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Auditor General

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January 15, 2019

The Honorable Christine Greig, House Democratic Leader  
and

The Honorable Winnie Brinks	The Honorable Vanessa Guerra	The Honorable Sylvia Santana
The Honorable Kevin Hertel	The Honorable Abdullah Hammoud	The Honorable Tim Sneller
The Honorable Wendell L. Byrd	The Honorable Jewell Jones	The Honorable William J. Sowerby
The Honorable Darrin Camilleri	The Honorable David LaGrand	The Honorable Robert Wittenberg
The Honorable Stephanie Chang	The Honorable Donna Lasinski	The Honorable Tenisha Yancey
The Honorable John Chirkun	The Honorable Frank Liberati	The Honorable Ronnie D. Peterson
The Honorable Cara A. Clemente	The Honorable Leslie Love	The Honorable Jon Hoadley
The Honorable Brian K. Elder	The Honorable Jeremy Moss	The Honorable Sara Cambensy
The Honorable Jim Ellison	The Honorable Kristy Pagan	The Honorable Sheldon Neeley
The Honorable Sherry Gay-Dagnogo	The Honorable Yousef Rabhi	
The Honorable Erika Geiss	The Honorable Terry J. Sabo	

Dear Representative Greig and Caucus Members:

Enclosed is background information regarding the Department of Environmental Quality's (DEQ's) per- and polyfluoroalkyl substances (PFAS) related activities and answers to the six questions posed in the October 2, 2018 letter to our office from then House Democratic Leader Sam Singh and Democratic Caucus members.

The six questions involved DEQ's response to the potential dangers of PFAS and, specifically, to the 2012 report entitled "Michigan's Contaminant Induced Human Health Crisis, Addressing Michigan's Future By Facing the Challenge of the Evolving Nature of Environmental Contamination."

Also enclosed are two exhibits:

- DEQ's June 2018 Responses to the 2012 Report Recommendations and Office of the Auditor General (OAG) Comments
- Time Line of PFAS Events

Consistent with our standard practice, we are sending an advance copy of this letter to you as the House Democratic Leader for the 2019-2020 session. We will post it on our publicly accessible Web site in five business days.

We appreciate the opportunity to assist in answering questions regarding this topic, and we will consider environmental contaminants in future audit planning. If you have further questions, please do not hesitate to contact our office.

Sincerely,

Doug Ringler  
Auditor General

Enclosures

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### **Background Information Regarding DEQ's PFAS Related Activities:**

DEQ executive management was aware of PFAS prior to the 2012 report entitled "Michigan's Contaminant Induced Human Health Crisis, Addressing Michigan's Future By Facing the Challenge of the Evolving Nature of Environmental Contamination" (2012 report). There had been some level of testing at the former Wurtsmith Air Force Base (WAFB) and discussion within DEQ concerning the potential risks of PFAS dating back to at least 2010.

In February 2011, DEQ staff conducting tests at WAFB made a presentation to DEQ's longstanding Toxics Steering Group (TSG) regarding test results that showed the presence of PFAS. DEQ executive management subsequently directed the TSG to provide recommendations to management for assessing the status of PFAS in Michigan's environment. The TSG was composed of toxicologists and other staff from DEQ, the Michigan Department of Health and Human Services (MDHHS), and the Michigan Department of Agriculture and Rural Development (MDARD) and provided a forum for the discussion of human health and risk assessment issues related to exposure to chemical contaminants in the environment.

The TSG formed the Perfluorinated Compounds Workgroup (PFCW) from cross-departmental staff, and included the DEQ staff person who would eventually coauthor the 2012 report along with Dr. Richard DeGrandchamp from the University of Colorado. The PFCW submitted a white paper entitled "Perfluorinated Compounds in Michigan, Current State of Knowledge and Recommendations for Future Actions" to DEQ executive management in September 2011, which included several recommendations related to PFAS, and published an addendum to this white paper in August 2017. The PFCW indicated that the 2017 addendum's primary focus was to provide DEQ, MDHHS, and MDARD management with the latest science on the toxicity and sources of PFAS in the environment, an update on Michigan state agency activities that have occurred, new environmental data collected since completion of the 2011 white paper, and recommendations for future PFAS related activities. The August 2017 addendum can be found at: [michigan.gov/documents/deq/deq-aqd-tox\\_pfas\\_white\\_paper\\_addendum\\_final\\_612789\\_7.pdf](http://michigan.gov/documents/deq/deq-aqd-tox_pfas_white_paper_addendum_final_612789_7.pdf)

E-mail correspondence indicated that the 2012 report was provided to the former DEQ Director and the former Chief Deputy Director in September 2012. DEQ has experienced nearly complete turnover of its executive management team since 2012, including the director and chief deputy director positions.

Although the DEQ executive management staff we met with in October and November 2018 indicated that PFAS related activities were occurring in their divisions, they did not learn of the 2012 report until after it was the subject of a radio broadcast in October 2017, and none of them had read the report. Although DEQ had ongoing PFAS related activity dating back to at least 2010 at WAFB and has steadily expanded testing elsewhere across the State as evidenced in the Time Line of PFAS Events in Exhibit #2, DEQ's actions outside of WAFB appeared largely coincidental to the recommendations in the 2012 report because the 2012 report was not widely reviewed.

In November 2017, Executive Directive No. 2017-4 established a multi-agency action team called the Michigan PFAS Action Response Team (MPART). MPART includes representation from health, environment, and other branches of State government that have joined together to:

- Investigate sources and locations of PFAS contamination in the State.
- Take action to protect people's drinking water.
- Keep the public informed as more is learned about PFAS.

MPART includes considerable representation from DEQ. In January 2018, the PFCW was absorbed into the PFAS Technical Workgroup and became part of MPART.

Opportunity exists for DEQ to adopt a more formal strategic approach concerning its PFAS efforts that includes a protocol for cross-divisional communication and collaboration, the establishment of PFAS related performance metrics, the identification of related resource needs, and periodic communication to all of DEQ executive management regarding the status of DEQ's PFAS efforts and emerging initiatives.

**Following are the six questions (and our corresponding answers) posed within the October 2, 2018 letter to our office:**

**Q1: Why was only one of the recommendations acted upon, and not the others?**

A: Subsequent to the PFCW's 2017 addendum to the 2011 white paper referenced above, DEQ took a retroactive look at how its activities concerning PFAS had addressed the recommendations in the 2012 report. DEQ indicated in June 2018 that it had addressed seven recommendations and determined that seven others were outside of its responsibility or ability to fulfill. DEQ indicated that it did not address one recommendation from the 2012 report.

We documented DEQ's responses to the recommendations, and our comments to those responses, in Exhibit #1.

**Q2: The report recommends that several other state departments be contacted and briefed on PFAS, were these departments contacted by the DEQ?**

A: DEQ communicated with other state departments concerning PFAS prior to and after the 2012 report.

**Q3: Following the report, how did the DEQ make its determination regarding the potential dangers of PFAS?**

A: It did not appear that DEQ had made a final determination of the potential dangers of PFAS. Scientific evaluation of the potential risks associated with PFAS is ongoing on both a statewide and national basis.

**Q4: What further inquiries and study did the DEQ perform to determine the potential risks of PFAS? What actions did the DEQ take in regards to PFAS after the report?**

A: Although DEQ had ongoing PFAS related activity dating back to at least 2010 at WAFB and has steadily expanded testing elsewhere across the State as evidenced in the Time Line of PFAS Events in Exhibit #2, DEQ's actions outside of WAFB appeared largely coincidental to the recommendations in the 2012 report because the 2012 report was not widely reviewed.

**Q5: How and why was the determination made to not inform the public of the potential dangers of PFAS statewide?**

A: DEQ's policy regarding public involvement in department programs and activities requires that its decisions be transparent, explainable, and based on the technical merits of criteria established by law.

Neither DEQ nor the U.S. Environmental Protection Agency (EPA) had made a final determination of the potential dangers of PFAS in 2012. Scientific evaluation of the potential health risks associated with PFAS is ongoing on both a statewide and national basis.

In addition, the MDHHS worked with local health departments to issue public health notices that included consumption advisories for fish and deer in areas surrounding Clark's Marsh, as well as foam advisories related to PFAS accumulation on lakes and rivers, based on testing performed by DEQ.

**Q6: Finally, in 2014 the Environmental Protection Agency (EPA) required that the Ann Arbor Municipal Water Treatment Plant test for PFAS. On March 5, 2014, PFOS was detected in a drinking water sample at 43 parts per trillion (PPT). Did the detection of PFOS cause the DEQ to reevaluate the risks of PFAS? Did the DEQ revisit and reconsider the 2012 report?**

A: The City of Ann Arbor tested its Water Treatment Plant in March 2014 as required by the EPA under the Third Unregulated Contaminant Monitoring Rule (UCMR 3). UCMR 3 required testing of all public water systems serving over 10,000 people, a sample of systems serving fewer than 10,000 people, and select systems serving fewer than 1,000 people. These systems were tested for 30 contaminants, including perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), and four other perfluorinated compounds (PFCs). Approximately 200 local municipalities in Michigan tested their public water systems between 2013 and 2015. DEQ had access to these test results through the National Contaminant Occurrence Database.

DEQ had ongoing PFAS related activity dating back to at least 2010; however, DEQ's actions appeared largely coincidental to the recommendations in the 2012 report.



No.	2012 Recommendations as Summarized by DEQ	DEQ June 2018 Response	OAG Comments
1.	<p>Convince upper management of the MDEQ (and eventually MDCH*, MDNR, and MDARD) that there is a statewide health crisis occurring with regard to increases in the autoimmune and neurological disorders.</p>	<p>The DEQ continues to recognize the severity and need to address PFAS. To provide an effective and efficient response to the emerging contaminant, on November 13, 2017, the Governor issued Executive Directive 2017-4 that created the Michigan PFAS Action Response Team (MPART). MPART is the first in the nation multi-agency team charged with researching, identifying, educating, and mitigating PFAS contamination throughout the State in conjunction with local and federal agencies. Based on the work performed by MPART, Michigan is considered a leader in the quantification of, and response to, PFAS contamination.</p>	<p>*Executive Order No. 2015-4, effective April 10, 2015, created the Michigan Department of Health and Human Services and abolished the Michigan Department of Human Services and Michigan Department of Community Health (MDCH).</p>
2.	<p>The Director of MDEQ and key upper level managers receive a briefing from the three following people: Dr. Richard DeGrandchamp (University of Colorado), Dr. John Meeker (University of Michigan), Dr. Deb MacKenzie-Taylor (MDEQ).</p>	<p>The Director and MPART Director have continuously consulted with leading experts of PFAS in both government and academia.</p>	<p>No comments.</p>
3.	<p>A 'blue ribbon' focus group should be formed from academia and the departments to review the situation, create white papers estimating the risks, the data gaps, needed studies, cost/benefit analysis of regulatory actions, adequacy of the existing laws, process to deal with the situation, and propose appropriate risk reduction measures that could be implemented.</p> <p>List of suggested participants: Amy Babcock (MDEQ), Dr. Niladri Basu (UM), John Buchweitz (MDARD), Christina Bush (MDCH), Dr. George Corcoran (WSU), Dr. Richard DeGrandchamp (University of Colorado – Denver), + 13 others.</p>	<p>As noted, the Executive Directive launched a statewide effort by creating MPART, which includes a Scientific Advisory Board and Local Public Health Board, along with Multi-Agency PFAS Technical Work Groups, to formulate and implement the State's response to PFAS contamination.</p>	<p>The PFCW existed before and after the 2012 report and performed some of the functions specified in the recommendation; however, its composition did not include academia.</p>
4.	<p>Funding additional dose response studies on PFOS, PFOA, and other PFCs that are found in common contaminant mixtures and exploring the differences in toxicity of PFCs between humans and lower species.</p>	<p>While it would support funding for such studies, along with any other that help develop an understanding [of] the issues surrounding PFCs, the DEQ has not initiated it since it is beyond the agency's authority.</p>	<p>No comments.</p>

No.	2012 Recommendations as Summarized by DEQ	DEQ June 2018 Response	OAG Comments
5.	Order a thorough review of the results of the C8 study*.	Such a review, if warranted, would most likely be undertaken by MDHHS; DEQ could lend support.	*C8 is a name given to PFOA. The C8 study refers to the C8 Health Project that resulted from a 2005 class action settlement with DuPont in Wood County West Virginia. A science panel consisting of three epidemiologists studied PFOA exposure and human disease in the affected communities between 2005 and 2013 and concluded that there were probable links to six disease categories.
6.	Sample blood serum, hair, and/or fingernails of the people from across the state for PFC contamination (the same can be done for other suspect chemicals). Map the findings and figure out where our biggest problems are.	This is a large-scale health study and is not within DEQ's authority.	In March 2018, MPART created the PFAS Scientific Advisory Panel, composed of six scientists from across Michigan and the United States, to assess data on potential PFAS contamination to further protect public health and the environment. On December 7, 2018, this panel issued the "Scientific Evidence and Recommendations for Managing PFAS Contamination in Michigan" report that included similar recommendations for Michigan to conduct biomonitoring of blood PFAS levels where high levels of PFAS contamination are detected at sources of drinking water.
7.	Umbilical cord blood should also be monitored across the state for contaminants.	Health studies are not within the DEQ's authority.	No comments.

No.	2012 Recommendations as Summarized by DEQ	DEQ June 2018 Response	OAG Comments
8.	Check our food supply for contaminants.	The DEQ does not regulate food supplies. However, the Department of Agriculture and Rural Development, which is responsible for food safety, is a member of MPART.	The TSG included representation from MDARD, as did the PFCW subcommittee.  The PFAS Scientific Advisory Panel's December 2018 report contained similar recommendations regarding the testing of food supplies.
9.	Toxicity testing on PFCs and PFC telomers*.	The DEQ does not have facilities to conduct toxicity testing; we rely upon published studies in general.	The PFAS Scientific Advisory Panel's December 2018 report contained similar recommendations regarding the testing of toxicity levels.  *The scientific term "telomer" refers to extremely small polymers.
10.	The Director could contact high level Air Force Staff [at] the Secretariat level through the Environmental Council of [the] State[s], and discuss the need for collaboration on the investigations at the former WAFB.	The DEQ and MPART continue to work with the Department of Defense, Air Force and federal elected officials to address contamination in and around military facilities throughout the State. Through the dispute resolution process with the Air Force steps are being taken to expand the investigation and remediation efforts at WAFB.	No comments.
11.	Water testing of private wells and municipal wells could be done around the state for PFC analysis.	If there is a suspicion of a PFAS contamination in a community, the DEQ collects water samples to determine if it has reached private water wells. If warranted, the DEQ works with DHHS and the local health department to make public health recommendations about drinking water.  A comprehensive state-wide testing program for all community drinking water supplies, including schools with well systems, is on-going and expected to be completed by the end of 2018. In addition, specific sites of concern are being tested, with response plans developed as warranted by the results. These efforts are funded through the \$23.2 million funding for PFAS in the FY 18 Supplemental.	No comments.

No.	2012 Recommendations as Summarized by DEQ	DEQ June 2018 Response	OAG Comments
12.	A general statewide investigation of the levels of contamination in streams, lakes, sediment, and biota would help pin point areas of concern to be further investigated.	The Water Resource Division (WRD) in cooperation with DHHS conducted a statewide reconnaissance survey in 2013 and 2014 of PFAS concentrations in Michigan waters. During the survey water and fish were sampled at a subset of sites that had been sampled in 2001, along with several Great Lakes fish populations. A report of the results of this survey is available. Results of the survey were also used to conduct follow up monitoring in 2016 and 2017 in waters having elevated concentrations of PFAS to learn more about the extent of the contamination and possible sources.	No comments.
13.	The state could direct and fund an effort to analyze consumer products for PFCs and other potential contaminants.	This is not within the DEQ's authority.	No comments.
14.	An annual conference of health advocacy groups, academia, social welfare, and environmental advocacy groups could be organized to discuss the impacts of environmental contaminants on human health and the environment.	The DEQ has initiated and participated in several national conversations about PFAS, including the recent EPA National Summit. The DHHS is leading an effort to share information about PFAS to the health community.	No comments.
15.	Michigan should become a member state in the Center for Disease Control's Autism and Developmental Disabilities Network.	The DEQ has not sought membership.	No comments.





Note: We identified the following events from various information put together by DEQ and/or MPART and from DEQ internal e-mail communications that we reviewed. This listing is not intended to capture all of DEQ's activities concerning PFAS, but rather it demonstrates the history of PFAS awareness within DEQ and examples of the expansion of DEQ's PFAS related activities since 2010.

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### 2001

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- DEQ's Water Resources Division (WRD) expanded its regular statewide monitoring of Michigan lakes and streams to include PFAS by sampling rivers in different parts of the State for the presence of PFOA and PFOS. DEQ collected samples for a researcher developing an analytical method for PFAS.

The sampling in Michigan found varying concentrations of PFOS and PFOA but indicated that the levels were not at concentrations of concern based on the knowledge available in 2001.

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### 2009

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- The EPA established provisional health advisories (HAs) for PFOA at 400,000 parts per trillion (ppt) and for PFOS at 200,000 ppt. The EPA reported at that time that epidemiological studies of exposure to PFOA and PFOS and potential adverse health outcomes in humans were inconclusive.
- DEQ asked the U.S. Air Force to sample for PFOS and PFOA at WAFB.

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### 2010

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- DEQ staff took first samples of soil for PFOS and PFOA analysis at WAFB.
- A DEQ toxicologist developed preliminary values for PFOS and PFOA for inclusion in draft Part 201 cleanup criteria rules.
- DEQ collected first samples from groundwater discharging into Clark's Marsh.

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### 2011

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- The DEQ employee who later coauthored the 2012 report presented background information and a case study on PFCs related to groundwater and soil detections during remedial activities at WAFB to DEQ's TSG. DEQ executive management tasked the TSG to provide recommendations that assessed the status of PFCs in the Michigan environment to be ". . . used by . . . management to prioritize efforts to conduct limited field investigations in summer 2011, as permitted by departmental budget allowances."
- The TSG established a PFC workgroup (PFCW).

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**2011, continued**

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- DEQ's WRD derived Rule 57, Water Quality Values for PFOA.
- DEQ staff collected fish from the three ponds of Clark's Marsh near WAFB.
- The PFCW submitted a white paper entitled "Perfluorinated Compounds in Michigan, Current State of Knowledge and Recommendations for Future Actions" to DEQ executive management. Recommendations included conducting limited air, groundwater, surface water, and wildlife tissue sampling at specified locations across the State to better understand the scope and extent of PFAS in the Michigan environment.
- DEQ sampled two residential wells just off base of WAFB. Test results were below 5 ppt in both wells.

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**2012**

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- The EPA published the Third Unregulated Contaminant Monitoring Rule (UCMR 3), which required local municipalities to monitor 30 contaminants, including PFOA and PFOS in public water systems. The EPA used the UCMR 3 program to collect data for unregulated contaminants suspected to be present in drinking water that did not have health-based standards established under the Safe Drinking Water Act.
- Approximately 200 local municipalities in Michigan tested their public water systems between 2013 and 2015. DEQ had access to these test results through the National Contaminant Occurrence Database.
- DEQ obtained results from the testing of Clark's Marsh fish, and MDHHS issued fish consumption advisories for Clark's Marsh and parts of the Au Sable River.
- A DEQ employee coauthored the report entitled "Michigan's Contaminant Induced Human Health Crisis, Addressing Michigan's Future By Facing the Challenge of the Evolving Nature of Environmental Contamination."

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**2013**

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- MDHHS posted fish consumption advisory signs at 20 locations along the Au Sable River, at Clark's Marsh, and at Allen Lake.
- DEQ started mapping sample locations at WAFB and related PFAS concentrations and continued to sample groundwater monitoring wells at WAFB.
- DEQ began statewide testing of selected Michigan rivers for PFAS in surface water and fish tissue. This survey extended into June 2014.

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**2013 - 2017**

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- DEQ incorporated PFAS into environmental investigations at locations throughout the State, including military sites with likely aqueous film forming foam usage and industrial sites and sites of other contamination (e.g., State Disposal Superfund site, Adams Plating Superfund site, the Flint River, and other sites).

## 2014

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- The EPA issued draft criteria for PFOA at 20 ppt and for PFOS at 30 ppt.
- UCMR 3 testing results indicated PFOS at 43 ppt in Ann Arbor's municipal water supply.
- DEQ's WRD derived Rule 57, Water Quality Values for PFOS.
- DEQ executive management gave approval to the Remediation and Redevelopment Division (RRD) to develop Part 201 cleanup criteria for PFOS and PFOA.

## 2015

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- DEQ completed its report entitled "Reconnaissance Sampling of Perfluorinated Compounds in Michigan Surface Waters and Fish, 2010 - 2014" (revised in April 2017). DEQ concluded that a more thorough assessment might be warranted to determine whether PFOS is affecting wildlife in the Oscoda area and along the Flint River.

## 2016

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- DEQ's RRD sent a demand letter to the U.S. Air Force regarding remedial actions at WAFB.
- DEQ collected and submitted 2 muskrat samples from Clark's Marsh and Tuttle Marsh for PFAS analysis. Results showed up to levels of 1,750,000 ppt PFOS contamination in the muskrats.
- The EPA issued HAs and Health Effects Support Documents for PFOA and PFOS. The EPA indicated that it did not anticipate concentrations at or below 70 ppt (combined for PFOS and PFOA) would cause adverse health effects.
- DEQ's RRD included PFOS in its "Cleanup Criteria and Screening Levels Development and Application" resource document.
- Public Act 268 of 2016 (Article VII, Part 2, Section 312) required DEQ's RRD to conduct a study on the effects of long-term exposure to perfluorinated compounds and to conduct a workgroup to establish cleanup criteria for perfluorinated compounds under part 201 of the Natural Resources and Environmental Protection Act.

## 2017

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- The DEQ employee who coauthored the 2012 report discussed PFAS and the report on a radio talk show.
- Governor Snyder issued Executive Order No. 2017-4, establishing the Michigan PFAS Action Response Team (MPART).
- DEQ's RRD prepared a revised comprehensive update to Part 201 cleanup criteria rules and published the rules package in the Michigan Register.

## 2018

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- DEQ promulgated a groundwater cleanup standard of 70 ppt for PFOA and PFOS.
- DEQ filed legal action against Wolverine Worldwide, Inc., under the Resource Conservation and Recovery Act (RCRA) and the Natural Resources and Environmental Protection Act (NREPA).
- DEQ began testing for PFAS at Michigan's 1,380 public water systems and some 461 schools that operate their own wells.