%-30%)			
Perfluorononanesulfonate (PFNS)	19.0			19.7	ng/L	3	104	(0%-30%)			
Perfluorononanoic acid (PFNA)	19.8			21.4	ng/L	15	108	(0%-30%)			
Perfluorooctanesulfonamide (PFOSA)	18.3			21.8	ng/L	10	119	(0%-30%)			
Perfluorooctanesulfonate (PFOS)	19.8			19.7	ng/L	8	100	(0%-30%)			
Perfluorooctanoic acid (PFOA)	19.8			20.5	ng/L	5	104	(0%-30%)			
Perfluoropentanesulfonate (PFPeS)	18.6			17.2	ng/L	16	93	(0%-30%)			
Perfluoropentanoic acid (PFPeA)	19.8			20.4	ng/L	6	103	(0%-30%)			

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## QC Summary

Workorder: 444169

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1742223										
Perfluorotetradecanoic acid (PFTeDA)	19.8			21.6	ng/L	3	109	(0%-30%)	JLS	03/02/18	15:20
Perfluorotridecanoic acid (PFTTrDA)	19.8			19.5	ng/L	8	99	(0%-30%)			
Perfluoroundecanoic acid (PFUdA)	19.8			19.1	ng/L	4	97	(0%-30%)			
QC1203978812 MB											
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)			U	ND	ng/L					03/02/18	14:45
Fluorotelomer sulfonate 4:2 (4:2 FTS)			U	ND	ng/L						
Fluorotelomer sulfonate 6:2 (6:2 FTS)			U	ND	ng/L						
Fluorotelomer sulfonate 8:2 (8:2 FTS)			U	ND	ng/L						
Nafion Byproduct 1			UX	ND	ng/L						
Nafion Byproduct 2			UX	ND	ng/L						
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)			UX	ND	ng/L						
Perfluoro(3,5,7-trioxaooctanoic) acid (PFO3OA)			UX	ND	ng/L						
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)			UX	ND	ng/L						
Perfluoro-2-methoxyacetic acid (PFMOAA)			UX	ND	ng/L						
Perfluoro-3-methoxypropanoic acid (PFMOPrA)			UX	ND	ng/L						
Perfluoro-4-methoxybutanic acid (PFMOBA)			UX	ND	ng/L						

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## QC Summary

Workorder: 444169

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1742223										
Perfluorobutanesulfonate (PFBS)			U	ND	ng/L				JLS	03/02/18	14:45
Perfluorobutyric acid (PFBA)			U	ND	ng/L						
Perfluorodecanesulfonate (PFDS)			U	ND	ng/L						
Perfluorodecanoic acid (PFDA)			U	ND	ng/L						
Perfluorododecanoic acid (PFDoA)			U	ND	ng/L						
Perfluoroheptanesulfonate (PFHpS)			U	ND	ng/L						
Perfluoroheptanoic acid (PFHpA)			U	ND	ng/L						
Perfluorohexanesulfonate (PFHxS)			U	ND	ng/L						
Perfluorohexanoic acid (PFHxA)			U	ND	ng/L						
Perfluorononanesulfonate (PFNS)			U	ND	ng/L						
Perfluorononanoic acid (PFNA)			U	ND	ng/L						
Perfluorooctanesulfonamide (PFOSA)			U	ND	ng/L						
Perfluorooctanesulfonate (PFOS)			U	ND	ng/L						
Perfluorooctanoic acid (PFOA)			U	ND	ng/L						
Perfluoropentanesulfonate (PFPeS)			U	ND	ng/L						

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## QC Summary

Workorder: 444169

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Perfluorinated Compounds</b>											
Batch	1742223										
Perfluoropentanoic acid (PFPeA)			U	ND	ng/L				JLS	03/02/18	14:45
Perfluorotetradecanoic acid (PFTeDA)			U	ND	ng/L						
Perfluorotridecanoic acid (PFTTrDA)			U	ND	ng/L						
Perfluoroundecanoic acid (PFUdA)			U	ND	ng/L						
<b>Semi-Volatile-GC/MS</b>											
Batch	1742447										
QC1203979384	LCS										
1,4-Dioxane	4.00			4.94	ug/L		124	(70%-130%)	JMB3	03/01/18	17:44
**1,4-Dioxane-d8	4.00			4.64	ug/L		116	(70%-130%)			
QC1203979383	MB										
1,4-Dioxane			U	ND	ug/L					03/01/18	17:14
**1,4-Dioxane-d8	4.00			4.13	ug/L		103	(70%-130%)			
QC1203979385	444140003	MS									
1,4-Dioxane	4.00	J	0.923	5.34	ug/L		110	(70%-130%)		03/01/18	18:47
**1,4-Dioxane-d8	4.00		4.22	4.23	ug/L		106	(70%-130%)			
QC1203979386	444140003	MSD									
1,4-Dioxane	4.00	J	0.923	5.08	ug/L	5	104	(0%-30%)		03/01/18	19:20
**1,4-Dioxane-d8	4.00		4.22	4.14	ug/L		104	(70%-130%)			

### Notes:

The Qualifiers in this report are defined as follows:

\*\* Analyte is a surrogate compound

# GEL LABORATORIES LLC

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

## QC Summary

Workorder: 444169

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<	Result is less than value reported										
>	Result is greater than value reported										
A	The TIC is a suspected aldol-condensation product										
B	The target analyte was detected in the associated blank.										
C	Analyte has been confirmed by GC/MS analysis										
D	Results are reported from a diluted aliquot of the sample										
E	Concentration of the target analyte exceeds the instrument calibration range										
H	Analytical holding time was exceeded										
J	Value is estimated										
JNX	Non Calibrated Compound										
N	Organics--Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor										
N	Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor										
N/A	RPD or %Recovery limits do not apply.										
N1	See case narrative										
ND	Analyte concentration is not detected above the detection limit										
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
P	Organics--The concentrations between the primary and confirmation columns/detectors is >40% different. For HPLC, the difference is >70%.										
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.										
R	Sample results are rejected										
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.										
UJ	Compound cannot be extracted										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	QC Samples were not spiked with this compound										
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
h	Preparation or preservation holding time was exceeded										

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.

**Technical Case Narrative**  
**H2GO Brunswick Regional Water & Sewer (H2GO)**  
**SDG #: 444169**

## **GC/MS Semivolatile**

**Product:** Analysis of 1,4-Dioxane in Drinking Water by Solid Phase Extraction (SPE) and Gas Chromatography/Mass Spectrometry

**Analytical Method:** EPA 522

**Analytical Procedure:** GL-OA-E-073 REV# 2

**Analytical Batches:** 1742447 and 1742446

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
444169002	GST/BPS
1203979383	Method Blank (MB)
1203979384	Laboratory Control Sample (LCS)
1203979385	444140003(NonSDG) Matrix Spike (MS)
1203979386	444140003(NonSDG) Matrix Spike Duplicate (MSD)

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.

### **Miscellaneous Information**

#### **Manual Integrations**

Samples (See Below) required manual integration in order to properly identify one or more peaks and/or to correctly position the baseline as set in the calibration standard injections.

Sample	Analyte	Value
1203979385 (Non SDG 444140003MS)	Tetrahydrofuran-d8	Result 10ug/L
1203979386 (Non SDG 444140003MSD)	Tetrahydrofuran-d8	Result 10ug/L
444169002 (GST/BPS)	Tetrahydrofuran-d8	Result 10ug/L

## **LCMSMS-Misc**

**Product:** The Extraction and Analysis of Per and Polyfluoroalkyl Substances Using LCMSMS

**Analytical Method:** EPA 537

**Analytical Procedure:** GL-OA-E-076 REV# 4

**Analytical Batches:** 1742223 and 1742222

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

<b><u>GEL Sample ID#</u></b>	<b><u>Client Sample Identification</u></b>
444169001	GST/BPS
444169002	GST/BPS
1203978812	Method Blank (MB)
1203978813	Laboratory Control Sample (LCS)
1203978814	Laboratory Control Sample Duplicate (LCSD)

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**

##### **Surrogate Recoveries**

Not all surrogate recoveries were within acceptable limits for the following samples. The samples were diluted due to matrix interference. 444169001 (GST/BPS) and 444169002 (GST/BPS).

##### **Internal Standard (ISTD) Acceptance**

The internal standard responses were outside of the acceptance criteria for the following samples. They were reanalyzed to confirm that the failures were the result of matrix interference prior to sample dilution. 444169002 (GST/BPS).

#### **Technical Information**

##### **Sample Dilutions**

The following samples and/or QC were diluted due to internal standard failures. 444169002 (GST/BPS).

Analyte	<b>444169</b>
	<b>002</b>
Fluorotelomer sulfonate 6:2 (6:2 FTS)	5X
Perfluorobutyric acid (PFBA)	5X

#### **Miscellaneous Information**

##### **Additional Comments**

Results reported with the X qualifier are estimated concentrations and were obtained the GenX calibration curve because authentic standards are not available at this time. 444169001 (GST/BPS) and 444169002 (GST/BPS).

#### **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.





**SAMPLE RECEIPT & REVIEW FORM**

Client: <b>H260</b>		SDG/AR/COC/Work Order: <b>444169</b>	
Received By: <i>Stacy Boony</i>		Date Received: <b>2/21/2018</b>	
Carrier and Tracking Number		Circle Applicable: <input type="checkbox"/> FedEx Express <input type="checkbox"/> FedEx Ground <input type="checkbox"/> UPS <input type="checkbox"/> Field Services <input type="checkbox"/> Courier <input type="checkbox"/> Other	
		4158 5143 4576	
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
Shipped as a DOT Hazardous?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____	
COC/Samples marked or classified as radioactive?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0</u> CPM / mR/Hr Classified as: Rad 1 Rad 2 Rad 3	
Is package, COC, and/or Samples marked HAZ?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, select Hazards below, and contact the GEL Safety Group. <input type="checkbox"/> PCB's <input type="checkbox"/> Flammable <input type="checkbox"/> Foreign Soil <input type="checkbox"/> RCRA <input type="checkbox"/> Asbestos <input type="checkbox"/> Beryllium    Other: _____	
Sample Receipt Criteria		Yes <input type="checkbox"/> NA <input checked="" type="checkbox"/> No <input type="checkbox"/>	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	
3	Samples requiring cold preservation within (0 ≤ deg. C)?*	<input checked="" type="checkbox"/>	Preservation Method: <u>Wet Ice</u> Ice Packs Dry Ice None Other: *all temperatures are recorded in Celsius <span style="float: right;">TEMP: <u>5°c</u></span>
4	Daily check performed and passed on IR temperature gun?	<input checked="" 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"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	Sample ID's and Containers Affected: If Preservation added, Lot#: _____ If Yes, Are Encores or Soil Kits present? Yes ___ No ___ (If yes, take to VOA Freezer)
7	Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	Do VOA vials contain acid preservation? Yes ___ No ___ N/A ___ (If unknown, select No) VOA vials free of headspace? Yes ___ No ___ N/A ___ Sample ID's and containers affected: _____
8	Samples received within holding time?	<input checked="" type="checkbox"/>	ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	Sample ID's affected:
12	Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	
13	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	
Comments (Use Continuation Form if needed):			

 PM (or PMA) review: Initials TWC Date 2/22/18 Page 1 of 1

**List of current GEL Certifications as of 07 March 2018**

<b>State</b>	<b>Certification</b>
Alaska	17-018
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	LA180011
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122018-1
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
Puerto Rico	SC00012
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-18-13
Utah NELAP	SC000122017-25
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404