

August 29, 2018

Vista Work Order No. 1802039

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 July 27, 2018 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 Work Order No. 1802039

Case Narrative

Sample Condition on Receipt:

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

Analytical Notes:

EPA Method 537, Rev. 1.1

The sample was 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 sample was 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
1802039-01	GWEF1807251430KER	25-Jul-18 14:30	27-Jul-18 10:04	HDPE Bottle, 250 mL HDPE Bottle, 250 mL

ANALYTICAL RESULTS

Sample ID: LRB **EPA Method 537**

Client Data				Laboratory Data			
Name:	Merit Laboratories, Inc.	Matrix:	Aqueous	Lab Sample:	B8H0003-BLK1	Column:	BEH C18
Project:	MDEQ State Municipal Sampling						

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	1
PFHxA	307-24-4	ND	2		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	1
PFHpA	375-85-9	ND	2		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	1
PFHxS	355-46-4	ND	2		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	1
PFOA	335-67-1	ND	2		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	1
PFNA	375-95-1	ND	2		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	1
PFOS	1763-23-1	ND	2		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	1
PFDA	335-76-2	ND	2		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	1
MeFOSAA	2355-31-9	ND	4		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	1
EtFOSAA	2991-50-6	ND	4		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	1
PFOA	2058-94-8	ND	4		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	1
PFDoA	307-55-1	ND	4		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	1
PFTeDA	72629-94-8	ND	4		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	1
PFTeDA	376-06-7	ND	4		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	1
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	122	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	1
13C2-PFDA	SURR	117	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	1
d5-EtFOSAA	SURR	99	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:15	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.

Sample ID: LFB

EPA Method 537

Client Data					Laboratory Data						
Name:	Merit Laboratories, Inc.	Matrix:	Aqueous		Lab Sample:	B8H0003-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	70	71	98	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1
PFHxA	307-24-4	94	80	118	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1
PFHpA	375-85-9	89	80	111	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1
PFHxS	355-46-4	80	73	110	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1
PFOA	335-67-1	85	80	106	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1
PFNA	375-95-1	100	80	125	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1
PFOS	1763-23-1	83	74	112	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1
PFDA	335-76-2	95	80	119	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1
MeFOSAA	2355-31-9	71	80	89	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1
EtFOSAA	2991-50-6	79	80	99	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1
PFOxA	2058-94-8	90	80	112	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1
PFDoA	307-55-1	94	80	117	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1
PFTTrDA	72629-94-8	88	80	110	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1
PFTeDA	376-06-7	80	80	100	70 - 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1
Labeled Standards		Type		% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR		120	70- 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1
13C2-PFDA		SURR		116	70- 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1
d5-EtFOSAA		SURR		91	70- 130		B8H0003	07-Aug-18	0.25 L	22-Aug-18 23:28	1

Data Reported per Michigan DEQ instructions.

Sample ID: GWEF1807251430KER **EPA Method 537**

Client Data				Laboratory Data			
Name:	Merit Laboratories, Inc.	Matrix:	Drinking Water	Lab Sample:	1802039-01	Column:	BEH C18
Project:	MDEQ State Municipal Sampling	Date Collected:	25-Jul-18 14:30	Date Received:	27-Jul-18 10:04		
Location:	BCVERONA00450TP101						

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	1
PFHxA	307-24-4	ND	2		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	1
PFHpA	375-85-9	ND	2		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	1
PFHxS	355-46-4	ND	2		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	1
PFOA	335-67-1	ND	2		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	1
PFNA	375-95-1	ND	2		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	1
PFOS	1763-23-1	ND	2		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	1
PFDA	335-76-2	ND	2		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	1
MeFOSAA	2355-31-9	ND	4		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	1
EtFOSAA	2991-50-6	ND	4		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	1
PFOA	2058-94-8	ND	4		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	1
PFDoA	307-55-1	ND	4		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	1
PFTeDA	72629-94-8	ND	4		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	1
PFTeDA	376-06-7	ND	4		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	1
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	111	70 - 130		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	1
13C2-PFDA	SURR	106	70 - 130		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	1
d5-EtFOSAA	SURR	89	70 - 130		B8H0003	07-Aug-18	0.24 L	23-Aug-18 00:59	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.

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.

CERTIFICATIONS

Accrediting Authority	Certificate Number
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.



CHAIN OF CUSTODY

For Laboratory Use Only
 Work Order #: 1802039 Temp: 1.9 °C
 Storage ID: WE-2 Storage Secured: Yes No

Project ID: MDEQ STATE MUNICIPAL SAMPLING PO#: 60570309 Sampler: KELLY RICHART
 (name)

TAT Standard: 21 days
 (check one): Rush (surcharge may apply)
 14 days 7 days Specify: _____

Invoice to: Name MIKE JURY Company MDEQ Address 401 KETCHUM ST, SUITE B City BAY CITY State MI Ph# 989-894-6255 Fax# 989-891-9237

Relinquished by (printed name and signature) Kelly Richart Date 7-26-18 Time 10:00 Received by (printed name and signature) Kim Eric Date 7/27/18 Time 1050

SHIP TO: Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 Ph: (916) 673-1520; Fax: (916) 673-0106				Method of Shipment:		Add Analysis(es) Requested										Comments	
ATTN: <u>Jennifer Miller</u>				Tracking No.:		Container(s)											
Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	PFAS Isotope Dilution	USEPA Method 537	Comments		
GWEF1807251430KER	7/25/18	1430	BCVERONA00450TP101	2	P	DW									X TZ		

Special Instructions/Comments: Send Results and Acknowledgements to the list provided by e-mail to Vista.

SEND DOCUMENTATION AND RESULTS TO:

Name: MIKE JURY
 Company: MDEQ
 Address: 401 KETCHUM ST, SUITE B
 City: BAY CITY State: MI Zip: 48708
 Phone: 989-894-6255 Fax: 989-891-9237
 Email: dorin.bogdan@aecom.com

Container Types: P= HDPE, PJ= HDPE Jar
 O = Other: _____
 Bottle Preservation Type: T = Thiosulfate,
 TZ = Trizma: _____
 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: _____

Sample Log-in Checklist

 Vista Work Order #: 1802039 TAT 3rd

Samples Arrival:	Date/Time: 07/27/18 1004	Initials: KE	Location: WR-2
			Shelf/Rack: NA
Logged In:	Date/Time: 07/27/18 1517	Initials: BAB	Location: WR-2
			Shelf/Rack: A3/D7
Delivered By:	<input checked="" type="radio"/> FedEx	<input type="radio"/> UPS	<input type="radio"/> On Trac
		<input type="radio"/> GSO	<input type="radio"/> DHL
		<input type="radio"/> Hand Delivered	<input type="radio"/> Other
Preservation:	<input checked="" type="radio"/> Ice	<input type="radio"/> Blue Ice	<input type="radio"/> Dry Ice
	<input type="radio"/> None		
Temp °C: 2.0 (uncorrected)	Time: 1043	Thermometer ID: IR-4	
Temp °C: 1.9 (corrected)	Probe used: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		

	YES	NO	NA
Adequate Sample Volume Received?	BAB		
Holding Time Acceptable?	BAB		
Shipping Container(s) Intact?	KE		
Shipping Custody Seals Intact?			KE
Shipping Documentation Present?	KE		
Airbill <u>—</u> Trk # <u>4377 0528 4133</u>	KE		
Sample Container Intact?	BAB		
Sample Custody Seals Intact?			KE
Chain of Custody / Sample Documentation Present?	KE		
COC Anomaly/Sample Acceptance Form completed?		BAB	
If Chlorinated or Drinking Water Samples, Acceptable Preservation?	BAB		
Preservation Documented:	Na ₂ S ₂ O ₃	<input checked="" type="radio"/> Trizma	<input type="radio"/> None
		<input checked="" type="radio"/> Yes	<input type="radio"/> No <input type="radio"/> NA
Shipping Container	Vista	<input checked="" type="radio"/> Client	<input type="radio"/> Retain <input checked="" type="radio"/> Return <input type="radio"/> Dispose

Comments: