United States Senate
Committee on Homeland Security and Governmental Affairs
Senator Gary C. Peters, Chairman
Senator Rob Portman, Ranking Member

IMPROVING INTERAGENCY AND INTERGOVERNMENTAL COORDINATION ON PFAS FOR MICHIGAN COMMUNITIES

Monday, August 1, 2022
10 a.m.
Michigan State University
Interdisciplinary Science & Technology Building, Room 1404
766 Service Road, East Lansing, MI 48824

WITNESS LIST

Panel I

PATRICK BREYSSE, PH.D.
Director
National Center for Environmental Health/
Agency for Toxic Substances and Disease Registry
Centers for Disease Control and Prevention
U.S. Department of Health and Human Services

BRUNO PIGOTT
Deputy Assistant Administrator
Office of Water
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RICHARD KIDD
Deputy Assistant Secretary for Environment and Energy Resilience
Office of the Assistant Secretary of Defense (Sustainment)
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NANCY BALKUS, P.E.
Deputy Assistant Secretary of the Air Force
(Environment, Safety, and Infrastructure)
Department of the Air Force

JOHN GILLESPIE
Senior Subject Matter Expert
Environmental Restoration
Air Force Civil Engineer Center

Panel II

ABIGAIL HENDERSHOTT
Executive Director
Michigan PFAS Action Response Team

BREANNA KNUDSEN
Tribal Environmental Response Program Specialist
Planning Department
Saginaw Chippewa Indian Tribe of Michigan

CHERYL MURPHY, PH.D.
Director
Center for PFAS Research
Michigan State University

LT. COL. CRAIG MINOR, USAF (RET.)
Former Resident
Wurtsmith Air Force Base

CATHY WUSTERBARTH
Founder
Need Our Water and Oscoda Citizens for Clean Water
and Community Leader, Great Lakes PFAS Action Network

Improving Interagency and Intergovernmental Coordination on PFAS for Michigan Communities
August 1, 2022
Testimony of Cathy Wusterbarth

Chairman Peters, thank you for the opportunity to appear before you today.

I am Cathy Wusterbarth, a founder of Need Our Water, Oscoda Citizens for Clean Water, a community leader with Great Lakes PFAS Action Network and a member of our local Restoration Advisory Board.

I am a Registered Dietitian, clean water advocate and a native of my beloved town of Oscoda Michigan. I was a competitive swimmer and young lifeguard on the USAF Base beach which we know now is highly contaminated with PFAS. Little did I know that the cancer and immunological disease I developed a few years later in my 20's may have been due to the drinking water and lake water exposure from performing that lifeguarding job as a civilian employee for the USAF. To this day I continue to battle these diseases much like my mother, father and both sisters who have lifetime illnesses potentially associated with their PFAS exposure. Unfortunately, our family in Oscoda is not unique. Military personnel, their families and our neighbors are reporting the same conditions, sadly some cases have led to preventable death.

I am proud to be a part a community that supported the former Wurtsmith Air Force base functions and continue to be proud of the mission of the Department of Defense (DOD) to provide combat credible military forces needed to deter war and protect the security of our nation.

However, at the same time as providing these important services to our national security, toxic PFAS has been flowing essentially uninterrupted for decades from the former Wurtsmith Base through the groundwater. This toxic PFAS contamination is bleeding into nearby Van Etten Lake, Clark's Marsh and the AuSable River-all of which carry that toxic water to the drinking water source for hundreds of thousands of people in the Great Lakes region. In 2015-2016 testing of the Lake Huron municipal water system revealed 4.2 parts per trillion of PFOA and PFOS combined for the sampling. We have health advisories throughout our community due to this uncontrolled spread of PFAS, including foam, fish, venison, and all animals living in Clark's Marsh-which used to be a popular fishing and hunting destination and is still used by subsistence hunters and anglers to gather food.

Because it is odorless, colorless and tasteless we unknowingly were subjected to these toxic PFAS chemicals for decades and continued to be exposed for decades after PFAS manufacturers and the military knew PFAS chemicals were harmful to human health. Shockingly, we now have the visual evidence in the PFAS-laden foam forming on our waterways and Lake Huron. After over a decade of knowing PFAS chemicals were impacting our health and community-the past exposure we experienced still has no comprehensive corrective measure. We must live the best we can with the harm caused and must do so while enduring a lack of transparency, accountability, and collaboration from the Air Force and DOD as part of the clean-up process.

Through Need Our Water's continued partnership with Wurtsmith site experts, The National Wildlife Federation, community members and Wurtsmith veterans I was involved with creating a document that summarizes the timeline of PFAS exposure and actions at Wurtsmith. Starting in the 1970's, it details the DOD actions that are inconsistent with the known severity of the problem, false promises and endless delays. This well researched, clearly detailed and thoughtful document was submitted by me at the September 2021 Restoration Advisory Board meeting. During the meeting when I asked for a formal response to this document, the USAF leadership asked me why I would ask for a response to a public document. As part of my testimony, I will submit this document for the committee to review. This incident is an example of the shift that needs to occur in USAF and DOD approach. Communities have vital information to provide, and we should not be dismissed when it is presented.

Through my advocacy I've learned to study the actions of those doing this work before me such as the late author of Silent Spring, Rachel Carson. She said, which ironically could be posed to the DoD in literal terms today, "Man's attitude toward nature is today critically important simply because we have now acquired a fateful power to alter and destroy nature. But man is part of nature, and his war against nature is inevitably a war against himself. We're challenged as mankind has never been challenged before to prove our maturity and our mastery, not of nature, but of ourselves." Thank you.

Your Annual Drinking Water Quality Report For
Oscoda Township
January 1, 2017 - December 31, 2017

Dear Customer:

We're pleased to present to you this year's Annual Drinking Water Quality Report. This report is designed to inform you about the quality of the water and services we deliver to you every day. Our constant goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts we make to continually improve the water treatment process and protect our water resources. We are wholly committed to ensuring the quality of your water.

Where does our water come from?
The source of our water is Lake Huron; the intake structure is located approximately 1 mile off shore at a depth of approximately 40 feet. This water source has been in use since 1992 and is considered to be of the highest quality.

The water is then treated via a very effective and unique process designed to reduce, remove or destroy contaminants in the source water. This processing takes place at our facility located at 247 S. Baldwin Resort Rd. and is owned by the ***Huron Shore Regional Utility Authority (HSRUA).*** The water treatment plant is staffed by MDEQ-certified professional water treatment specialists who in addition to formal education and job-related courses, keep current on ever-changing technology and regulations by attending continuing education courses, workshops, and seminars. As you will see in the following information, we monitor our lake water and drinking water supplied to you very closely to ensure its quality.

The State of Michigan has completed a Source Water Assessment Report (SWAR) for our water system. Included in the SWAR is the susceptibility ranking for our intake. The ranking is based on several factors, including intake location, depth, water chemistry, and contaminant sources. Based on the report, our intake has a moderate degree of sensitivity to potential contaminants. The potential contaminant sources have a minimal influence over the intake. This minimal contaminant threat combined with the moderately sensitive intake yields a moderate susceptibility determination for the HSRUA intake. If you would like to review a copy of the complete report, please contact your Local Township.

Oscoda Township wants their customers to be informed about their water quality and will be glad to answer any questions pertaining to your water supply. If you as a customer are confused or feel misinformed, give your utility the opportunity to clarify things.

We routinely monitor your drinking water for contaminants according to federal and state laws. The following tables included with this report show the results of our monitoring for the period of January 1 to December 31, 2017. Sample results that are more than five years old need not be included in the report, even if it is the last available data for the supply (e.g., some metals are collected on a nine-year frequency). All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency Safe Drinking Water Hot Line at 1-800-426-4791.

It's our pleasure to report that in 2017 as in all years past, the water delivered from the water treatment plant met or surpassed all federal and state standards for quality.

If you wish to obtain a copy of this report contact your Township Hall listed at the end of this report. If you have questions concerning the contents of this report or the water utility, contact:

Catherine Garnham
HSRUA Superintendent
989-362-0050
247 S. Baldwin Resort Rd.
East Tawas, MI 48730

In this table you will find many terms and abbreviations you might not be familiar with. To help you better understand these terms we've provided the following definitions:

***Action Level* (AL)** - The concentration of a contaminant that if exceeded triggers treatment or other requirements that a water system must follow.

***Environmental Protection Agency* (EPA)**

***Food and Drug Administration* (FDA)**

***Maximum Contaminant Level* (MCL)** - The "Maximum Allowed" is the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

***Maximum Contaminant Level Goal* (MCLG)** - The "Goal" is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

***Maximum residual disinfectant level (*MRDL)** - The highest level of a disinfectant allowed in drinking water. There is convincing evidence that the addition of a disinfectant is necessary for control of microbial contaminants

***Maximum residual disinfectant level goal* (MRDLG)**- The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

***Michigan Department of Environmental Quality* (MDEQ)**

***Nephelometric Turbidity Unit* (NTU)** - Nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

***Not regulated* (NR)** - The substance is not currently regulated by the USEPA and or MDEQ. Monitoring helps EPA to determine where these contaminants occur and whether there is a need to regulate them.

***Not applicable* (NA)**

***Not Detected* (ND)**

***Parts per million* (ppm)**

***Parts per billion* (ppb)**

***Treatment Technique* (TT)** - A treatment technique is a required process intended to reduce the level of a contaminant in drinking water.

The table contain the only drinking water contaminants we detected in the year 2017. The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in this table is from testing done in the calendar year of the report.

Inorganic Contaminants

Contaminant	MCL, MRDL or TT	MCLG or MRDLG	Level Detected		Range	Unit of Measurement	Violation Yes / No	Typical Source of Contaminant
Barium (Plant Tap - 2012)	2	2	0.01		N/A	ppm	No	Discharge of drilling wastes; Discharge of metal refineries; Erosion of natural deposits
Fluoride (Plant Tap)	4	4	0.67		N/A	ppm	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Sodium	NR	NR	6		N/A	ppm	No	Naturally occurring constituent in water
Turbidity*	TT	N/A	0.04 avg.	0.08 max.	N/A	NTU	No	Soil Runoff

*Turbidity is the measure of clarity of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system. High levels may pose a health hazard by interfering with disinfection. Low turbidity is one of the most important indicators of effective water treatment. Samples of the system's filtered water must be less than or equal to 0.3 NTU in at least 95% of the samples. During the year 2017, all (100%) of samples have met this requirement.

Disinfectants (Chlorine) & Disinfection By-Products (DBP's)

Chlorine (Distribution System)	4	4	Running Annual Average 0.62	0.07/1.23	ppm	No	Water additive used to control microbes
TTHM - Total Trihalomethanes	80	N/A	60.8	N/A	ppb	No	Byproduct of drinking water disinfection
HAA5 Haloacetic Acids	60	N/A	47	N/A	ppb	No	Byproduct of drinking water disinfection
Total Organic Carbon** (Sampled Quarterly)	None	N/A	–	1.35/2.02	ppm	No	Normally present in the environment

**Total Organic Carbon (TOC) has no health effects. However, total organic carbon provides a medium for the formation of disinfection byproducts such as Trihalomethanes and Haloacetic acids. Due to low TOC values there is no TT requirement for a percentage reduction.

Lead and Copper Monitoring

Sampled in Oscoda Township's distribution system at individual taps during the monitoring period of June 1, 2016 thru September 30, 2016.

Inorganic Contaminant Subject to AL	AL	MCLG	90th Percentile Value	# of Samples >AL	Unit of Measurement	Exceeds Action Level?	Typical Source of Contaminant
Copper	1300	1300	310	0	ppb	No	Corrosion of household plumbing
Lead	15	0	3	0	ppb	No	Corrosion of household plumbing

Important Information About Lead

If present elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with services lines and home plumbing. HSRUA is responsible for providing high quality drinking water but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using your water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline (800-426-4791) or at http://www.epa.gov/safewater/lead.

As you can see by these tables, our water system had no violations during this reporting period.

PFAS (Per- and Polyfluoroalkyl Substances)

Date	Location	PFOS (ppt)	PFOA (ppt)	PFOS + PFOA (ppt)	LHA (ppt)	Total of Other PFAS (ppt)
2015 – 2016*	Water Plant Tap	2.9 avg.	1.9 avg.	4.2 avg.	70	6.21 avg.
		6.1 max.	4.1 max.	8.6 max.		19.8 max.

** A total of 13 samples were collected between 12/15/2015 – 10/12/2016. For more detailed PFAS data, please contact the HSRUA water treatment plant Superintendent at 989-362-0050.*

What are Per- and polyfluoroalkyl substances (PFAS) and why are they harmful?

Per- and polyfluoroalkyl substances (PFAS), sometimes called PFCs, are a group of chemicals that are resistant to heat, water, and oil. PFAS have been classified by the U.S. Environmental Protection Agency (EPA) as an emerging contaminant on the national landscape. For decades, they have been used in many industrial applications and consumer products such as carpeting, waterproof clothing, upholstery, food paper wrappings, fire-fighting foams, and metal plating. They are still used today. PFAS have been found at low levels both in the environment and in blood samples of the general U.S. population.

These chemicals are persistent, which means they do not break down in the environment. They also bioaccumulate, meaning the amount builds up over time in the blood and organs. Studies in people who were exposed to PFAS found links between the chemicals and increased cholesterol, changes in the body's hormones and immune system, decreased fertility, and increased risk of certain cancers.

Are there health advisory levels?

The EPA has not established enforceable drinking water standards, called maximum contaminant levels, for these chemicals. However, EPA has set a lifetime health advisory (LHA) level in drinking water for two PFAS: perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). The PFOA and PFOS LHA is the level, or amount, ***below which no harm is expected from these chemicals***. The LHA level is 70 parts per trillion (ppt) for PFOA and 70 ppt for PFOS. If both PFOA and PFOS are present, the LHA is 70 ppt for the combined concentration.

The estimated levels of PFOA and PFOS combined in the samples collected from the HSRUA water treatment plant tap ranged from 0.9 to 8.6 ppt, which is more than seven times lower than the LHA for the combination of these two chemicals. There are many other PFAS compounds that currently do not have LHA levels. For information on PFOA, PFOS and other PFAS, including possible health outcomes, you may visit these websites: https://www.epa.gov/pfas; http://www.michigan.gov/som/pfasresponse; or www.atsdr.cdc.gov/pfas.

Who can I call if I have questions about PFAS in my drinking water?

If any resident has additional questions regarding this issue, the State of Michigan Environmental Assistance Center can be contacted at 800-662-9278. Representatives may be reached to assist with your questions Monday – Friday, 8:00 AM to 4:30 PM.

How can PFAS affect people's health?

Some scientific studies suggest that certain PFAS may affect different systems in the body. The National Center for Environmental Health (NCEH)/Agency for Toxic Substances and Disease Registry (ATSDR) is working with various partners to better understand how exposure to PFAS might affect people's health.

If you are concerned about exposure to PFAS in your drinking water, please contact the MDHHS Toxicology Hotline at 800-648-6942 or the CDC/ATSDR: **https://www.cdc.gov/cdc-info/** or 800-232-4636. Currently, scientists are still learning about the health effects of exposures to PFAS, including exposure to mixtures.

How can I stay updated on the situation?

The state has created a website where you can find information about PFAS contamination and efforts to address it in Michigan. The site will be updated as more information becomes available. The website address is **http://michigan.gov/pfasresponse**

Oscoda Township is proud that your drinking water meets all federal and state requirements. We have learned from our monitoring and testing that some contaminants have been detected but are well within the standards. The EPA has determined that your water is safe at these levels.

Information for people with special health concerns

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV-AIDS or other immune system disorders, some elderly, and infants can be particularly at risk. EPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hot Line (800-426-4791).

The sources of all drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

- **Microbial contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic contaminants**, such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- **Pesticides and herbicides**, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.
- **Organic Chemical contaminants**, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- **Radioactive contaminants**, which can be naturally occurring or be the result of oil and gas production in mining activities.

In order to ensure that tap water is safe to drink, the **EPA** prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. **FDA** regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

There is nothing more important to our community than quality drinking water. The maintenance and expansion of the treatment facility and distribution system has and will continue to be important to the growth and welfare of Iosco County.

We will continue to work around the clock to provide top quality water to every tap. We ask that all our customers help us protect our water sources, which are the heart of our community, our way of life, and our children's future.

Opportunities for Public Participation:

We believe that informed citizens can be strong allies of water systems as they take action on pressing problems. The following is a listing of meeting dates and locations where your elected officials may discuss water system issues.

Water Supplier	Regular Meeting Schedule	Time/Location/Contact
Oscoda Township	**2nd and 4th Monday of each month**	**7:00 p.m. Robert J. Parks Library 6010 Skeel Ave. Oscoda, MI 48750 989-739-3211**
Huron Shore Regional Utility Authority	**1st Tuesday of each month**	**9:00 a.m. HSRUA Treatment Plant 247 S. Baldwin Resort Road East Tawas, MI 48730 989-362-0050**

NEED OUR WATER

PFAS Contamination at the Former Wurtsmith Air Force Base: The True Story

Setting the record straight about what the Air Force, the Department of Defense, and the state of Michigan have actually done (or not done) to protect people and natural resources in Oscoda (1974-2021)

Introduction

The U.S. military's heavy and long-standing use of aqueous film forming foam ("AFFF") has contributed to one of the worst environmental crises of our time. For over fifty years, the U.S. military has used AFFF containing high concentrations of toxic chemicals called per- and polyfluoroalkyl substances ("PFASs"). PFASs are a family of chemicals that are extraordinarily toxic and persistent in the environment. They have been linked to cancer, kidney disease, and numerous birth and developmental disorders. Also known as "forever chemicals," PFASs are widespread in the environment because they take decades to break down, and many tend to bioaccumulate in people, fish, and wildlife. Moreover, PFASs are exceptionally numerous—there are thousands of individual PFAS compounds—and their durability and resistance to water, oils, and heat make them ubiquitous in both commercial and industrial settings.

Scientists first discovered toxic PFAS contamination at the former Wurtsmith Air Force base in Oscoda, Michigan, over two decades ago.[1] From the 1970s until at least the base's closure in 1993, the Air Force sprayed PFAS-laden AFFF at Wurtsmith during training exercises to extinguish fires, and regularly disposed of spent AFFF in grassy areas of the base.[2] It should come as no surprise that these activities caused massive groundwater contamination—contamination that is running largely unchecked through the Oscoda area due to the Air Force's failure to control and clean up the PFAS plumes from the base.

The Air Force has known about the toxic nature of PFASs since the 1970s.[3] Despite this knowledge, the Air Force has been extremely slow to address the devastating effects of its historic discharges of AFFF at Wurtsmith. When it has responded, the Air Force has taken inadequate actions that have only worsened the public health crisis in Oscoda. Adding insult to injury, the Air Force has repeatedly attempted to assure Wurtsmith veterans and Oscoda residents that it takes their health and its own cleanup responsibility seriously. In doing so, the Air Force has hidden behind lax federal guidelines[4] and denied its need to comply with Michigan's stricter standards.[5]

The state of Michigan's actions have also been deficient. Although the state has played a significant role in uncovering the extent of PFAS contamination at Wurtsmith, it has frequently been slow, opaque, and ineffective in warning Michiganders of the dangers of exposure to PFAS contamination from Wurtsmith. Furthermore, because its attempts to push back on the Air Force's positions have been weak or unavailing, the state has generally failed to use the strict PFAS cleanup standards that it developed over the past few years to its advantage.

Despite their dubious track records protecting public health in Oscoda, both the Air Force and the state of Michigan have often defended and even praised their own actions, even when those actions have resulted in delays and missteps. This document aims to set the record straight regarding what the Air Force and the state have actually done—and failed to do—about the rampant PFAS contamination in Oscoda.

PFAS foam on Van Etten Lake.

Photo credit: Michigan Department of Environmental Quality

In this June 6, 2018 photo, residents demand answers and solutions outside of Robert J. Parks Library, in a rally for safe water before a Restoration Advisory Board meeting in Oscoda, Mich. These residents are asking the Air Force to claim responsibility for damages after findings of high levels of the toxic chemical PFOS in the foam near a plume coming from the former nuclear bomber base. PFAS foam continues to rise up on the shoreline of Van Etten Lake almost daily, and residents are demanding answers and solutions.

Photo credit: Jake May/The Flint Journal via AP

The Air Force and the Department of Defense

The Air Force, and the Department of Defense more generally, have known for decades about the toxicity of PFASs, and about its heavy use of AFFF at military bases, including Wurtsmith. Yet instead of claiming accountability for their releases of PFASs into the environment, the Department of Defense and the Air Force have adopted a strategy of avoidance, using tactics such as delay and deflection in an attempt to limit their liability for the large-scale environmental havoc they have wreaked. At Wurtsmith in particular, the Air Force has routinely attempted to dodge responsibility for cleaning up PFAS contamination: it has frequently delayed necessary actions and made promises regarding cleanup upon which they later went back on their word. And when the agency has taken action, those actions have been inconsistent with the known dangers of PFASs and the pervasive contamination emanating from Wurtsmith.

Photo credit: iStockPhoto/kzenon

Actions Inconsistent with the Known Severity of the Problem

1970s–80s: Numerous Air Force reports indicated that PFAS are highly toxic.[6]

WHAT SHOULD HAVE HAPPENED

- The Department of Defense and Air Force should have been cautious with their use of AFFF in light of growing amounts of concerning data.

WHAT REALLY HAPPENED

- Neither the Department of Defense nor the Air Force warned service members or the public about the possible dangers of use of and exposure to PFAS via AFFF, and continued to use AFFF heavily.

Nov. 1999: Academic research, eventually published in a scientific journal with the help of federal funding, demonstrated that PFAS were present in groundwater at Wurtsmith.[7]

WHAT SHOULD HAVE HAPPENED

- Upon receiving this troubling information, the Air Force should have initiated an investigation of PFAS contamination at Wurtsmith.

WHAT REALLY HAPPENED

- The Air Force failed to investigate any further until such inaction became untenable when the state of Michigan discovered PFAS contamination at Wurtsmith over a decade later.

Jun. 2009: Based on the Air Force's historic use of AFFF, EGLE (known as MDEQ until early 2019[8]) recommended that the Air Force sample for PFOS and PFOA at Wurtsmith.[9]

WHAT SHOULD HAVE HAPPENED

- The Air Force should have followed EGLE's advice and acted immediately.

WHAT REALLY HAPPENED

- The Air Force ignored EGLE's advice, delaying confirmation that Wurtsmith had PFAS contamination until April 2010, when EGLE discovered PFASs in the soil at the base.[10] Further sampling that year by EGLE showed PFAS contamination throughout the entire base.[11]

Mar. 2011: The Department of Defense released a Chemical and Material Emerging Risk Alert for AFFF, warning of the "human health and environmental risks" associated with PFOS and PFOA.[12]

WHAT SHOULD HAVE HAPPENED

- The Air Force should have quickly initiated a sitewide investigation of PFAS contamination at Wurtsmith, in light of its widespread use of AFFF at the former base.

WHAT REALLY HAPPENED

- The Air Force did not take immediate action, waiting until 2013 to analyze its own groundwater samples.[13]

Apr. 2015: The Air Force installed a single pump-and-treat system at Wurtsmith and later claimed that it was successfully intercepting PFAS-contaminated groundwater from Fire Training Area #2 before the groundwater reached surface water.[14]

Actions Inconsistent with the Known Severity of the Problem (continued)

WHAT SHOULD HAVE HAPPENED

- The Air Force should have installed a more robust system, and should have ensured that its system for intercepting PFAS-contaminated groundwater actually worked properly.

WHAT REALLY HAPPENED

- Contrary to the Air Force's assertions, the system failed to intercept or contain PFAS-contaminated groundwater or to prevent expansion of the PFAS plumes migrating off the former base.[15]

Dec. 2015: The Air Force began sampling private residential drinking water wells to the east and south of the base.[16] Several wells had water containing total PFAS concentrations above 70 ppt, but at first, only one well tested above 70 ppt combined PFOS and PFOA.[17]

WHAT SHOULD HAVE HAPPENED

- Especially considering the Air Force's knowledge of its use of AFFF at Wurtsmith, the agency should have begun sampling residential wells far earlier. It also should have provided an alternate source of drinking water to all affected private well water users, and taken action to prevent further off-base movement of PFAS-impacted groundwater.

WHAT REALLY HAPPENED

- The Air Force refused to provide an alternate source of drinking water to all but one household, where the well water tested over 3000 ppt combined PFOS and PFOA.[18] Initially, the Air Force justified this refusal by stating that the sampling results were below the EPA's provisional health advisories for PFOS (200 ppt) and PFOA (400 ppt).[19] Later, after the EPA published a final lifetime health advisory for combined PFOS and PFOA (70 ppt), and after the state of Michigan provided alternate water supplies to affected well owners, the Air Force refused to reimburse the state for that cost, insisting that the EPA's lifetime health advisory was sufficiently protective of human health.[20]
- Despite the Air Force's sampling coming over five years after EGLE first found PFASs at Wurtsmith, the agency was quick to pat itself on the back for supplying bottled water to this single household "immediately" and later connecting that household to municipal water.[21]

Apr. 2016: EGLE asked the Air Force to test drinking water on the base due to concern about residual PFAS contamination in the water distribution system piping.[22]

WHAT SHOULD HAVE HAPPENED

- The Air Force should have complied with EGLE's request so that the agencies could work together to better and more quickly understand the PFAS crisis in Oscoda.

WHAT REALLY HAPPENED

- The Air Force did not perform the sampling. EGLE eventually ended up checking the system itself and found PFAS levels that were higher than the local utility that now provides water.[23]

Oct. 2017: The Air Force submitted a revised site evaluation work plan, proposing to change its sampling approach and stating that it was "no longer collecting samples at private properties, i.e. along [] Van Etten Lake and Van Etten Creek."[24]

WHAT SHOULD HAVE HAPPENED

- At the very least, the Air Force should have maintained its sampling of threatened or tainted residential wells. Continued, frequent monitoring would have helped protect the numerous private well users in Oscoda, and would have assisted the Air Force in gathering data to delineate the plume emanating from Wurtsmith.

WHAT REALLY HAPPENED

- Ultimately, the Air Force agreed to conduct quarterly sampling in 2018 for the 45 private water wells that it sampled in the summer of 2017, and annually for the following two years.[25]

Mar. 2018: The Air Force indicated that it had "no plans to investigate areas east of [Van Etten Lake] until there is evidence PFOS/PFOA has migrated there from the base."[26]

WHAT SHOULD HAVE HAPPENED

- By this point, there were numerous water and wildlife consumption advisories in place all around the former base. Van Etten Lake itself was contaminated with PFASs.[27] In addition, the Air Force did not fully understand and was not adequately controlling the Wurtsmith plume. Thus, the Air Force should have proactively sought to identify and monitor all areas in Oscoda where contamination might continue to spread.

WHAT REALLY HAPPENED

- Soon afterward, PFAS contamination was found in the groundwater on the east side of Van Etten Lake and in Lake Huron.[28] Then, the Air Force denied responsibility for causing that contamination.

Jul. 2018: The Department of Defense said that it believed a combined 380 ppt was an appropriate maximum cleanup threshold for PFOS and PFOA.[29]

WHAT SHOULD HAVE HAPPENED

- 380 ppt is more than 30 times a level suggested as safe for drinking water by the federal Agency for Toxic Substances and Disease Registry, and more than 5 times the EPA's health advisory level.[30] If the Department of Defense took its responsibility to protect public health seriously, it would not have proposed such a high level.

Actions Inconsistent with the Known Severity of the Problem (continued)

WHAT REALLY HAPPENED

- The Department of Defense faces billions of dollars in remediation costs from its widespread use of AFFF, and knows that more health-protective cleanup standards (such as Michigan's) will result in higher cleanup costs.[31] The agency clearly prioritized its desire to limit its liability for PFAS contamination that it caused over public health.

Dec. 2018: The state of Michigan sent a notice of violation to the Air Force resulting from the Air Force's treatment system's persistent failures to comply with Michigan's 12 ppt of PFAS water quality standard for non-drinking water sources.[32]

WHAT SHOULD HAVE HAPPENED

- The Air Force should have engaged with the state to address its discharges concerning amounts of PFASs.

WHAT REALLY HAPPENED

- The Air Force refused to take any new actions to stem the flow of contamination entering Clark's Marsh, citing the absence of a federal hazardous substance designation.[33] In addition, the Air Force claimed that it did not need to comply with Michigan's 12 ppt PFOS standard, limiting how much PFAS can enter surface water from groundwater because of the federal government's sovereign immunity from state laws.[34]

Photo credit: Drew Youngedyke

Feb. 2020: The Air Force stopped sampling wells on the west side of Van Etten Lake, citing "five years of quarterly sample results that showed levels well below the EPA lifetime health advisory."[35]

WHAT SHOULD HAVE HAPPENED

- The Air Force should have continued to sample these wells, particularly given the unpredictable nature of PFAS contamination plume movement, and because testing below the EPA's lifetime health advisory is not necessarily indicative of the well water's safety.

WHAT REALLY HAPPENED

- The Air Force has not resumed residential well sampling in this area.

Mar. 2020: The Air Force declined to take interim actions to remove and prevent further spread of PFAS contamination while planning its remedial investigation.[36]

WHAT SHOULD HAVE HAPPENED

- After years of interacting with the community and other stakeholders, the Air Force should have understood the need to act quickly to contain and remove existing PFAS contamination in Oscoda.

WHAT REALLY HAPPENED

- Faced with intense pressure from the community, the Air Force backtracked from its original position and agreed to perform two interim remedial actions to address PFAS contamination.[37]

Apr. 2020: The Air Force said that there is no imminent human health harm because nobody in Oscoda is drinking water that is contaminated above the EPA health advisory level.[38]

WHAT SHOULD HAVE HAPPENED

- The Air Force should not have attempted to minimize the scope of the problem, because people have been and are likely still being harmed by PFAS contamination from Wurtsmith.

WHAT REALLY HAPPENED

- For one, the EPA's lifetime health advisory level (70 ppt PFOS + PFOA) is far higher than Michigan's maximum contaminant levels ("MCLs") for PFASs in drinking water,[39] and is too lax to protect public health. Moreover, the Air Force's statement ignored the fact that there may be dire consequences from people's continued consumption of highly contaminated fish and wildlife at Clark's Marsh.[40]

False Promises

Mar. 2017: The Air Force assured the Michigan state Senate that it was working to comply with the state's surface water quality criteria ("Rule 57") for groundwater discharges into Clark's Marsh.[41]

WHAT REALLY HAPPENED

- One month later, the Air Force refused to investigate Wurtsmith plumes discharging PFOS into adjoining surface waters, arguing that Rule 57 does not apply to groundwater discharges.[42]

Nov. 2019: The Air Force vowed that its "first priority is protecting human drinking water because drinking water is a direct pathway to human consumption."[43]

WHAT REALLY HAPPENED

- Despite these assertions, the Air Force has failed to respect Michigan's new MCLs for PFASs. It has refused to provide alternate water supplies to residents whose well water has exceeded state MCLs for PFOA or PFOS but not EPA's under-protective lifetime health advisory. In order to adequately protect people and drinking water from PFAS contamination, including groundwater that private well users have traditionally relied on,[44] the Air Force should be complying with Michigan's new MCLs now.

Photo credit: Drew Youngedyke

Endless Delays

Apr.–Oct. 2016: EGLE sent substantive requirements documents to the Air Force requiring the Air Force to install three permanent multi-stage activated carbon treatment systems to achieve discharge limitations by the end of 2017.[45]

WHAT REALLY HAPPENED

- The Air Force failed to install all required treatment systems until December 2019.[46]

Oct. 2016: The Air Force said that it planned to award an initial remedial investigation ("RI") of PFAS contamination at Wurtsmith some time in 2017.[47] Under CERCLA, remedial investigations serve as the mechanism for collecting data to determine the nature and extent of contamination, assess risk to human health and the environment, and evaluate treatment technologies.

WHAT REALLY HAPPENED

- The Air Force did not award the RI contract until July 2020.[48]

Apr. 2018: The Air Force refused to provide a timeline for cleanup actions at Wurtsmith, stating that it would determine "whether further action is warranted" at the conclusion of the supplemental site inspection ("SSI") phase.[49]

WHAT REALLY HAPPENED

- In April 2020, the Air Force finally said that the earliest any new cleanup efforts might begin is not until 2024.[50]

Feb. 2020: After Congress appropriated $13.5 million in the fiscal year 2020 National Defense Authorization Act to PFAS cleanup at Wurtsmith, the Air Force planned to spend all of those funds on studies, claiming that more data is needed.[51]

WHAT REALLY HAPPENED

- Because Congress set aside those funds for the purpose of cleanup, the Air Force should have followed that mandate. The bulk of the appropriations should have been used on interim response measures, rather than further investigation of the PFAS problem that the Air Force and state of Michigan had already studied for years.
- Eventually, the Air Force partially reversed course, promising to award contracts for interim cleanup measures designed to expand capture fields around Wurtsmith.[52]

The Air Force can and must do better in addressing PFAS contamination in Oscoda. It should start by increasing transparency in its processes and becoming more responsive to public concerns. In addition, the Air Force must stop unreasonably drawing out the cleanup process through countless delays, and take actions that will actually remove and prevent the further spread of pollution. The Air Force must act quickly both to prevent harm to people, fish, and wildlife, and to stop remediation costs from spiraling out of control. The longer the Air Force postpones putting multiple treatment measures in place or expanding existing treatment mechanisms, the more expensive the taxpayer-funded cleanup will become.

State of Michigan

Although it has sometimes displayed a desire to address the PFAS contamination in Oscoda, the state of Michigan has diminished the value of its efforts by failing to timely and transparently communicate the extent and risks of the PFAS contamination. Consequently, Oscoda residents have understandably lost trust in the state's ability to protect their environment and health. Moreover, the state has repeatedly stumbled and failed to show the community that it will do all in its power to fight on their behalf. All in all, the state has consistently been either unable or unwilling to protect its citizens and natural resources.

Inability or Unwillingness to Protect People and Natural Resources in Oscoda

May 2012: EGLE sampling of fish tissue collected from Clark's Marsh showed PFOS concentrations ranging from 334 to 9580 ppb in pumpkinseed, bluegill, yellow perch, and largemouth bass.[53] Sampling of fish tissue from the lower Au Sable River, Van Etten Lake, Allen Lake, and Lake Huron also showed high concentrations of PFOS.[54]

WHAT THE STATE SHOULD HAVE DONE

- The state should have immediately warned people, especially local residents and the large number of tourists who visit the area, to not eat fish from these water bodies.

WHAT THE STATE REALLY DID

- Although the state did issue a do-not-eat-fish advisory for Clark's Marsh and the Au Sable river soon after receiving the troubling sampling results, it did not post fish advisory signs along the Au Sable River, and at Clark's Marsh, Allen Lake, and the Au Sable River, until June 2013.[55]

Aug. 2012: Robert Delaney, an MDEQ scientist, delivered a 93-page report that he and Dr. Richard DeGrandchamp, a University of Colorado scientist, had authored on PFAS contamination to then-MDEQ Director Dan Wyant.[56] The report, titled "Michigan's Contaminant Induced Human Health Crisis," warned that extremely high levels of PFAS in fish from the Au Sable and Clark's Marsh areas were likely leading to dangerous levels of PFAS in the blood of some residents of Oscoda.[57] The report also contained significant warnings about the extent of PFAS contamination across the entire state.[58]

WHAT THE STATE SHOULD HAVE DONE

- In light of the serious threat detailed extensively in the report, Director Wyant and his agency should have immediately acted upon this information to protect public health and the environment.

WHAT THE STATE REALLY DID

- EGLE hid the report from the public for over five years. In October 2017, Robert Delaney disclosed the report to the public in a radio interview, leaving the agency with no other choice but to acknowledge the report.[59]

Photo credit: Jennifer Hill

- To date, neither the state of Michigan nor the Air Force have implemented methods for identifying, locating, or assisting residents who may have abnormally high levels of PFAS in their blood.

Jun. 2015: EGLE published a site assessment stating that 20 PFASs had been detected at the site and multiple plumes exceeding Michigan's water quality criteria were entering water bodies. The site assessment also acknowledged that people who use the natural resources

around the base might be experiencing high-level toxic exposure.[60]

WHAT THE STATE SHOULD HAVE DONE

- The state should have quickly and clearly communicated this information, particularly the concerns about natural resource usage around Wurtsmith, to Michiganders.

WHAT THE STATE REALLY DID

- By failing to adequately share this information at this stage of the PFAS investigation in Oscoda, the state left people in the dark about potential human exposure to contaminated wildlife around Wurtsmith.

Sept. 2015: MDHHS noted a lack of PFAS sampling in wildlife near Wurtsmith and recommended that such sampling be conducted to evaluate the effects of wild game consumption on human health.[61]

WHAT THE STATE SHOULD HAVE DONE

- The state should have commenced wildlife sampling right away so that it could swiftly make appropriate recommendations regarding the safety of wildlife consumption around Wurtsmith.

WHAT THE STATE REALLY DID

- MDNR sampled muskrat tissue from Clark's Marsh and Tuttle Marsh in Feb. 2016, which showed high levels of PFAS (up to 1,750,000 ppt PFOS).[62] MDNR did not sample deer until 2017, when it sampled 20 deer around Wurtsmith, and found one to have an incredibly high 547 ppb of PFOS in its muscle tissue.[63]

Feb. 2016: After evaluating private residential well water samples, the state told residents living downstream of the base not to use their water for drinking or cooking.[64]

WHAT THE STATE SHOULD HAVE DONE

- The state should have been transparent and candid in informing Oscoda residents of the risks of past and continued consumption of contaminated water. Moreover, the state should have responded with a permanent, protective solution: immediately connecting to municipal water all residences with private wells that were affected by the PFAS plumes, as well as those residences with wells that were likely in the future to be affected.

WHAT THE STATE REALLY DID

- MDHHS distributed a pamphlet playing down the severity of the problem: for example, it claimed that "[n]o one can say for sure if drinking water that has PFAS in it will harm you."[65] Furthermore, the state has only helped connect 27 residences to municipal water,[66] refusing to provide the funding needed to connect residences on the east side of Van Etten Lake to the municipal supply.

Mar. 2016: The state told residents east of Van Etten Lake not to worry about PFAS contamination from Wurtsmith.[67]

WHAT THE STATE SHOULD HAVE DONE

- The state should not have made these assurances without knowing for certain that contamination was not spreading to the east side of Van Etten Lake.

WHAT THE STATE REALLY DID

- PFAS contamination was later detected in the groundwater on the east side of Van Etten Lake and in Lake Huron.[68] In 2020, EGLE acknowledged that the contaminated groundwater on the southeastern end of Van Etten Lake could be due to infiltration of lake water to near-shore groundwater.[69] At the same time, EGLE continues to claim that it is unable to track the source of the PFAS contamination on the east side of Van Etten Lake.

Apr. 2017: After previously assuring the Michigan Senate that it was working to comply with Rule 57 for groundwater discharges into Clark's Marsh, the Air Force refused to investigate Wurtsmith plumes discharging PFOS into adjoining surface waters, arguing that Rule 57 does not apply to groundwater discharges.[70]

WHAT THE STATE SHOULD HAVE DONE

- The state should have defended the applicability of its own legal standard to these circumstances.

WHAT THE STATE REALLY DID

- For reasons unknown, the state did not argue against the Air Force's position for several months.

Jul. 2017: EGLE and the Air Force confirmed that surface water foam from Van Etten Lake was highly contaminated with PFASs, with one sample having over 164,000 ppt PFOS.[71]

WHAT THE STATE SHOULD HAVE DONE

- In the absence of reliable information on the safety of touching PFAS foam, the state should have taken a precautionary approach, particularly as children swim in the lake. The state should have issued a foam advisory urging people to avoid all contact with foam at Van Etten Lake.

WHAT THE STATE REALLY DID

- After initially indicating that it was safe to ingest the foam,[72] MDHHS and EGLE delayed issuing a foam advisory for Van Etten Lake until September 2017.[73] That advisory recommended, "out of an abundance of caution," that residents avoid accidentally ingesting foam from the

lake.[74] The advisory noted that "[s]kin contact with the foam is not considered to be of concern."[75]

- In 2019, the state reversed its position, telling people to avoid coming into contact with the foam at all.[76]

Dec. 2017: EGLE invoked dispute resolution pursuant to the DSMOA between the Department of Defense and the state of Michigan to resolve various issues stemming from the Air Force's refusal to do enough to address PFAS contamination at Wurtsmith.[77]

WHAT THE STATE SHOULD HAVE DONE

- The state should have used this process to push hard for changes to benefit the Oscoda community.

WHAT THE STATE REALLY DID

- In July 2020, EGLE told the Air Force that the issues it raised in 2017 have been resolved, thus ending the dispute resolution process.[78] EGLE could have chosen to further escalate the dispute but chose not to, resulting in a weak final outcome.

Photo credit: Jennifer Hill

Oct. 2018: EGLE and MDHHS issued a "do not eat" advisory for deer taken within five miles of Clark's Marsh.[79]

WHAT THE STATE SHOULD HAVE DONE

- Many Oscoda residents rely on hunting wildlife, including deer, for food.[80] The state should have begun sampling in the environment several years earlier—as soon as it became clear that there was widespread contamination in water and soil near Wurtsmith—so that it could have issued this advisory far earlier to protect public health.

WHAT THE STATE REALLY DID

- The state issued the advisory over eight years after it first discovered widespread PFAS contamination at Wurtsmith, and over three years after MDHHS recommended that wild game near Wurtsmith be sampled for PFASs.[81]

Dec. 2019: EGLE issued a do not eat advisory for all aquatic and semi-aquatic wildlife taken from the Clark's Marsh area.[82]

WHAT THE STATE SHOULD HAVE DONE

- In order to reach all people affected by the expanded advisory, the state should have very publicly and prominently announced the new advisory.

WHAT THE STATE REALLY DID

- The state published the advisory notice in a very limited number of fora—on a district health department website and in new advisory signs around the marsh.[83]

Jul. 2019: EGLE boasted about a verbal deal with the Air Force that a news release said would "accelerate" the investigation into PFAS pollution at Wurtsmith.[84]

WHAT THE STATE SHOULD HAVE DONE

- EGLE should have let its actions do the talking by coming to an agreement that compelled the Air Force to act more quickly to clean up the pollution.

WHAT THE STATE REALLY DID

- The agreement did not commit the Air Force to any new actions, and the Air Force continues to draw out the cleanup process to this day. Meanwhile, EGLE has since failed to expeditiously use all available tools at its disposal to force the Air Force to act in ways that will benefit the state's people, wildlife, and natural resources. For example, Governor Whitmer's administration delayed invoking the state's legal authority to compel the Air Force to clean up PFAS contamination to Michigan's PFAS standards—an action it should have taken in early 2020—until the end of March 2021.[85] Prior to that action, the administration had merely stated its "expect[ation]" that the Air Force meet the state's PFAS cleanup standards in Oscoda.[86]

The state of Michigan must work to repair its relationship with the Oscoda community, and it must more competently protect its people and natural resources. For one, the state needs to be more transparent with the public about the serious risks of the PFAS contamination in Oscoda, and about its strategy to respond to and mitigate those risks. And as a general rule, the state must be far more aggressive in its actions: it must vigorously defend the applicability of its own PFAS cleanup standards to the Air Force's pollution, and it must proactively use all authorities available to it to keep people, wildlife, and natural resources safe. If the state adopts such an approach, the state will be much more effective in protecting the environment and public health in Oscoda, and it will begin to restore the community's trust.

Endnotes

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4 The EPA issued a "lifetime health advisory" for PFOS and PFOA in 2016 to "describe non-regulatory concentrations of drinking water contaminants at or below which adverse health effects are not anticipated to occur over specific exposure durations." *PFAS Laws and Regulations*, EPA, https://www.epa.gov/pfas/pfas-laws-and-regulations (last visited Jan. 22, 2021). That advisory was set at 70 ppt for PFOS and PFOA combined.

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7 Cheryl M. Bartel, Occurrence and Distribution of Perfluorinated Surfactants in Groundwater Contaminated by Fire-Fighting Activity (Nov. 23, 1999) (Ph.D. thesis, Oregon State University), https://ir.library.oregonstate.edu/concern/graduate_thesis_or_dissertations/b2773x806. With the assistance of funding from the National Institute of Environmental Health Sciences ("NIEHS"), findings based on this research were later published in a scientific journal in 2003, *see supra* note 1.

8 In a 2019 executive order, Governor Whitmer reorganized MDEQ as EGLE. Mich. Exec. Order No. 2019-06 (Feb. 20, 2019). For purposes of clarity, this document will refer to the agency as "EGLE" when describing the agency both pre- and post-reorganization.

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