City of Plainwell

"The Island City"

211 N. Main Street
Plainwell, Michigan 49080
Phone: 269-685-6821
Fax: 269-685-7282
Web Address: www.plainwell.org

To: City Council
From: Erik J. Wilson, City Manager
Date: August 8, 2018
Subject: Per-and Polyfluoroalkyl Substances (PFAS) Update

The Michigan PFAS Action Response Team (MPART) is conducting a statewide PFAS investigation of sources and occurrences. Part of this effort includes the Michigan Department of Environmental Quality (MDEQ) testing all community water supplies that are classified as non-transient, non-community water supplies for PFAS.

The City has received testing results from the MDEQ which supplement the proactive PFAS sampling that we had previously conducted in the spring. If you recall, we directed our engineers, Fleis & Vandenbrink, to sample each of our wells prior to the State announcing they would test all municipalities across Michigan. MDEQ sampling of groundwater from wells #4/#7 confirmed no detectable PFAS is being distributed to our system.

Results from primary wells #4 & 7

MDEQ reported no detectable PFAS (both regulated and unregulated) in groundwater sampled from the aquifer that contains wells #4 and #7. This matches the non-detectable results reported by our engineers. Since April 10, 2018, these have been the only wells used to provide water to the City.

Results from back up well #5

MDEQ reported 23 parts per trillion (ppt) of regulated PFAS (perfluorooctanesulfonic acid, PFOS and perfluorooctanoic acid, PFOA). This is consistent with our initial regulated PFAS results (22.9 ppt). Additionally, the MDEQ reported 31 parts of non-regulated PFAS compared to our initial testing of 24.2 ppt. The Environmental Protection Agency (EPA) has established a Lifetime Health Advisory of 70 ppt. Regulated and unregulated PFAS of both tests indicate a total of 47.1 and 54 respectively. Per the Environmental Protection Agency (EPA), a health advisory level for the other (non-regulated) compounds hasn't been set because not enough is known about them.

Well #5 has not been used by the City since April 10, 2018, when we first became aware that PFAS was detected in well #5. Despite the fact that well #5 results were below EPA's advisory limits, we made the decision to remove it from service based on two factors. One, since MDEQ had not yet

developed guidance on how to address PFAS in municipal wells, we decided to take the well out of service. Secondly, well #5 served as a back-up and generated approximately 5% of our water. Wells #4 and #7, are our primary wells, and have enough capacity to serve our needs.

To date, all of the testing that has been conducted on our wells (#4, #5 & #7), both regulated and unregulated, show that none of the water distributed has ever exceeded any Federal or State drinking water standard or the Lifetime Health Advisory (LHA) for PFAS.

MDEQ Recommendations and City actions to date

Recently, MDEQ provided us with five specific actions to consider based on the results of the sampling. We have already initiated action on each of the MDEQ recommendations, as summarized below.

1. Inform the public of these sample results through posting on your website or other means.

We notified our water customers by direct mailing on April 13, 2018 that PFAS was not present in wells #4 and #7 and was present in well #5. We also informed our customers at that time that well #5 was removed from service. The City of Plainwell remains committed to providing our customers with the most up to date information as it becomes available. Additionally, updates are posted to our web-site at http://www.plainwell.org/Reference-Desk/Water-Quality-Reports.aspx.

2. Investigate potential sources of PFAS in your watershed and initiate steps to remove any identified source, if possible.

Three initiatives are in progress. Upon detecting PFAS in well #5, we authorized our Engineer (Fleis & VandenBrink) to investigate potential sources. Additionally, City staff reviewed potential sources of PFAS in our watershed that discharge to our waste water treatment plant. We have also authorized Fleis & VandenBrink, as part of our Wellhead Protection Program, to conduct a contaminant source inventory to identify potential PFAS sources within our existing and potential future Wellhead Protection Areas.

3. Evaluate options to modify operations to reduce PFAS in the water supply should levels approach the existing LHA (Lifetime Health Advisory).

Upon detecting PFAS in well #5, we removed the well from service. Based on samples analyzed by multiple laboratories using multiple analytical methods, we currently have no detectable levels of PFAS being distributed into our system. Regardless, we have authorized Fleis & VandenBrink to review treatment technologies and develop a plan to quickly and effectively treat for PFAS and potentially other contaminants.

4. Within one month, collect and analyze a confirmation sample, unless the system is already on routine monitoring for PFAS or you have obtained verified sample results within the last six months.

Upon detecting PFAS in groundwater sampled from production well #5, we re-tested to confirm the results. Our early discussions of the results with MDEQ also resulted in additional, proactive testing for 2,3,7,8-TCDD, a dioxin compound. Dioxin was not detected in groundwater sampled from our three wells.

5. Continue monitoring for PFAS on a quarterly basis to demonstrate the concentrations of PFAS are consistently and reliably below any existing LHA.

We are placing well #5 on a quarterly testing frequency. While MDEQ has no recommendations for continued monitoring of wells #4 and #7 since they have no detectable PFAS, I have instructed our Water Department to include PFAS testing in our annual sampling plan. The monitoring frequencies will be re-evaluated in the future as we gain more information regarding PFAS in our area, MDEQ gains more information regarding PFAS state-wide and the United States Environmental Protection Agency gains more information nation-wide.

Overall, groundwater from the only two wells being used (#4 & #7) by the City has no detectable PFAS. We will continue to proactively protect and aggressively monitor our water supply for PFAS to ensure our drinking water is of high quality. If you have additional questions or would like more information, contact me at 269-685-6821 or ewilson@plainwell.org.

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

RICK SNYDER
GOVERNOR

C. HEIDI GRETHER
DIRECTOR

April 19, 2018

VIA E-MAIL

Mr. Erik Wilson, Administrator
City of Plainwell
211 North Main Street
Plainwell, Michigan 49080-1397

Dear Mr. Wilson:

SUBJECT: Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) Sampling at Plainwell, 05380

Per- and Polyfluoroalkyl Substances (PFAS) have been classified by the U.S. Environmental Protection Agency as an emerging contaminant; which means they present real or potentially unacceptable human health risks and do not have peer-reviewed human health standards. PFAS are a class of chemicals historically used throughout the industrial, food, and textile industries. PFAS have been used in firefighting foams, food packaging, cleaning products, and various other products. They are incredibly stable, breaking down very slowly in the environment; and are highly soluble, easily transferring through soil to groundwater.

To respond to this emerging national public health issue, the Michigan Department of Environmental Quality (MDEQ) has decided to sample for PFAS at all community water supplies that have their own source of drinking water and at all schools classified as Non-Transient Noncommunity Water Systems (NTNCWS). This monitoring is a proactive measure to identify where this unregulated, emerging contaminant occurs and to determine actions necessary to protect public health wherever it is found. Funding for this sampling and laboratory analysis is provided by legislation signed by Governor Rick Snyder as a supplemental appropriation for the current fiscal year.

The MDEQ has contracted with AECOM, an environmental consulting firm, to conduct this sampling. Because PFAS compounds are commonly used in our environment, including in plumbing taps, cosmetics, cleaning products, and clothing, it is important to follow strict sampling protocols to reduce the possibility of cross contamination, which could result in false positives. The MDEQ will provide AECOM with your contact information and they will contact you or your certified drinking water operator directly to schedule this sample collection sometime before October 1, 2019.

The MDEQ and the Michigan Department of Health and Human Services (MDHHS) will be available and involved in interpretation of the PFAS sample results. Educational materials will be developed for you to share with your customers.

For more information about PFAS, please visit the State of Michigan PFAS Action Response Team (MPART) web page, which serves as the main resource for public information on PFAS contamination in Michigan, at http://www.michigan.gov/PFASresponse.

If you have any questions concerning this sampling, please contact me at the telephone number below; by email at DEQ-PFAS-DrinkingWater@michigan.gov; or by mail at DEQ-DWMAD, P.O. Box 30817, Lansing, Michigan 48909-8311.

Sincerely,

Lois Elliott Graham

Lois Elliott Graham, R.S., M.S.A.
Drinking Water and Municipal Assistance Division
810-730-8674

cc: Mr. Daniel Neeson, Operator, City of Plainwell
Mr. Randy Rapp, Director of Environmental Health, Allegan County
Mr. Steven Crider, MDHHS
Ms. Susan Leeming, MDEQ
Ms. Melanie Brown, MDEQ
Mr. Travis Boeskool, MDEQ
Ms. Amy Peterson, MDEQ
Ms. Heather Bishop, MDEQ, Kalamazoo District Office

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

RICK SNYDER
GOVERNOR

C. HEIDI GRETHER
DIRECTOR

August 3, 2018

VIA E-MAIL

PLAINWELL
211 N MAIN STREET
PLAINWELL, MICHIGAN 49080

WSSN: 5380

Dear Water Supply Owner/Operator:

SUBJECT: PLAINWELL
Per- and Polyfluoroalkyl Substances (PFAS)

As you may be aware, the Michigan PFAS Action Response Team (MPART) has undertaken a proactive effort to investigate sources and locations of PFAS contamination in Michigan, to protect our drinking water, and to inform the public about PFAS. This involves the work of ten state departments, in coordination with local and federal officials.

One vital piece of this effort is the ongoing collaboration between the Michigan Department of Environmental Quality (MDEQ) and our water supply partners. It is through your generous participation that we are able to set and achieve our goal: to proactively test all community water supplies and schools that are classified as non-transient non-community water supplies for PFAS contamination. Once complete, this study will be an invaluable tool in determining the extent of PFAS in Michigan's drinking water, and empowering the MPART in the pursuit of their mission. We thank you for your continuing partnership, collaboration, and dedication to the residents of our great state.

This letter is intended to provide the results of PFAS analyses in samples collected from the PLAINWELL, WSSN # 5380(water supply) on the date(s) indicated below.

The table below summarizes the sampling results. A copy of the laboratory report is enclosed for your review. The analyses of these samples reported less than or equal to 70 parts per trillion (ppt), but greater than or equal to 10 ppt for either perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) and/or total tested PFAS.

Date Collected	Sampling Location	PFOS + PFOA (ppt)	LHA (ppt) PFOS + PFOA	Total Tested PFAS (ppt)
4/26/2018	SS047	ND	70	ND
4/26/2018	TP005	23	70	54

ND – The parameter was not detected based on the laboratory's analytical report.
See Official lab results for test method used.

Currently, there is no regulatory drinking water standard for any of the PFAS chemicals. However, in May 2016, the United States Environmental Protection Agency (USEPA) established a non-regulatory Lifetime Health Advisory (LHA) for two of these chemicals, PFOS and PFOA. The LHA for PFOS and PFOA is 70 ppt combined, or individually if only one of them is present. The USEPA recommends that this LHA applies to both short-term (i.e., weeks to months) scenarios during pregnancy and lactation, as well as to lifetime-exposure scenarios. The LHA is the level, or amount, below which no harm is expected from these chemicals. The Michigan Department of Health and Human Services (MDHHS), as well as the MDEQ, have used this LHA of 70 ppt to inform decisions on actions that should be taken or are recommended to reduce exposure and prevent increased risk to public health from these PFAS contaminants. The USEPA has not set health advisory levels for the other PFAS compounds because not enough is known about them.

Your water supply may have returned results greater than non-detect (ND) for the total amount of PFAS analytes tested. Neither the MDEQ nor the USEPA have any guidance values for these other analytes at this time. If additional guidance and/or comparison values are developed for PFOS, PFOA, or other PFAS chemicals in the future, we may reevaluate this water supply.

According to the Agency for Toxic Substances and Disease Registry (ATSDR), some, but not all, studies in humans with drinking water levels well above the LHA for extended periods of time have shown that certain PFAS may: affect the developing fetus and child including possible changes in growth, learning, and behavior; decrease fertility; interfere with the body's natural hormones; increase cholesterol; affect the immune system; and increase cancer risk. For more information about PFAS-related health effects, visit www.atsdr.cdc.gov/pfas.

The concentrations of PFOS and PFOA in these samples are below the USEPA LHA of 70 ppt. Should information become available which would indicate that they could potentially exceed the LHA, we provide the following recommendations:

1. Inform the public of these sample results through posting on your website or other means. The MDEQ, in collaboration with the MDHHS, has developed a toolkit containing communication templates to help notify the consumers of your water supply on the presence of PFAS in the drinking water and the response measures that are being initiated. This is a resource available to you if you choose and can be modified to fit your needs. The toolkit is available at www.michigan.gov/pfasresponse and click on "visit news and education."

2. Investigate potential sources of PFAS in your watershed and initiate steps to remove any identified source, if possible.

3. Evaluate options to modify operations to reduce PFAS in the water supply should levels approach the existing LHA. For example, this could be accomplished by minimizing use of wells with elevated PFAS levels, or through the installation of treatment technology capable of reducing PFAS prior to distribution.

4. Within one month, collect and analyze a confirmation sample, unless the system is already on routine monitoring for PFAS or you have obtained verified sample results within the last six months. Depending on the level of the initial results, you may want to expedite the confirmation sample. The MDEQ requests you report your confirmation sample results to the email or address listed below.

5. Continue monitoring for PFAS on a quarterly basis to demonstrate the concentrations of PFAS are consistently and reliably below any existing LHA. Typically, four quarterly samples have been sufficient for making this determination, at which time the monitoring may become less frequent.

We look forward to working with your water supply to address this issue, inform your customers, and evaluate solutions to this challenge. These recommendations are based on the best available and most current information and may change depending on additional information related to site conditions; the availability of new data; or other new information as it becomes available. We may recommend further action at that time.

As part of the MDEQ's proactive statewide sampling initiative, the results of this sampling will be posted online on the MPART website within two weeks of this notification. The results can be found online by going to the MPART website address listed below, and by clicking on "Michigan PFAS Sites," and scrolling down and selecting "Public Water Supply Information." We recommend you inform your consumers as soon as possible. If you need assistance, please contact me.

For information on PFOS, PFOA, and other PFAS, including possible health outcomes, you may visit these websites:

- **State of Michigan PFAS Action Response Team** (MPART) website serving as the main resource for public information on PFAS contamination in Michigan: www.michigan.gov/pfasresponse
- **United States Environmental Protection Agency** (USEPA) website including basic information, USEPA actions, and links to informational resources: www.epa.gov/pfas
- **Agency for Toxic Substances and Disease Registry** (ATSDR) website including health information, exposure, and links to additional resources: www.atsdr.cdc.gov/pfas

Thank you once again for your continued collaboration with this investigation. The ongoing partnership between the MDEQ and Michigan's public water supplies plays an integral role in the state's continued efforts to ascertain and address the incidence of PFAS in drinking water for Michiganders.

If you have any questions concerning this sampling, please contact me at the telephone number below; by email at DEQ-PFAS-DrinkingWater@michigan.gov; or by mail at DEQ-DWMAD, P.O. Box 30817, Lansing, Michigan 48909-8311.

Sincerely,

Lois Elliott Graham

Lois Elliott Graham, R.S., M.S.A.
Drinking Water and Municipal Assistance Division
810-730-8674

Enclosure

cc: Mr. Randy Rapp, Allegan County Health Department
Mr. Steven Crider, Supervisor, Drinking Water Unit, MDHHS
Ms. Heather Bishop, MDEQ

August 03, 2018

Vista Work Order No. 1800788

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

Dear Ms. Murshak,

Enclosed are the amended results for the sample set received at Vista Analytical Laboratory on April 27, 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

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. 1800788
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. This report has been re-issued following the reporting conventions specified by the Michigan Department of Environmental Quality.

Analytical Notes:

EPA Method 537, Rev. 1.1

Sample "GW1804261155GSC" contained particulate and was centrifuged prior to extraction.

The samples were extracted and analyzed for a selected list of PFAS using EPA Method 537, Rev. 1.1.

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 Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank above 1/2 the LOQ. The LFB recoveries were within the method acceptance criteria.

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

TABLE OF CONTENTS

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1800788-01	GW1804261130GSC	26-Apr-18 11:30	27-Apr-18 09:33	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800788-02	GW1804261155GSC	26-Apr-18 11:55	27-Apr-18 09:33	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

Vista Project: 1800788

Client Project: MDEQ STATE MUNICIPAL SAMPLING

ANALYTICAL RESULTS

Sample ID: LRB **EPA Method 537**

Client Data				Laboratory Data			
Name:	Merit Laboratories, Inc.	Matrix:	Aqueous	Lab Sample:	B8E0049-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		B8E0049	08-May-18	0.25 L	22-May-18 17:01	1
PFHxA	307-24-4	ND	2		B8E0049	08-May-18	0.25 L	22-May-18 17:01	1
PFHpA	375-85-9	ND	2		B8E0049	08-May-18	0.25 L	22-May-18 17:01	1
PFHxS	355-46-4	ND	2		B8E0049	08-May-18	0.25 L	22-May-18 17:01	1
PFOA	335-67-1	ND	4		B8E0049	08-May-18	0.25 L	22-May-18 17:01	1
PFNA	375-95-1	ND	2		B8E0049	08-May-18	0.25 L	22-May-18 17:01	1
PFOS	1763-23-1	ND	2		B8E0049	08-May-18	0.25 L	22-May-18 17:01	1
PFDA	335-76-2	ND	2		B8E0049	08-May-18	0.25 L	22-May-18 17:01	1
MeFOSAA	2355-31-9	ND	4		B8E0049	08-May-18	0.25 L	22-May-18 17:01	1
EtFOSAA	2991-50-6	ND	4		B8E0049	08-May-18	0.25 L	22-May-18 17:01	1
PFUnA	2058-94-8	ND	4		B8E0049	08-May-18	0.25 L	22-May-18 17:01	1
PFDoA	307-55-1	ND	4		B8E0049	08-May-18	0.25 L	22-May-18 17:01	1
PFTrDA	72629-94-8	ND	4		B8E0049	08-May-18	0.25 L	22-May-18 17:01	1
PFTeDA	376-06-7	ND	4		B8E0049	08-May-18	0.25 L	22-May-18 17:01	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	95	70 - 130		B8E0049	08-May-18	0.25 L	22-May-18 17:01	1
13C2-PFDA	SURR	96	70 - 130		B8E0049	08-May-18	0.25 L	22-May-18 17:01	1
d5-EtFOSAA	SURR	87	70 - 130		B8E0049	08-May-18	0.25 L	22-May-18 17:01	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: LFBD **EPA Method 537**

Name:	Merit Laboratories, Inc.	Lab Sample:	B8E0049-BS1/B8E0049-BSD1
Project:	MDEQ STATE MUNICIPAL SAMPLING	QC Batch:	B8E0049
Matrix:	Aqueous	Samp Size:	0.25/0.25 L
		Date Extracted:	08-May-18
		Column:	BEH C18

Analyte	CAS Number	LFB (ng/L)	LFB Spike Amt	LFB % Rec	LFB Quals	LFBD (ng/L)	LFBD Spike Amt	LFBD % Rec	RPD	LFBD Quals	%Rec Limits	RPD Limits	LFB Analyzed	LFB Dil	LFBD Analyzed	LFBD Dil
PFBS	375-73-5	74	71	105		75	71	106	1		70-130		22-May-18 16:35	1	22-May-18 16:48	1
PFHxA	307-24-4	93	80	117		86	80	108	8		70-130		22-May-18 16:35	1	22-May-18 16:48	1
PFHpA	375-85-9	85	80	106		90	80	113	6		70-130		22-May-18 16:35	1	22-May-18 16:48	1
PFHxS	355-46-4	73	73	100		72	73	99	1		70-130		22-May-18 16:35	1	22-May-18 16:48	1
PFOA	335-67-1	88	80	110		89	80	111	1		70-130		22-May-18 16:35	1	22-May-18 16:48	1
PFNA	375-95-1	93	80	116		88	80	110	5		70-130		22-May-18 16:35	1	22-May-18 16:48	1
PFOS	1763-23-1	73	74	99		70	74	94	5		70-130		22-May-18 16:35	1	22-May-18 16:48	1
PFDA	335-76-2	90	80	113		87	80	109	3		70-130		22-May-18 16:35	1	22-May-18 16:48	1
MeFOSAA	2355-31-9	64	80	80		71	80	89	11		70-130		22-May-18 16:35	1	22-May-18 16:48	1
EtFOSAA	2991-50-6	67	80	84		82	80	102	19		70-130		22-May-18 16:35	1	22-May-18 16:48	1
PFUnA	2058-94-8	88	80	110		83	80	104	6		70-130		22-May-18 16:35	1	22-May-18 16:48	1
PFDoA	307-55-1	81	80	101		79	80	98	3		70-130		22-May-18 16:35	1	22-May-18 16:48	1
PFTrDA	72629-94-8	81	80	102		75	80	94	8		70-130		22-May-18 16:35	1	22-May-18 16:48	1
PFTeDA	376-06-7	79	80	99		76	80	95	4		70-130		22-May-18 16:35	1	22-May-18 16:48	1

Labeled Standards	Type	LFB % Rec	LFB Quals	LFBD % Rec	LFBD Quals	Limits	LFB Analyzed	LFB Dil	LFBD Analyzed	LFBD Dil
13C2-PFHxA	SURR	107		104		70-130	22-May-18 16:35	1	22-May-18 16:48	1
13C2-PFDA	SURR	99		92		70-130	22-May-18 16:35	1	22-May-18 16:48	1
d5-EtFOSAA	SURR	91		99		70-130	22-May-18 16:35	1	22-May-18 16:48	1

Data Reported per Michigan DEQ instructions.

Vista Analytical Laboratory

Sample ID: GW1804261130GSC — **EPA Method 537**

Client Data				Laboratory Data			
Name:	Merit Laboratories, Inc.	Matrix:	Drinking Water	Lab Sample:	1800788-01	Column:	BEH C18
Project:	MDEQ STATE MUNICIPAL SAMPLING	Date Collected:	26-Apr-18 11:30	Date Received:	27-Apr-18 09:33		
Location:	PLAINW05380SS047						

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2		B8E0049	08-May-18	0.26 L	22-May-18 19:47	1
PFHxA	307-24-4	ND	2		B8E0049	08-May-18	0.26 L	22-May-18 19:47	1
PFHpA	375-85-9	ND	2		B8E0049	08-May-18	0.26 L	22-May-18 19:47	1
PFHxS	355-46-4	ND	2		B8E0049	08-May-18	0.26 L	22-May-18 19:47	1
PFOA	335-67-1	ND	4		B8E0049	08-May-18	0.26 L	22-May-18 19:47	1
PFNA	375-95-1	ND	2		B8E0049	08-May-18	0.26 L	22-May-18 19:47	1
PFOS	1763-23-1	ND	2		B8E0049	08-May-18	0.26 L	22-May-18 19:47	1
PFDA	335-76-2	ND	2		B8E0049	08-May-18	0.26 L	22-May-18 19:47	1
MeFOSAA	2355-31-9	ND	4		B8E0049	08-May-18	0.26 L	22-May-18 19:47	1
EtFOSAA	2991-50-6	ND	4		B8E0049	08-May-18	0.26 L	22-May-18 19:47	1
PFUnA	2058-94-8	ND	4		B8E0049	08-May-18	0.26 L	22-May-18 19:47	1
PFDoA	307-55-1	ND	4		B8E0049	08-May-18	0.26 L	22-May-18 19:47	1
PFTrDA	72629-94-8	ND	4		B8E0049	08-May-18	0.26 L	22-May-18 19:47	1
PFTeDA	376-06-7	ND	4		B8E0049	08-May-18	0.26 L	22-May-18 19:47	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	100	70 - 130		B8E0049	08-May-18	0.26 L	22-May-18 19:47	1
13C2-PFDA	SURR	104	70 - 130		B8E0049	08-May-18	0.26 L	22-May-18 19:47	1
d5-EtFOSAA	SURR	105	70 - 130		B8E0049	08-May-18	0.26 L	22-May-18 19:47	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.

Sample ID: GW1804261155GSC — **EPA Method 537**

Client Data				Laboratory Data			
Name:	Merit Laboratories, Inc.	Matrix:	Drinking Water	Lab Sample:	1800788-02	Column:	BEH C18
Project:	MDEQ STATE MUNICIPAL SAMPLING	Date Collected:	26-Apr-18 11:55	Date Received:	27-Apr-18 09:33		
Location:	PLAINW05380TP005						

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	19	2		B8E0049	08-May-18	0.25 L	22-May-18 20:00	1
PFHxA	307-24-4	2	2		B8E0049	08-May-18	0.25 L	22-May-18 20:00	1
PFHpA	375-85-9	ND	2		B8E0049	08-May-18	0.25 L	22-May-18 20:00	1
PFHxS	355-46-4	10	2		B8E0049	08-May-18	0.25 L	22-May-18 20:00	1
PFOA	335-67-1	6	4		B8E0049	08-May-18	0.25 L	22-May-18 20:00	1
PFNA	375-95-1	ND	2		B8E0049	08-May-18	0.25 L	22-May-18 20:00	1
PFOS	1763-23-1	17	2		B8E0049	08-May-18	0.25 L	22-May-18 20:00	1
PFDA	335-76-2	ND	2		B8E0049	08-May-18	0.25 L	22-May-18 20:00	1
MeFOSAA	2355-31-9	ND	4		B8E0049	08-May-18	0.25 L	22-May-18 20:00	1
EtFOSAA	2991-50-6	ND	4		B8E0049	08-May-18	0.25 L	22-May-18 20:00	1
PFUnA	2058-94-8	ND	4		B8E0049	08-May-18	0.25 L	22-May-18 20:00	1
PFDoA	307-55-1	ND	4		B8E0049	08-May-18	0.25 L	22-May-18 20:00	1
PFTrDA	72629-94-8	ND	4		B8E0049	08-May-18	0.25 L	22-May-18 20:00	1
PFTeDA	376-06-7	ND	4		B8E0049	08-May-18	0.25 L	22-May-18 20:00	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	101	70 - 130		B8E0049	08-May-18	0.25 L	22-May-18 20:00	1
13C2-PFDA	SURR	98	70 - 130		B8E0049	08-May-18	0.25 L	22-May-18 20:00	1
d5-EtFOSAA	SURR	79	70 - 130		B8E0049	08-May-18	0.25 L	22-May-18 20:00	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
	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.

1 of 1

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1800788 Temp: 2.3 °C
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: MDEQ STATE MINICIPAL SAMPLING PO#: 60570309 Sampler: GARTH COUSINEAU (name)

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

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

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
Garth Cousineau	4/26/18	1700	Bethna Benedict	04/27/18	1039
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
(916) 673-1520 * Fax (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment:

Tracking No.:

Add Analysis(es) Requested

Container(s): Quantity, Type, Matrix

Mod. EPA Method 537: PFOA/PFOS; UCMR3 PFAS Listed; 537 List: 14; Full List of 26; Other: Please List Below; Branch and Linear

EPA Method 537(DW only): PFOA/PFOS; UCMR3 PFAS Listed; PFAS List: 14

Sample ID	Date	Time	Location/Sample Description	Comments
GW1804261130GSC	4/26/18	1130	PLAINW05380SS047	X Trizma
GW1804261155GSC	4/26/18	1155	PLAINW05380TP005	X Trizma

Special Instructions/Comments: Send Results and Acknowledgements to:

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: JURYM1@MICHIGAN.GOV

Container Types: P= HDPE, PJ= HDPE Jar, O = Other: P

Bottle Preservation Type: T = Thiosulfate, TZ = Trizma: TZ

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: DW

Vista Analytical Laboratory

Sample Log-in Checklist

Vista Work Order #: ~~1800773~~ 1800788 KE 04/27/18 **TAT** STD

Samples Arrival:	**Date/Time** 04/27/18 0933			**Initials:** JBLB		**Location:** WR-2 **Shelf/Rack:** NA	
Logged In:	**Date/Time** 04/27/18 ~~1401~~ 1549 KE 04/27/18			**Initials:** KE JBLB		**Location:** WR-2 **Shelf/Rack:** E4	
Delivered By:	(FedEx)	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	(Ice)		Blue Ice		Dry Ice		None
Temp °C: 2.4 (uncorrected)			**Time:** 1034			**Thermometer ID:** IR-4	
Temp °C: 2.3 (corrected)			**Probe used:** Yes ☐ No ☑				

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?			✓
Shipping Documentation Present?	✓		
Airbill Trk # 4377 0628 1693	✓		
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present?	✓		
COC Anomaly/Sample Acceptance Form completed?		✓	✓
If Chlorinated or Drinking Water Samples, Acceptable Preservation?	✓		

Preservation Documented:	$Na_2S_2O_3$	(Trizma)	None	(Yes)	No	NA
Shipping Container	(Vista)	Client	Retain	Return	Dispose	

Comments: