

July 17, 2018

Vista Work Order No. 1801291

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 15, 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

Martho Maier



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

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Vista Work Order No. 1801291 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.

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1801291-01	GW1806140950EDK	14-Jun-18 09:50	15-Jun-18 10:01	HDPE Bottle, 250 mL HDPE Bottle, 250 mL
1801291-02	GW1806141005EDK	14-Jun-18 10:05	15-Jun-18 10:01	HDPE Bottle, 250 mL HDPE Bottle, 250 mL

Client Project: MDEQ State Municipal Sampling

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Vista Project: 1801291

ANALYTICAL RESULTS



Data	ories Inc	Matrix:	Aqueous	Laboratory Data Lab Sample:	B8F0154-BLK1	EK1	Column:	вен С18	
Project: MDEQ State Municipa	MDEQ State Municipal Sampling	172441 1231	YNIGHT	r					
Analyte	CAS Number	Conc. (ng/L)		RL Qualifiers	Batch	Extracted	Samp Size	Analyzed I	Dilution
PERS	375-73-5	ND		2	B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	-
PFHxA	307-24-4	N)		2	B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	_
PFHnA	375-85-9	N		2	B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
PFHxS	355-46-4	N		2	B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	_
PFOA	335-67-1	ND		2	B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	-
PFNA	375-95-1	ND		2	B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	_
PFOS	1763-23-1	N		2	B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
PFDA	335-76-2	ND		2	B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
MeFOSAA	2355-31-9	ND		4	B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
EtFOSAA	2991-50-6	ND		4	B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
PFUnA	2058-94-8	ND		4	B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
PFDoA	307-55-1	ND		4	B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
PFTrDA	72629-94-8	ND		4	B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	. 1
PFTeDA	376-06-7	ND		4	B8F0154	26-Jun-18	0.25 L):14	
Labeled Standards	Туре	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	102	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
13C2-PFDA	SURR	95	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
d5-EtFOSAA	SURR	96	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
	RL - Reporting limit	Results reported to RL	Results reported to RL.	When rep	orted, PFHxS, I	When reported, PFHxS, PFOA, PFOS, McFOSAA and EtFOSAA include bo	feFOSAA and Eth	When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both	



Sample ID: LFB	ÆΒ										EPA Method 537	hod 537
Client Data						Lal	Laboratory Data					
Name: Project:	Merit Laboratories, Inc. MDEQ State Municipal Sampling	c. al Sampling	Matrix:	Aqueous		Lab	b Sample:	B8F0154-BS1	BS1	Column:	BEH C18	
Analyte		CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFRS		375-73-5	35	35	99	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PFHxA		307-24-4	38	40	96	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	ш
PFHnA		375-85-9	38	40	95	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PFHxS		355-46-4	36	36	98	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PFOA		335-67-1	38	40	95	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	_
PFNA		375-95-1	36	40	90	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PEOS		1763-23-1	29	37	78	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PFDA		335-76-2	44	40	110	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	-
MeFOSAA		2355-31-9	40	40	99	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
EtFOSAA		2991-50-6	38	40	95	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	
PFUnA		2058-94-8	39	40	97	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	-
PFDoA		307-55-1	36	40	89	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PFTrDA		72629-94-8	36	40	89	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	-
PFTeDA		376-06-7	36	40	91	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	-
Labeled Standards	rds		Туре		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA			SURR		98	70- 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	_
13C2-PFDA			SURR		101	70- 130		B8F0154	B8F0154 26-Jun-18	0.25 L	06-Jul-18 19:37	_
d5-EtFOSAA			SURR		97	70- 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1

Data Reported per Michigan DEQ instructions.



TO A A LANGING BOTH	eFOSAA and Eth	PFOA PFOS. M	When reported, PFHxS, PFOA, PFOS, McFOSAA and EtFOSAA include both	When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include by	AND RESIDENCE AND RESIDENCE AND RESIDENCE	18	Results reported to RL	DI Bonostino limit	
06-Jul-18 21:08 1	0.26 L	26-Jun-18	B8F0154		30	70 - 130	79	SURR	d5-EtFOSAA
06-Jul-18 21:58 1	0.26 L	26-Jun-18	B8F0154		30	70 - 130	96	SURR	13C2-PFDA
06-Jul-18 21:58 1	0.26 L	26-Jun-18	B8F0154		30	70 - 130	96	SURR	13C2-PFHxA
Анагугей Бишион	Samp Size	Extracted	Batch	Qualifiers		Limits	% Recovery	Туре	Labeled Standards
	0.20 L	01-Inf-07	B&FUI34		4		ND	376-06-7	PFTeDA
06-Inl-18 21:58 1	1950	26 Jun 18	D0F0154		4.		Z	72629-94-8	PFTrDA
06-1nl-18 21:58 1	0.261	26-Tun-18	Der 0154		· 1		ie	307-55-1	PFDoA
06-Jul-18 21:58 1	0.26 L	26-Jun-18	B8F0154		Δ.		Ni de	2036-94-0	PrUnA
06-Jul-18 21:58 1	0.26 L	26-Jun-18	B8F0154		4			0 00 00 00	EFOSAA
06-Jul-18 21:58 1	0.26 L	26-Jun-18	B8F0154		4		N	2991-50-6	SEOS V V
06-Jul-18 21:58 1	0.26 L	26-Jun-18	B8F0154		4		ND	2355-31-9	MeEOSAA
06-Jul-18 21:58 I	0.26 L	26-Jun-18	B8F0154		2		ND	335-76-2	PFDA
06-Jul-18 21:58 I	0.26 L	26-Jun-18	B8F0154		2		ND	1763-23-1	PFOS
06-Jul-18 21:38 1	0.26 L	26-Jun-18	B8F0154		2		ND	375-95-1	PFNA
06-Jul-18 21:36 1	0.26 L	26-Jun-18	B8F0154		2		A S	335-67-1	PFOA
00-Jul-10 21:50 1	0.26 L	20-Jun-18	B8F0154		2		ND	355-46-4	PFHxS
06 1:118 21:58 1	0.26 L	26-Jun-18	B&F0154		2		ND	375-85-9	PFHpA
06 1:1 18 21:59 1	0.261	26 I 18	B8F0154		. 2		ND	307-24-4	PFHxA
06 1:1 19 21:59 1	1020	20-Jull-10	B8F0154		2		ND	375-73-5	PFBS
06-[11]-18 21:58 1	1960	26 Inn 19	DOED154						Allalyte
Analyzed Dilution	Samp Size	Extracted	Batch	Qualifiers	RI-		Conc. (ng/L)	CAS Number	
								CBI COMHIGHOGOSOTPIOO	•
		10:01	15-Jun-18 10:01	ite Received:	Date	14-Jun-18 09:50	Date Collected:	MDEQ State Municipal Sampling	••
BEH C18	Column:	; =	1801291-01	Lab Sample:	La	Drinking Water	Matrix:	Merit Laboratories, Inc.	Name: Merit I
	i.	.		Laboratory Data	La				Client Data
								140950EDK	Sample ID: GW1806140950EDK
EPA Method 537									



Tip101 CAS Number Conc. (ng/L) 375-73-5 375-73-5 375-85-9 375-85-9 375-85-9 375-85-9 375-85-9 375-85-9 375-85-9 375-95-1 375-95-1 376-06-7 Type Date Collected: 14-Jun-18 10:05 R R R R R R R R R R R R R	n-18 0.26 L 06-Jul-18 22:0	201010101			ç	NAOS	- NOO
Sampling Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01	227				85	CTIDD	AS EFENS A A
Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01	U.20 L			70 - 130	98	SURR	13C2-PFDA
Sampling Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01 CAS Number Conc. (ng/L) RL Qualifiers Batch Extracted Samp Size Analyzed 1	0.26 L			70 - 130	101	SURR	3C2-PFHxA
Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01	azic dinge		Qualifiers	Limits	% Recovery	Туре	Labeled Standards
Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01	0.20		4		ND	376-06-7	PFTeDA
Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01	1900		4		N	72629-94-8	PFTrDA
Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01	0.26 L		1		i E	307-55-1	PFDoA
Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01	0.26 L		7		íE	2058-94-8	PFUnA
Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01	0.26 L		4			2991-50-6	EtFOSAA
TP101 Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01	0.26 L		4		i	2355-31-9	MeFOSAA
TP101 Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01	0.26 L	O H	Δ !		1	333-70-2	PEDA
Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01	0.26 L	•	2			335 76 3	PFOS
TP101 CAS Number Conc. (ng/L) ND 375-73-5 ND 375-85-9 ND ND 335-67-1 ND Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01 RL Qualifiers Batch Extracted Samp Size Analyzed 2 B8F0154 26-Jun-18 0.26 L 06-Jul-18 22:07 B8F0154 26-Jun-18 0.26 L 06-Jul-18 22:07	0.26 L		2			1763 03 1	FFNA
TP101 CAS Number Conc. (ng/L) ND 375-73-5 ND 307-24-4 ND 375-85-9 ND ND 335-46-4 ND ND 335-46-1 ND	0.26 L		2		3 i	375-95-1	PENA BENIA
Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01	0.26 L		2		ND	335-67-1	EOV
Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01	0.26 L		2		ND	355-46-4	DEH _v S
Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01	0.26 L		2		ND	375-85-9	PFHnA
TP101 CAS Number Conc. (ng/L) Date Collected: 14-Jun-18 10:05 RL Qualifiers Batch Extracted Samp Size Analyzed 2 B8F0154 26-Jun-18 0.26 L 06-Jul-18 22:07	0.26 L		2		ND	307-24-4	PFHvA
TP101 CAS Number Conc. (ng/L) Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01 RL Qualifiers Batch Extracted Samp Size Analyzed	0.26 L		2		ND	375-73-5	PEBS
Date Collected: 14-Jun-18 10:05 Date Received: 15-Jun-18 10:01 TP101 Di Constigne Botch Extracted Samp Size Analyzed					Conc. (ng/L)	CAS Number	Analyte
I Sampling Date Collected: 14-Jun-18 10:05 Date Received:	Somn Size					1HIGH060801F101	Location: SBLOOM
Date Collected: 14-Jun-18 10:05 Date Received:						and minimizer our company	I IOJect.
		15-Jun-18 10:01	Date Received:	14-Jun-18 10:05	Date Collected:	tate Municipal Sampling	
Matrix: Drinking Water		1801291-02	Lab Sample:	Drinking Water	Matrix:	Merit Laboratories, Inc.	Name: Merit Lab
Data			Laboratory Data				Client Data
1806141005EDK						1005EDK	Sample ID: GW1806141005EDK

DATA QUALIFIERS & ABBREVIATIONS

В	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
Н	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.

CERTIFICATIONS

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	17-015-0
	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.

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Relinquished by (printed name and signature)	EMILY KEENAN	Relinquished by (printed name and signature)	MIKE JURY MDEQ	Invoice to: Name Company	(1)	Project ID: MDEG STATE MUNICIPAL SAMPLING		Vista Analytical Laboratory
Date	MINION GIHIS	Date				PO#: 60570309		CHAIN OF CUSTODY
Time Received by (printed name and standature)	1700 Symmy Ko	Time Received by (printed name and signature)	401 KETCHUM ST, SUITE B	Address	(name)	Sampler: EMILY KEENAN		USTODY
(chature) // Date lime	3/18	gnature) Date Time	BAY CITY MI 989-894-6255 989-891-9237	City State Ph# Fax#	/ days spe	(check one): Rush (surcharge may apply)	TAT Standard: x 21 days	For Laboratory Use Only North Order #: 150 30 Temp: 4.5 °C Storage ID: WP-2 Storage Secured: Yes XI No □

Container Types: P= HDPE, PJ= HDPE Jar O = Other:	by e-mail to Vista.	Special Instructions/Comments: Se							GW1806141005EDK	GW1806140950EDK V 6	Sample ID		ATTN: Jennifer Miller	Pn. (916) 673-1920, rax. (916) 675-6166	SHIP TO: Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762
		end Resul							6/14/18	6/14/18	Date		The second secon	0,000,00	23
		ts and /							1005 -	0950	Time L		1		
Bottle Preservation Type: T = Thiosulfate, TZ = Trizma:		Send Results and Acknowledgements to the list provided							1005 SBLOOMHIGH06080TP101	SBLOOMHIGH06080TP100	Location/Sample Description		Tracking No.:		Method of Shipment:
e: T = Thic		list provi		1					2	2	Quant	W.	_	8	Add Ana
osulfate,		ded		\dagger	\vdash				P DW	P DW	Type		\	Container(s)	lysis(es)
				1	F						Listo	1	/	۳	Add Analysis(es) Requested
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:	DOCUMENTATION AND RESULTS TO:	SEND									List of List of	21 WISC	me		PFAS Solope Dillution
N = Drink astewater	Add	z	H	+	\dagger	+	+		T	\vdash	PFO				
ing Wate	Address: 401 KE City: BAY CI Phone: 989-89 Email: dorin.b	ame: M		-	-	-			×	×		AV PFOS PR3 PFAS SLIST: 10		1	
od/Serum, 0 = Other:	TCHUM ST, SUITE B	Name: MIKE JURY							ZZ	Z1	C.F.A.	S List: 14	List.6		USEPA Method 537
per, SD = Sediment,	B Slate: MI Zip: 48708 Fax: 989-891-9237										Comments				



Sample Log-in Checklist

Vista Work Orde	r#:l	8017	41			TAT_STO	<u> </u>	
Samples Arrival:	Date/Time 06/15/19	1001	^	nitials:			R-2 J/A	
Lagrandin	Date/Time	P386/06/16		itials:		Location: W.Z.		
Logged In:	6/17/18	0837	B	18		Shelf/Rack:	B4	
Delivered By: FedEx UPS		S On T	rac	GSO	DHI	Hand Delivered	Other	
Preservation:	lce	В	Blue Ice			Dry Ice None		
Temp °C: 4.6 Temp °C: 4.5		Time: Probe us		2 Yes□	No)X	Thermometer ID	: IR-4	

						YES	NO	NA
Adequate Sample Volu	me Re	eceived?			1	BAB		
Holding Time Acceptab	le?					84		
Shipping Container(s) I	ntact?					SIR		
Shipping Custody Seals	s Intac	et?			6/15/18	-5 40	AND THE RESERVE OF TH	812
Shipping Documentatio	n Pres	sent?				8R		
Airbill	Trk#	7724 804	8 6150)		812		
Sample Container Intac	t?				(BUB		
Sample Custody Seals	Intact	?					1	BUD
Chain of Custody / Sam	ple D	ocumentation Pre	sent?			8P		
COC Anomaly/Sample	Ассер	tance Form comp	leted?				uus	uus
If Chlorinated or Drinkin	g Wat	er Samples, Acce	ptable Pres	servation?	U	BUB		
Preservation Document		Na ₂ S ₂ O ₃	Trizma	None	6	Yes	No	NA
Shipping Container		(Vista)	Client	Retain	Re	turn	Disp	ose

Comments: