

PFAS Action Team Initial Report

2019

PENNSYLVANIA



PFAS Action Team

Appointed PFAS Action Team Representatives

Department of Environmental Protection—**Secretary Patrick McDonnell**

Department of Health—**Dr. Rachel Levine**

Department of Military and Veterans Affairs—**Adjutant General Anthony Carrelli**

Department of Transportation—**Secretary Leslie Richards**

Department of Agriculture—**Secretary Russell Redding**

Department of Labor & Industry—**Secretary Jerry Oleksiak**

Office of the State Fire Commissioner—**Acting Secretary Bruce Trego**

Department of Community and Economic Development—**Secretary Dennis Davin**

Pennsylvania Fish & Boat Commission—**Executive Director Tim Schaeffer**

Pennsylvania Public Utility Commission—**Chairman Gladys Brown Dutrieuille**



Letter from the PFAS Action Team Chair



As Chair of the PFAS Action Team and Secretary of Pennsylvania's Department of Environmental Protection (DEP), I am proud of the work we are doing in Pennsylvania to address the risks that perfluoroalkyl and polyfluoroalkyl substances (PFAS) pose to human health and the environment.

A little over a year ago, with Governor Wolf's leadership, [Executive Order 2018-08](#), brought together officials from ten commonwealth Agencies and Commissions to research the sources of PFAS contamination, examine the scientific understanding of these chemicals, listen to residents who have been impacted by these chemicals, and assert our collective authorities to reduce human exposure to PFAS pollution. This initial report is a snapshot in time, which aims to highlight the work we've done to date, the work that is on-going, and the work that we intend to do.

The multi-agency PFAS Action Team recognizes the complex nature of perfluorinated compounds and their prevalence in our everyday lives. From the clothes we wear to the packaged food we eat, we routinely come into contact with PFAS in many forms. The solution for reducing our exposure to these chemicals requires creative, holistic strategies that embrace collaboration with stakeholders, such as scientists and medical experts, industrial groups, all levels of government, and residents.

In the absence of federal leadership, states like Pennsylvania are grappling with how to best move forward with substantive, cohesive plans that are protective of human health and the environment. For the past year, the PFAS Action Team has strategized a path forward to address this legacy issue. Detailed in this initial report are the completed, ongoing, and planned actions that will be carried out by the commonwealth agencies participating on this Action Team.

I would like to thank all of those who continue to focus their time and expertise on this very important issue. This report is not a conclusion of our efforts, but simply the beginning. PFAS will continue to be a top priority and our duty is to keep Pennsylvanians informed of our efforts. I look forward to the continued collaboration and successes that lie ahead.

A handwritten signature in black ink, appearing to read "Patrick McDonnell". The signature is fluid and cursive, written over a white background.

Patrick McDonnell,
Chair, PFAS Action Team
Secretary, Pennsylvania DEP

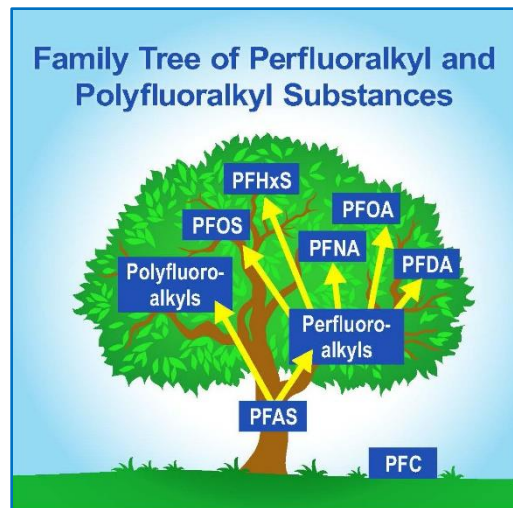
Table of Contents

Letter from the PFAS Action Team Chair	i
Table of Contents	ii
Introduction	1
Summary.....	1
History of PFAS in Pennsylvania	1
Executive Order 2018-08.....	2
Background.....	3
What Are PFAS?	3
How Are PFAS Used?.....	3
Firefighting Foam	4
Do PFAS Impact Humans and the Environment?.....	5
Why is This a Problem in Pennsylvania?	5
Water.....	6
Biosolids.....	7
Food.....	7
Landfills.....	7
Fire Training Facilities.....	8
Are These Substances Regulated?	8
What Are the Challenges with Managing PFAS Contamination?	9
PFAS Action Team.....	10
Department of Environmental Protection (DEP)	10
Department of Health (DOH).....	11
Department of Military and Veterans Affairs (DMVA)	11
Department of Transportation (PennDOT).....	11
Department of Community and Economic Development (DCED)	12
Department of Agriculture (PDA)	12
Office of the State Fire Commissioner (OSFC)	12
Department of Labor & Industry (L&I).....	13
Pennsylvania Fish and Boat Commission (PFBC)	13
Pennsylvania Public Utility Commission (PUC)	13
Actions and Recommendations	14
Directive – Ensure drinking water is safe. Identify impacted locations and resources and create and implement an action plan to assist state and local authorities and public water systems in delivering safe drinking water.	14
Directive – Manage environmental PFAS contamination. Develop and implement environmental response protocols for all positively identified sites.	17
Directive – Develop specialized site plans, engaging the public and other relevant stakeholders, where appropriate.	18

Directive – Reduce risks to drinking water and the environmental from firefighting foam and other sources of PFAS. Identify PFAS uses that are most likely to pose a risk to human health and the environment. Develop recommendations and actions that can be taken to limit or control sources of PFAS.....	19
Directive – Develop a clearinghouse of information on PFAS. Establish a public information site and protocol to effectively inform and educate the public about PFAS.	22
Directive – Establish a standard process for sharing information between Action Team members.....	23
Directive – Explore avenues of funding for remediation efforts.....	24
Directive – Engage academic institutions and field experts when necessary.....	25
Additional actions carried out by the members of the PFAS Action Team include:	28
Conclusion.....	29
Appendix	30
Process to Establish a Maximum Contaminant Level in Pennsylvania.....	30
Phase 1: Develop the Necessary Science, Data, Cost to Benefit Analysis and Justification	30
Phase 2: Initiate the Proposed Rulemaking Process as prescribed by Pennsylvania’s	
Regulatory Review Act	31
How the Regulatory Process Begins	32
How a Regulation is Proposed.....	32
Public Comment Period.....	33
How a Regulation Becomes Final	33
PFAS Action Team Meetings.....	34
Public Comments.....	38
Acronyms List	40

Introduction

Summary



A unique class of chemicals known as perfluoroalkyl and polyfluoroalkyl substances (PFAS) were created in the 1930s for use in many industrial and manufacturing applications. An array of industries rapidly adopted PFAS because of their exceptional ability to repel water and oils, reduce friction, and resist heat. Commonplace items known to contain these substances are non-stick pans, fast food wrappers, cosmetics, carpets, fire resistant textiles, fire-fighting foams, paints, clothing, and more. Consequentially, products containing one or more PFAS are now ubiquitous to every home, school, and office.

The scientific community at large classifies PFAS as emerging contaminants because they are only now

beginning to understand the potential impacts PFAS pose to human and animal health and the environment. These substances are highly persistent, difficult to break down, and bioaccumulate in living organisms over time. An estimated 6,000 chemical compounds belong to the PFAS family and each of those chemicals reacts uniquely depending on its environmental conditions, creating a complex range of scenarios for scientists to study.

In September 2018, Governor Tom Wolf signed [Executive Order 2018-08](#) (EO), moving Pennsylvania to the forefront of states taking proactive steps to address PFAS and other contaminants. Through this EO, Governor Wolf established the PFAS Action Team (Action Team) and tasked its members with exercising their collective authorities to ensure drinking water is safe, to manage PFAS exposure, and to collaborate with stakeholders.

Through collaboration and strategic planning, Action Team members identified actions their respective agencies accomplished and plan to complete in the future. Certain actions may be hindered or delayed due to known or perceived barriers, which are explained in this report. Also included are the actions each agency has taken to advance the mission of the EO, the actions they plan to take, and their recommendations to overcome known barriers that impede action.

History of PFAS in Pennsylvania

Pennsylvania state authorities first became aware of PFAS as an emerging contaminant in 2013 when the U.S. Environmental Protection Agency (EPA) included perfluorooctane sulfonic Acid (PFOS) and perfluorooctanoic Acid (PFOA) in its Third Unregulated Contaminant Monitoring Rule (UCMR) for drinking water. The UCMR is a federal regulation that is updated every five years to include new contaminants that public water systems must monitor if they serve more than 10,000 customers. As a result, 175 of about 3,000 public water systems in Pennsylvania sampled for these compounds. Although these water suppliers are required to sample for the contaminants listed in UCMR, the contaminants are

still considered “unregulated” because they do not hold a legally enforceable limit for drinking water regarding those compounds. To create a legally enforceable limit, regulators must establish a Maximum Contaminant Level (MCL) for the PFAS compounds.

At that time, PFAS were primarily identified in the environment near Department of Defense (DoD) facilities and were investigated by the federal government. Pennsylvania’s Department of Environmental Protection (DEP) worked cooperatively with federal partners to offer support, guidance, and resources as needed.

In 2009, EPA issued a Health Advisory Level (HAL) for PFOA and PFOS of 400 parts per trillion (ppt) and 200 ppt, respectively. In May 2016, EPA reduced the combined lifetime drinking water HAL for PFOA and PFOS to 70 ppt. With the announcement of the reduced HAL, Pennsylvania worked closely with federal and local partners to identify public water wells and water systems with elevated levels of PFAS. Because contamination was already extensively identified in Southeastern Pennsylvania near the DoD facilities in Horsham, Warrington, and Warminster, DEP worked with municipal partners in those areas to identify additional areas of contamination. Any public water system with elevated levels of PFOS and PFOA were taken offline and investigated.

While PFAS chemicals have received much attention in both the scientific and regulatory communities, there remains a lack of knowledge regarding these chemicals, the occurrence of these chemicals in the waters of the commonwealth and how they impact the human body. However, state agencies will continue to learn about, investigate, adapt and react to PFAS found in the environment and the impacts they may have on human health.

Executive Order 2018-08

In the absence of federal action to address PFAS in the environment, Governor Tom Wolf signed [Executive Order 2018-08](#) (EO) on September 19, 2018. The EO created the PFAS Action Team, a multi-agency group tasked with:

- Ensuring drinking water is safe, identifying impacted natural resources, and creating plans to assist state and local authorities and public water systems with delivering safe drinking water.
- Managing PFAS contamination, developing and implementing environmental response protocols for all positively identified sites.
- Developing specialized site plans, engaging the public and other relevant stakeholders when appropriate.
- Reducing risks to drinking water and the environment from firefighting foam and other sources of PFAS. Identifying PFAS uses that are most likely to pose a risk to human health and the environment, such as the use of firefighting foam, industrial releases, carpets, food packaging materials, and other uses. Developing recommendations and actions that can be taken to limit or control these sources of PFAS.
- Developing a clearing house of information on PFAS and establishing a public information site and protocol to effectively inform and educate the public about PFAS.
- Establishing a standard process for sharing pertinent information between members of the Action Team.
- Exploring avenues of funding for remediation efforts.
- Engaging academic institutions and experts in the field when necessary.

More information about the PFAS Action Team, its designated membership, and its work to address PFAS contamination in Pennsylvania is detailed in this report.

Background

What Are PFAS?

Perfluoroalkyl and polyfluoroalkyl substances, commonly known as PFAS, are a family of human-made chemicals that are composed of fluorine and carbon bonded with different combinations of other elements. The PFAS family is complex because it contains over 6,000 chemical compounds. Two of the most commonly known chemicals in this family are perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA). During the development of these compounds, PFOA and PFOS were discovered to be chemically unique because of their ability to both attract *and* repel water – a characteristic particularly useful in industrial applications.

PFAS ¹	Development Time Period							
	1930s	1940s	1950s	1960s	1970s	1980s	1990s	2000s
PTFE	Invented	Non-Stick Coatings			Waterproof Fabrics			
PFOS		Initial Production	Stain & Water Resistant Products	Firefighting Foam				U.S. Reduction of PFOS, PFOA, PFNA (and other select PFAS ²)
PFOA		Initial Production	Protective Coatings					
PFNA					Initial Production	Architectural Resins		
Fluoro-telomers					Initial Production	Firefighting Foams		Predominant form of firefighting foam
Dominant Process ³		Electrochemical Fluorination (ECF)						Fluoro-telomerization (shorter chain ECF)
Pre-Invention of Chemistry			Initial Chemical Synthesis / Production			Commercial Products Introduced and Used		

How Are PFAS Used?

Formulated in the 1930s, the first PFAS chemicals were quickly adopted for use by manufacturers to apply non-stick surface coatings to goods like paper, packaging, pans, and textiles. The PFAS family includes chemicals with properties that prevent corrosion, provide electrical insulation, are flame-retardant, and repel moisture, grease, and stains - making them ubiquitous in every home and workplace.

Such characteristics are advantageous in consumer goods and are often used in the following products:

- Non-stick cookware
- Paper and packaging
- Firefighting foams
- Carpet
- Clothing
- Shampoo and conditioners
- Outdoor and sporting equipment
- Paint, varnishes, and dyes
- Toothpaste and dental floss
- Cosmetics
- Cleaning products and fabric softeners
- Fast food wrappers and containers



Firefighting Foam

A deadly explosion on a U.S. Naval Aircraft carrier in 1967 propelled scientists to develop a firefighting foam with the ability to rapidly and efficiently suppress fires. With their temperature-resiliency and moisture-repelling qualities, PFAS chemicals were added to firefighting foams to create aqueous film forming foam (AFFF). AFFF's unique ability to quickly extinguish fires, particularly petroleum-based fires, made it a common-place product for emergency service providers and established itself as the industry standard firefighting product for fire departments, airports, military bases, oil refineries, and manufacturing plants.

When emergency responders or responders-in-training use AFFF, the foam concentrate is mixed with water to create a foam solution. The foam solution is sprayed on the hazard as well as the surrounding area to contain the fire. Afterwards, the AFFF runs off into nearby waterways or is absorbed into the soil and groundwater. Depending on the severity of the fire, a single event may release hundreds to thousands of gallons of foam solution into the environment. Repeated releases of AFFF into the environment increases the likelihood and degree of PFAS exposure for humans and animals.

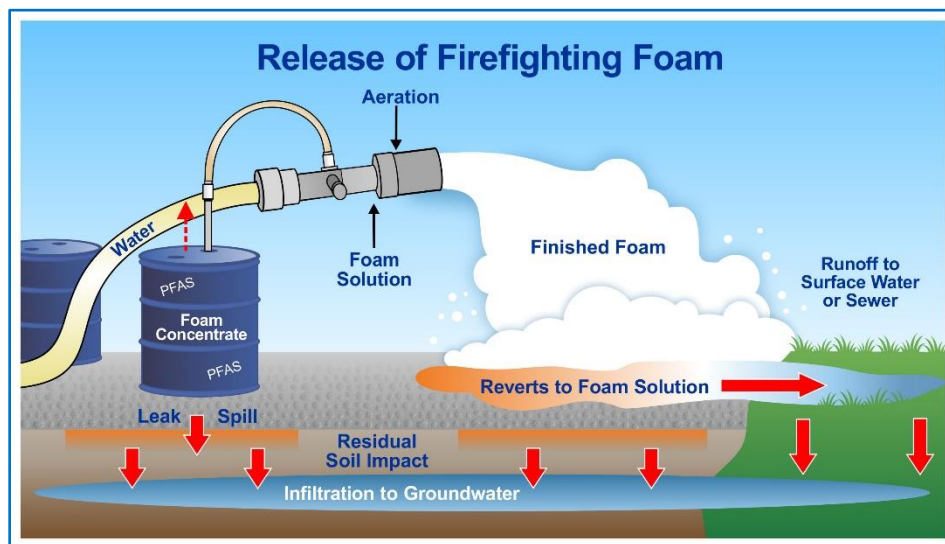


Figure 1 How firefighting foams containing PFAS enter the environment

It is important to note that certain PFAS are no longer manufactured in the United States as a result of the EPA's 2006 voluntary [PFOA stewardship program](#). Eight major companies from the chemical industry participated in the stewardship program which required two commitment goals:

- A commitment to achieve by no later than 2010, a 95 percent reduction in both facility emissions to all media of PFOA, precursor chemicals that can break down to PFOA, related chemicals, and product content levels of these chemicals.
- A commitment to working toward the elimination of these chemicals from emissions and products by 2015.

According to the EPA's [final progress report](#), all eight of the participating companies achieved the program commitment goals.

Do PFAS Impact Humans and the Environment?

Products containing long-chain PFAS chemicals leach into the soil and water where they continue to be mobile, highly persistent, and bioaccumulative. This means that the chemicals do not break down easily and build up over time in animals and the environment. Significant exposure to humans and animals occurs when water or food contaminated with PFAS is consumed. For example, exposure can occur when fish caught in waters contaminated with PFAS are eaten, foods packaged in PFAS-coated materials are consumed, soil and dust polluted with PFAS are unintentionally ingested, or products made with PFAS chemicals are handled.

According to the U.S. Agency for Toxic Substances and Disease Registry (ATSDR), employees who work directly with PFAS or PFAS-containing materials are more likely to be exposed than the general population. These employees are at a greater risk because they may inhale, touch, and ingest these substances more frequently¹.

Scientists classify PFAS as emerging contaminants because the risks they pose to human health and the environment are not completely understood. While health impacts continue to undergo research studies, the C8 Science Panel has concluded a probable link of PFAS to ulcerative colitis, thyroid disease, pregnancy-induced hypertension, high cholesterol, testicular cancer, and kidney cancer. Occupational health studies also suggest that PFAS disrupt the endocrine system and alter thyroid, kidney, and metabolic functions².

Why is This a Problem in Pennsylvania?

Decades of widespread use of products containing PFAS have resulted in, for certain areas, elevated levels of environmental pollution and exposure to humans and animals. As illustrated below, PFAS substances remain in the environment but cycle through different environments depending on how and where the substances were released. The primary means of distribution for these chemicals throughout Pennsylvania's environment occurs through water, biosolids, food, landfill leachate, and firefighting activities. This process is illustrated in the image below.

¹ <https://www.atsdr.cdc.gov/pfas/pfas-exposure.html>

² http://www.c8sciencepanel.org/prob_link.html

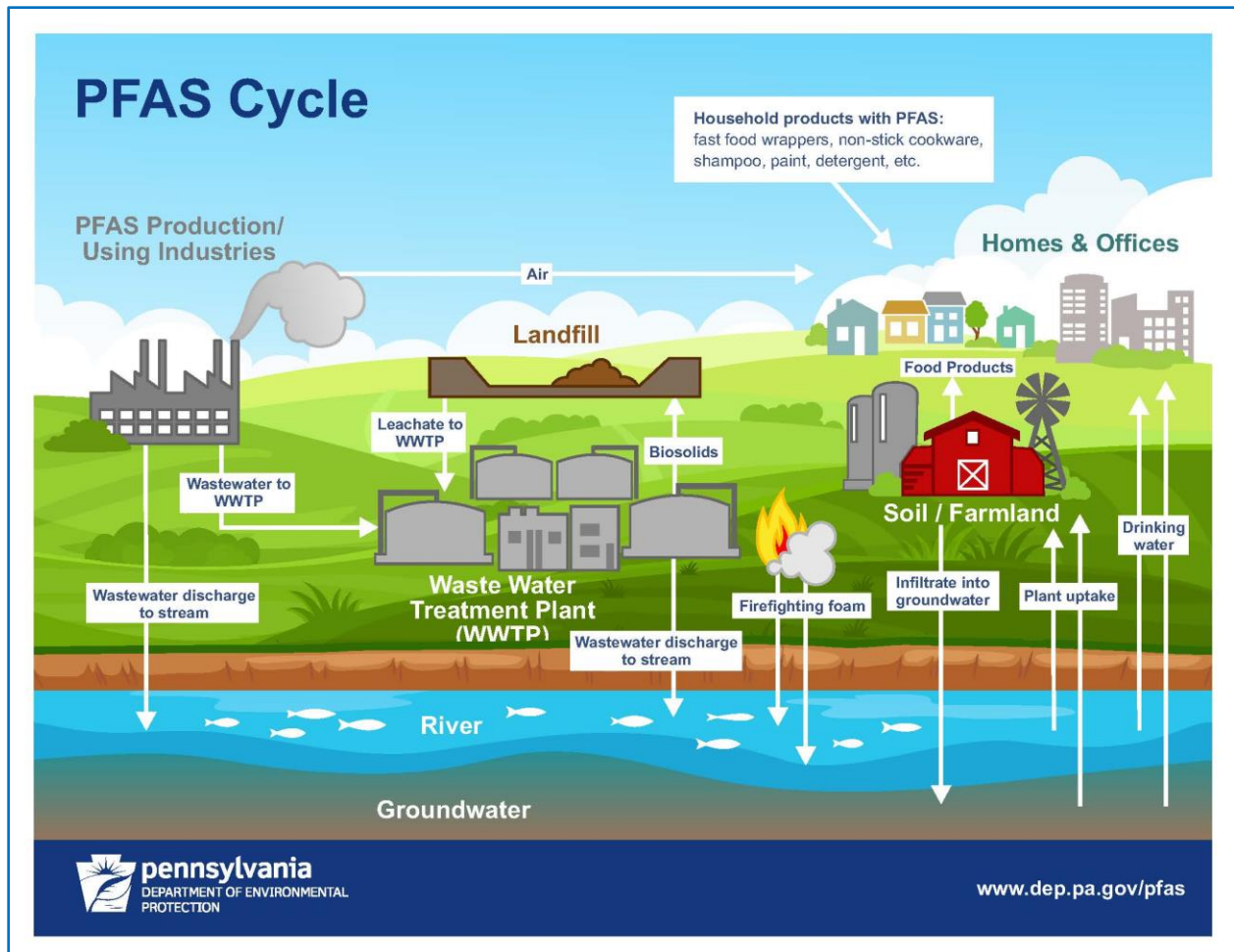


Figure 2 The PFAS cycle and its exposure pathways

Water



In Pennsylvania, there are two primary sources of drinking water: public water systems (PWSs) and private water wells. With 8,521 PWSs serving 11.3 million customers, it is the most common drinking water source in Pennsylvania. PWSs collect water from surface water sources (e.g., a lake, stream, or reservoir) or underground sources, treat the water for certain contaminants, store the treated water, and distribute the water to establishments for consumption. DEP regulates PWSs by issuing permits, regularly inspecting facilities, and collecting PWSs water sample data. All facilities must meet DEP’s requirements to maintain the highest quality water source available and to protect the source from existing and foreseeable contamination. However, under current state and federal regulations, PWSs are not required to report sample results of PFAS to regulatory authorities unless they exceed the Health Advisory Level of 70 ppt.

Over one million Pennsylvanians rely on private well water systems as their primary drinking water source. Private water wells are most prevalent in rural communities due to the difficulty and expense associated with constructing distribution systems for distant, sparse populations. However, Pennsylvania is one of only two states that do not regulate the construction of privately-owned water wells. This lack of oversight can be problematic if a well is poorly constructed or if a homeowner is unfamiliar with testing and treatment options. Homeowners with water wells should have their water

sampled and submitted to a Pennsylvania certified laboratory for testing if they are concerned about PFAS in their drinking water.

Biosolids



Pennsylvanians produce an estimated 2.2 million tons of wastewater solids (biosolids), or sewage sludge and residential septage, each year. This material has proven to be a valuable resource when heavily treated, controlled, and safely applied as a fertilizer to help rejuvenate farmland, forests, and mine lands. In order to ensure safe use of biosolids, Pennsylvania sets strict standards for the quality of biosolids before they can be applied to land. This approach was developed after extensive studies by the EPA found that land application is environmentally safe and beneficial to the soil. However, despite the regulatory controls and valuable nutrients and organic material that biosolids provides, state regulators suspect biosolids may contain PFAS and research indicates that it may be a source of contamination on farms where this material has been applied.

Food



Pennsylvania has an abundance of dairy, produce, and livestock farms and PFAS contamination is an emerging threat for these food products. In addition to being detected in dairy milk in several states, a recently-released [study](#) revealed the Food and Drug Administration (FDA) has found PFAS compounds in everything from sweet potatoes, leafy greens and pineapples to seafood, meat, and chocolate cake, and experts say the use of contaminated biosolids applied on farm fields is likely a primary source of food contamination. Produce grown in soil contaminated with PFAS absorb the chemicals into their roots, fruit, and leaves, which humans and animals eat.

Landfills



Modern landfills are carefully designed structures that can be built into or on top of the ground to store waste. Pennsylvania is home to 43 active municipal solid waste landfills and three active residual waste landfills. Pennsylvania also contains landfills that are categorized as inactive, abandoned, reclaimed, out of business, and illegally unpermitted. Collectively, landfills account for a minimum of 29 square miles of land and accept nearly nine million tons of waste annually. For decades, landfills did not use protective liners that provide a barrier between waste and the soil until the establishment of modern environmental regulations. This legacy contamination has exacerbated the extent of PFAS pollution in the environmental in and near landfills. Landfills may contribute to the PFAS pollution cycle because garbage buried in landfills contain materials and products made with PFAS. As these products break down, their chemical components are released through liquid leachate that drains from the bottom of the landfill structure and into the environment. Although modern treatment processes remove most hazardous substances from landfill leachate, PFAS are not included in the treatment process at this time because the EPA has not established an approved sampling methodology and has not provided states with guidance to properly treat and/or dispose of leachate containing PFAS. Consequentially, landfills are recognized as potential sources of contamination and PWSs located near landfills should be aware of this.

Fire Training Facilities



Due to their effectiveness, firefighting foams containing PFAS were regularly used by local fire departments, airports, training facilities, and military installations across all of Pennsylvania. Notably, the federal Department of Defense (DoD) routinely used these foams for over 50 years during large-scale training exercises and emergency responses at military bases, including those located in Pennsylvania. At some locations, the chemicals from the firefighting foam used in fire training exercises may have soaked into the soil and groundwater and contaminated nearby water sources. Despite their phase-out in 2001, these foams maintain a lengthy shelf-life and are likely still amassed in storage for ongoing use.

Are These Substances Regulated?

Currently, PFOS and PFOA are not regulated with legally enforceable limits established by the federal government. EPA uses peer-reviewed health studies to establish Health Advisory Levels (HAL) for chemical substances in drinking water. In 2016, the EPA determined a lifetime HAL for PFOS and PFOA of 70 ppt to be protective of consumers. While HALs are not legally enforceable, they do provide drinking water operators with information about the health risks associated to specific chemicals and require drinking water systems to notify their state regulatory agency when their water exceeds the HAL. However, they are not required to test for the contaminants.

Generally, to establish legally enforceable drinking water standards, the EPA assesses available health studies and determine how much of a substance can be present in water without posing adverse health effects. This maximum threshold for substances is known as a Maximum Contaminant Level (MCL). In February 2019, the EPA announced it will begin the preliminary regulatory determination process to decide whether they will pursue an MCL. If the EPA decides to establish an MCL, their process may take multiple years to collect samples, assess the occurrence data, and evaluate the relative effectiveness and cost for treatment options before going into effect.

Due to the lack of guidance and assistance from the federal government, Pennsylvania's DEP has begun the process to establish the first ever state-level MCL for certain PFAS. By enacting an MCL, Pennsylvania will establish its own legally enforceable standard. Per Pennsylvania's Regulatory Review Act (71 P.S. §§ 745.1—745.14), the proposed regulations must include:

- the compelling need for regulatory action,
- the scientific basis and the data used to develop the regulation,
- all direct and indirect cost estimates to be incurred by the commonwealth and affected stakeholders, which include public water suppliers, customers, and regulatory agencies,
- a statement of legal, accounting or consulting procedures and additional reporting, or recordkeeping or other paperwork, including forms that are required for implementation,
- a schedule for review of the proposed regulation,
- the persons, small businesses, businesses, and organizations affected,
- the financial, economic, and social impact,
- special provisions for affected groups,
- possible alternative regulatory provisions,
- and a plan for evaluating the regulation's effectiveness.

What Are the Challenges with Managing PFAS Contamination?

The Action Team recognizes that the ubiquitous nature of PFAS presents complicated challenges that require creative solutions and intentional collaboration. While state and local authorities strive to bridge the gap between providing immediate assistance and creating long-term solutions, there are several obstacles impeding this effort.

- The [Hazardous Site Cleanup Fund](#) (HSCF) is the primary funding source for the cleanup of land polluted by hazardous substances and contaminants. However, due to the elimination of HSCF's funding source in Pennsylvania's state budget, the fund will reach insolvency in fiscal year 2019-2020, forcing DEP to discontinue site investigations and to shut-down cleanup work at existing sites. It is imperative that a funding source be re-established for HSCF, otherwise there will be no means to eliminate PFAS pollution at its point source and all Pennsylvanians will continue to be at risk.
- The United States EPA has failed to provide states with critical guidance related to drinking water standards, cleanup recommendations, and sampling methodologies. States rely on the EPA's direction to establish and carry out a cohesive set of regulatory standards but, due to EPA's lack of leadership, individual states are leading the governmental response to PFAS, resulting in redundant research and regulatory efforts, disparate drinking water standards, and regulatory uncertainty.
- Pennsylvania is one of only two states in the nation that do not regulate the construction of private water wells. Additionally, Pennsylvania does not regulate the quality of water produced from private water wells. While most Pennsylvanians are connected to public water systems, over one million residents rely on private wells as their main source of drinking water. Because water from private wells is often not treated to remove many harmful substances (such as PFAS), wells that are poorly constructed or drilled in less than ideal locations are at a higher risk for contamination. Moreover, when enforceable drinking water standards for PFAS are enacted, by DEP or by EPA, they will not be applicable to these unregulated private wells.
- While many public and private entities are researching the safest methods for the disposal of PFAS-contaminated soil and commercial/industrial products, there is no currently known, viable disposal option currently available. Many landfills use granulated activated carbon (GAC) to filter PFAS from the landfill leachate which prevents downstream pollution. However, this is problematic because GAC filters must be removed and replaced frequently, but there is no recommended means for disposing of the used GAC filters containing PFAS.
- The nature of emerging contaminants presents inherent challenges. Emerging contaminants are new to researchers and the scientific understanding of their chemical makeup and interactions with other chemicals is rapidly evolving. This presents a significant challenge for Pennsylvania's policy makers, who design regulatory standards, because the standards must be developed using the best scientific and economic information available.

PFAS Action Team

Recognizing that PFAS issues cross agencies and even programs within agencies, Governor Wolf designated executive leadership from Commonwealth agencies, whose missions and resources are essential to successfully achieving the goals outlined in the [EO](#), to participate on the [PFAS Action Team](#). Each agency participating on the PFAS Action Team holds the specialized, technical expertise required to address the complex challenges that PFAS present. Membership on this Action Team includes:

Department of Environmental Protection (DEP)

The Department of Environmental Protection protects Pennsylvania's air, land, water, and the health and safety of its residents by implementing environmental laws and regulations. Its Bureau of Safe Drinking Water (BSDW) implements federal and state Safe Drinking Water Acts by protecting consumers from biological, chemical, and radiological contaminants in drinking water served at nearly 8,400 public waters systems. Statewide, BSDW staff conduct surveillance, compliance, enforcement and permitting activities at public water systems to ensure compliance with drinking water standards; protect water sources through proper planning and resource management; respond to water supply emergencies; and maintain water system inventory, violation and sample result data in the PA Drinking Water Information System.

DEP's Bureau of Environmental Cleanup and Brownfields (ECB) oversees the commonwealth's Land Recycling (brownfields), Site Remediation (state and federal superfund), and Storage Tank programs. Nearly 200 DEP employees work to ensure that Pennsylvanians are not exposed to harmful levels of toxic substances in their soil, groundwater, or other environmental media. ECB oversees the development and implementation of risk-based cleanup standards which are used during the remediation of contaminated sites across the commonwealth.

The Bureau of Waste Management (BWM) manages the permitting and inspection of hazardous, municipal, and residual waste generation, transportation, storage, beneficial use and disposal facilities and administration of the municipal solid waste planning program, recycling program, resource recovery development program, and household hazardous waste program. BWM also implements the Waste Transportation Safety Program, including licensing of municipal and residual waste, hazardous waste, regulated medical waste, and waste tire transporters. Through researching and establishing viable disposal options, BWM will curb the pollution cycle by appropriately directing soil containing PFAS through the proper channels for disposal, which will curb the pollution cycle and prevent further environmental harm.

The Bureau of Laboratories (BOL) provides laboratory testing and accreditation to meet the needs of the DEP programs' federal and state environmental statutes, provides testing for investigative, and monitoring activities. BOL provides essential testing services that help the commonwealth identify impacted groundwater, soil, and other environmental media. This fall, BOL expects to become one of only twelve nationally accredited laboratories able to test for PFAS.

The Bureau of Air Quality (BAQ) regulates release of air emissions from facilities in Pennsylvania. DEP's Bureau of Air Quality is responsible for safeguarding the health of Pennsylvanians by achieving the goals of the federal Clean Air Act and the Pennsylvania Air Pollution Control Act. BAQ develops air quality regulations, conducts meteorological tracking and air quality modeling studies and reviews and develops

transportation control measures and other mobile source programs. BAQ will research the science behind destroying PFAS in contaminated soils and firefighting foam and ensure that no PFAS are volatilized in the process.

The Bureau of Clean Water (BCW) oversees the preservation of Pennsylvania's 86,000 miles of streams and lakes. To accomplish this, BCW implements surface water quality standards, water quality monitoring assessments, municipal sewage management, National Pollutant Discharge Elimination System permits, water quality management inspections, technical outreach to wastewater treatment facilities, biosolid permits, and agricultural pollutant limits. BCW actively monitors national fish tissue testing results and the evolving science with biosolids application as they relate to PFAS.

Department of Health (DOH)

The Department of Health's Bureau of Epidemiology collects data on diseases affecting persons in the commonwealth including numbers of diseases, causes of diseases and locations of diseases. The Bureau also conducts investigations for outbreaks of disease or unusual exposures and advises on health issues, rules, and regulations affecting citizens, such as PFAS exposure. Its Division of Environmental Health Epidemiology maintains primary oversight on PFAS-related projects and activities, such as public health surveillance and assessment programs. Through its activities, the Bureau of Epidemiology contributes to DOH's mission to promote healthy lifestyles, prevent injury and disease, and to assure the safe delivery of quality health care for all commonwealth citizens.

Department of Military and Veterans Affairs (DMVA)

The Department of Military and Veterans Affairs provide quality service to the commonwealth's Veterans and administers support to members of Pennsylvania's National Guard. DMVA's Bureau of Environmental Management oversees its agency's environmental programs such as natural resource management, pollution and hazardous waste control, and endangered species surveillance. Through its partnership with the federal government's National Guard Bureau (NGB), both agencies coordinate the environmental management at Pennsylvania's large military stations in Horsham, Johnstown, Pittsburgh, Middletown, and State College, including PFAS sampling and remediation efforts.

Department of Transportation (PennDOT)

The Department of Transportation implements programs and policies affecting highways, urban and rural public transportation, airports, railroads, ports, and waterways. PennDOT's Bureau of Aviation is responsible for the safety of approximately 650 airports and heliports to ensure compliance with federal and state safety standards. This Bureau also collaborates with the 127 public airports, providing guidance and expertise on prioritizing and funding airport system preservation projects that foster optimization, promote economic development, and support a sustainable airport system. Airports must follow certain federal regulations that require the availability of fluorinated firefighting foams in case of a fire emergency. The Bureau of Aviation is collaborating with state and federal partners to identify the use and storage of firefighting foams with PFAS chemicals and will enforce new federal requirements that prohibit airports from requiring the use of firefighting foams that contain PFAS chemicals.

Department of Community and Economic Development (DCED)

The Department of Community and Economic Development encourages the shared prosperity of all Pennsylvanians by supporting stewardship and sustainable development initiatives across the commonwealth. DCED acts as a public advisor, providing strategic technical assistance, training, and financial resources to help communities and businesses grow. DCED's independent agency, the Commonwealth Financing Authority, has awarded assistance and treatment systems to communities whose water exceeds the health advisory level for certain PFAS.

Department of Agriculture (PDA)

The Department of Agriculture commits to a sustainable and safe supply of food and other agricultural products in Pennsylvania. PDA promotes the viability of farms, protects consumers, and safeguards the health of people, plants, and the environment. Several offices within PDA assist with PFAS-related efforts including the bureaus of Food Safety and Laboratory Services, Animal Health and Diagnostic Services, Farmland Preservation, and the State Conservation Commission. Among other duties, these offices collectively monitor the latest PFAS science related to dairy milk, food supply, biosolids, livestock, preserved farmland, and laboratory testing.

Office of the State Fire Commissioner (OSFC)

The Office of the State Fire Commissioner operates Pennsylvania's State Fire Academy and provides comprehensive resident programs for firefighters, rescue personnel, arson investigations, hazardous response team, and other emergency responders. OSFC's State Fire Academy provides response training to the entire emergency response community in Pennsylvania and consequentially, provides the PFAS Action Team insight on the use and storage of firefighting foams that contain PFAS chemicals.

The extensive scope of work associated with managing PFAS holistically requires the Action Team to collaborate with additional Commonwealth agencies to assist with reducing PFAS exposure, obtaining specialized information, and disseminating knowledge and resources to individuals impacted by PFAS contamination. These state agencies are:

Department of Labor & Industry (L&I)

The Department of Labor and Industry administers benefits to unemployed individuals, oversees the workers' compensation benefits to individuals with job-related injuries, provides workforce development programs, and promotes an improved business climate. L&I's Bureau of Occupational Industrial Safety administers the laws that protect the safety of workers in Pennsylvania. This includes the materials and substances that may cause harm to human health, like PFAS. L&I maintains the state Tier II Hazardous Chemical Inventory and Toxic Release Inventory reports that are filed by business owners and operators. If certain PFAS were to become legally recognized as hazardous substances, Pennsylvania would have the ability to track their use and storage statewide.

Pennsylvania Fish and Boat Commission (PFBC)

The Pennsylvania Fish and Boat Commission's Division of Environmental Services is primarily responsible for the protection of the agency's trust species from potential aquatic impacts through review and comment on permit applications; environmental laws and regulations; and water quality, water quantity and habitat concerns as they relate to aquatic resource protection. This office also sits on the Fish Consumption Advisory Technical Workgroup to ensure fish and human are protected from aquatic contaminants such as PFAS.

Pennsylvania Public Utility Commission (PUC)

The Pennsylvania Public Utility Commission balances the needs of consumers and utilities; ensures safe and reliable utility service at reasonable rates; protects the public interest; educates consumers to make independent and informed choices; furthers economic development; and fosters new technologies and competitive markets in an environmentally responsible manner. The PUC's Bureau of Technical Utility Services ensures safe and reliable service from regulated public water and wastewater systems and holds primary oversight over rate changes that may occur due to PFAS filtration or other treatment.

Actions and Recommendations

The PFAS Action Team regularly convenes to discuss strategies for managing PFAS pollution in Pennsylvania. Each agency on the Action Team holds its own unique legislative and regulatory authorities to implement solutions derived from strategy meetings. Below are the PFAS Action Team's initial steps and actions taken to advance the directives established in EO 2018-08. Additionally, the Action Team also describes actions it plans to take as more information and resources become available in the future.

Directive – Ensure drinking water is safe. Identify impacted locations and resources and create and implement an action plan to assist state and local authorities and public water systems in delivering safe drinking water.

Department of Environmental Protection (DEP)

DEP's Bureau of Safe Drinking Water implemented a PFAS Drinking Water Sampling Plan (Sampling Plan) to generate occurrence data from public water systems throughout the commonwealth. Gathering occurrence data is crucial because it is a key component for the development of enforceable regulatory drinking water standards for PFAS. The Sampling Plan outlines DEP's collection of at least 360 samples from public water systems with the potential for contamination based on proximity to common sources of PFAS (as per the literature), such as military bases, fire training sites, landfills, and select manufacturing facilities. 40 additional samples will be collected to determine background levels for PFAS throughout the commonwealth. To prepare for this effort, DEP hired a third-party expert to provide PFAS sample collection training for personnel in DEP's Safe Drinking Water Program personnel, the Bureau of Laboratories, the Bureau of Investigations, and the Bureau of Environmental Cleanup and Brownfields. DEP concluded its training and began collecting samples in June 2019 and it plans to publicly release the laboratory results on a quarterly basis until the sampling is complete in June 2020.

When an impacted drinking water source has been identified, the Bureau of Safe Drinking Water will continue to ensure corrective actions are taken at public water systems with levels above EPA's current Health Advisory Level of 70 parts per trillion (ppt). Corrective actions may include conducting additional sampling, issuing public notification, and taking contaminated sources offline or providing treatment, to remove PFAS from drinking water. As of October 29, 2019, 96 samples have been collected. Of those samples, 67 indicated non-detectable levels for certain PFAS and 32 samples detected certain PFAS. The sample results range from non-detect to 114 ppt with an average of 14 ppt. The Sampling Plan is publicly accessible on DEP's PFAS webpage by clicking [here](#).

DEP's Bureau of Environmental Cleanup and Brownfields also maintains a list of locations where analytical data has identified a potential or confirmed PFAS source area. When confirmation samples validate the presence of PFAS at a site, the identified site is added to the master site list and posted publicly on DEP's and the PFAS Action Team's websites.

Department of Health (DOH)

If DEP determines multiple sites have PFOS and PFOA levels greater than the EPA's existing Health Advisory Level of 70 ppt, DOH will work with DEP to prioritize an immediate response. Prioritization criteria will include the concentration level of PFAS detected in drinking water, the length of time the population may have been exposed, the size of the affected population and population characteristics including poverty status. Every effort will be made to address each site in a timely manner.

DOH's Bureau of Laboratories is prioritizing its testing capability enhancements for PFAS and approved to fill two new positions to carry out this work. The new positions are for Chemists who will manage specimens, perform biomonitoring testing, and record patient information and test results, manage and review scientific literature, identify the biomonitoring testing methods, adapt and validate testing methods, write procedures for specimen collection, transport, storage, and testing, and assist in performing testing. Through emergency procurement, DOH received state funds to purchase a new Liquid Chromatograph-Tandem Mass Spectrometer to perform this testing.

Department of Military and Veterans Affairs (DMVA)

All public water suppliers used by DMVA's Pennsylvania Army National Guard (PAARNG) state-wide facilities and Veteran Homes were contacted by PAARNG about PFAS testing. Sixty out of eighty-three water suppliers collected water samples. Additionally, seven active potable wells at Fort Indiantown Gap and two wells located at Williamstown and New Milford Readiness Centers were sampled by a National Guard Bureau (NGB) contractor. All sample results returned with non-detectable levels of PFAS. PAARNG will continue to regularly survey its water suppliers about their PFAS monitoring and sampling conduct at all PAARNG water wells. This action will provide for continuous monitoring and improved responses in the event that elevated levels of certain PFAS are identified.

The Horsham Air Guard Station entered into three cooperative agreements (CAs) with local townships (Horsham, Warminster, and Warrington) to ensure adequate treatment of affected public drinking water supplies. Through these CAs, the townships are responsible for the work and the Pennsylvania Air National Guard (PAANG) reimburses the expenses for work once it is completed. The base is responsible for ensuring that only approved work/costs are reimbursed, the townships are responsible for ensuring the work is completed in a timely and cost-effective manner. The financial liability for remediation falls on the owners and operators of the Horsham Air Guard Station (the government) because they are the party responsible for the release of PFAS contamination on the property.

The CA with **Horsham** consists of work to connect five private properties to public water and to abandon their private wells. Currently the CA is nearing its close as the properties have been connected to HWSA for water and sewer service; four of the five wells have been abandoned thus far. Once the actions with the fifth well are completed, the CA can be closed out. The costs associated with this CA are \$250,000.00 and funded through the federal National Guard Bureau.

The CA with **Warminster** Township Water Authority was established to connect, at most, 14 properties to public water and sewer and abandon their private wells; thus far, 11 properties have been connected and their wells abandoned. The cost associated with the original CA is \$250,000.00. In 2017, the CA was modified to add a temporary storm filtration system, worth \$200,000.00. That CA is being modified to add work for a permanent storm filtration system, worth \$2.5 million which will be funded by the federal National Guard Bureau.

The CA with **Warrington** Township Water Department was implemented originally to add filtration to two public supply wells and hook up 25 properties to public water and sewer and abandon their wells, costing \$5.87 million. In 2016, the provisional Health Advisory Level (pHAL) of 400 parts per trillion (ppt) for PFOS and 200 ppt for PFOA was lowered to a new HAL of combined 70 ppt combined, and the scope of the work in the CA increased to five total public wells and 45 total properties; this equated to an increase of \$7.66 million to a new grant total of \$13.5 million and funded through the federal National Guard Bureau.

PAANG will continue the work to design and construct the permanent storm filtration systems with Warminster and will keep the CA open until the permanent filtration system is in place and shown to be fully functional and capturing of the water leaving the base. Additionally, PAANG will continue to work with Warrington Water and Sewer Department to ensure the public well filtration is constructed, and the individual properties are connected to the public system.

All the water and sewer lines at the Horsham Air Guard Station were replaced base wide; this project was initiated prior to understanding PFAS as an emerging contaminant. A new water treatment facility was built as part of the same project and completed in 2017. This work ensures that there is no infiltration of ground water into the water or sewer systems (prior to completion of the project, infiltration of ground water accounted for approximately 80% of the flow). The cost for this project was \$6.3 million and funded through the federal National Guard Bureau.

Until the *permanent* filtration system is in operation, PAANG will continue to use a temporary Granulated Activated Carbon filtration system installed on the water supply wells at the Horsham Air Guard Station. This allows for the supply wells to continue being pumped and filtered free of contaminants. The cost to rent the temporary filtration system is \$87,000 annually and a total of \$348,000 has been spent to date. Funding for this project is provided by the federal National Guard Bureau. The construction of a *permanent* GAC filtration system for the water supply wells on the Horsham Air Guard Station base commenced in 2018. This system will continue to pump and filter water from the supply wells and will allow the base populace to return to drinking base water. The cost of this project is \$2.8 million and funded by the federal National Guard Bureau.

Department of Community and Economic Development (DCED)

Through the Commonwealth Financing Authority, DCED has provided a total of \$8,000,000 to two communities in the southeast, Warminster and Warrington to address PFAS groundwater contamination in 17 of its water wells and to purchase water from other sources. The funding will assist with the installation of treatment systems that will aim to reduce the amount of PFCs in the drinking water to a “Non-Detect” level.

RECOMMENDATION: The Action Team recommends additional funding be identified and secured to sufficiently address PFAS contamination in Pennsylvania communities.

RECOMMENDATION: The Action Team recommends that a rebate fund be established for homeowners who invest in PFAS filtration systems for their homes using out-of-pocket capital.

Directive – Manage environmental PFAS contamination. Develop and implement environmental response protocols for all positively identified sites.

Department of Military and Veterans Affairs

Through a CA with Warminster Township, a filtration system was built at the main storm water outfall for the Horsham Air Guard Station base, allowing for ground water that surfaces in the basin to be filtered and PFAS to be removed prior to leaving the base via an unnamed tributary. In addition to the water exiting the basin, the old sanitary sewer system was piped into the filtration system to include groundwater that flows through the old pipes when the water table rises. The cost for this project was \$200,000. The base is currently working with Warminster Township through a CA modification to construct a more permanent system to ensure the maximum amount of water is filtered prior to leaving the base boundary – the cost of this project is \$2.5 million and funded by the federal National Guard Bureau.

Department of Health

In response to potential detection of PFAS on a site, DOH will implement outreach efforts in collaboration with DEP, county and municipal health departments, Public Water Systems, other state and local agencies and stakeholders as appropriate. DOH will continue to work with DEP on developing a template for communicating test results to the customers of affected Public Water Systems. The template includes a description of PFAS, explanation of health advisory levels, potential health risks of PFAS, proposed plans to avoid and minimize exposure, information for residents' healthcare providers and other resources. Additionally, DOH will, within selected communities, conduct biomonitoring following ATSDR's PFAS Exposure Assessment Technical Tools (PEATT) and permit volunteer participants to be included in biomonitoring with that information analyzed separately.

DOH officials provided additional outreach assistance to the U.S. Navy at the Naval Support Activity Center in Mechanicsburg, Pennsylvania, for its PFAS community engagement forum where there were interactive educational discussions regarding the potential health effects associated with drinking water containing PFAS.

Department of Environmental Protection

To streamline response protocols, DEP's Bureau of Environmental Cleanup and Brownfields developed uniform, science-based operating procedures to guide the identification and assessment of commercial and industrial properties that have contaminated private and/or public drinking water sources.

Additionally, to manage environmental contamination, DEP's Bureau of Waste Management will initiate a Sampling Plan Phase 2 in 2020. This Plan will map active, recently closed, and abandoned landfills across Pennsylvania and propose a strategy to sample landfill leachate, which can be a potential source of PFAS contamination to surface and groundwater.

RECOMMENDATION: Pennsylvania's General Assembly should provide DEP with the explicit statutory authority to require that landfill operations sample landfill leachate for PFAS as a condition of all landfill permits, regardless of whether a landfill site is aware of a current or past discharge of leachate with PFAS contamination. This will assist DEP with identifying impacted

sites and prioritize cleanup at sources located near drinking water supply sources while minimizing tax-payer funded sampling costs.

Directive – Develop specialized site plans, engaging the public and other relevant stakeholders, where appropriate.

Department of Environmental Protection

DEP oversees implementation of the Hazardous Sites Cleanup Act (HSCA). To carry out HSCA, DEP conducts investigations, removal and remediation actions at sites where hazardous substances and contaminants have been released, holds responsible parties accountable for releasing the hazardous substances, and ensures ongoing oversight of remediation activities. DEP's Land Recycling Program has enabled DEP to transform blighted, contaminated, and often abandoned properties in Pennsylvania into tax-generating community assets. Without these programs, residents across the commonwealth would be regularly exposed to dangerous substances that pose a threat to human health and the environment. PFAS releases will require soil and groundwater remediation. Left unremediated, contaminated properties will continue to threaten the drinking water quality and the health of all Pennsylvanians. Two of Pennsylvania's first sites of concern and remediation efforts include:

Ridge Run (Montgomery County): The HSCA Ridge Run PFAS Site is centered between two North Penn Water Authority public water supply wells which were identified in 2016 to have combined levels of PFOA and PFOS above the health advisory level of 70 ppt. A HSCA investigation is underway to determine the nature and extent of contamination in the site area. Under HSCA authority, DEP is concurrently performing an interim response action to install whole-house water treatment systems on private residential wells that exceed the HAL. However, financial resources will need to be allocated for the long-term maintenance and replacement of the filters.

Easton Road (Bucks County): The HSCA Easton Road PFAS Site investigation was initiated in June 2016, after analytical testing of a Doylestown Township Municipal Authority public water supply well revealed combined concentrations of PFOA and PFOS above the HAL. The impacted well was taken out of service. DEP has subsequently collected private drinking water samples from approximately 350 individual properties in the nearby area and is currently providing bottled water to residential users that exceed the HAL. The bottled water supply is paid through the HSCA fund and, as previously mentioned, this fund is anticipated to be insolvent in FY 2019-2020. DEP will no longer be able to provide bottled water to impacted consumers unless a new funding source for HSCA is established.

Department of Health

DOH developed a plan to address public health concerns in communities if DEP identifies any water system contaminated with PFAS above the EPA's health advisory level of 70 ppt. The proposed plan will include educational outreach efforts and biomonitoring.

Public Utility Commission (PUC)

The PUC has encouraged regulated water and wastewater utilities to actively engage with stakeholders to address issues related to emerging contaminants including PFAS. For example, the Commission hosts the Small Water Company Task Force to discuss how regulators may assist small water providers with regulatory compliance and service issues. Currently, the Commission is exploring how it may work to address financing and cost recovery issues related to PFAS remediation as directed by the federal EPA and DEP. The Commission anticipates that these costs will include infrastructure and personnel investment as well as public education related to the safety and integrity of public utility water and wastewater service. Going forward, the Commission is prepared to address financing and cost recovery issues as a part of its rate setting function as these issues arise.

RECOMMENDATION: In line with the PUC’s public interest mandates under the Public Utility Code, the Commission recommends the development of specific treatment targets by DEP, such as an MCL for PFAS, so regulated entities can determine appropriate treatment options. The Commission may then consider those options as a part of the capital and expense review and approval process to determine just and reasonable rates in relation to PFAS remediation.

RECOMMENDATION: The Commission also encourages development of grant funding and/or low interest financing available for small (under 1,000 customers) water utilities to help defray the cost of implementing treatment options.

Department of Military and Veterans Affairs

An assessment into PFAS releases by the U.S. Army Reserve and the Pennsylvania Army National Guard was initiated at the John Murtha Cambria County Airport in Johnstown, Pennsylvania. Based on verbal history and interviews, PAARNG determined it is appropriate to collect soil and water samples for analysis. If samples confirm the presence of elevated PFAS levels, this location will be added to the master list of impacted sites and the appropriate environmental responses will be taken.

Directive – Reduce risks to drinking water and the environmental from firefighting foam and other sources of PFAS. Identify PFAS uses that are most likely to pose a risk to human health and the environment. Develop recommendations and actions that can be taken to limit or control sources of PFAS.

Department of Environmental Protection

DEP drafted proposed regulatory amendments to Chapter 250; Administration of the Land Recycling Program. Among other things, this draft proposed rulemaking will establish groundwater and soil remediation standards for PFOA, PFOS and PFBS (three PFAS chemical compounds) and was reviewed twice by stakeholders on DEP’s Cleanup Standards Scientific Advisory Board in 2018 and 2019. The Environmental Quality Board considered and adopted these proposed regulatory amendments on November 19, 2019.

While these regulations are in process, DEP will concurrently conduct research and gather data through the Sampling Plan to support a proposed MCL. This work includes:

- Collaborating with DOH and managing a toxicology services contract to review and evaluate human health effects and toxicity data and prepare a report with recommendations for an appropriate MCL. DEP has earmarked up to \$250,000 for the toxicology services contract.
- Using PFAS occurrence data and other data, conduct a cost and benefit analysis as required to support a proposed rulemaking.

RECOMMENDATION: DEP continues to use existing staff to manage its response to PFAS contamination. This is diverting staff and resources away from the core drinking water program and other important priorities. Additional resources are needed to adequately address PFAS and ensure the core drinking water program is effective at protecting public health.

RECOMMENDATION: The PFAS Action Team recommends that the General Assembly create legislation recommending community, nontransient noncommunity and bottled water systems test for PFAS compounds and notify DEP when the levels meet or exceed 80% of the current health advisory level (56 ppt).

DEP's Bureau of Waste Management is evaluating viable disposal options for stockpiled firefighting foam and other products containing PFAS. Landfills are a known pathway for PFAS chemicals to enter the environment, therefore DEP staff are contacting nearby states to identify potential incineration options for PFAS-soil disposal. To address this issue, the Bureau of Waste Management is currently coordinating with leaders in the waste industry to prevent known sources of significant PFAS contamination from being disposed of in landfills. This action will minimize the perpetual cycle of PFAS pollution and prevent further contamination of surface and groundwater.

Additionally, DEP will include monitoring and reporting requirements for PFAS in biosolids under individual and general permits issued for the generation and land application of biosolids. The first step DEP will take is a review and update of the PAG-07 (beneficial use exceptional quality biosolids), PAG-08 (beneficial use of biosolids by land application) and PAG-09 (beneficial use of residential septage by land application) to include monitoring and reporting requirements for PFAS.

Department of Labor & Industry (L&I)

Pennsylvania's Department of Labor and Industry will work with a vendor to build out a program enhancement that identifies PFAS chemical compounds within the Pennsylvania Tier Two System where business owners and operators submit hazardous substances reports. This will allow for better tracking of PFAS sources and potential exposure locations because business owners and operators will submit these reports annually. While L&I will begin this process, the information is not required to be submitted to state authorities unless PFAS are listed as "hazardous substances" under the Hazardous Sites Cleanup Act.

The primary barrier to tracking PFAS in the workplace is the expense to create a report that identifies the PFAS chemical compounds and embed that into the current system. Staff will need to write new software and program code, an update would be pushed through the staging portion of the program, then testing would occur. The total cost of this is not known at the time, but there is a minimum estimate of \$15,000 based on previous experiences. If this enhancement was created, L&I would restrict

the information to state level planners, program users and administrators for quick access if an event occurred.

Department of Transportation (PennDOT)

PennDOT developed a fluorinated firefighting foam inventory survey that was completed by Pennsylvania's commercial airports and railways. The survey's objective was to identify the presence and location of fluorinated foams on commercial airfields, past usage of the product, and data for foam products stored on site. A database was developed to highlight each airport's responses and the active ingredients contained within their foam.

PennDOT will continue to monitor the Federal Aviation Administration's future testing of non-fluorinated foam and any development of a new performance specification for Part 139 Certificated Airports.

Department of Agriculture (PDA)

The Pennsylvania Department of Agriculture's Bureau of Food Safety Laboratory plans to have testing methodology and lab upgrades by spring 2020. Proactively, the Bureau of Food Safety has researched several testing methods to detect PFAS in food products and has modified an existing testing methodology used by FDA to match our current lab equipment. The bureau will need to update several pieces of equipment and purchase additional supplies to test for PFAS. Supplies needed are listed below:

- Chemical standards and internal standards: \$5,500.00
 - Analytical column for HPLC: \$700.00
 - Reagents: \$500.00
- Total: \$6,700.00**

RECOMMENDATION: State agencies should employ the PDA Bureau of Food Safety's laboratory to enhance investigations and testing for food products and packaging. PDA's laboratory can sample raw agricultural products and prepared, packaged foods for PFAS. The Action Team recommends that, after DEP pinpoints locations with environmental PFAS contamination, testing for PFAS be done of commoditized food products originating near the contaminated locations.

PDA will continue to work with federal Food and Drug Administration to develop testing methods and to increase the baseline knowledge of PFAS levels in foods.

Office of the State Fire Commissioner (OSFC)

The State Fire Academy will update its state-wide training programs to reflect best practices regarding firefighting operations and the use of newer, compliant foams. The Office of the State Fire Commissioner will educate fire departments about the concerns and disposal of fluorinated foams. Additionally, OSFC will work with industry experts to update training curricula that reflects best practices when for the use of PFAS-free foams. This project would require hiring a consultant and approximately one year of curricula development. In the interim, OSFC will develop and issue guidance encouraging the limited use of fluorinated foams only for situations where life safety is threatened. This guidance will be available in spring 2020.

RECOMMENDATION: Currently, there is no legal authority for the OSFC’s State Fire Academy to require that fire departments and training facilities submit to the Academy information about their use and storage of fluorinated foams. The Action Team recommends that legislation be enacted to provide the State Fire Academy with the authority to acquire this information. This recommendation will assist with the efforts to pinpoint potentially impacted areas and to engage in remediation if necessary.

RECOMMENDATION: The Action Team recommends that officials, such as the General Assembly or agencies under the Governor’s jurisdiction, establish an AFFF “take-back” collection program. This program model has been successfully demonstrated by the state of Michigan who authorized \$1.4 million in funding for the collection and safe disposal of over 30,000 gallons of AFFF.

RECOMMENDATION: The Action Team recommends that Commonwealth Officials establish a fund to replace fire departments’ AFFF inventory with environmentally safer firefighting foams that are available on the market. This will significantly reduce the financial burden from local fire departments and result in increased program participation.

Lastly, the collective agencies and commissions on this Action Team are working with their counsel to include a standard term in Commonwealth contracts that prohibit the use of firefighting foams with PFAS by their contractors.

Directive – Develop a clearinghouse of information on PFAS. Establish a public information site and protocol to effectively inform and educate the public about PFAS.

The Action Team created a website that offers informational resources for those interested in a comprehensive view of PFAS in Pennsylvania. This website includes PFAS Action Team updates; the official list of sites with confirmed PFAS contamination which is updated upon receipt of laboratory results; Pennsylvania DOH’s health-related informational resources; DEP’s involvement with PFAS; an outline of the steps required to establish an MCL for certain PFAS in drinking water; and answers to frequently asked questions. Individuals interested in accessing this information should visit: www.dep.pa.gov/pfas.

Department of Health

Given that cancer is a concern of residents in communities affected by PFAS-contaminated drinking water, DOH worked with ATSDR and examined cancer incidence rates in Warminster, Warrington and Horsham Townships between 1985-2013. DOH examined the rates for seven different cancers in a three-zip code area and presented the results to the community in 2016. Later, DOH performed a refined analysis using the areas of four public water systems which include the townships as the study area, geocoded cancer cases from 1995 to 2014 and published a report in May 2018. Analysis did show

some increases and some decreases in cancer rates, but no consistent pattern. The analyses can be found by visiting the following webpages on the DOH website:

- [Cancer Data Review \(1985-2013\)](#)
- [Cancer Review Addendum 1](#) (2017)
- [Cancer Review Addendum 2](#) (2018)

DOH updated its [website](#), providing additional information regarding PFAS including the reports on prior cancer studies conducted in Warrington, Warminster and Horsham area, an area affected by PFAS contamination in drinking water. To further advance this work, DOH will collect demographic and other exposure information to develop the best predictive multivariate model of serum PFAS levels. This model will assist in the prediction of serum PFAS levels for individuals with known estimated levels of PFAS in their drinking water but who have not had their blood tested for PFAS.

Additionally, DOH will work with DEP to develop a template for communicating pilot blood test results to the consumers of affected PWSs. The template will include a description of PFAS, explanation of health advisory levels, potential health risks of PFAS, proposed plans to avoid/minimize exposure, information for residents' healthcare providers and other resources.

Office of the State Fire Commissioner

The State Fire Academy will educate fire departments about the availability of firefighting foams free of PFAS. Additionally, OSFC will develop and deliver a training program to educate fire departments about the need to eliminate the use of fluorinated foams. It is estimated it will take approximately one month to develop a training program. Delivery to all regions of the commonwealth would take approximately an additional six months.

Department of Agriculture

The State Conservation Commission works with farmers on nutrient and manure management and is available to support efforts identified by the Action Team related to biosolids. In the six-state Chesapeake Bay watershed, there are at least 18 sites where PFAS have been detected. The SCC is a trusted resource for the farm community, given its relationship with DEP and PDA, and will assist with disseminating information to the farming community when necessary.

Directive – Establish a standard process for sharing information between Action Team members.

The Action Team Chair assembles meetings on an as-needed basis throughout the development and implementation of actions established by the Action Team. A workgroup composed of agencies with relevant oversight holds meetings to address PFAS firefighting foam issues. The workgroup works collaboratively to survey fire stations, airports, and railways about their foam use; identify locations with stockpiles of PFAS-containing firefighting foam; and collaborate with agency counterparts from other states about their PFAS-related efforts.

Departments of Health and Environmental Protection

Tying the link between environmental contamination and human health, executive leadership from DEP and DOH convene on a monthly basis to share each agency's latest efforts regarding PFAS and to identify opportunities for further collaboration. As contaminated sites are identified, DEP staff have and will continue to notify DOH officials immediately. DOH integrates this information into monitor the possible health impacts for certain PFAS.

Department of Environmental Protection

DEP developed a set of instructions that direct staff to notify the appropriate Action Team agency when a contaminated site is identified. This direction will ensure that all agencies are actively kept abreast of the latest PFAS developments as it relates to their respective agency mission.

Directive – Explore avenues of funding for remediation efforts.

Department of Environmental Protection

The Action Team recognizes that PFAS contamination will persist until source properties are identified, assessed, and remediated and therefore recommends that the Pennsylvania General Assembly secure a new funding source for the Hazardous Sites Cleanup Fund prior to FY2020.

With the elimination of the \$40 million per year transfer from the Capital Stock and Franchise Tax, revenue projections to the Hazardous Sites Cleanup Fund are insufficient to conduct investigation and cleanup activities at current levels beyond FY2020. The total average annual expenditures of \$45-50 million will need to be reduced by approximately 50% if additional revenue is not allocated. This financial deficit would require DEP to, among other things:

- Discontinue the funding of new investigation and cleanup projects or long-term phases of existing projects that are not deemed imminent human health threats.
- Discontinue fund transfers to the Brownfield Grants, Small Business Pollution Prevention Grants, and Household Hazardous Waste Account.
- Shut-down or restrict work occurring at existing projects according to a priority schedule based on public health threat.
- Freeze vacancies and other operational expenses (e.g. travel/training/IT initiatives)
- Transfer indirect costs and indirect positions to other funds.

If certain PFAS become designated as hazardous substances under the Hazardous Sites Cleanup Act, DEP will execute its authority to enforce liability on responsible parties. This action will hold polluters financially accountable for contaminating the environment and for posing a risk to human health. By holding responsible parties accountable, public funds in the Hazardous Sites Cleanup fund will be preserved and used to clean up sites where no responsible party can be identified.

Directive – Engage academic institutions and field experts when necessary.

Department of Health

As part of the efforts to better address PFAS-related public health concerns, DOH requested additional staff and resources to strengthen its environmental health program and laboratory capacity through a budget request. The request was approved by Governor Wolf, allowing DOH to hire additional staff including, toxicologists, epidemiologists and chemists. The bureau hired a toxicologist who began working in July 2019. DOH also secured federal funding through a competitive grant to implement the PFAS Exposure Assessment Technical Tool (PEATT), a technical document developed by the Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry (CDC/ATSDR) to assist states and other jurisdictions wanting to conduct community level biomonitoring for PFAS. This pilot project was implemented in southeastern Pennsylvania, near two former military bases where PFAS containing firefighting foams were used extensively for decades, leading to contamination of nearby drinking water sources. Biomonitoring among 235 randomly selected residents indicated serum PFAS (PFOA, PFOS, PFHxS and PFNA) levels higher than national averages. The study indicated positive associations between mean serum PFAS levels and various demographic and exposure characteristics such as total length of residence in the area, drinking water source, quantity of tap water consumed, age and employment in the area. The results were presented to the community members in December 2018 and in April 2019. Upon successful completion of the PEATT pilot project, DOH received additional federal funding to expand biomonitoring for PFAS in urine samples and to test PFAS levels in drinking water and household dust from the study households. This work was completed in November 2019 and DOH has received the rest results for water and dust samples. The Department expects to receive the test results in December 2019-January 2020.

To further the public health efforts, DOH collaborated with external partners such as RTI and Pennsylvania universities in applying for ATSDR funding under the “Multi-Site Study of the Health Implications of Exposure to PFAS-Contaminated Drinking Water” grant program. The awards were announced in October 2019. Pennsylvania was ultimately selected as one of the seven awardees for the multi-site health study, with RTI as the principal investigator, DOH as a sub-contractor, and Temple University leading investigator led research related to cancer. The funding package that RTI submitted requested approximately \$1.8 million in funding, Pennsylvania was awarded \$1 million. This is a five-year cooperative agreement with no funding levels yet guaranteed for years 2-5. Grantees have been asked to prioritize the historical PFAs levels in water reconstruction and the steps that are needed to begin collecting a random sample of individuals and gather needed resources to complete the complex medical testing and review to be done. DOH will continue to work with environmental health physicians as needed to address public health concerns.

DOH staff presented on community-level biomonitoring for PFAS as part of a national webinar. Bureau staff continue to participate in PFAS discussions at the national level and collaborate with the Council of State and Territorial Epidemiologists (CSTE) workgroup on PFAS. Due to Pennsylvania’s experiences, it is expected that the states will assist other states dealing with PFAS-related public health challenges. DOH staff have presented progress and updates on PFAS issues in the community on numerous occasions and will continue to do so.

Department of Environmental Protection

DEP created a framework for a Safe Drinking Water Advisory Board (Board). This Board will advise DEP staff on the technical and regulatory aspects of carrying out both state and federal Safe Drinking Water Acts. Membership of the Board will include experts with specialized knowledge about Pennsylvania's drinking water resources, public water systems, and water quality standards.

Additionally, DEP's Bureau of Laboratories is researching and participating in discussions with internal programs and national workgroups for testing PFAS in air, biosolids, and fish tissue, including researching the proper instrumentation in preparation that may be necessary. Barriers will include the limited staffing, the cost of instrumentation for testing and extraction procedures, training for different matrices, and extraction procedures to meet the capacity of DEP.

RECOMMENDATION: The Action Team recommends procuring funding for instrumentation and technical staffing to meet the DEP's needs for PFAS testing in various matrices.

DEP staff have also led the development of the Interstate Technology and Regulatory Council (ITRC) PFAS Team's Regulations, Guidance, Advisories, Toxicity, and Risk Assessment guidance. The goal of this effort is to create concise technical resources that will help regulators and other stakeholders to improve their understanding of the current science regarding PFAS. DEP will attend all future ITRC PFAS Team meetings to continue the ongoing work on the Team's technical and regulatory guidance document. DEP staff also participates on the Environmental Council of States (ECOS) PFAS Caucus. ECOS is a national nonprofit, nonpartisan association of state and territorial environmental agency leaders and this caucus provides a forum for state and federal governments, as well as nongovernmental organizations, to exchange policy and regulatory information and best management practices.

Additionally, DEP's Bureau of Air Quality will continue to evaluate destruction data to develop a set of permitting criteria for the incineration of PFAS. To date, EPA has not provided states with the essential guidance or the specific procedural steps necessary to completely destroy PFAS through incineration. Due to the concerns with disposing material containing PFAS into landfills, guidance from EPA is critical for the immediate challenge that states face because of limited viable disposal options. DEP will continue to follow and evaluate new research and test methods developed by the EPA's Office of Research and Development.

DEP's Bureau of Waste Management staff attended an informational summit about PFAS in leachate. The Summit convened engineers, academics, industry professionals, government personnel and policy makers to facilitate discussion and share perspectives on the management, issues and policies related to PFAS. Agenda topics included: Addressing Emerging Contaminants: Lessons Learned from Prior Experiences; Health/Environmental Implications of PFAS & Exposure Pathways: A Summary of Current Research; PFAS in Food Packaging & Testing Considerations; Testing for PFAS in Leachate and Wastewater: Sampling Considerations and Analytical Challenges; Fate and Transport of PFAS in Landfills; PFAS in Landfill Leachate and Municipal Wastewater; Michigan State-Wide Landfill PFAS Leachate Impact on Wastewater Treatment Plant Influent; and PFAS Cycling Between Landfills and Wastewater Treatment Plants. This office has also solicited information through the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) regarding how other states are identifying, evaluating and treating PFAS in landfill leachate. Ten states (AK, ID, IL, MI, MN, NY, VT, VA, WA, WI) provided responses. Based on the responses received, other states are interested in managing PFAS at

waste disposal facilities. However, they are still primarily in the identification stage. A limited number of states are using chemical analysis to evaluate concentration levels of PFAS, as well. Many states are using the EPA's HAL as a limit for PFAS, but no states have developed a scientifically justified standard for PFAS. BWM will continue to work with ASTSWMO on this and provide any relevant information to the PFAS Action Team.

The EPA hosted a National Leadership Summit on PFAS hosted and DEP participated in this event. The leadership summit included representatives from over 40 states, tribes, and territories; 13 federal agencies; Congressional staff; associations; industry groups; and non-governmental organizations. During the summit, the participants used panel presentations, digital brainstorming, plenary Q & A, and small table discussions to: Share information on ongoing efforts to monitor and characterize risks from PFAS; discuss specific near-term actions that are needed to address the challenges currently facing states and local communities; and discuss risk communication strategies to address public concerns with PFAS.

DEP's Bureau of Clean Water entered into a collaborative agreement with the United States Geologic Survey (USGS) Pa. Science Center to monitor PFAS in surface waters across the Commonwealth's Water Quality Network (WQN). Water samples were collected at all 173 WQN stations one time in August and September 2019. In addition, quality control samples will be collected at 20% of the WQN sites. Analysis will be for 33 compounds that includes GenX, ADONA and both factions of F-53B. In addition, analysis will include total oxidizable precursors (TOP) assay to determine if other PFAS compounds are present in the sample. Analysis will be completed at SGS AXYS Analytical Services in Sidney, British Columbia, Canada.

In addition to sample monitoring, passive water samples will also be collected at a subset of 21 water quality network stations. These samplers were deployed for approximately 30 days and the deployments ended in August. The collected and concentrated sample will be analyzed for 13 PFAS compounds. After collection, samples were processed to extract the sample concentrate at Environmental Sampling Technologies, Inc. (EST Labs) in St. Joseph, MO. The resulting sample were then analyzed at SGS AXYS in British Columbia. The Clean Water Fund has expensed \$380,000 for this effort. From this total, \$230,000 is being used for contractual services with USGS, SGS-AXYS, EST-Labs and others and the remaining \$150,000 was expensed for equipment costs.

Additionally, DEP's Bureau of Safe Drinking Water has and will continue to work with state and federal partners, such as the Association of State Drinking Water Administrators, Environmental Council of the States, and other states, to share information and develop tools for states and water suppliers to address PFAS.

Pennsylvania Fish and Boat Commission (PFBC)

PFBC will continue to support and offer technical assistance to DEP in their efforts to determine how widespread the PFAS problem is throughout the state and as they work toward setting an MCL for PFAS and as technical experts on potential impacts of PFAS chemicals to fish and aquatic organisms.

Additional actions carried out by the members of the PFAS Action Team include:

Department of Environmental Protection

DEP's Bureau of Laboratories procured instrumentation, trained staff, participated in discussion groups, and performed demonstrations of capability for accreditation from March through August 2019. The DEP testing capability for PFAS was prioritized through emergency procurement. The laboratory expedited its process to purchase, train, and implement instruments in order to apply for accreditation. To purchase the equipment and obtain accreditation \$426,000 in funding from the Hazardous Sites Cleanup Funds were used to purchase equipment for performing PFAS analysis at the Bureau of Laboratories. This accreditation allows DEP to test for PFAS compounds and monitoring/testing in conjunction with the DEP Bureau of Safe Drinking Water Program. Through this expedited process, the laboratory accomplished the accreditation process in six months whereas it typically takes one-year to accomplish. It also trained two additional Chemists in the Laboratory Accreditation Section to review the laboratories in Pennsylvania that maintain PFAS testing accreditation. This action is critical because DEP's lab capacity alone cannot meet the commonwealth's significant demand for testing of PFAS compounds.

To meet this demand, DEP trained two additional chemists to assess and accredit private laboratories, which in turn, assures quality data for PFAS monitoring at more labs within the commonwealth. DEP also received accreditation from Pennsylvania's Laboratory Accreditation Program for PFAS testing by EPA Method 537.1 in Drinking Water and Non-Potable Water in August 2019. BOL is also collaborating with DEP's Clean Water Program and Safe Drinking Water Program to begin split sample testing. The office was inspected by the New Jersey National Environmental Laboratory Accreditation Program (NELAP) during the week of June 24 and anticipates receiving accreditation from the NJ Accrediting Authority. DEP's BOL is waiting for the final national accreditation report from the NJ NELAP Accrediting Authority.

Conclusion

The PFAS Action Team recognizes the complex reality that emerging contaminants impose on the lives of individuals, and families who do not feel completely safe drinking water in their homes or playing in their yards. Although PFAS were created for industrial uses starting in the 1930s, the risks they pose are only now coming to light and the science is evolving to fully understand how the extent to which they interact with other chemicals, our bodies, and our environment.

However, in consultation with scientists, toxicologists, and healthcare professionals, government authorities can formulate decisions to mitigate the negative impacts of PFAS by adopting the best science available. Using the most up-to-date research, Pennsylvania state officials who participate on the PFAS Action Team continuously evaluate options and make decisions based on what is protective of human health and the environment.

Provided in this initial report are the past, ongoing, and future actions that state officials propose to take to continue their efforts to eliminate sources of PFAS pollution, improve drinking water quality, clean up contaminated properties, prevent the spread of PFAS contamination, and educate the public about these substances. As science advances and technology evolves, there will be more opportunities to reassess the direction we are taking as a team.

Appendix

Process to Establish a Maximum Contaminant Level in Pennsylvania

Currently, there is no Pennsylvania or federal maximum contaminant level (MCL) for Perfluorooctanoic Acid (PFOA) and perfluorooctane sulfonic acid (PFOS). The U.S. Environmental Protection Agency (EPA) established a health advisory for PFOA and PFOS in May of 2016 based on the agency's assessment of the latest peer-reviewed science. According to EPA, the combined lifetime HAL for PFOA and PFOS of 0.07 micrograms per liter ($\mu\text{g}/\text{L}$) is protective of all consumers, including the most sensitive populations, with a margin of protection from a lifetime of exposure to PFOA and PFOS from drinking water.

Pennsylvania has the authority to set an MCL for unregulated contaminants such as PFOA, PFOS, and other per- and poly-fluoroalkyl substances (PFAS). As per the Pennsylvania Safe Drinking Water Act (SDWA), the Environmental Quality Board (EQB) is authorized to adopt MCLs or treatment technique requirements, even in situations where a federal standard has not been set. In order for the EQB to consider adoption of a state MCL, DEP will need to provide the necessary science, data, studies, cost-benefit analysis, and justification to support a proposed MCL. This supporting data is required by Pennsylvania's Regulatory Review Act and rulemaking process. This data will also be necessary for DEP to be able to defend and enforce the state MCL in a court of law.

Pennsylvania's decision to move forward with setting an MCL was made when EPA announced the agency's PFAS Action Plan and did not include specific deadlines for setting an MCL. Included below is an outline of the process that is required to prepare for, develop, and implement an MCL through the Regulatory Review Act process.

Phase 1: Develop the Necessary Science, Data, Cost to Benefit Analysis and Justification

- 1. Conduct statewide sampling and analyze occurrence data to determine whether PFOA and PFOS, and other PFAS are problematic statewide.** Pennsylvania has approximately 8,400 Public Water Systems (PWS). As per the Safe Drinking Water Act, all PWSs must deliver water that meets safe drinking water standards. However, under the current federal and state standardized monitoring framework for chemical contaminants, only a subset of PWSs would be required to monitor for PFOA and PFOS. This subset includes all community water systems (CWS) (1,946) and nontransient noncommunity water systems (NTNCWSs) (1,094) for a total of 3,040 water systems.

DEP will need to obtain additional occurrence data using a statistically significant number of PWSs in order to support a statewide MCL. DEP lacks the statutory and regulatory authority to require large numbers of PWSs to monitor for unregulated contaminants. Therefore, DEP will need to secure the necessary funding and DEP will need to conduct this monitoring.

- 2. Hire toxicologists and or contract for toxicologist support to review and develop the necessary risk assessment and health effects data in support of a state MCL.** MCLs are legally enforceable standards. Contract toxicologists in coordination with DOH toxicologists will need to conduct the necessary research and develop a final report to support a proposed MCL. The toxicologists will also need to testify in court if the MCL is challenged.

3. Determine whether the proposed MCL is technically feasible. This includes, but is not limited to, the following:

- Research and establish best available treatment technologies to adequately and consistently remove PFOA, PFOS, and other PFAS to levels below the proposed MCL. DEP will need to work with various third parties to develop standards for treatment design, construction, operations and efficacy.
- Determine any simultaneous compliance concerns or unintended consequences with the Safe Drinking Water regulations or other laws of this commonwealth. For example, will the treatment technologies have any adverse impact on disinfection efficacy for microbial control, disinfection byproduct formation, corrosion control for lead, etc.
- Research and establish required analytical methods, sample collection procedures, and QA/QC requirements.
- Ensure adequate lab capacity and capability and establish and maintain a state lab accreditation program for PFOA, PFOS, and other relevant PFAS. Labs must be able to achieve detection and reporting limits that are below the proposed MCL. Ensure that performance standards are available for proper QA/QC.

4. Conduct a cost-benefit analysis to support a statewide standard as per Pennsylvania's Regulatory Review Act

- A state MCL would apply to all PWSs in Pennsylvania. A subset of 3,040 systems would be required to conduct routine compliance monitoring. Routine quarterly compliance monitoring would be established for the first year, with options for reduced monitoring (annual and triennial) based on previous sample results. If levels are found above a state MCL, the system would be required to take any and all actions needed to return to compliance, including taking sources offline, or installing treatment (at a cost of \$500,000 to \$1 million per system). The potential cumulative costs for treatment among all impacted sources will need to be quantified.
- Develop the necessary justification for proposing a drinking water standard that is more stringent than EPA. It is important to note that in this scenario, creating standards more stringent than federal levels is only acceptable under the Safe Drinking Water Act and does not apply to cleanup standards under Pennsylvania's Land Recycling Program (Act 2 of 1995).

Phase 2: Initiate the Proposed Rulemaking Process as prescribed by Pennsylvania's Regulatory Review Act

The Pennsylvania General Assembly passes laws to protect the environment. To implement and enforce these laws, the General Assembly delegates specific responsibilities to administrative agencies and rulemaking boards, such as DEP and the EQB to develop and adopt regulations.

To enact environmental regulations in Pennsylvania, a unique and thorough process must be followed.

How the Regulatory Process Begins

The process to change or create a new regulation begins when a need or opportunity for improvement is identified by DEP or the public. DEP then evaluates and addresses the need by developing draft regulations in consultation with stakeholders, including DEP advisory committees. DEP continuously reviews existing regulations for opportunities to improve and enhance those regulations.

- DEP regularly evaluates scientific studies and determines whether justified regulatory adjustments can be enacted to be protective of human health and the environment. Based on its findings, DEP may develop a new regulation, amend an existing regulation, or find that current regulations are adequately protective to the environment and human health. This evaluation may take several weeks or months depending on the scope and complexity of the regulation.
- DEP then collaborates with nearly thirty advisory committees composed of stakeholders with various perspectives such as non-profit organizations, environmental consultants, industry, grassroots organizations, healthcare professionals, environmental lawyers, and local governments. The advisory committees can review DEP regulations related to their specific area of expertise and provide advice for improvement or suggestions for addressing the regulatory need. Each of DEP's advisory committees has its own website that includes the committee's charge and responsibilities, committee membership, minutes from previous meetings, and information about future meetings.

How a Regulation is Proposed

After DEP creates a draft regulation and confers with the appropriate advisory committee(s), the draft regulation is presented to DEP's rulemaking body, the Environmental Quality Board (Board). The EQB is a 20-member independent board that adopts all DEP regulations. The members of this board include representatives from eleven state agencies, including the following Departments, Commissions, and the General Assembly:

- Environmental Protection (Chair)
- Agriculture
- Health
- Community and Economic Development
- Transportation
- Public Utility Commission
- Fish and Boat Commission
- Game Commission
- Labor and Industry
- The Governor's Office of Policy
- The Historical and Museum Commission
- Five members of the Citizens Advisory Council
- Four members of the Pennsylvania House of Representatives and Senate.

Providing that the EQB votes to adopt a proposed regulation, the regulation will proceed to external review by the Governor's Offices of the Budget and General Counsel and the Office of the Attorney General. After the Office of the Attorney General completes its review and signs off of the proposed regulation, it is delivered to the House and Senate Environmental Resources and Energy (ERE) Committees, the Independent Regulatory Review Commission (IRRC), and the Legislative Reference

Bureau (LRB). Next, the proposed regulation is scheduled for publication in the *Pennsylvania Bulletin*. This will initiate the public comment period on the regulation.

Public Comment Period

To maximize transparency and to collect stakeholder feedback, DEP makes the proposed regulation publicly available online and holds a public comment period. Public comment periods for regulations are held for a minimum of 30-days. Certain regulations will have longer comment periods depending on applicable legal requirements, the regulation's complexity, and the overall level of public interest. Individuals interested in submitting comments may do so through DEP's online [eComment system](#), email, or by mail to the Environmental Quality Board. When DEP's comment period closes, IRRC holds an additional 30-day comment period for the regulation. At the close of the comment period, DEP reviews all feedback and initiates the final review process.

How a Regulation Becomes Final

DEP reviews all comments received during the public comment period and adjusts regulatory language where appropriate. Additionally, DEP staff create a comment-response document to accompany the final version of the regulation. In the comment-response document, DEP must provide an adequate, thoughtful response for each comment received. The response should identify if a change was made to the regulation as a result of the comment. If DEP does not agree with a comment and if no change was made based on the comments' recommendations, DEP must explain its rationale for not incorporating the feedback into the regulation. Depending on the scope and complexity of the regulation, it may take a several weeks or several months to incorporate feedback into the regulation and to complete the comment-response document.

Once this step is completed, the final regulation is presented to the appropriate advisory committee(s) for an additional round of feedback. After all advisory committee feedback is considered and the regulation is adjusted accordingly, the final regulation is reviewed internally by program staff, Bureau Directors, Deputy Secretaries, Regulatory Counsel, Chief Counsel, Policy Director, and the Secretary.

Once internal reviews are complete, the regulation is sent for preliminary external review to the Governor's Office of General Counsel and the Governor's Policy Office. After all internal and external reviews are complete, the final regulation is presented to the EQB for final adoption.

After the EQB adopts the final-form regulation, it will then be reviewed by the Governor's Offices of Budget and General Counsel. Upon this review and approval, the final regulation is delivered to the House and Senate ERE Committees and to IRRC, which will place the regulation on the next IRRC public meeting agenda for consideration.

At the IRRC public meeting, IRRC commissioners will approve or disapprove the final-form regulation, determining whether the regulation is in the public interest. If IRRC approves, the regulation is submitted to the Office of the Attorney General who has, per statute, 30-days to complete its final review. Afterwards, the final-form regulation is then delivered to the LRB for publication in the *Pennsylvania Bulletin* and codified into Pennsylvania's Code.

On average, the process to create and/or amend regulations can take two years to complete. Relatively minor regulatory amendments that do not significantly impact stakeholders and do not yield significant

public interest may proceed through the process at an accelerated pace. Even at an accelerated pace, regulations still take at least 18 months to proceed through Pennsylvania's full regulatory review process.

PFAS Action Team Meetings

The Action Team first convened in October 2018 to discuss the objectives outlined in Governor Wolf's EO. After familiarizing themselves with this topic, members scheduled a follow-up meeting in November to hear from experts and state counterparts who could share their expertise and advise Action Team members with best practices to curb PFAS pollution and mitigate its known impacts.

On November 30, 2018, the Action Team held a public meeting where representatives from the EPA, U.S. Agency for Toxic Substances and Disease Registry, and state agencies from Minnesota, New Hampshire, North Carolina, Michigan, and New Jersey participated in discussions about the evolving science behind the 6,000 known PFAS chemical compounds. Pennsylvania residents also spoke to their concerns about living, working, and raising families in communities with significant levels of PFAS pollution.

Action Team members took this information back to their respective agencies to further investigate options to manage PFAS.

Between public meetings, the PFAS Action Team Chair convened informal meetings to discuss agency updates, strategize concrete actions, and drive progress with tangible results. For example, state agencies with relevant oversight formed a PFAS firefighting foam workgroup to survey fire stations, airports, and railways about their foam use; identify locations with stockpiles of PFAS-containing firefighting foam; and collaborate with agency counterparts from other states about their PFAS-related efforts.

The Action Team held an additional public meeting in Abington, Pennsylvania on April 15, 2019, to update residents about the ongoing work of each agency to advance the directives established in Governor Wolf's EO. With approximately 200 individuals in attendance, the Action Team discussed the breadth of ongoing effort, planning, and outreach involved with addressing PFAS contamination statewide. DEP staff outlined a plan to establish an enforceable Maximum Contaminant Level (MCL) for a list of PFAS compounds in drinking water. DEP staff informed the public that, before an MCL can be established through regulation, Pennsylvania law requires that DEP demonstrate a science-based need for an MCL, the compelling public need for an MCL, the financial, economic, and social impact to stakeholders, a strong defense for exceeding federal standards, a comparison of other state MCL regulations, and a cost-benefit analysis.

In order to gather the necessary information, DEP outlined a plan to aggregate data through a Drinking Water Sampling Plan (Sampling Plan) where approximately 400 drinking water samples from public water systems statewide would be collected and analyzed for PFAS. The results from the Sampling Plan will provide key occurrence data that is crucial for advocating for enforceable regulatory drinking water standards for PFAS. The map below illustrates the 360 water intake locations and the additional 40 baseline locations where DEP staff are collecting water samples for analysis. For security purposes, the exact location of water intake lines were not included with this map. In the event sample results

detect PFAS above the HAL of 70 ppt, DEP and DOH will conduct outreach and education, to those impacted.

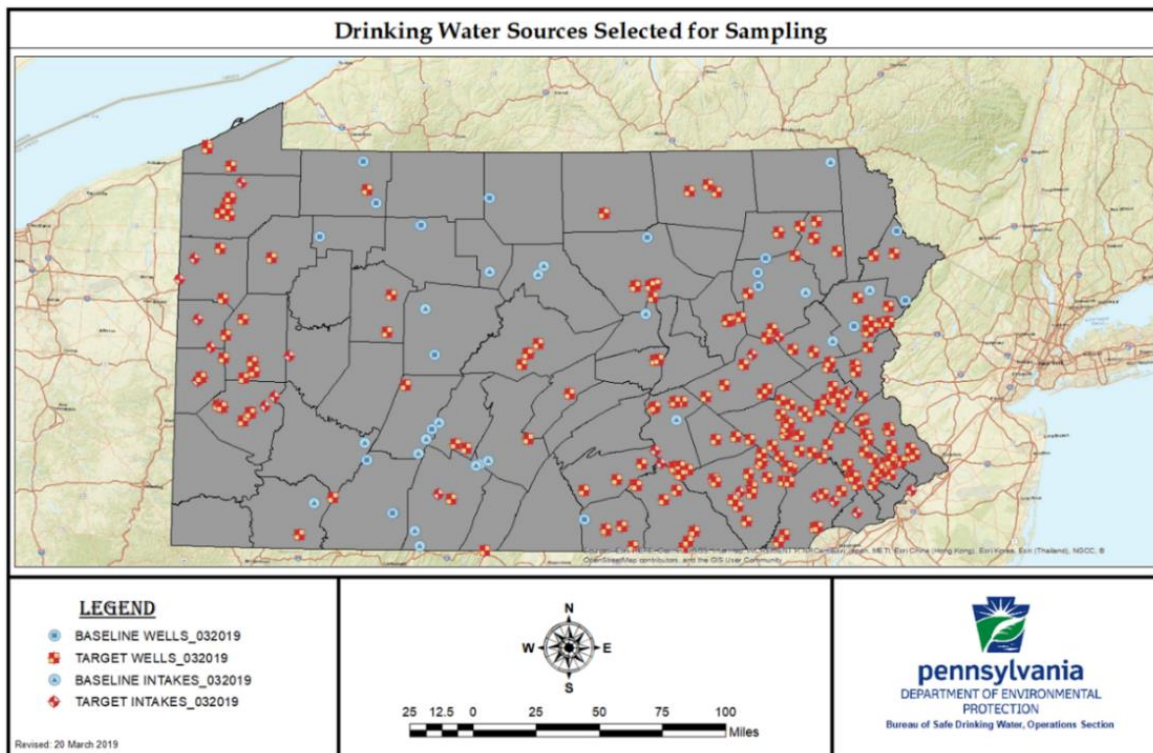


Figure 3 Locations of the water wells and water intakes to be sampled

Additionally, DEP staff discussed a proposed rulemaking which, among other things, will establish numeric soil cleanup standards for PFOA, PFOS, and PFBS. These standards will facilitate the timely identification, delineation, and remediation of these chemical compounds at contaminated properties. This regulation was developed in consultation with the state’s Cleanup Standards Scientific Advisory Board throughout 2018 and 2019. DEP anticipates releasing this proposed regulation for public comment in winter 2019 with an estimated implementation of winter 2020-2021.

DOH presented its PFAS Exposure Assessment Technical Toolkit (PEATT) Pilot Project which gathered data on serum PFAS levels among residents in the towns of Warrington, Warminster, and Horsham in southeastern Pennsylvania. DOH indicated that the highest level of PFOA and PFOS (combined) detected in these three communities’ drinking water was roughly 1,440 ppt of PFAS, almost 21 times higher than the health advisory level of 70 ppt.

The PEATT Project enlisted 235 participants from 118 different households within the three communities mentioned above to participate in the study. The blood results from the participants indicated that the average PFAS levels in blood serum were higher than the national average. The average blood serum results from the participants for four common PFAS chemicals are listed on the left side of the chart below. The national average for the same chemicals are compared on the right side of the chart.

PFAS Compound	Community Results				NHANES National Results (2013-2014)	
	Average	95% Confidence Interval	Median	Range	Average	95% Confidence Interval
PFOA	3.13	2.81-3.50	3.06	0.55-24.8	1.94	1.76-2.14
PFOS	10.24	8.86-11.83	9.86	1.02-105.00	4.99	4.50-5.52
PFHxS	6.64	5.51-7.99	6.61	0.54-116.00	1.35	1.20-1.52
PFNA	0.74	0.67-0.80	0.76	0.50-2.56	0.68	0.61-0.74

Results shown in ug/L. Range. Excludes values < Level of Detection (LOD)

The blood serum test results indicate increased localized exposure for the participating communities when compared to national blood serum results. The most common exposure pathways for an individual to encounter PFAS are by consuming drinking water contaminated with PFAS, touching or breathing in dust or soil contaminated with PFAS, and using everyday products made with PFAS. The data in the table above suggests, of the individuals who participated in the study from the three select communities,

- 94% had higher levels of PFHxS,
- 81% had higher levels of PFOS,
- 75% had higher levels of PFOA,
- And 59% had higher levels of PFNA.

The study suggested that PFAS levels increased with age, male gender, residence time in these communities, amount of daily private well and public source water consumption, and the water service area’s proximity to the contamination source. To explain what the PEATT study results mean in a more intimate and sensitive setting, DOH presented the full analysis during a community meeting in Horsham, Pennsylvania in April 2019. The final PEATT [study report](#) is available on the DOH website.

DOH also announced its plan to expand the PEATT study by collecting urine, dust, and water samples from the initial list of participants. The data collected from this expanded study will help DOH better understand the extent that PFAS impacts human health and how individuals can better reduce their exposure.

Also, during this PFAS Action Team meeting the Action Team invited officials from Horsham Township, the EPA, Horsham Water and Sewer Authority, Aqua Pennsylvania, and the Horsham Land Redevelopment Authority to speak about their concerns, resource constraints, and needs.

Horsham Township officials described their community’s history with PFAS when the media began to spot-light the township’s water quality in 2014. When the EPA reduced the HAL for PFOA and PFOS to 70 ppt, the Horsham Council and Horsham Water and Sewer Authority (HWSA) decided to go further and [endorse “non-detectable” levels for PFOS and PFOA](#). Horsham Township created a plan titled

“Horsham Township and Horsham Township Water and Sewer Authority PFC Update and Long-term Remediation Options”, which is supported by four key pillars: education, communication, remediation, and compensation. Horsham’s Township Manager shared its concerns that federal and state officials lack a coordinated response, that private well owners are most affected, and that veterans and former base employees are excluded from the ongoing remediation efforts. Based on these concerns, it was recommended that DEP should permit alternative treatment systems; Horsham should be included in all health studies; stormwater controls should be enhanced to prevent the spread of PFAS to other waterways; DEP should expedite the permitting process for public water well filters; the Commonwealth should pool resources with other states to avoid duplicity; and DEP should establish a statewide drinking water standard.

Next, an official from the EPA outlined the agency’s PFAS Action Plan which includes a four-pronged approach to combat PFAS contamination, exposure, and remediation. Within its PFAS Action Plan, the EPA stated it will finish its regulatory determination process by the end of 2019 to decide if it will establish a drinking water MCL for PFOS and PFOA. The EPA will also continue to facilitate cleanup efforts by providing groundwater cleanup recommendations and initiate the regulatory process to list certain PFAS as hazardous substances. Additionally, the EPA committed to include certain PFAS under its next UCMR monitoring cycle. To better understand PFAS toxicity, the EPA is researching PFAS exposure, assessing risk and identifying effective treatment and remediation options. To better share information with state and local officials, the EPA will create a risk communication toolbox with multi-media materials to use with the public.

Individuals representing Horsham’s Water and Sewer Authority (HWSA) also shared their experiences managing PFAS on a local level. Under UCMR-3, sampling revealed the presence of PFAS in five of 14 public water wells in Horsham, Pennsylvania. Two of those wells exceeded 200 ppt for PFOS and were immediately shut down in consultation with DEP and the EPA. In 2016, the HWSA shut down three additional water wells because they exceeded the HAL of 70 ppt. The source of PFAS contamination is linked to historical firefighting exercises held on the former Naval Air Station Joint Reserve Base in Willow Grove and the Horsham Air Guard Station. HWSA stressed the undue burden ratepayers experience to receive water with safe levels of PFAS and urge regulators to hold the responsible party accountable for its release of PFAS into the environment.

Aqua Pennsylvania then presented its recommendations to the Action Team. Aqua Pennsylvania is a water utility service provider that provides drinking water to 1.2 million people in 112 municipalities throughout Pennsylvania. Since 2016, Aqua has invested in equipment for water analysis, installed granular activated carbon filters on two systems, completed engineering evaluations on the Neshaminy water treatment plant, and evaluated alternative water treatment technologies. Aqua reiterated its position that it looks forward to federal and state regulators establishing a regulation that will further guide their ability to deliver safe water.

The Horsham Land Redevelopment Authority (HLRA) provided the closing remarks for the panel discussion. The HLRA was created to redevelop the former Naval Air Station Joint Reserve Base Willow Grove property which contains 862 acres of fenced off, undeveloped land. HLRA created a Redevelopment Plan for this property that includes 1.7 million square feet of commercial space, 40 acres for educational use, 200 acres of open space, and construction plans for a retirement community, town center retail, hotel conference center, aviation museum, and recreational center. According to the HLRA, the lack of established cleanup standards prevents redevelopment of this property, resulting in hindered economic growth for Horsham. The HLRA recommended the Action Team establish uniform cleanup standards for soil, surface water, and drinking water. The HLRA also recommended that all PFAS become categorized as hazardous substances which, in turn, will hold the polluters liable for the cost of environmental remediation.

The area outlined in green on the right illustrates the 862 acres of the former Naval Air Station Joint Reserve Base Willow Grove property. This property closed in 2005 and is undergoing environmental remediation by the EPA which added this property to its list of [Superfund sites](#) in 1995 because of contamination migration originating from its onsite waste disposal facilities.

The area outlined in orange is the location of the Horsham Air Guard Station, which as of 2019, is still in operation.



Figure 4 Aerial view of the former Naval Air Station Joint Reserve Base in Willow Grove, PA

[Public Comments](#)

At the close of this meeting, approximately twenty individuals shared their thoughts and concerns to the Action Team during the public comment portion of the meeting. Those individuals requested:

- A timeline for establishing an MCL
- Informational resources for individuals with private water wells
- Rebates for water filters and treatment systems
- A list of locations included in DEP's Drinking Water Sampling Plan
- Treatment systems funded by responsible parties, not ratepayers
- An action timeline
- Actions with urgency
- Official legislative action categorizing PFAS as hazardous substances
- A State Toxicologist
- An interim MCL
- Notification of potential health exposure to current and previous veterans who worked on the military stations

The prevailing themes from the public speakers were the sense of urgency for action and a request to only return for another meeting when a proposed MCL is established.

Following these public meetings, the Action Team members relayed to their staff the concerned sentiment expressed by individuals who live, work, and raise families in neighborhoods with elevated potential for PFAS contamination. The public's feedback and recommendations reinforced the Action Team's central tenet of focusing on inclusive, "big picture" solutions for PFAS contamination management.

In addition to its internal and public meetings, the PFAS Action Team held a six-month public comment period where it accepted comments from all stakeholders, including the general public, scientists, business owners, community leaders, and government officials. Throughout this open comment period, nearly [900 comments](#) were submitted to the Action Team. After review, a significant majority of the comments echoed the sentiments expressed at the Action Team's public meetings.

The content of these comments were used to inform the Recommendations included in this report. For specific information about the completed, ongoing, and planned actions that each state agency on the Action Team is taking to address PFAS contamination, please see the following "Actions and Recommendations" section of this report.

Acronyms List

AFFF – Aqueous film forming foam
ATSDR – United States Agency for Toxic Substances and Disease Registry
BAQ – DEP’s Bureau of Air Quality
BCW – DEP’s Bureau of Clean Water
BOL – DEP’s Bureau of Laboratories
BSDW – DEP’s Bureau of Safe Drinking Water
BWM – DEP’s Bureau of Waste Management
CA – Cooperative Agreements
DCED – Department of Community and Economic Development
DEP – Department of Environmental Protection
DOH – Department of Health
DMVA – Department of Military and Veterans Affairs
ECB – DEP’s Bureau of Environmental Cleanup and Brownfields
EQB – Environmental Quality Board
EO – Executive Order 2018-08
EPA – United States Environmental Protection Agency
HAL – Health Advisory Level
HLRA – Horsham Land Redevelopment Authority
HWSA – Horsham Water and Sewer Authority
IRRC – Independent Regulatory Review Commission
L&I – Department of Labor and Industry
LRB – Legislative Reference Bureau
MCL – Maximum Contaminant Level
NGB – U.S. National Guard Bureau
OSFC – Office of the State Fire Commissioner
PAANG – Pennsylvania Air National Guard
PAARNG – Pennsylvania Army National Guard
PDA – Pennsylvania Department of Agriculture
PennDOT – Pennsylvania Department of Transportation
PFBC – Pennsylvania Fish and Boat Commission

PFAS – Perfluoroalkyl and Polyfluoroalkyl Substances

PFHxS - Perfluorohexane sulfonic acid

PFNA - Perfluorononanoic acid

PFOA – Perfluorooctanoic Acid

PFOS – Perfluorooctane Sulfonic Acid

PPT – Parts Per Trillion

PUC – Public Utility Commission

USGS – United States Geologic Survey

2019



Commonwealth of Pennsylvania—**Governor Tom Wolf**

