









PO Box 30712 Charleston, SC 29417 2040 Savage Road Charleston, SC 29407

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gel.com

November 17, 2017

Bob Walker H2GO Brunswick Regional Water & Sewer 516 Village Road, NE Leland, North Carolina 28451

a member of The GEL Group INC

Re: Sample Analysis Work Order: 437215

Dear Bob Walker:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on November 07, 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. 4778.

Sincerely,

Hope Taylor Project Manager

Purchase Order: signed quote Enclosures

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: 437215 GEL Work Order: 437215

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.



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Certificate of Analysis

Report Date: November 17, 2017

Company: H2GO Brunswick Regional Water & Sewer

Address: 516 Village Road, NE

Leland, North Carolina 28451

Contact: Bob Walker Project: Sample Analysis

Client Sample ID: H2GO GST/BPS Project: H2GO00117 Sample ID: 437215001 Client ID: H2GO001

Matrix: Drinking Water (Potable)
Collect Date: 31-OCT-17 15:10

Receive Date: 07-NOV-17
Collector: Client

Parameter (Qualifier	Result	DL	RL	Units	PF	DF	Analyst Date	Time Batch	Method
LCMSMS PFCs										
NC 6 PFCs by LC-MS/MS	S "As Rec	eived"								
Nafion Byproduct 1	UX	ND			ng/L	0.0197	1	JLS 11/13/17	0125 1717449	1
Nafion Byproduct 2	UX	ND			ng/L	0.0197	1			
Perfluoro(3,5,7,9-tetraoxadecano	ic) UX	ND			ng/L	0.0197	1			
acid (PFO4DA)						0.0107				
Perfluoro(3,5,7-trioxaoctanoic) a (PFO3OA)	cid UX	ND			ng/L	0.0197	1			
Perfluoro(3,5-dioxahexanoic) aci	d UX	ND			ng/I	0.0197	1			
(PFO2HxA)	u 071	ND			ng/L	0.0177	1			
Perfluoro-2-methoxyacetic acid	UX	ND			ng/L	0.0197	1			
(PFMOAA)										
Perfluoro-3-methoxypropanoic a	cid UX	ND			ng/L	0.0197	1			
(PFMOPrA) Perfluoro-4-methoxybutanic acid	UX	ND			ng/I	0.0197	1			
(PFMOBA)	UA	ND			ng/L	0.0197	1			
PFOA, PFOS by LC-MS/N	MS "As Ro	eceived"								
2,3,3,3-Tetrafluoro-2-	U	ND	0.651	1.97	ng/L	0.0197	1	JLS 11/13/17	0125 1717449	2
(1,1,2,2,3,3,3-heptafluoropropoxy		1,2	0.001	1.57	119, 2	0.0177	•	11,10,17	0120 1717.19	-
propanoic acid (PFPrOPrA)										
Fluorotelomer sulfonate 4:2 (4:2	U	ND	1.30	3.71	ng/L	0.0197	1			
FTS)	**	NID	1.20	2.75	/7	0.0107	1			
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.30	3.75	ng/L	0.0197	1			
Fluorotelomer sulfonate 8:2 (8:2	U	ND	1.30	3.79	ng/L	0.0197	1			
FTS)					Z					
Perfluorobutanesulfonate (PFBS)		ND	0.651	1.76	ng/L	0.0197				
Perfluorobutyric acid (PFBA)	U	ND	0.651	1.97	ng/L					
Perfluorodecanesulfonate (PFDS	,	ND	0.651	1.91	ng/L	0.0197				
Perfluorodecanoic acid (PFDA)	U	ND	0.651	1.97	ng/L	0.0197				
Perfluorododecanoic acid (PFDo	,	ND	0.651	1.97	ng/L	0.0197				
Perfluoroheptanesulfonate (PFH _I		ND	0.651	1.87	ng/L	0.0197				
Perfluoroheptanoic acid (PFHpA		ND	0.651	1.97	ng/L	0.0197				
Perfluorohexanesulfonate (PFHx	,	ND	0.651	1.80	ng/L					
Perfluorohexanoic acid (PFHxA)		ND	0.651	1.97	ng/L	0.0197				
Perfluorononanesulfonate (PFNS	,	ND	0.651	1.89	ng/L	0.0197				
Perfluorononanoic acid (PFNA)	U	ND	0.651	1.97	ng/L					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.651	1.84	ng/L	0.0197	1			
Perfluorooctanesulfonate (PFOS)	U	ND	0.651	1.97	ng/L	0.0197	1			
Perfluorooctanoic acid (PFOA)	Ü	ND	0.651	1.97	_	0.0197				
					_					

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Certificate of Analysis

Report Date: November 17, 2017

Company: H2GO Brunswick Regional Water & Sewer

Address: 516 Village Road, NE

Leland, North Carolina 28451

Contact: Bob Walker Project: Sample Analysis

Client Sample ID: H2GO GST/BPS Project: H2GO00117 Sample ID: 437215001 Client ID: H2GO001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF A	Analyst Date	Time Batch	Method
LCMSMS PFCs										
PFOA, PFOS by LC-M	S/MS "As Re	eceived"								
Perfluoropentanesulfonate (PI	FPeS) U	ND	0.651	1.86	ng/L	0.0197	1			
Perfluoropentanoic acid (PFP	eA) U	ND	0.651	1.97	ng/L	0.0197	1			
Perfluorotetradecanoic acid	U	ND	0.651	1.97	ng/L	0.0197	1			
(PFTeDA)										
Perfluorotridecanoic acid (PF	TrDA) U	ND	0.651	1.97	ng/L	0.0197	1			
Perfluoroundecanoic acid (PF	UdA) U	ND	0.651	1.97	ng/L	0.0197	1			
The following Prep Met	hods were pe	erformed:								
Method	Description	n		Analyst	Date	ı	Time	Prep Batch		
EPA 537	PFCs Extract	ion in Drinking Water		GXC1	11/09/17		1100	1717448		

The following Analytical Methods were performed:

	J 1	
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

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 17, 2017

Company: H2GO Brunswick Regional Water & Sewer

Address: 516 Village Road, NE

Leland, North Carolina 28451

Contact: Bob Walker Project: Sample Analysis

Client Sample ID: H2GO GST/BPS Project: H2GO00117 Sample ID: 437215002 Client ID: H2GO001

Matrix: Drinking Water (Potable)

Collect Date: 31-OCT-17 15:10

Receive Date: 07-NOV-17

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analys	st Date	Time	Batch	Method
LCMSMS PFCs												
NC 6 PFCs by LC-MS/M	S "As Rece	eived"										
Nafion Byproduct 1	X	0.797			ng/L	0.021	1	JLS	11/13/17	0312	1717449	1
Nafion Byproduct 2	X	2.16			ng/L	0.021	1					
Perfluoro(3,5,7,9-tetraoxadecandacid (PFO4DA)	oic) X	1.42			ng/L	0.021	1					
Perfluoro(3,5,7-trioxaoctanoic) a (PFO3OA)	acid X	4.63			ng/L	0.021	1					
Perfluoro(3,5-dioxahexanoic) ac (PFO2HxA)	eid X	16.1			ng/L	0.021	1					
Perfluoro-2-methoxyacetic acid (PFMOAA)	X	0.601			ng/L	0.021	1					
Perfluoro-3-methoxypropanoic a (PFMOPrA)	acid UX	ND			ng/L	0.021	1					
Perfluoro-4-methoxybutanic acid (PFMOBA)	d X	1.58			ng/L	0.021	1					
PFOA, PFOS by LC-MS/	MS "As Re	eceived"										
Fluorotelomer sulfonate 4:2 (4:2 FTS)		ND	1.39	3.95	ng/L	0.021	1	JLS	11/13/17	0312	1717449	2
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.39	4.00	ng/L	0.021	1					
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U U	ND	1.39	4.04	ng/L	0.021	1					
Perfluorobutanesulfonate (PFBS	5)	3.95	0.694	1.87	ng/L	0.021	1					
Perfluorobutyric acid (PFBA)		19.9	0.694	2.10	ng/L	0.021	1					
Perfluorodecanesulfonate (PFDS	S) U	ND	0.694	2.04	ng/L	0.021	1					
Perfluorodecanoic acid (PFDA)	J	1.86	0.694	2.10	ng/L	0.021						
Perfluorododecanoic acid (PFDo	oA) U	ND	0.694	2.10	ng/L	0.021	1					
Perfluoroheptanesulfonate (PFH	pS) U	ND	0.694	2.00	ng/L	0.021	1					
Perfluoroheptanoic acid (PFHpA	A)	25.2	0.694	2.10	ng/L	0.021	1					
Perfluorohexanesulfonate (PFHx	xS)	4.65	0.694	1.91	ng/L	0.021	1					
Perfluorononanesulfonate (PFNS	S) U	ND	0.694	2.02	ng/L	0.021	1					
Perfluorononanoic acid (PFNA)	,	2.61	0.694	2.10	ng/L	0.021	1					
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.694	1.96	ng/L	0.021	1					
Perfluorooctanesulfonate (PFOS	5)	7.19	0.694	2.10	ng/L	0.021	1					
Perfluorooctanoic acid (PFOA)		11.2	0.694	2.10	ng/L	0.021	1					
Perfluoropentanesulfonate (PFPe	eS) J	0.898	0.694	1.98	ng/L	0.021	1					
Perfluorotetradecanoic acid (PFTeDA)	U	ND	0.694	2.10	ng/L	0.021	1					
Perfluorotridecanoic acid (PFTrl	DA) U	ND	0.694	2.10	ng/L	0.021	1					

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Certificate of Analysis

Report Date: November 17, 2017

Company: H2GO Brunswick Regional Water & Sewer

Address: 516 Village Road, NE

Leland, North Carolina 28451

Contact: Bob Walker Project: Sample Analysis

Client Sample ID: H2GO GST/BPS Project: H2GO00117 Sample ID: 437215002 Client ID: H2GO001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst Date	Time Batch	Method
LCMSMS PFCs										
PFOA, PFOS by LC-M	IS/MS "As Re	eceived"								
Perfluoroundecanoic acid (PI	FUdA) U	ND	0.694	2.10	ng/L	0.021	1			
2,3,3,3-Tetrafluoro-2-		51.4	1.39	4.21	ng/L	0.021	2	JLS 11/13/17	0208 1717449	3
(1,1,2,2,3,3,3-heptafluoropro propanoic acid (PFPrOPrA)	poxy)-									
Perfluorohexanoic acid (PFH	(xA)	42.5	1.39	4.21	ng/L	0.021	2			
Perfluoropentanoic acid (PFF	· ·	47.8	1.39	4.21	ng/L	0.021				
The following Prep Me	thods were pe	erformed:								
Method	Description	1		Analyst	Date	,	Time	e Prep Batch		
EPA 537	PFCs Extracti	on in Drinking Water		GXC1	11/09/17		1100	1717448		

The following Analytical Methods were performed:

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

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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Certificate of Analysis

Report Date: November 17, 2017

Company: H2GO Brunswick Regional Water & Sewer

Address: 516 Village Road, NE

Leland, North Carolina 28451

Contact: Bob Walker Project: Sample Analysis

Client Sample ID: BELVILLE ELEMENTARY Project: H2GO00117 Client ID: H2GO001

Sample ID: 437215003

Collector:

Matrix: Drinking Water (Potable) Collect Date: 06-NOV-17 13:20 07-NOV-17 Receive Date:

Client

Parameter (Qualifier	Result	DL	RL	Units	PF	DF	Analyst Date	Time Batch	Method
LCMSMS PFCs										
NC 6 PFCs by LC-MS/MS	"As Rece	eived"								
Nafion Byproduct 1	UX	ND			ng/L	0.0196	1	JLS 11/13/17	0229 1717449	1
Nafion Byproduct 2	UX	ND			ng/L	0.0196	1			
Perfluoro(3,5,7,9-tetraoxadecanoi	c) UX	ND			ng/L	0.0196	1			
acid (PFO4DA) Perfluoro(3,5,7-trioxaoctanoic) ac (PFO3OA)	eid UX	ND			ng/L	0.0196	1			
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	i UX	ND			ng/L	0.0196	1			
Perfluoro-2-methoxyacetic acid (PFMOAA)	UX	ND			ng/L	0.0196	1			
Perfluoro-3-methoxypropanoic ac (PFMOPrA)	eid UX	ND			ng/L	0.0196	1			
Perfluoro-4-methoxybutanic acid (PFMOBA)	UX	ND			ng/L	0.0196	1			
PFOA, PFOS by LC-MS/N	IS "As Re	eceived"								
2,3,3,3-Tetrafluoro-2- (1,1,2,2,3,3,3-heptafluoropropoxy	U	ND	0.647	1.96	ng/L	0.0196	1	JLS 11/13/17	0229 1717449	2
propanoic acid (PFPrOPrA) Fluorotelomer sulfonate 4:2 (4:2 FTS)	U	ND	1.29	3.68	ng/L	0.0196	1			
Fluorotelomer sulfonate 6:2 (6:2 FTS)	U	ND	1.29	3.72	ng/L	0.0196	1			
Fluorotelomer sulfonate 8:2 (8:2 FTS)	U	ND	1.29	3.76	ng/L	0.0196	1			
Perfluorobutanesulfonate (PFBS)	U	ND	0.647	1.74	ng/L	0.0196	1			
Perfluorobutyric acid (PFBA)	U	ND	0.647	1.96	ng/L	0.0196				
Perfluorodecanesulfonate (PFDS)	U	ND	0.647	1.90	ng/L	0.0196	1			
Perfluorodecanoic acid (PFDA)	U	ND	0.647	1.96	ng/L	0.0196	1			
Perfluorododecanoic acid (PFDo	A) U	ND	0.647	1.96	ng/L	0.0196	1			
Perfluoroheptanesulfonate (PFHp	S) U	ND	0.647	1.86	ng/L	0.0196	1			
Perfluoroheptanoic acid (PFHpA)	U	ND	0.647	1.96	ng/L	0.0196	1			
Perfluorohexanesulfonate (PFHxS		ND	0.647	1.78	ng/L	0.0196	1			
Perfluorohexanoic acid (PFHxA)	U	ND	0.647	1.96	ng/L	0.0196	1			
Perfluorononanesulfonate (PFNS)) U	ND	0.647	1.88	ng/L	0.0196	1			
Perfluorononanoic acid (PFNA)	U	ND	0.647	1.96	ng/L	0.0196				
Perfluorooctanesulfonamide (PFOSA)	U	ND	0.647	1.82	ng/L	0.0196				
Perfluorooctanesulfonate (PFOS)	U	ND	0.647	1.96	ng/L	0.0196	1			
Perfluorooctanoic acid (PFOA)	U	ND	0.647	1.96	ng/L	0.0196				

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Certificate of Analysis

Report Date: November 17, 2017

Company: H2GO Brunswick Regional Water & Sewer

Address: 516 Village Road, NE

Leland, North Carolina 28451

Contact: Bob Walker Project: Sample Analysis

Client Sample ID: BELVILLE ELEMENTARY Project: H2GO00117

Sample ID: 437215003 Client ID: H2GO001

RL	Units	PF 1	DF Ar	nalyst Date	Time Batch	Method
1.84	ng/L	0.0196	1			
1.96	ng/L	0.0196	1			
1.96	ng/L	0.0196	1			
1.96	ng/L	0.0196	1			
1.96	ng/L	0.0196	1			
Analyst	Date	Т	ime	Prep Batch		
GXC1	11/09/17	1	100	1717448		
_	1.84 1.96 1.96 1.96 1.96	1.84 ng/L 1.96 ng/L 1.96 ng/L 1.96 ng/L 1.96 ng/L 1.96 ng/L	1.84 ng/L 0.0196 1.96 ng/L 0.0196 1.96 ng/L 0.0196 1.96 ng/L 0.0196 1.96 ng/L 0.0196 1.96 ng/L 0.0196	1.84 ng/L 0.0196 1 1.96 ng/L 0.0196 1	1.84 ng/L 0.0196 1 1.96 prep Batch	1.84 ng/L 0.0196 1 1.96 ng/L 0.0196 1 1.97 ng/L 0.0196 1

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

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: November 17, 2017

Company: H2GO Brunswick Regional Water & Sewer

Address: 516 Village Road, NE

Leland, North Carolina 28451

Contact: Bob Walker Project: Sample Analysis

BELVILLE ELEMENTARY Client Sample ID: Project: H2GO00117 Client ID: H2GO001

Sample ID: 437215004

Collector:

Matrix: Drinking Water (Potable) Collect Date: 06-NOV-17 13:20 07-NOV-17 Receive Date:

Client

Parameter Qualifier DL RL Units PF Result DF Analyst Date Time Batch Method LCMSMS PFCs NC 6 PFCs by LC-MS/MS "As Received" Nafion Byproduct 1 X 0.697 ng/L 0.0204 1 JLS 11/13/17 0251 1717449 1 Nafion Byproduct 2 ng/L X 1.73 0.0204 1 Perfluoro(3,5,7,9-tetraoxadecanoic) X 1.66 0.0204 ng/L acid (PFO4DA) 0.0204 Perfluoro(3,5,7-trioxaoctanoic) acid X 3.89 ng/L (PFO3OA) Perfluoro(3,5-dioxahexanoic) acid 0.0204 X 11.8 ng/L (PFO2HxA) Perfluoro-2-methoxyacetic acid X 0.427 ng/L 0.0204 1 (PFMOAA) Perfluoro-3-methoxypropanoic acid UX ND 0.0204 (PFMOPrA) Perfluoro-4-methoxybutanic acid X 1.03 0.0204 ng/L (PFMOBA) PFOA, PFOS by LC-MS/MS "As Received" 2,3,3,3-Tetrafluoro-2-30.1 0.672 2.04 ng/L 0.0204 JLS 11/13/17 0251 1717449 (1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid (PFPrOPrA) Fluorotelomer sulfonate 4:2 (4:2 ND 1.34 3.83 ng/L 0.0204 1 FTS) Fluorotelomer sulfonate 6:2 (6:2 U ND 1.34 3.87 0.0204 FTS) Fluorotelomer sulfonate 8:2 (8:2 U ND 1.34 3.91 ng/L0.0204 1 FTS) Perfluorobutanesulfonate (PFBS) 2.71 0.672 1.81 0.0204 ng/L Perfluorobutyric acid (PFBA) 13.3 0.672 2.04 ng/L 0.0204 Perfluorodecanesulfonate (PFDS) U ND 0.672 1.97 0.0204 ng/L Perfluorodecanoic acid (PFDA) J 1.41 0.672 2.04 ng/L 0.0204 Perfluorododecanoic acid (PFDoA) U ND 0.672 2.04 0.0204 ng/L 1 U Perfluoroheptanesulfonate (PFHpS) ND 0.672 1.93 ng/L 0.0204 1 ng/L Perfluoroheptanoic acid (PFHpA) 18.4 0.672 2.04 0.0204 1 ng/L Perfluorohexanesulfonate (PFHxS) 3.52 0.672 1.85 0.0204 1 Perfluorohexanoic acid (PFHxA) 28.1 0.672 2.04 ng/L 0.0204 U Perfluorononanesulfonate (PFNS) ND 0.672 1.95 ng/L 0.0204 0.0204 2.04 Perfluorononanoic acid (PFNA) J 1.82 0.672 ng/L 1 Perfluorooctanesulfonamide U ND 0.672 1.89 0.0204 ng/L (PFOSA) Perfluorooctanesulfonate (PFOS) 5.03 0.672 2.04 ng/L 0.0204 Perfluorooctanoic acid (PFOA) 8.76 0.672 2.04 ng/L 0.0204

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Certificate of Analysis

Report Date: November 17, 2017

Company: H2GO Brunswick Regional Water & Sewer

Address: 516 Village Road, NE

Leland, North Carolina 28451

Contact: Bob Walker Project: Sample Analysis

Client Sample ID: BELVILLE ELEMENTARY Project: H2GO00117

Sample ID: 437215004 Client ID: H2GO001

Parameter	Qualifier	Result	DL	RL	Units	PF L	OF Analyst Date	Time Batch	Method
LCMSMS PFCs									
PFOA, PFOS by LC-M	S/MS "As Re	eceived"							
Perfluoropentanesulfonate (Pl	FPeS) U	ND	0.672	1.91	ng/L	0.0204	1		
Perfluoropentanoic acid (PFP	eA)	32.8	0.672	2.04	ng/L	0.0204	1		
Perfluorotetradecanoic acid	U	ND	0.672	2.04	ng/L	0.0204	1		
(PFTeDA)									
Perfluorotridecanoic acid (PF	TrDA) U	ND	0.672	2.04	ng/L	0.0204	1		
Perfluoroundecanoic acid (PF	(UdA) U	ND	0.672	2.04	ng/L	0.0204	1		
The following Prep Mer	thods were pe	erformed:							
Method	Description	n	I	Analyst	Date	Ti	me Prep Batch	1	
EPA 537	PFCs Extracti	ion in Drinking Water	(GXC1	11/09/17	11	00 1717448		
FD1 C 11 . A 1	137.1.1	C 1							

The following Analytical Methods were performed:

	J 1	
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

Lc/LC: Critical Level

PF: Prep Factor

RL: Reporting Limit

MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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QC Summary

Report Date: November 17, 2017

Page 1 of 8

H2GO Brunswick Regional Water & Sewer

516 Village Road, NE Leland, North Carolina

Contact: Bob Walker

Workorder: 437215

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Perfluorinated Compounds Batch 1717449 ———											
QC1203916045 LCS 2,3,3,3-Tetrafluoro-2- (1,1,2,2,3,3,3- heptafluoropropoxy)-propanoic acid (PFPrOPrA)	19.7			19.7	ng/L		100	(70%-130%)	JLS	11/13/	17 00:42
Fluorotelomer sulfonate 4:2 (4:2 FTS)	18.4			19.5	ng/L		106	(70%-130%)	ı		
Fluorotelomer sulfonate 6:2 (6:2 FTS)	18.7			16.4	ng/L		87	(70%-130%)	1		
Fluorotelomer sulfonate 8:2 (8:2 FTS)	18.9			19.4	ng/L		103	(70%-130%)	1		
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-trioxaoctanoic) 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						
Perfluorobutanesulfonate (PFBS)	17.5			17.1	ng/L		98	(70%-130%)	ı		

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QC Summary

Workorder: 437215

Page 2 of 8

Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range A	Anlst	Date 7	Гіте
Perfluorinated Compounds Batch 1717449										
Perfluorobutyric acid (PFBA)	19.7		18.6	ng/L		94	(70%-130%)	JLS	11/13/17	00:42
Perfluorodecanesulfonate (PFDS)	19.0		18.4	ng/L		97	(70%-130%)			
Perfluorodecanoic acid (PFDA)	19.7		18.3	ng/L		93	(70%-130%)			
Perfluorododecanoic acid (PFDoA)	19.7		17.7	ng/L		90	(70%-130%)			
Perfluoroheptanesulfonate (PFHpS)	18.7		17.0	ng/L		91	(70%-130%)			
Perfluoroheptanoic acid (PFHpA)	19.7		19.4	ng/L		98	(70%-130%)			
Perfluorohexanesulfonate (PFHxS)	18.0		16.1	ng/L		90	(70%-130%)			
Perfluorohexanoic acid (PFHxA)	19.7		19.1	ng/L		97	(70%-130%)			
Perfluorononanesulfonate (PFNS)	18.9		18.3	ng/L		97	(70%-130%)			
Perfluorononanoic acid (PFNA)	19.7		19.5	ng/L		99	(70%-130%)			
Perfluorooctanesulfonamide (PFOSA)	18.3		18.0	ng/L		99	(70%-130%)			
Perfluorooctanesulfonate (PFOS)	19.7		18.2	ng/L		92	(70%-130%)			
Perfluorooctanoic acid (PFOA)	19.7		18.5	ng/L		94	(70%-130%)			
Perfluoropentanesulfonate (PFPeS)	18.5		16.6	ng/L		90	(70%-130%)			
Perfluoropentanoic acid (PFPeA)	19.7		19.2	ng/L		98	(70%-130%)			

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QC Summary

Workorder: 437215 Page 3 of 8

Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range A	Anlst	Date Time
Perfluorinated Compounds Batch 1717449									
Perfluorotetradecanoic acid (PFTeDA)	19.7		17.8	ng/L		90	(70%-130%)	JLS	11/13/17 00:42
Perfluorotridecanoic acid (PFTrDA)	19.7		17.9	ng/L		91	(70%-130%)		
Perfluoroundecanoic acid (PFUdA)	19.7		21.0	ng/L		107	(70%-130%)		
QC1203916046 LCSD 2,3,3,3-Tetrafluoro-2- (1,1,2,2,3,3,3- heptafluoropropoxy)-propanoic acid (PFPrOPrA)	19.7		20.9	ng/L	6	106	(0%-30%)		11/13/17 01:04
Fluorotelomer sulfonate 4:2 (4:2 FTS)	18.4		19.4	ng/L	1	105	(0%-30%)		
Fluorotelomer sulfonate 6:2 (6:2 FTS)	18.7		18.5	ng/L	12	99	(0%-30%)		
Fluorotelomer sulfonate 8:2 (8:2 FTS)	18.9		18.3	ng/L	6	97	(0%-30%)		
Nafion Byproduct 1		UX	ND	ng/L	N/A				
Nafion Byproduct 2		UX	ND	ng/L	N/A				
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)		UX	ND	ng/L	N/A				
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)		UX	ND	ng/L	N/A				
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)		UX	ND	ng/L	N/A				
Perfluoro-2-methoxyacetic acid (PFMOAA)		UX	ND	ng/L	N/A				
Perfluoro-3-methoxypropanoic acid (PFMOPrA)		UX	ND	ng/L	N/A				
Perfluoro-4-methoxybutanic acid (PFMOBA)		UX	ND	ng/L	N/A				

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QC Summary

Workorder: 437215 Page 4 of 8 QC **Parmname** NOM Sample Qual Units RPD% REC% Range Anlst Date Time **Perfluorinated Compounds** 1717449 Batch Perfluorobutanesulfonate (PFBS) 17.5 17.1 ng/L 0 98 (0%-30%)JLS 11/13/17 01:04 Perfluorobutyric acid (PFBA) 19.7 20.6 ng/L 10 104 (0%-30%)Perfluorodecanesulfonate (PFDS) 19.0 18.1 ng/L 2 95 (0%-30%)19.7 7 100 Perfluorodecanoic acid (PFDA) 19.7 ng/L (0%-30%)Perfluorododecanoic acid (PFDoA) 19.7 18.0 ng/L 2 91 (0%-30%)Perfluoroheptanesulfonate (PFHpS) 18.7 18.3 8 98 ng/L (0%-30%)Perfluoroheptanoic acid (PFHpA) 19.7 0 19.4 ng/L 98 (0%-30%)Perfluorohexanesulfonate (PFHxS) 18.0 18.0 ng/L 11 100 (0%-30%)Perfluorohexanoic acid (PFHxA) 19.7 20.1 5 102 ng/L (0%-30%)Perfluorononanesulfonate (PFNS) 18.9 19.0 4 100 ng/L (0%-30%)20.4 103 Perfluorononanoic acid (PFNA) 19.7 5 (0%-30%)ng/L Perfluorooctanesulfonamide 18.3 18.2 1 100 (0%-30%)ng/L (PFOSA) Perfluorooctanesulfonate (PFOS) 19.7 19.7 ng/L 8 100 (0%-30%)Perfluorooctanoic acid (PFOA) 19.7 18.5 ng/L 94 (0%-30%)Perfluoropentanesulfonate (PFPeS) 18.5 18.2 9 98 (0%-30%)ng/L

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QC Summary

Workorder: 437215 Page 5 of 8 NOM QC RPD% **Parmname** Sample Qual Units REC% Range Anlst Date Time **Perfluorinated Compounds** 1717449 Batch Perfluoropentanoic acid (PFPeA) 19.7 19.5 ng/L 1 99 (0%-30%)JLS 11/13/17 01:04 Perfluorotetradecanoic acid 19.7 18.7 ng/L 4 95 (0%-30%)(PFTeDA) Perfluorotridecanoic acid 19.7 19.5 ng/L 9 99 (0%-30%)(PFTrDA) 19.7 20.4 103 Perfluoroundecanoic acid (PFUdA) ng/L 3 (0%-30%)QC1203916044 MB 2,3,3,3-Tetrafluoro-2-U ND 11/13/17 00:21 ng/L (1,1,2,2,3,3,3heptafluoropropoxy)-propanoic acid (PFPrOPrA) Fluorotelomer sulfonate 4:2 (4:2 U ND ng/L U ND Fluorotelomer sulfonate 6:2 (6:2 ng/L FTS) Fluorotelomer sulfonate 8:2 (8:2 U ND ng/L FTS) UX ND Nafion Byproduct 1 ng/L Nafion Byproduct 2 UX ND ng/L Perfluoro(3,5,7,9-tetraoxadecanoic) UX ND ng/L acid (PFO4DA) UX ND Perfluoro(3,5,7-trioxaoctanoic) ng/L acid (PFO3OA) UX ND Perfluoro(3,5-dioxahexanoic) acid ng/L (PFO2HxA) Perfluoro-2-methoxyacetic acid UX ND ng/L (PFMOAA)

UX

ND

ng/L

acid (PFMOPrA)

Perfluoro-3-methoxypropanoic

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QC Summary

Workorder: 437215 Page 6 of 8 RPD% NOM Sample Qual QC REC% **Parmname** Units Range Anlst Date Time **Perfluorinated Compounds** 1717449 Batch Perfluoro-4-methoxybutanic acid UX ND ng/L JLS 11/13/17 00:21 (PFMOBA) U ND Perfluorobutanesulfonate (PFBS) ng/L Perfluorobutyric acid (PFBA) U ND ng/L U ND Perfluorodecanesulfonate (PFDS) ng/L U ND Perfluorodecanoic acid (PFDA) ng/L U Perfluorododecanoic acid (PFDoA) ND ng/L Perfluoroheptanesulfonate (PFHpS) U ND ng/L U ND Perfluoroheptanoic acid (PFHpA) ng/L U ND Perfluorohexanesulfonate (PFHxS) ng/L Perfluorohexanoic acid (PFHxA) U ND ng/L U ND Perfluorononanesulfonate (PFNS) ng/L Perfluorononanoic acid (PFNA) U ND ng/L Perfluoro octane sulfonamideU ND ng/L (PFOSA) Perfluorooctanesulfonate (PFOS) U ND ng/L U Perfluorooctanoic acid (PFOA) ND ng/L

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QC Summary

Workorder: 437215 Page 7 of 8 Parmname **NOM** Sample Qual QC Units RPD% REC% Range Anlst Date Time **Perfluorinated Compounds** Batch 1717449 Perfluoropentanesulfonate (PFPeS) U ND ng/L JLS 11/13/17 00:21 U Perfluoropentanoic acid (PFPeA) ND ng/L Perfluorotetradecanoic acid U ND ng/L (PFTeDA) U ND Perfluorotridecanoic acid ng/L (PFTrDA)

ND

ng/L

U

Notes:

The Qualifiers in this report are defined as follows:

** Analyte is a surrogate compound

Perfluoroundecanoic acid (PFUdA)

- < 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

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QC Summary

Page 8 of 8 **Parmname NOM** Sample Qual \mathbf{QC} Units RPD% REC% Range Anlst Date Time

- IJ Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- UJ Compound cannot be extracted

437215

Workorder:

- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ٨ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- Preparation or preservation holding time was exceeded h

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.

LCMSMS-Misc

Technical Case Narrative H2GO Brunswick Regional Water & Sewer (H2GO) SDG #: 437215

Product: The Extraction and Analysis of Per and Polyfluroalkyl Substances Using LCMSMS

Analytical Method: EPA 537

Analytical Procedure: GL-OA-E-076 REV# 4 **Analytical Batches:** 1717449 and 1717448

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

GEL Sample ID#	Client Sample Identification
437215001	H2GO GST/BPS
437215002	H2GO GST/BPS
437215003	BELVILLE ELEMENTARY
437215004	BELVILLE ELEMENTARY
1203916044	Method Blank (MB)
1203916045	Laboratory Control Sample (LCS)
1203916046	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.

Technical Information

Sample Dilutions

The following sample was diluted to bring the over range concentration within the calibration range. 437215002 (H2GO GST/BPS).

Analyte	
Analyte	002
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (PFPrOPrA)	2X
Perfluorohexanoic acid (PFHxA)	2X
Perfluoropentanoic acid (PFPeA)	2X

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. 1203916044 (MB), 437215001 (H2GO GST/BPS), 437215002 (H2GO GST/BPS), 437215003 (BELVILLE ELEMENTARY) and 437215004 (BELVILLE ELEMENTARY).

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.

Pag			
Page:	OF Thois of Custody on	A wolvetion Dogwood	GEL Laboratories, LLC
Project #: (TFI: Onote #:		Custony and Analytical Keduesi	2040 Savage Road Charleston, SC 29407
(0),	GEL Work Order Number: 42718		Phone: (843) 556-8171 Fax: (843) 766-1178
Client Name: 497.0	Phone #:	Sample Analysis Requested (5)	Sample Analysis Requested (5) (Fill in the number of containers for each test)
Project/Site Name:	Fax #;	 	< Preservative Type (6)
Address:		2) +	
Collected by: Send R	Send Results To: Bob Welke	T	Comments Note: extra sample is
Sample ID * For composites - indicate start and stop date/time	*Date Collected Collected QC Code Field Sample (mm-dd-yy) (hhimm)	Radioactive TSCA Regula	required for sample specific QC
HZGO GST/BPS	103117 1510 TB N	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	
1	WG N N 0131 (1180)	7	
18 E 185	110617 1320 TB N	7	
Belville Elementary	WG N N 0251 (18011	\ \	
-			
TAT Requested: Normal: Rush: Specify:	(Subject to Surcharge) Fax Results: Yes /	No Circle Deliverable: C of A / C	/ QC Summary / Level 1 / Level 2 / Level 4
ny known hazards c	ole to these samples? If so, please list the hazards		Sample Collection Time Zone Eastern Pacific
			Mountain
Chain of Ct	Chain of Custody Signatures	Sample S	Sample Shipping and Delivery Details
Relinquished By (Signed) Date Time	Time	GEL PM:	
18th Walker 110617 1430	- 4 H	Method of Shipment:	Date Shipped:
2	$\frac{1}{2}$	Airbill #:	
3	3	Airbill#:	
1.) Chain of Custody Number = Client Determined		Seile Paulines Comple	For Lab Receiving Use Only

2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite

3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.

Custody Seal Intact? YES NO Cooler Temp:

^{4.)} Matrix Codeş; DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Water, W=Water, W=Water, SO=Soif, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal 5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).

^{6.)} Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

YELLOW = FILE

WHITE = LABORATORY

YELLOW = FILE

GEL	Laboratories	LLC
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SAMPLE RECEIPT & REVIEW FORM

		SDG	AR/COC/Work Order: 46/2/5
		Dat	e Received: 11/7/17
			Circle Applicable: Fedex Express FedEx Ground UPS Field Services Courier Other 7-336 9701 Dieles
Yes	No		Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further stigation.
		Haza	ard Class Shipped: UN#:
	\ <u>\</u>	Clas	imum Net Counts Observed* (Observed Counts - Area Background Counts):CPM/mR/Hr sified as: Rad 1
		PCB	
Yes	NA	S.	Comments/Qualifiers (Required for Non-Conforming Items)
L	1		Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
·			
سا	+		Preservation Method: Wellow Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP:
			Temperature Device Serial #: IR3-16 Secondary Temperature Device Serial # (If Applicable):
<u></u>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
n	٠	-	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) 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:
-	1		ID's and tests affected:
			Sample ID's and containers affected: No ID on 2nd GST/BPS Sample
e			No Dotol Time on 2nd GST/BPS Sample
-			Sample ID's affected:
~			
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GL-CHL-SR-001 Rev 5

List of current GEL Certifications as of 17 November 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	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	T104704235-17-12				
Utah NELAP	SC000122017-24				
Vermont	VT87156				
Virginia NELAP	460202				
Washington	C780				
West Virginia	997404				