Letter Health Consultation

Evaluation of Drinking Water near

WURTSMITH AIR FORCE BASE

OSCODA, IOSCO COUNTY, MICHIGAN

Prepared by
Michigan Department of Community Health

SEPTEMBER 8, 2015

Prepared under a Cooperative Agreement with the
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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LETTER HEALTH CONSULTATION

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Under cooperative agreement with the
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STATE OF MICHIGAN
DEPARTMENT OF COMMUNITY HEALTH
LANSING

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GOVERNOR

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DIRECTOR

January 5, 2015

Robert Delaney, DSMOA Coordinator
Michigan Department of Environmental Quality
Remediation and Redevelopment Division
P.O. Box 30426
Lansing, MI 48909

Dear Mr. Delaney:

This letter is in response to your request that the Michigan Department of Community Health (MDCH) evaluate perfluorinated chemical (PFC) concentrations detected in four residential drinking water well samples taken from the Oscoda area in Iosco County, Michigan. PFC contamination at the former Wurtsmith Air Force Base (WAFB) in Oscoda has impacted on-site soils, groundwater, surface water, and some area fish (MDCH 2012a,b).

I have determined that the concentrations of perfluorobutane sulfonate (PFBS), perfluorobutanoic acid (PFBA), perfluorooctane sulfonate (PFOS), and perfluorooctanoic acid (PFOA) found in the drinking water samples are not expected to cause harm to people drinking that water. This is based on the concentrations of those chemicals being up to three orders of magnitude lower than screening values developed by the Michigan Department of Environmental Quality (MDEQ), the Minnesota Department of Health, or the New Jersey Department of Environmental Protection. **I cannot determine whether the concentrations of other PFCs detected in these samples may cause harm to people drinking the water.**

These findings are limited by the fact that very few PFCs have had chronic toxicity values derived and that there are no federal or Michigan drinking water standards/criteria for the chemicals. These findings are also limited by the fact that heavy PFC contamination of fish exists in the Oscoda area and people may be additionally exposed by eating locally-caught fish (MDCH 2012a,b). The fish contamination issue is being discussed in a separate document (in progress). However, with several routes of exposure to PFCs possible in the Oscoda area, PFCs in drinking water may be a public health concern (MDCH 2014).

The number of and PFC concentration in impacted drinking water wells near WAFB is unknown. It is possible that there are more impacted wells and that PFC concentrations in those wells are higher. **For next steps, I recommend that residential drinking water wells near WAFB be identified and sampled for PFCs.** Owners of affected wells may choose to connect to the municipal water system.

The remainder of this letter details the supporting information for the conclusions above.

Drinking Water Data

The Michigan Department of Environmental Quality (MDEQ) sampled drinking water from four private residential wells and had the samples analyzed for up to 19 PFCs. MDEQ conducted the sampling in 2011 (Well "A"), 2012 (Well "B"), and 2014 (Wells "C" and "D"). The samples were sent to private laboratories for PFC analysis. Table 1 shows the analyte list and those PFCs that were detected.

Table 1. Perfluorinated chemicals (PFCs) tested for in Oscoda-area (Michigan) drinking water samples between 2011 and 2014. PFCs with at least one detection are bolded.

Perfluorobutane sulfonate (PFBS)	Perfluorononanoic acid (PFNA)
Perfluorobutanoic acid (PFBA)	Perfluorooctane sulfonamide (PFOSA)
Perfluorodecane sulfonate (PFDS)[1]	**Perfluorooctane sulfonate (PFOS)**
Perfluorodecanoic acid (PFDA)	**Perfluorooctanedecanoic acid (PFODA)[1]**
Perfluorododecanoic acid (PFDoA)	**Perfluorooctanoic acid (PFOA)**
Perfluoroheptane sulfonate (PFHpS)[1]	**Perfluoropentanoic acid (PFPeA)**
Perfluoroheptanoic acid (PFHpA)	Perfluorotetradecanoic acid (PFTeA)[1]
Perfluorohexadecanoic acid (PFHxDA)[1]	Perfluorotridecanoic acid (PFTriA)[1]
Perfluorohexane sulfonate (PFHxS)	Perfluoroundecanoic acid (PFUnA)
Perfluorohexanoic acid (PFHxA)	

[1]The laboratory analyzing sample B did not test for this chemical. A different laboratory analyzed samples A, C, and D, and tested for all the chemicals listed.

The state of Michigan does not have promulgated Drinking Water Criteria for PFCs at this time. However, the MDEQ Water Resources Division has calculated drinking water values for PFOS in groundwater, so I have compared the analytical results for PFOS to that. I also compared the concentrations of PFBS, PFBA, PFOS, and PFOA to Health Risk Limits published by the Minnesota Department of Health and guidance levels established by the state of New Jersey (PFOA only). Please see Table 2 for the comparison.

Table 2. Concentrations of perfluorinated chemicals detected in four Oscoda-area (Michigan) private residential drinking water wells. Concentrations are in nanograms per liter (ng/L, or parts per trillion [ppt].) Sampling occurred between 2011 and 2014.

Perfluorinated Chemical[1]	**Drinking Water Well**				**Screening Value**		
	A[2]	*B*	*C*	*D*	*MDEQ[3]*	*MN[4]*	*NJ[5]*
PFBS	ND	ND	1.9	6.1	NA	7,000	NA
PFBA	3.7	1.6	8.1	27.0	NA	7,000	NA
PFHpA	ND	ND	3.4	11.0	NA	NA	NA
PFHxDA	ND	NT	0.3	0.3	NA	NA	NA
PFHxS	5.0	4.2	19.0	88.0	NA	NA	NA
PFHxA	2.1	ND	2.8	23.0	NA	NA	NA
PFOS	ND	ND	1.5	13.0	100	300	NA
PFODA	5.5	NT	ND	ND	NA	NA	NA
PFOA	2.3	1.8	2.9	11.0	NA	300	40
PFPeA	2.1	1.2	2.5	27.0	NA	NA	NA

NA = no screening value available. ND = not detected. NT = not tested for.

[1]See Table 1 for PFC name.

[2]Well A had two samples taken. Only the higher concentration is shown for each chemical.

[3]Michigan Department of Environmental Quality Water Resources Division Groundwater Drinking Water Value.

[4]Minnesota Department of Health Health Risk Limit.

[5]New Jersey Department of Environmental Protection guideline for chronic exposure.

The screening values are protective of:

- blood, kidney, and liver effects, for PFBS (MDH 2011);
- cholesterol (liver) and thyroid effects, for PFBA (MDH 2011);
- cholesterol (liver) and thyroid effects, for PFOS (MDH 2009, MDEQ 2014);
- liver, immune, developmental, and cancer effects, for PFOA (MDH 2009, NJDEP 2007).

In 2009, the U.S. Environmental Protection Agency (EPA) requested that the Agency for Toxic Substances and Disease Registry (ATSDR) conduct an Exposure Investigation (EI) in several counties in Alabama after PFC-containing biosolids applied to farm fields contaminated groundwater used for drinking water. The EI results indicated that the levels of several PFCs in the blood of area residents (sample size = 155) were two to four times higher than average levels in the U.S., similar to or lower than levels found in other U.S. communities exposed to PFCs, and much lower than levels found in occupational studies. Potential health effects cannot be inferred from the EI. ATSDR concluded that drinking well water with detectable levels of PFCs may contribute to an increase in blood PFC levels (ATSDR 2013). I am concerned that, if more drinking water wells in the Oscoda area are impacted by PFCs from WAFB, people may have exposures that could increase the likelihood of adverse health effects.

I have sent letters to the homeowners where these wells were sampled, explaining my findings.

I am available as needed for future consultation on this matter.

Sincerely,

Christina Rose Bush

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Agency for Toxic Substances and Disease Registry

References:

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Greetings,

You are receiving a document from the Agency for Toxic Substances and Disease Registry (ATSDR). We are very interested in your opinions about the document you received. We ask that you please take a moment now to complete the following ten question survey. You can access the survey by clicking on the link below.

Completing the survey should take less than 5 minutes of your time. If possible, please provide your responses within the next two weeks. All information that you provide will remain confidential.

The responses to the survey will help ATSDR determine if we are providing useful and meaningful information to you. ATSDR greatly appreciates your assistance as it is vital to our ability to provide optimal public health information.

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