

July 27, 2018

#### Vista Work Order No. 1801515

Ms. Maya Murshak Merit Laboratories, Inc. 2680 East Lansing Drive East Lansing, MI 48823

Dear Ms. Murshak,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on June 29, 2018. This sample set was analyzed on a standard turn-around time, under your Project Name 'MDEQ State Municipal Sampling'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier Laboratory Director



Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

Work Order 1801515 Page 1 of 13

## Vista Work Order No. 1801515 Case Narrative

### **Sample Condition on Receipt:**

Two drinking water samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

#### **Analytical Notes:**

## **EPA Method 537, Rev. 1.1**

The samples were extracted and analyzed for a selected list of 14 PFAS using EPA Method 537, Rev. 1.1. The results have been reported following the conventions specified by the Michigan Department of Environmental Quality.

## **Holding Times**

The samples were extracted and analyzed within the method hold times.

#### **Quality Control**

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Laboratory Fortified Blank (LFB) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB recoveries were within the method acceptance criteria.

The surrogate recoveries for all QC and field samples were within the acceptance criteria.

Work Order 1801515 Page 2 of 13

## TABLE OF CONTENTS

Case Narrative	1
Table of Contents	3
Sample Inventory	4
Analytical Results	5
Qualifiers	10
Certifications	11
Sample Receipt	12

Work Order 1801515 Page 3 of 13

# **Sample Inventory Report**

Vista Sample	Client ID Sample ID	Sampled	Received	Components/Containers
1801515-01	GWNT1806221335KER	22-Jun-18 13:35	29-Jun-18 10:01	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1801515-02	2 GWNT1806221345KER	22-Jun-18 13:45	29-Jun-18 10:01	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

Vista Project: 1801515 Client Project: MDEQ State Municipal Sampling

Work Order 1801515 Page 4 of 13

## ANALYTICAL RESULTS

Work Order 1801515 Page 5 of 13



Sample ID: LF	RB								EPA Meth	nod 537
Client Data				Lat	boratory Data					
Name: Project:	Merit Laboratories, Inc. MDEQ State Municipal Sampling	Matrix:	Aqueous	Lab	Sample:	B8G0011-BLK1		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1
PFHxA	307-24-4	ND		2		B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1
PFHpA	375-85-9	ND		2		B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1
PFHxS	355-46-4	ND		2		B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1
PFOA	335-67-1	ND		2		B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1
PFNA	375-95-1	ND		2		B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1
PFOS	1763-23-1	ND		2		B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1
PFDA	335-76-2	ND		2		B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1
MeFOSAA	2355-31-9	ND		4		B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1
EtFOSAA	2991-50-6	ND		4		B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1
PFUnA	2058-94-8	ND		4		B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1
PFDoA	307-55-1	ND		4		B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1
PFTrDA	72629-94-8	ND		4		B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1
PFTeDA	376-06-7	ND		4		B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1
Labeled Standard	ls Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	104	70 - 130			B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1
13C2-PFDA	SURR	99	70 - 130			B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1
d5-EtFOSAA	SURR	94	70 - 130			B8G0011	03-Jul-18	0.25 L	17-Jul-18 13:47	1

RL - Reporting limit

Results reported to RL.
Reporting convention specified by MI DEQ.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Work Order 1801515



Sample ID: LFB

Client Data Laboratory Data

Name: Merit Laboratories, Inc. Matrix: Aqueous Lab Sample: B8G0011-BS1 Column: BEH C18
Project: MDEQ State Municipal Sampling

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	71	71	100	70 - 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1
PFHxA	307-24-4	88	80	110	70 - 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1
PFHpA	375-85-9	85	80	106	70 - 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1
PFHxS	355-46-4	73	73	100	70 - 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1
PFOA	335-67-1	85	80	106	70 - 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1
PFNA	375-95-1	92	80	115	70 - 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1
PFOS	1763-23-1	72	74	97	70 - 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1
PFDA	335-76-2	97	80	121	70 - 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1
MeFOSAA	2355-31-9	74	80	93	70 - 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1
EtFOSAA	2991-50-6	88	80	111	70 - 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1
PFUnA	2058-94-8	85	80	106	70 - 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1
PFDoA	307-55-1	83	80	104	70 - 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1
PFTrDA	72629-94-8	77	80	96	70 - 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1
PFTeDA	376-06-7	77	80	96	70 - 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1
Labeled Standards		Type		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR		109	70- 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1
13C2-PFDA		SURR		104	70- 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1
d5-EtFOSAA		SURR		98	70- 130		B8G0011	03-Jul-18	0.25 L	17-Jul-18 14:00	1

Data Reported per Michigan DEQ instructions.

Work Order 1801515 Page 7 of 13



Sample ID: G	WNT1806221335KER								EPA Meth	hod 537
Client Data Name: Project: Location:	Merit Laboratories, Inc. MDEQ State Municipal Sampling CRKVLYMHP40079WL001	Matrix: Date Collected:	Drinking Water 22-Jun-18 13:35	Lab	oratory Data Sample: Received:	ole: 1801515-01		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1
PFHxA	307-24-4	ND		2		B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1
PFHpA	375-85-9	ND		2		B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1
PFHxS	355-46-4	ND		2		B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1
PFOA	335-67-1	ND		2		B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1
PFNA	375-95-1	ND		2		B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1
PFOS	1763-23-1	ND		2		B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1
PFDA	335-76-2	ND		2		B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1
MeFOSAA	2355-31-9	ND		4		B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1
EtFOSAA	2991-50-6	ND		4		B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1
PFUnA	2058-94-8	ND		4		B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1
PFDoA	307-55-1	ND		4		B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1
PFTrDA	72629-94-8	ND		4		B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1
PFTeDA	376-06-7	ND		4		B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA	SURR	103	70 - 130			B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1
13C2-PFDA	SURR	86	70 - 130			B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1
d5-EtFOSAA	SURR	75	70 - 130			B8G0011	03-Jul-18	0.23 L	17-Jul-18 18:03	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ..

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Work Order 1801515 Page 8 of 13



Sample ID: G	WNT1806221345KER								EPA Meth	nod 537
Client Data				Lab	oratory Data					
Name:	Merit Laboratories, Inc.	Matrix:	Drinking Water	Lab	Sample:	1801515-0	)2	Column:	BEH C18	
Project: Location:	MDEQ State Municipal Sampling CRKVLYMHP40079WL002	Date Collected:	22-Jun-18 13:45		Date Received: 29-Jun-18 10:01		10:01		2211 010	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1
PFHxA	307-24-4	ND		2		B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1
PFHpA	375-85-9	ND		2		B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1
PFHxS	355-46-4	ND		2		B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1
PFOA	335-67-1	ND		2		B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1
PFNA	375-95-1	ND		2		B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1
PFOS	1763-23-1	ND		2		B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1
PFDA	335-76-2	ND		2		B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1
MeFOSAA	2355-31-9	ND		4		B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1
EtFOSAA	2991-50-6	ND		4		B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1
PFUnA	2058-94-8	ND		4		B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1
PFDoA	307-55-1	ND		4		B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1
PFTrDA	72629-94-8	ND		4		B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1
PFTeDA	376-06-7	ND		4		B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1
Labeled Standar	ds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	108	70 - 130			B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1
13C2-PFDA	SURR	96	70 - 130			B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1
d5-EtFOSAA	SURR	85	70 - 130			B8G0011	03-Jul-18	0.24 L	17-Jul-18 18:16	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ..

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Work Order 1801515 Page 9 of 13

## **DATA QUALIFIERS & ABBREVIATIONS**

B This compound was also detected in the method blank

**Conc.** Concentration

D Dilution

DL Detection limit

E The associated compound concentration exceeded the calibration range of

the instrument

H Recovery and/or RPD was outside laboratory acceptance limits

I Chemical Interference

J The amount detected is below the Reporting Limit/LOQ

**LOD** Limits of Detection

**LOQ** Limits of Quantitation

M Estimated Maximum Possible Concentration (CA Region 2 projects only)

NA Not applicable

ND Not Detected

Q Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)

**TEQ** Toxic Equivalency

U Not Detected (specific projects only)

\* See Cover Letter

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

Work Order 1801515 Page 10 of 13

## **CERTIFICATIONS**

Accrediting Authority	<b>Certificate Number</b>
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	17-015-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-18
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2016026
Minnesota Department of Health	1322288
New Hampshire Environmental Accreditation Program	207717
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-008
Pennsylvania Department of Environmental Protection	014
Texas Commission on Environmental Quality	T104704189-17-8
Virginia Department of General Services	9077
Washington Department of Ecology	C584
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

Work Order 1801515 Page 11 of 13



Container Types: P= HDPE, PJ= HDPE Jar

O = Other:

Vista Analytical Laboratory			CHAIN OF	C	US	TC	D	Υ				For La Work C		tory Use	80151 R-2		2.9 ₀( I: Yes □ No □
Project ID: MDEQ STATE MUNICIPA	L SAMPLII	NG	PO#: 60570309			-	Sam	pler:	KELL	Y RICH	IART (name)			rAT heck one)	Standard: Rush (sur	x 21 days charge may apply) ays 7 days Sp	pecify:
nvoice to: Name		Compan	у		Addr					2000		City			State	Ph#	Fax#
MIKE JURY		MDEQ					HUM		SUITE			BAY	ITY		MI	989-894-6255	989-891-9237
Relinquished by (printed name and sign	2	+	6/28/18		Time 180		1			y (print	ed name and signat	ure)	fro	Hud	~	04/24/18	Time
Relinquished by (pfinted name and ≸igi	nature)		<b>/</b> Date		Time			Rece	eived b	y (print	ed name and signat	ure)				Date	Time
SHIP TO: Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 Ph: (916) 673-1520; Fax: ( ATTN: Jennifer Miller	?	106	Method of Shipment: Tracking No.:		Analysi	ainer(s	5)	7	7 Wilsoness	James de la companya	2 7 2 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8		3/4	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
Sample ID	Date	Time	Location/Sample Description	O. College	28	No.	183	15/2/2018/		10 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1 2 2	3	1 2 X		Comments	3
GWNT1806221335KER	6/22/18	1335	CRKVLYMHP40079WL001	2	Р	DW							7	K TZ, we	ell 1 = west w	ell	
GWNT1806221345KER	6/22/18	1345	CRKVLYMHP40079WL002	2	Р	DW							7	C TZ, we	ell 2 = north v	vell	
											1	$\Box$					- //
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				$\top$			П			$\top$			$\top$				
Special Instructions/Comments:	Sand Pas	ulte and	Acknowledgements to the	liet pro	widor							Nan	o: M	IKE JURY	,		
by e-mail to Vista.	ocha rec	unto una	Acknowledgements to the	not pre	viace					DOCL	SEND	Compa	5000	Section 1995	16	300	
			1.5 3								IMENTATION RESULTS TO:		-		IUM ST, SUIT	ЕB	
														AY CITY			p: 48708
														19-894-62	55 in@aecom.co	Fax: 989-891-92	237
					NO. 10. 10. 1							L111	an. uc	min.buyua	iii@aecuiii.cu	111)	

Work Order 1801515 Page 12 of 13

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,

SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Bottle Preservation Type: T = Thiosulfate,

TZ = Trizma:



## Sample Log-in Checklist

Vista Work Orde	er#:	180	015	15			TAT Sta					
Samples Arrival:	Date/Time		101	Initials:			tion: WR-					
Logged In:	Date/Time 06/29/18											
Delivered By:	FedEx	UPS	On Tra	ac GSO					her			
Preservation:	Ice	)	Blu	ue Ice		Dry	Ice	No	ne			
Temp °C: 2.0	(uncorrect		ime: ১০	09 ed: Yes□	Nob	Thern	nometer ID:	eter ID: IR-4				
							YES	NO	NA			
Adequate Sample	e Volume Re	eceived?	>				4	,				
Holding Time Acc	ceptable?						Ke					
Shipping Contain	er(s) Intact?						**					
Shipping Custody	y Seals Intac	et?						th	th			
Shipping Docume							th		,			
Airbill 2 of	7   Trk #	437	7052	8 329	5		th					
Sample Containe	er Intact?						KG					
Sample Custody	Seals Intact	?					. 0		Ka			
Chain of Custody	/ Sample D	ocumen	tation Pr	esent?			H					
COC Anomaly/Sa	ample Accep	tance F	orm com	pleted?					Kle			
If Chlorinated or I	Orinking Wat	ter Samı	oles, Acc	eptable Pre	eservat	tion?	Ke					
Preservation Doc	umented:	Na	S <sub>2</sub> O <sub>3</sub>	Trizma	) 1	lone	Yes	No	NA			
Shipping Contain	er	V	ista	Client	Re	etain	Return	Dis	oose			
Comments:												

ID.: LR - SLC

Rev No.: 0

Rev Date: 05/18/2017

Page: 1 of 1