Managing PFAS in Maine

Final Report from the Maine PFAS Task Force
December 2019

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Guiding Principles

Governor Janet Mills created the Maine PFAS Task Force in March 2019 to review the extent of PFAS contamination in Maine and provide recommendations about how we can protect Maine residents from exposure.

The Maine PFAS Task Force reviewed information from a variety of sources, including results of sampling by State of Maine agencies and various health studies, and solicited input from stakeholders and other members of the public.

The varied viewpoints of Task Force members strengthened discussions about priorities for State action. These diverse perspectives helped us deliver more comprehensive recommendations that center around a shared set of priorities.

Summary of Recommendations

To be most protective of Maine citizens, now and in the future, we believe the following are of greatest importance:

1. **Identifying and reducing sources of PFAS;**
2. **Providing safe drinking water;**
3. **Protecting our food supply;**
4. **Responsible waste disposal and management;**
5. **Improving public education about PFAS;**
6. **Demanding federal action; and**
7. **Funding for state agencies to investigate, respond to and reduce exposure of Maine citizens to PFAS.**

PFAS is a health concern for Maine citizens and requires our attention. Nearly everyone is exposed to these chemicals from numerous sources. Our recommendations reflect a commitment to determine where PFAS contaminants exist in Maine and put in place strategic responses to protect people from exposure. The following report details recommendations the Task Force has identified as action items State of Maine agencies should implement.

PFAS Background

What is PFAS?

"PFAS" (per- and poly-fluoroalkyl substances) are a large group of manmade fluorinated chemicals. There are over 4,000 compounds that have been identified as PFAS to-date.

The two most commonly used PFAS were PFOA (perfluorooctanoic acid) and PFOS (perfluorooctane sulfonate). These two compounds were used in households across the country in the non-stick, grease resistant convenience items of the 20th century. PFOA and PFOS are still required components in a class of firefighting foam (Class B Aqueous Film Forming Foam (AFFF)) used to quickly extinguish petroleum-based fires. Some of the highest levels of PFOA and PFOS in Maine have been found at current or former military bases where Class B AFFF had been repeatedly discharged.

Chemical manufacturers in the U.S. phased out production of PFOA and PFOS in the early 2000's, but they were replaced with a wide variety of other PFAS. PFOA and PFOS are also still present in imported products, and many other PFAS break down in the environment into the more stable PFOA and PFOS compounds.

A wide variety of PFAS, many still unidentified as manufacturers claim their formulations to be proprietary information, are now used in consumer products that are stain, oil, heat, and water resistant, such as clothing, furniture fabric, food packaging, carpets, cookware, outdoor recreational items, and electronics. Because these chemicals are used so widely in consumer products, they are also present in our wastewater in septic tanks and at treatment plants.

The scientific understanding of how PFAS impacts people and the environment is still developing, and for thousands of PFAS compounds much remains unknown. Laboratories can still only accurately analyze for a small subset of PFAS.

State governments typically rely on the federal government to certify analytical methods for environmental contaminants. At this time, the U.S. EPA has only formally certified one method for analysis of 18 PFAS in drinking water (Method 537.1, Document #EPA/600/R-18/352 (2018)), although other methods for groundwater, wastewater and soils have been accepted by the U.S. EPA and Department of Defense for remediation site cleanup decisions. Other states have wide-ranging levels of industrial activity and methods for managing wastes, which have resulted in varying levels of PFAS contaminants within their borders. These differences among states are reflected in the variety of standards and screening levels for PFAS that other states have established in the absence of federal action to respond to their own unique circumstances.

Human exposure to PFAS continues to be widespread because this chemistry is used in hundreds of products for a variety of applications. Manufacturers do not report their uses of PFAS so it is difficult to limit exposures. International studies have been supported by Maine-specific sampling to indicate that PFAS are present in our environment, and that the highest concentrations of PFAS exist in environmental media such as soil and groundwater in areas where materials containing PFAS were disposed. In 2019, Maine is similar to other states trying to manage a shifting landscape while keeping pace with changes in our knowledge of this emerging contaminant and protecting human health with limited resources and authority.

Health Concerns

Scientists are still learning about the possible health effects from exposure to PFAS chemicals. Four specific PFAS chemicals - PFOA, PFOS, PFHxS and PFNA - have been studied more extensively than other PFAS. According to the U.S. Agency for Toxic Substances and Disease Registry (ATSDR), studies of people who have higher PFOA or PFOS levels in their blood have shown that these chemicals may:[1]

- increase cholesterol levels;
- decrease how well the body responds to vaccines;
- increase the risk of thyroid disease;
- increase the risk of high blood pressure or pre-eclampsia in pregnant women;
- lower infant birth weights; however, the decrease in birth weight is small and may not affect the infant's health;
- increase risk of kidney cancer or testicular cancer.

Studies with laboratory animals exposed to high doses of one or more of these PFAS have shown changes in liver, thyroid, pancreatic function, and hormone levels, and increases in testicular, liver and pancreatic tumors.

Nearly everyone is exposed to PFAS chemicals. By measuring PFAS in blood serum it is possible to estimate the amount of PFAS that have entered people's bodies. Because some PFAS persist in our bodies for years, the levels in our blood serum at any time reflects exposure to these chemicals over the preceding several years. U.S. Centers for Disease Control (CDC) scientists have measured at least 12 PFAS in the blood serum of participants who have taken part in the National Health and Nutrition Examination Survey (NHANES) since 1999.[2] Four PFAS (PFOS, PFOA, PFHxS and PFNA) have been found in the

[1] https://www.atsdr.cdc.gov/pfas/PFAS-health-effects.html

[2] National Report on Human Exposure to Environmental Chemicals – US CDC: https://www.cdc.gov/exposurereport/index.html

blood serum of nearly all the people tested, indicating widespread exposure to these PFAS in the U.S. population. Notably, since 1999 the measured levels of PFOS and PFOA in the blood serum of NHANES participants have decreased by about 80 percent. The exposure pathway or pathways responsible for this decline remains unclear, though the timing does coincide with the declining use of these chemicals in the U.S.

For most people, diet is thought to be the primary source of exposure to PFAS.[1] The major types of dietary exposure for PFAS include either ingesting food contaminated with PFAS and eating food packaged in materials containing PFAS. Hand-to-mouth transfer from dust in households containing products treated with PFAS-containing stain protectants, such as carpets, is thought to be an important exposure pathway for infants and toddlers. Dermal exposure from water is thought to be a minor exposure pathway, and therefore bathing is not considered of concern.

For individuals drinking water with even relatively low level PFAS contamination (e.g., as low as 20 ppt), water consumption is likely their dominant exposure pathway.[2] Much of the early attention to PFAS nationally has been in response to contaminated drinking water supplies. Both community drinking water supplies and residential wells have been contaminated through past use of AFFF at military bases, as well as releases at chemical manufacturing facilities. Sizable population exposures to contaminated water have been reported in Colorado, Michigan, Minnesota, New York, New Hampshire, Pennsylvania, and Vermont.

More recent testing has shown drinking water may be contaminated by many different sources, such as landfills, residuals and septage spreading sites, air emissions from manufacturing facilities, and the discharge of AFFF for firefighting.

In 2016, the U.S. Environmental Protection Agency (EPA) issued a final Lifetime Health Advisory (LHA) informing state health agencies with regulatory authority over public water systems that, due to its adverse health effects, members of the public should not drink water where PFOA and PFOS individually or combined are measured above 70 parts per trillion (ppt). EPA Health Advisories are intended as informational resources for administrators of public water systems and agencies responsible for their oversight. Health Advisories are not regulations and do not represent legally enforceable standards. (EPA HA, 2016)

[1] Egeghy & Lorber. Journal of Exposure Science and Environmental Epidemiology (2011) 21, 150–168

[2] Need to check calculations on this, but latest NHANES blood serum levels and pharmacokinetic modeling suggests a typical daily intake for PFOS of around 28 ng/day. A typical adult person consumes a bit less than a liter per day of tap water. So at water levels above 20 ng/L, water is clearly the dominant exposure pathway.

Since the release of the 2016 PFOA/PFOS health advisory, the ATSDR and several states have reviewed the toxicity information available for PFOA, PFOS (and some agencies have also reviewed information on PFHxS and PFNA) and proposed or developed their own toxicity values. Despite looking at the same toxicity information as EPA, nearly all of these agencies have adopted toxicity values as much as 10-fold lower (including ATSDR's – another federal agency - proposed values), with differences largely a consequence of divergent views on which animal studies and which toxic effects to rely on, as well as divergent views on the appropriate application of uncertainty factors.

Absent a federal drinking water standard (called a Maximum Contaminant Level or MCL), some states confronting significant community water contamination problems have proposed or adopted their own drinking water standards. These state specific standards are lower than EPA's Health Advisory, a consequence of both the aforementioned lower toxicity values but also differences in the modeling of exposure. EPA's Health Advisory is based on water consumption by a lactating woman, to be consistent with a toxicity value based on developmental toxicity resulting from in utero exposure. Some states have instead modeled water consumption by the formula-fed infant, conservatively assuming the infant has similar sensitivity to PFAS as the developing fetus. Recently a few states have modeled transgenerational exposure to PFAS in water that considers both exposure in utero from water consumption during pregnancy followed by exposure to the infant from breast feeding. While most states continue to rely on EPA's Health Advisory for making risk management decisions on water contamination (including Maine), a national consensus regarding appropriate guidelines for PFAS in water has not been achieved. Moreover, toxicity data is lacking for most PFAS.

Across the country, as well as here in Maine, PFOA, PFOS, and other PFAS are also being detected in soils, sediment, surface water, air, biosolids, septage, compost, fish, and some foods. With these discoveries, new exposure pathways become apparent, such as soil-to-groundwater and soil-to-plant. Yet models and data for some of these exposure pathways are limited, posing challenges for developing guidelines for these media. It is also becoming apparent that trace levels of PFAS can be found in soils and freshwater fish in locations with no known release of PFAS, indicating a possible role for atmospheric transport and deposition.[3]

[3] Reference VT background soil study.

PFAS in Maine

PFAS was first discovered in groundwater in Maine at former military installations. Those sites were already known to contain other contaminants and surrounding areas are served by public water supplies. The potential for more widespread PFAS impacts in Maine was not realized until PFAS was discovered in the Kennebunk, Kennebunkport, Wells Water District supply well, which led to the discovery of PFAS in a nearby dairy farm well, milk, hay and soil. This one incident raised a series of questions about the soil-to-groundwater pathway, agronomic exposure pathways, and whether this was an isolated or more common occurrence. Since that time, many State of Maine agencies have become involved in efforts to investigate, respond to, and reduce exposure of Maine citizens to PFAS.

Maine DEP, the Maine Department of Agriculture, Conservation and Forestry (DACF), and the Maine Drinking Water Program, in cooperation with the Maine Center for Disease Control (Maine CDC) continue to investigate sites and materials for possible PFAS compounds, including:

- Public water supplies near potential sources of PFAS
- Groundwater, surface water, and private water supplies around Maine DEP cleanup sites, landfills, sludge land application sites, and Superfund sites
- Retail milk supply
- Vegetation (corn and hay) associated with agricultural feed for the dairy industry
- Sludge and other residuals
- Fish tissue

Maine Department of Environmental Protection

As of October 2019, the Maine DEP has more than 30,000 records for PFAS at 244 locations across the State. The DEP follows a step-out approach to site investigation – if contaminants are found above screening levels at a sampling point, DEP evaluates environmental pathways for those contaminants and conducts testing at nearby locations where impacts may also be predicted. For example, DEP may investigate contamination along a bedrock fracture where groundwater is predicted to travel to drinking water wells. DEP's Remedial Action Guidelines, developed in collaboration with Maine CDC, recommend treatment or replacement of drinking water supplies where PFOA and PFOS exceed 70 ppt, or where all PFAS exceed 400 ppt. As a result of this approach, carbon filtration drinking water treatment systems for PFAS have been installed on several private supplies near closed, unlined municipal landfills.

Maine DEP, DACF, and Maine CDC are continuing efforts to refine modeling assumptions to ensure that decisions are made based on the best available science. Work is on-going or underway to:

- Assess historic records to determine extent of sludge spreading activities on farmland and determine appropriate next steps;
- Sample corn stalks growing on farm fields with extensive land spreading history that will be harvested for silage feedstock;
- Further evaluate the extent to which PFAS compounds transfer from soil to silage corn to animals and ultimately into the food chain;
- Communicate with other states and agencies to evaluate toxicological data that is the foundation of our modeling work.

All data is publicly available through Maine DEP's website in several formats, including:

- An interactive mapping tool that includes a visual map, the ability to search for sites, and all supporting data in a downloadable format
- For sludge land application sites, a table that includes information for all licensed sites as well as all available records of land application
- A copy of all PFAS test results for all site types included in Maine DEP's database

Recognizing the financial burden PFAS has placed on some of Maine's wastewater treatment facilities, in 2019 Maine DEP:

- Offered emergency dewatering grants to certain facilities that did not have a way to dispose of low-solids content wastewater sludge that cannot be land applied due to high PFAS levels
- Offered planning grants to assist these same facilities in planning for future wastewater sludge disposal.

Maine Drinking Water Program

Just over half (51 %) of Maine citizens obtain their drinking water from private wells, which are not subject to federal or state regulation or testing requirements. The remaining 49% of Maine's population is served water by Community Water Systems, which are regulated under the federal Safe Drinking Water Act administered through Maine CDC's Drinking Water Program. Maine has approximately 378 regulated Community Water Systems (water systems that serve people in their homes on a year-round basis). Community Water Systems must test for approximately 87 manmade and natural contaminants on a regular basis and take necessary steps to reduce detected contaminant levels to below

drinking water standards established by EPA, known as Maximum Contaminant Levels (MCLs). Maine also has 375 Non-Transient Non-Community systems (these include schools and businesses); 1,151 Transient systems (these include restaurants and campgrounds); and 54 regulated bottled water sources. These systems are also subject to regulation, albeit less rigorous than the requirements for Community Water Systems.

Public water supplies are not required to monitor for or treat PFAS in drinking water. However, several public water supplies have been sampled for PFAS in Maine through an EPA-coordinated sampling program from 2013-2015 and two sampling rounds coordinated by the Maine CDC Drinking Water Program in 2017 and 2019. These programs were part of a data gathering effort to help evaluate the presence of PFAS in Maine's public water systems to inform future decisions on possible regulation of these chemicals as drinking water contaminants. The combined sampling efforts have resulted in analysis of drinking water samples for PFAS concentration in a total of 53 public water systems in Maine, mostly Community Water Systems. These systems represent more than 65% of the population served by Community Water Systems.

Maine CDC has advised public water systems testing for PFAS to use EPA's Health Advisory to guide decisions on whether to install filtration to reduce PFAS levels. The current Health Advisory for drinking water is a combined concentration of 70 ppt for two PFAS compounds, perfluorooctanoic acid (PFOA) and perfluoro octane sulfonate (PFOS). To date, only one public water supply was found to have combined PFOA and PFOS above the health advisory of 70 ppt. This is a small community system in Houlton, Maine (Houlton Mobile Home Park) serving approximately 140 people. This system is currently providing bottled water to their customers while considering installation of a treatment system and/or replacement of the water source. In addition, one public water supply in southern Maine (Kennebunk, Kennebunkport & Wells Water District) serving a population of approximately 34,250 elected to install a treatment system for PFAS in one of their well sources, although PFAS levels in the well did not exceed 70 ppt.

Based on PFAS sampling in Maine's public water systems to-date, PFAS does not appear to be present in most public drinking water. Where detected, PFAS levels tend to be very low (i.e., well below EPA's Health Advisory), with a couple of exceptions as noted above. Considering that all the systems included in the State-coordinated sampling programs were selected due to their proximity to potential sources of PFAS contamination, these results indicate that Maine does not have widespread PFAS contamination of public drinking water. However, since PFAS is present in many consumer products, waste streams and industrial processes, a thorough assessment of potential risk to consumers served by Community Water Systems would need to include sampling of all 378 systems.

In Maine's most recent PFAS sampling round conducted in 2019, seventeen (17) of the thirty-six (36) public water systems included in the program declined to participate, in several cases stating that they wished to wait until testing was required rather than participating in the voluntary sampling program. Based on this result, it may be necessary to create a requirement for Community Water Systems to sample for PFAS to assess potential risks to all of Maine's citizens that receive their water from Community Water Systems. This would require action by the State Legislature to enact new laws requiring Community Water Systems to test for PFAS at specified intervals in addition to their regular monitoring requirements under the Safe Drinking Water Act. The Maine CDC recommends that public water systems continue to use EPA's Health Advisory to guide decision making on treatment and public notification when PFAS is detected until EPA's Health Advisory may be superseded by new MCLs established at the federal level.

Maine Department of Agriculture, Conservation and Forestry

DACF is responsible for ensuring the safety of Maine's food supply while providing support to farmers and food producers through a host of programs and resources. To date, DACF has concentrated its efforts on investigating potential contamination of PFAS in retail milk; however, it anticipates this scope to expand upon further data collection and assessment, additional scientific study, and the establishment of recognized PFAS standards for food.

In late 2016, PFAS chemicals were found to be present at levels up to 1420 ppt in the milk of a Maine dairy farm that had historically applied biosolids and papermill residuals to its fields. These results exceeded the Action Threshold of 210 ppt for milk that was developed by the Maine Center for Disease Control & Prevention to determine when milk is considered adulterated.

To determine the safety of Maine's current overall milk supply, DACF completed a state-wide retail milk survey in June 2019. The survey focused on Maine-produced, fluid pasteurized milk that was: 1) bottled in-state; or 2) was bottled out of state but sold in Maine. Twenty-six samples were taken throughout the state to ensure broad geographic representation. All results were below the laboratory reporting level of 50 ppt.

At the same time DACF tested milk from three commercial dairy farms, two with an extensive history of biosolid and/or paper mill residual applications and whose soil samples exceeded DEP's screening levels for PFOA and/or PFOS. The third farm was near the farm that had tested high for PFOS in 2016. The results from all three farms were also below the lab's reporting level of 50 ppt.

Future testing of milk and other agricultural products will occur based on additional factors, including the careful review of historic records, assessment of emerging science (including improved testing methods), and with the establishment of PFAS thresholds for other foods. DACF is in the process of assessing historical records of where licensed residuals may have been applied on Maine farmland. These records must be vetted to fully understand past spreading activities (residual type(s), location(s), amount(s), and date(s)), the crops or livestock produced, soil characteristics, and other relevant data to assess potential risk and next steps.

DACF will work closely with any farmer whose products may be found to be adulterated by PFAS, with the goal of identifying mitigation strategies that could allow them to continue farming and producing safe agricultural products. DACF, in collaboration with DEP and DHHS, is prepared to help identify on-farm sources of PFAS contamination, design elimination strategies, and conduct ongoing testing and monitoring. It will further advocate for additional sources of funding to assist farmers who face financial hardship from lost production caused by PFAS contamination.

Maine Emergency Management Agency

The Maine Emergency Management Agency implements the Toxics Release Inventory (TRI) reports for the State. At the current time PFAS is not a TRI chemical but recommendations to the US EPA have been sent on behalf of Maine to include PFAS on the chemical list.

The AFFF working group was formed to establish a comprehensive inventory of Class B AFFF firefighting foam throughout Maine and to make recommendations to the Governors PFAS Task Force regarding the future use of Class B AFFF. The AFFF workgroup included the State Fire Marshal and representation from Maine DEP, MEMA, Maine Fire Chief's Association, Maine Professional Firefighters Association, Maine Department of Labor, Maine Fire Service Institute, Bangor International Jetport, Portland International Jetport, Sappi Fine Paper, Maine State Police, Irving Oil, Citgo Oil, Global Partners LP, Gulf Oil, State Emergency Response Commission, and the Maine Air National Guard. A formal letter of request from the State Fire Marshall along with a survey was developed and sent to all Maine fire departments and industry partners to collect Class B AFFF information on behalf of the Task Force. Additionally, working group members developed and emailed a Class B AFFF infographic to all fire service organizations and industry partners in the state. Out of 305 fire departments in the State only 60 responses were received and out of 20 industry partners only 8 were received. Response to these surveys has been

disappointing, even after multiple requests. We are unaware of any mechanism that obligates response to these surveys. Maine DEP, MEMA and the State Fire Marshal's office will continue to encourage organizations to respond to these surveys and manage survey data for future use to ensure accurate information is available once an appropriate takeback and replacement program is established.

The AFFF workgroup submitted their recommendations to the Maine PFAS Task Force at their October 29, 2019 meeting. Those recommendations are included in Appendix D.

Recommendations

1. **Identifying and reducing sources of PFAS;**
2. **Providing safe drinking water;**
3. **Protecting our food supply;**
4. **Responsible waste management;**
5. **Improving public education about PFAS;**
6. **Demanding federal action; and**
7. **Funding for state agencies to investigate, respond to and reduce exposure of Maine citizens to PFAS.**

1. Identifying and Reducing Sources of PFAS

The Task Force recommends that the State of Maine require manufacturers to report the intentional use of all PFAS in manufacturing processes and in consumer products, and to require the use of safer alternatives when they are available. Legislation would be necessary to require this.

The Task Force supports the recommendations of the Firefighting Foam workgroup, included in Appendix D. This includes reporting discharges of Class B AFFF to the DEP and establishing a Class B AFFF take back and replacement program.

The Task Force recommends that State of Maine procurement guidelines should discourage the purchase of PFAS-containing products.

2. Providing Safe Drinking Water

The Task Force recommends that all public water systems should be required to test for PFAS and to notify their customers if PFAS are detected. This is similar to the approach taken by the State of California.

Task Force members disagreed about the level at which customers should be notified; Maine DWP recommended 10 ppt while some other members recommended notification at any level of detection. Maine has not, to-date, taken this approach with any other contaminants. For all other drinking water contaminants, Maine public water systems are only required to provide notice if concentrations exceed a maximum contaminant level

(MCL). Legislation would be required to establish a testing and notification requirement for PFAS.

The Task Force also recommends that private drinking water should be tested for PFAS in areas where groundwater is likely to have been impacted by PFAS at unsafe levels, such as: 1) manufacturing locations that utilized PFAS chemistry; 2) unlined landfills; 3) areas where Class B AFFF has been discharged or stored; and 4) residuals land spreading sites. Some members recommended that the State should require PFAS testing of private wells at the time of real estate transfers.

3. Protecting our Food Supply

Foods may contain PFAS in unsafe quantities due to contact with PFAS-containing materials (such as packaging or processing equipment), due to vegetative uptake into produce, due to livestock consumption of PFAS-containing feed, or due to other environmental exposures. Regulation of contaminants in food is controlled almost exclusively by the U.S. Food and Drug Administration. (See Recommendation #6 for further discussion of federal actions.)

The Task Force recommends that the State protect foods produced in Maine from PFAS adulteration through restrictions on PFAS uses, restrictions on the agronomic utilization and land application of PFAS-containing residuals, and through the investigation and remediation of PFAS contamination.

4. Responsible Waste Management

The State of Maine must take actions to prevent PFAS from entering Maine's environment, food supply, and drinking water. The Task Force supports legislation to amend Maine's Uncontrolled Sites law to include pollutants and contaminants, which would give the State authority to require the removal and treatment of PFAS when they are a danger to public health.

The Task Force recommends that DEP require regular testing of residuals for PFAS prior to land spreading or commercial distribution in Maine. The Task Force also recommends expanding existing requirements to include septage that is agronomically utilized or land applied. The Task Force supports legislation that would authorize the Board of Environmental Protection to update DEP's screening levels for individual PFAS and other constituents through routine technical rulemaking so those levels can be kept up to date.

The Task Force also recommends the State continue efforts to sample for PFAS in prioritized locations, analyze sampling results for patterns, and refine models of PFAS fate and transport.

Maine DEP should investigate the availability of treatment and disposal technologies that minimize the potential for environmental PFAS contamination. Preference should be given to technologies with the demonstrated capacity to safely destroy PFAS. Additionally, the State of Maine should promote the development of infrastructure, on the scale necessary to meet the needs of the State, to manage PFAS-contaminated wastes safely and in a cost-effective manner.

5. Public Education

Maine citizens, physicians, government officials and other professionals must have access to information regarding PFAS to guide their own decision making. The Task Force recommends that the State develop educational materials at the appropriate literacy level for their intended audience, to be provided through a variety of forums such as webpages, training events, and fairs. Those audiences should include healthcare providers, farmers, drinking water and wastewater utility customers, fire fighters and students.

6. Demand for Federal Action

The Maine PFAS Task Force demands that federal government agencies take prompt action to reduce harmful exposures of citizens to PFAS due to the widespread nature of PFAS uses and potential exposures. These actions should include:

a) Source reduction

The federal government should require manufacturers to reduce and eliminate the use of PFAS chemistry in non-essential applications, with particular focus on those uses with the highest potential for human exposure. Manufacturers (domestic and foreign) of consumer products should be required to report their use of PFAS compounds in products sold in the United States.

The Federal Aviation Administration and the Department of Defense should identify effective foams that do not contain PFAS and should eliminate requirements for firefighting foams to contain PFAS.

OSHA and NIOSH should adopt exposure limits for workers exposed to PFAS. These limits should also apply to firefighters and other emergency personnel supporting emergency response activities.

The U.S. EPA should add PFAS to the hazardous substance list under CERCLA authority.

b) Drinking Water

The U.S. EPA should establish a Maximum Contaminant Level for PFAS in drinking water, which should also apply to bottled water.

c) Food supply

The U.S. FDA should establish PFAS adulteration levels for foods in order to minimize dietary exposures to all PFAS.

The U.S. Department of Agriculture should establish additional sources of funding support for farmers impacted by PFAS contamination, similar to the Farm Service Agency's Dairy Indemnity Payment Program.

d) Waste Management

ATSDR should finalize toxicity values for PFAS commonly found in environmental samples. The U.S. EPA should then update Regional Screening Levels to include additional screening level guidelines. The U.S. EPA should also certify additional laboratory methods to measure PFAS in various media (groundwater, wastewater, soils and other solids, ambient air).

7. Funding for State Actions

The State of Maine is expending significant funds to investigate and control PFAS exposures for Maine citizens, and substantial additional funding will be needed to continue this work. Municipalities, drinking water and wastewater utility districts, farmers, businesses, property owners and other Maine citizens are also bearing direct and indirect costs from PFAS contamination.

State funding

The Task Force recommends that funding from appropriate State of Maine accounts should be utilized, to the extent it is available, to fund sampling and treatment of drinking water supplies, and to fund the investigation of PFAS contamination that threatens Maine's citizens. State of Maine agencies must also be adequately staffed to

conduct the work necessary to implement any and all of the Task Force's recommendations, which will cost many millions of dollars in the coming years.

Bond Initiative

The Task Force recommends that the State of Maine introduce a bond initiative to raise money for the State's costs for PFAS sampling, remediation, and drinking water treatment.

Damage Claims

Many municipalities and states across the country are engaged in litigation against companies that manufactured PFOA and PFOS products, including claims for financial compensation. The Task Force recommends that the State of Maine fully consider available legal avenues to apply the costs of PFAS contamination in Maine to appropriate responsible parties who knowingly supplied products that are harmful to human health and the environment.

Conclusion

These recommendations reflect a commitment to determine where contamination exists in Maine and to put in place strategic responses to protect people from exposure. Through our deliberations and review of data, we concluded that PFAS is a health concern for Maine citizens and requires our attention. We believe that these recommendations exemplify the sincerity of our work and the seriousness of this contamination issue.

APPENDIX A

OFFICE OF
THE GOVERNOR

NO. S FY 19.QO
DATE March6,2019

**AN ORDER TO STUDY THE THREATS OF
PFAS CONTAMINATION TO PUBLIC HEALTH AND THE ENVIRONMENT**

WHEREAS, Perfluoroalkyl and Polyfluoroalkyl (PFAS) are chemicals that are not naturally occurring, are stable and persistent in the environment, bioaccumulative, toxic at low concentrations, and easily transferred to groundwater and other media; and

WHEREAS, the use of PFAS in thousands of commercial and industrial applications, processes, and products has resulted in detectable concentrations in drinking water, soil and vegetation throughout the country, including sites in Maine; and

WHEREAS, the United States Environmental Protection Agency has established a lifetime health advisory level for perfluorooctanoic acid and perfluoro octane sulfonate in drinking water, and has developed a National Action Plan to protect public health from exposure to these compounds; and

WHEREAS, Maine State agencies are charged by *MR.S. Titles* 7, *22 and 38* with protecting public health and the environment from the risks of human exposure to these substances; and

WHEREAS, a coordinated response informed by persons with pertinent expertise is necessary to study PFAS distribution, assess the potential environmental and health impacts of PFAS, and recommend effective strategies to reduce or eliminate or reduce those impacts;

NOW THEREFORE, I, Janet T. Mills, Governor of the State of Maine, pursuant to authority conferred by *Me. Const. Art. V. Pt. 1, §1 and §12,* do hereby Order the following:

I. ESTABLISHMENT

The Governor's Task Force on the Threats of PFAS Contamination to Public Health and the Environment (Task Force) is hereby created. The purpose of the Task Force is to identify the extent of PFAS exposure in Maine, examine the risks of PFAS to Maine residents and the environment, and recommend State approaches to most effectively address this risk.

II. MEMBERSHIP

The Task Force shall consist of the following members:

A. The Commissioners, or their designees, of the Departments of:

1. Environmental Protection;

2. Health and Human Services;

3. Agriculture, Conservation and Forestry; and

4. Defense, Veterans and Emergency Management;

B. A public health physician designated by the Maine Public Health Association;

C. A representative, selected jointly by the Commissioners of Environmental Protection and Health and Human Services, from:

1. A Maine-based non-profit whose mission includes protecting human health and the environment from the effects of chemical contamination;

2. Maine's pulp and paper industry; and

3. A Maine-based association of:

a. Certified wastewater treatment plant operators;

b. Drinking water supply professionals; and

c. Biosolids and residuals management professionals.

The Commissioner of Environmental Protection shall, after conferring with the Governor, select a chair of the Task Force.

III. DUTIES

The Task Force shall:

A. Review information regarding known locations of PFAS detection in Maine and the status of any response strategies for those sites;

B. Identify significant data gaps in the knowledge of PFAS in Maine and develop recommendations to address such gaps;

C. Identify opportunities for public education regarding PFAS contamination and the effects of its exposure on public health and the environment;

D. Identify the sources of PFAS contamination and exposure pathways that pose the greatest risk to public health and the environment in Maine;

E. Examine the benefits and burdens of various treatment and disposal options for PFAS-contaminated media;

F. Assess how State agencies can most effectively use their existing authority and resources to reduce or eliminate priority and other risks from PFAS contamination;

G. Determine the inventory and use of fluorinated Aqueous Film Forming Foam in firefighting and fire training activities in Maine and evaluate effective nonfluorinated alternatives; and

H. Examine Maine and other data regarding PFAS contamination in freshwater fish and marine organisms and determine whether further such examination is warranted.

IV. OPERATIONS

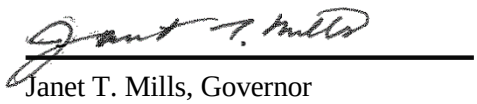
The Task Force shall meet at the call of its Chair. The Task Force may form workgroups, make inquiries, conduct studies, hold public hearings and otherwise solicit and consider public comment. The Task Force may also consult with outside experts including those in other governmental agencies, institutions of higher education, non-governmental organizations, and the private sector. The Task Force shall issue a written report as soon as reasonably practicable.

V. OTHER

State agencies shall assist the Task Force in the performance of its duties and provide administrative and other support as requested. This Order shall not be construed to limit the discretion of any such agency to exercise its lawful authority to take any such action it deems necessary and appropriate to address issues of PFAS contamination.

VI. EFFECTIVE DATE

The effective date of this Order is March 6, 2019.



Janet T. Mills, Governor

APPENDIX B

Definitions and Acronyms

Acronym	Definition
AFFF	Aqueous Film Forming Foam
ATSDR	Agency for Toxic Substances and Disease Registry
Biosolids	Sewage sludge managed by wastewater treatment facilities
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
Chain length	Number of carbon atoms linked together in a PFAS molecule
DACF	Maine Department of Agriculture, Conservation and Forestry
DEP	Maine Department of Environmental Protection
HA	Health Advisory issued by EPA Office of Water
MCL	Maximum contaminant level
Method 537.1	U.S. EPA certified analytical method used to determine presence of 18 different PFAS in drinking water
MRL	Minimal Risk Levels
NHANES	National Health and Nutrition Examination Survey
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PFAS	per- and poly- fluoroalkyl substances
PFHxS	Perfluorohexane sulfonate
PFNA	Perfluorononanoic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
Residuals	Solid wastes generated from municipal, commercial or industrial facilities that may be suitable for agronomic utilization.

Common Units of Measure

1 milligram/kilogram (mg/kg) = 1 milligram/liter (mg/L) = 1 part per million (ppm)

1 microgram/kilogram (µg/kg) = 1 microgram/Liter (µg/L) = 1 part per billion (ppb)

1 nanogram/kilogram (ng/kg) = 1 nanogram/Liter (ng/L0 = 1 part per trillion (ppt)

Conversions

1 ppm = 1,000 ppb = 1,000,000 ppt

APPENDIX C

CLASS B AFFF Working Group
Report To Governor's PFAS Task Force

Report Outline

Working Group Membership

Background

Recommendations

Survey Results

Enclosures 1-4

Prepared By

Faith Staples - Maine Emergency Management – Technical Hazards Program Coordinator

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Membership:

Joseph Thomas – Maine State Fire Marshal

James Graves – Maine Fire Training Institute

John Duross – Maine Fire Chiefs Association

John Martell – Professional Firefighters of Maine

Brain Bernosky – Bangor International Airport

Chris Cronin – Maine Air National Guard

Sean Goodwin – State Emergency Response Commission

Bruce Yates – Global Partners LP

Jon Hendricks – Portland Fire Department/ Portland Jetport

Skip Pratt – Sappi Fine Paper

Monika Niedbala – Buckeye Partners

Jeff Squires – Maine DEP

Faith Staples – Maine Emergency Management Agency

Chris Rogers – Maine State Police

Michael LaPlante – Maine Department of Labor

Drake Bell – Irving Oil

Donald Griffin – Citgo

Terry Sullivan – Gulf Oil

Jason Farris – Maine Fire Chiefs Association

Arthur True – Kennebec County Emergency Management Agency

Matt Fournier – Maine Emergency Management Agency

Jeff Zahniser – Maine Air National Guard

Paul LaValle – Global Partners LP

Thomas Palmer – City of Bangor

Mike Scott – Professional Firefighters of Maine

Date Group Created: June 28th, 2019

Meetings Held: 3

Background: Recent reports and studies have raised awareness about the potential health effects associated with Perfluoroalkyl and Polyfluoroalkyl substances (PFAS), inclusive of the compounds PFOA and PFOS, and how it has been found in ground water sources. It has been determined that Class B Aqueous Film-Forming Foam (AFFF) used during fire suppression and firefighter training contributes to PFAS contamination of ground water. Aqueous film-forming foam (AFFF) is highly effective foam intended for fighting high-hazard flammable liquid fires. AFFF products are typically formed by combining hydrocarbon foaming agents with fluorinated surfactants. When mixed with water, the resulting solution achieves the interfacial tension characteristics needed to produce an aqueous film that spreads across the surface of a hydrocarbon fuel to extinguish the flame and to form a vapor barrier between the fuel and atmospheric oxygen to prevent re-ignition. [Interstate Technology Regulatory Council (ITRC) document "Aqueous Film-Forming Foams (AFFF)", (October 2018). **(Enclosure 1)**.]

The AFFF working group was formed to establish a comprehensive inventory of Class B AFFF firefighting foam throughout Maine and to make recommendations to the Governors PFAS Task Force regarding the future use of Class B AFFF. A formal letter of request from the State Fire Marshall **(Enclosure 2)** along with a survey **(Enclosure 3)** was developed and sent out to all Maine fire departments and industry partners to collect Class B AFFF information. Additionally, working group members developed and emailed a Class B AFFF infographic **(Enclosure 4)** to all fire service organization and industry partners in the state. Out of 305 fire departments in the State only 60 responses were received and out of 20 industry partners only 8 were received. Response to these surveys has been underwhelming, even after multiple requests. We are unaware of any mechanism that obligates response to these surveys. Maine DEP, MEMA and the State Fire Marshal's office will continue to encourage organizations to respond to these surveys and manage survey data for future use to ensure accurate information is available once an appropriate takeback and replacement program is established.

Recommendations:

1. **Best Management Practices**

   That fire departments and industry partners in the State of Maine adopt the best management practices for Class B AFFF use outlined in the ITRC October 2018 document.

2. **Inventory and Product Management**

   a. That all fire departments in the State of Maine be required to disclose the type and quantity of current inventory of Class B AFFF using the survey that was sent out in August 2019. Maine DEP and MEMA will continue to track and compile that information until an appropriate takeback program is established.

   b. Establish standardized protocols for the safe containerization, storage and routine inspection of Class B AFFF foam inventories in accordance with adopted best management practices.

   c. Establish protocols for the proper disposal of containers used to store Class B AFFF and any associated equipment that may contain residual product.

3. **Continued Use of PFAS-Containing AFFF**

   a. Because Class B AFFF is vital for controlling and extinguishing petroleum-based fires, allow continued use of the currently available product until a suitable and effective replacement is identified to save life and critical infrastructure.

   b. That any Maine fire department or industry that uses PFAS-containing Class B AFFF for operational response, report that use immediately to the Maine Department of Environmental Protection Response Hotline (1-800-452-4664) to include the type of foam, manufacturer, quantity, location and circumstances in the report so that a determination can be made regarding potential impact to nearby drinking water supplies.

   c. Require the use of non-PFAS containing foam for training and flushing/testing systems unless otherwise directed by federal law (such as airports). This option may not be available for foam dispensing fire trucks that contain pre-filled internal foam storage tanks. These internal systems must be tested routinely and may already contain CLASS B AFFF which contains PFAS. In these situations, users will follow best management practices for the complete containment and disposal of any dispensed product.

4. **Establish State Level Funding Mechanism**

    a. That allows MEMA and Maine DEP to develop and execute a Class B AFFF takeback and/or replacement program that does not financially burden Maine fire departments or their municipalities.

    b. So that fire departments and their municipalities are not financially burdened for environmental clean-up incidental to Class B AFFF used for operational response if best management practices are adopted and utilized.

5. **Training and Education**

    a. That a training and educational component be added to the Fire Fighter I and Fire Fighter II programs of instruction at the Maine State Fire Academy. Education should focus on gaining a basic understanding of the threat PFAS containing Class B AFFF presents, as well as best practices for the operational use and training with foam.

    b. That all current/active firefighters in Maine receive similar instruction related to PFAS as a component to their annual In-Service training programs.

    c. That all fire service organizations and industry partners that use Class B AFFF, display the Class B AFFF infographic in a prominent location at their worksites and where foam is stored to increase employee awareness.

6. **Medical Surveillance Program**

    Incorporate baseline testing and medical monitoring procedures for Maines Firefighters and HAZMAT Technicians that have had and continue to have a greater exposure potential than the general population, with special focus on those who have had direct contact with AFFF over the course of their employment.

7. **Class B AFFF Formulation Analysis**

    Require Total Oxidizable Precursor (TOP) Assay sample analysis of Class B AFFF foams used by industry and Maine Fire Departments if it is unclear whether or not the foam contains the PFAS family of compounds.

Survey Results: As of 25 October 2019

Fire Departments: 60 responses

Fire Department Name	AFFF Firefighting Foam (gallons)	Manufacturer	No Foam Confirmed by FD (Need to Follow Up)
Littleton Fire	55	Not Listed	Cape Elizabeth Fire Department
Newcastle Fire	200	Not Listed	Farmingdale Fire Department
Bath Fire Department	65	Rockwood, Lightwater	Vassalboro Fire Department
Rumford Fire Department	115	Chemguard, Angus, Fire Ade	Frenchville Fire Department
Sabattus Fire Dept	95	National Foam	Farmington Fire Department
Fryeburg Fire Department	100	Fire Ade	Livermore Falls Fire Department
Bremen Fire Department	5	National Foam	Lincoln Fire Department
City of Augusta Fire Department	490	Fire Ade, Chemguard	Milford Fire/Rescue
Kennebunk Fire Rescue	30	National Foam	Presque Isle
Owls Head FD	345	Denko, 3M, Rockwood	Phillips Fire Department
Portland Fire Dept	1750	Chemguard	Westbrook Fire Department
Strong Fire Department	55	National Foam, Angus Fire, Rockwoood, Ansul	Peru Fire Department
Union Fire-Rescue	150	Minn. Mining & MFG., Co.	Mount Desert Fire Department
Biddeford Fire Department	155	Chemguard	Kingfield Fire Department
Eddington Fire Dept	50	National Firefighting Foam	Easton Fire Department
Richmond Fire Department	60	National Foam	Warren Fire Department
Scarborough Fire Department	195	Varies	Caribou Fire and Ambulance
South Portland Fire Department	3400	Many kinds	St. Agatha Volunteer Fire Department
South China Volunteer Fire Dept	10	3M 9/90	Lovell
Presque Isle Fire Department	440	Chemguard Class B AFFF	
Windham Fire Department	150	Chemguard AR-AFFF	
Monmouth Fire Department	5	Not Listed	
Bridgton Fire Department	430	National Foam Universal Gold AR-AFFF and GVC Aqua Det	
Raymond Fire Rescue Department	45	National Foam	
Fairfield Fire Department	10	National Foam	
Brunswick Fire Department	120	Chemguard	
Brewer Fire Department	90	Denko Class A&B Hi-X Foam	
Albion Fire Department	70	FireAde 2000 (Fore Service Plus Mfg)	
Limestone Fire Department	50	Denko	
Gardiner Fire Department	20	National Foam	
Brownfield Fire Department	15	Chemguard, Ansulite	
Thomaston Fire Department	250	Chemguard, Angus and 3M Lightwater	
Epping Volunteer Fire District	95	Fire Ade	
Dixfield Fire Department	130	FireAde 2000	
Cumberland Fire Department	165	Chemguard	
Mexico Fire Department	30	Fire Service Plus Inc.	
Goodwins Mills Fire Rescue	25	Specialty Chemicals and Equipment	
Dedham Fire Department	50	Fire Ade	
Waterville Fire Department	150	Chemguard, FireAid	
Orono Fire Department	25	Kiddie Fire	
Berwick Fire Department	40	National Foam	
Total Gallons	**9730**		

Industry: 8 responses

Industry Name	AFFF Foam (gallons)	Manafacturer	No Foam Confirmed by Industry - Follow Up
Sprague Operating Resources, LLC	4600	National Foam	Penobscot Bay Terminals
Cold Brook Energy	400	National Foam	Global Companies LLC
Sappi Mill Skowhegan	1100		Irving Oil Terminals
			Portland Pipe Line Corporation
			Portland Jetport
Total Gallons	**6100**		