

Table of Contents

U.S. Senate Date: Thursday, March 28, 2019

Committee on Environment
and Public Works Washington, D.C.

STATEMENT OF:	PAGE:
THE HONORABLE JOHN BARRASSO, A UNITED STATES SENATOR FROM THE STATE OF WYOMING	3
THE HONORABLE THOMAS CARPER, A UNITED STATES SENATOR FROM THE STATE OF DELAWARE	8
DAVID ROSS, ASSISTANT ADMINISTRATOR, OFFICE OF WATER, ENVIRONMENTAL PROTECTION AGENCY	14
MAUREEN SULLIVAN, DEPUTY ASSISTANT SECRETARY OF DEFENSE FOR ENVIRONMENT, DEPARTMENT OF DEFENSE	19
PATRICK BREYSSE, DIRECTOR OF THE NATIONAL CENTER FOR ENVIRONMENTAL HEALTH/AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, CENTERS FOR DISEASE CONTROL AND PREVENTION	24
LINDA BIRNBAUM, DIRECTOR OF THE NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES AND THE NATIONAL TOXICOLOGY PROGRAM, NATIONAL INSTITUTES OF HEALTH	30

EXAMINING THE FEDERAL RESPONSE TO THE RISKS ASSOCIATED WITH PER-
AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Thursday, March 28, 2019

United States Senate

Committee on Environment and Public Works

Washington, D.C.

The committee met, pursuant to notice, at 10:04 a.m. in room 406, Dirksen Senate Office Building, the Honorable John Barrasso [chairman of the committee] presiding.

Present: Senators Barrasso, Carper, Capito, Rounds, Boozman, Wicker, Ernst, Cardin, Gillibrand, Markey, Duckworth, and Van Hollen.

STATEMENT OF THE HONORABLE JOHN BARRASSO, A UNITED STATES
SENATOR FROM THE STATE OF WYOMING

Senator Barrasso. Good morning. Before we start, I just want to mention that Senator Sullivan regrets that he is unable to join us today. Earlier this week his mother passed away and he is with his family, mourning the loss. I know this is an issue that is very important to him, very important to the people of Alaska, and he will be following what is happening and certainly continue to be very engaged in this critical issue.

That is why we call this hearing to order, because we are going to examine the issue of per- and polyfluoroalkyl substances, or PFAS.

You are okay if we just use PFAS?

Senator Carper. No, I think we should use the real word.

[Laughter.]

Senator Carper. That will double the length of the hearing.

[Laughter.]

Senator Barrasso. PFAS are a large class of chemicals known for their resistance to oil and water.

Since the 1940s, PFAS has been used in a broad array of industrial, commercial, and consumer applications, including nonstick cookware, waterproof clothing, stain-resistant fabrics, food packaging, and Aqueous Film Forming Foams. These are foams

used by the U.S. military and others to fight fires.

Scientists have found that PFAS breakdown very slowly, if at all, in the natural environment. They have also found that some accumulate in the human body. These chemicals travel through water, through air, through soil, and humans absorb them through ingestion, inhalation, and their skin. It is estimated that about 97 percent of Americans have detectible concentrations of PFAS in their blood.

Scientists believe that PFAS are associated with negative health effects and more research is needed. To date, scientists have detected PFAS pollution in nearly every State. It appears to be concentrated in communities adjacent to, nearby, or downstream from military bases, from airfields, from airports, from firefighting facilities, and chemical manufacturing and processing facilities.

Today we are going to hear from four very qualified witnesses representing three Federal agencies, the Environmental Protection Agency, the Department of Defense, and Health and Human Services. This is the first congressional hearing where all four witnesses from the relevant agency will testify on the same panel, so we are looking forward to hearing from all of you today. This will give us a chance to hear how the Administration is addressing this important issue.

Last month, the EPA released its PFAS Action Plan. The

Plan includes deciding by the end of the year whether to set a maximum contaminant level, or MCL, for two types of PFAS, PFOA and PFOS, under the Safe Drinking Water Act, deciding whether to list these two chemicals as hazardous substances under the Superfund law, and issuing cleanup guidance for groundwater contaminated with these two chemicals. EPA's cleanup guidance is currently pending at the Office of Management and Budget.

The Defense Department has identified 401 active or closed military facilities with known or suspected releases of PFOA and PFOS. These include the F.E. Warren Air Force Base and the Cheyenne Air National Guard Base in my home State of Wyoming. The Defense Department needs to take responsibility for its pollution. Most rural communities can't afford to clean up this contamination.

Scientists have identified over 4,700 different PFAS chemicals. Over 1,200 of these at some point in time entered U.S. commerce. To date, the EPA has only been able to publish a monitoring methodology for 18 different PFAS chemicals in drinking water, so it is important that industry work with the EPA, the Centers for Disease Control, and the National Institutes of Health to help these agencies better detect PFAS, identify where these chemicals are produced and used, and understand the risks associated with them.

In addition to the Federal agency response, I would like to

take a moment and highlight the bipartisan work that Ranking Member Carper and I and members of the Committee have done on helping address this issue in our America's Water Infrastructure Act, which was signed into law by President Trump in October of last year.

This Committee, along with our House counterparts, placed several provisions in the legislation to help address PFAS. These include new grant opportunities for States to address contaminants that are present or likely present in public water systems or underground drinking water sources. These grants will assist States with small and disadvantaged communities to promptly address problems associated with testing, with treatment, and with remediation of contamination sources such as PFAS.

Our legislation also reauthorized the Drinking Water State Revolving Funds for the first time in decades. It greatly increases funding for this critical program so that drinking water systems can improve or replace their facilities to meet Safe Drinking Water Act standards and to improve public health.

With the enactment of the America's Water Infrastructure Act, we have taken a significant step in the right direction to help address contaminants in drinking water, including PFAS, so we hope that this hearing can help the Committee assess the next steps on PFAS. Working together, we are committed to continue

to find bipartisan solutions to address this important issue.

With that, I would like to turn to my friend and Ranking Member, Senator Carper.

[The prepared statement of Senator Barrasso follows:]

STATEMENT OF THE HONORABLE THOMAS R. CARPER, A UNITED STATES
SENATOR FROM THE STATE OF DELAWARE

Senator Carper. Thanks, Mr. Chairman. It is good to be here with you and our colleagues.

I want to welcome all of our witnesses. At least one or two of you have been before us previously for a confirmation hearing, and I think this is might the first time we have seen Mr. Ross since he was before us. You look none the worse for wear. We are glad to see you all.

Mr. Chairman, thanks a whole lot for scheduling this hearing. I think it is an important hearing.

Just last week, our EPA Administrator, Andrew Wheeler, said that access to clean drinking water was, and I quote him, "the biggest environmental threat." Access to drinking water, the biggest environmental threat. Those are his words. In a typical administration, one could safely assume that we would see some greater sense of urgency from EPA to address this one significant aspect of what Administrator Wheeler describes as the biggest environmental threat that we face. But that is not the case here, at least so far. EPA is simply not approaching the issue of protecting drinking water for millions of Americans with the same sense of urgency and zeal with which it repeals Obama-era regulations.

That brings us to our central focus today, per- and

polyfluorinated alkyl substances, commonly referred to as PFAS. These chemicals can be found in many household products, as well as in firefighting foam used by the military. Unfortunately, though, some PFAS chemicals have been shown to cause cancer, thyroid problems, and other adverse health impacts.

Just last year, the town of Blades, Delaware, in southern Delaware, just south of Wyoming, Delaware, in my home State alerted more than 1,000 residents there and some area businesses and schools to stop drinking and cooking with public water because PFAS chemicals were found to be present at nearly twice the Federal Health Advisory level. Just up the road from Route 13 from Blades, 36 of 67 sampled groundwater wells on Dover Air Force Base have reported shown dangerously high levels of PFOS and PFOA, two kinds of PFAS chemicals.

This is a map. It is hard to see Delaware. In fact, it is also hard to see Maryland. But we are over there under all those blue circles, and some red ones as well.

This is not just a problem in Delaware, as you can see; PFAS contamination is widespread. It is found in red States, it is found in blue States, in small water systems and large water systems, from dairy farms in Maine to Air Force bases in Alaska.

That brings us to EPA's PFAS Action Plan. In May of 2018, then-Administrator Scott Pruitt held a PFAS National Leadership Summit and there he announced four "concrete steps" that EPA

would take to address PFAS contamination. Mr. Pruitt said that with one of those steps EPA would decide to set a drinking water standard for PFOA and PFOS.

Nearly a year after that summit, I asked then-Acting Administrator Andrew Wheeler, at his confirmation hearing for the post of Administrator, asked him if he would commit to setting a drinking water standard for PFAS. He would not make that commitment that day.

Shortly after that hearing, press reports revealed that EPA had actually decided not to set a drinking water standard for PFAS. Understandably, this news was met with real concern from both sides of the aisle here.

Weeks later, to my dismay, the final PFAS Action Plan essentially re-announced that EPA was still considering the very same four measures that Scott Pruitt had announced almost a year earlier, including that the Agency would decide whether to set a drinking water standard by the end of this year.

With Mr. Wheeler's nomination at stake, he was finally, I think, compelled to commit to setting a drinking water standard for PFOA and for PFOS. This is a considerable victory, except that it will likely take years to complete because EPA has not yet even started its work.

The second step that Mr. Pruitt laid out almost a year ago was that EPA would propose designating PFOA and PFOS as

hazardous substances under the Superfund law. This move would help to hold polluters responsible for cleaning up contaminated areas. EPA's PFAS Action Plan said, again, that it would issue the proposal at some unspecified time in the future.

I have introduced legislation that has been cosponsored by 30 of our colleagues, bipartisan bill, that puts a one-year deadline on this important action because the American people deserve to see some sense of urgency on this issue.

The third step that Scott Pruitt announced was that EPA would issue guidance for cleanup standards for PFAS at contaminated sites by the fall of 2018. That guidance has been trapped at the White House since last August because the Defense Department has apparently actively been trying to weaken the EPA's proposal.

Finally, Scott Pruitt said that EPA would assess the risks from other PFAS chemicals. Sadly, the PFAS Action Plan falls short of this promise as well. It does not include a commitment to ensure communities will be given information to assess whether their drinking water is safe from any identified risks.

At his confirmation hearing, Mr. Wheeler said this, "It is these Americans that President Trump and his Administration are focused on, Americans without access to safe drinking water or Americans living on or near hazardous sites, often unaware of the health risks that they and their families face. Many of

these sites have languished for years, even decades" in some instances. He goes on to ask, "How can these Americans prosper if they cannot live, learn, or work in healthy environments?"

EPA's PFAS Action Plan fails to answer that question and only leads to one other: Where is the urgency? Where is the urgency from EPA on this issue?

My hope, I think our hope is that the witnesses before us today will commit to moving forward with a range of measures to protect Americans with an appropriate amount of urgency to benefit a problem that Administrator Wheeler himself says is part of the biggest environmental threat that we face in this Country.

Thank you all. Welcome.

[The prepared statement of Senator Carper follows:]

Senator Barrasso. Thank you very much, Senator Carper.

We are now going to hear from our witnesses. We are delighted to have the four of you here. First is Mr. David Ross, who is the Assistant Administrator of the Office of Water at the Environmental Protection Agency.

We also have with us Ms. Maureen Sullivan, who is the Deputy Assistant Secretary for Environment at the Department of Defense. Welcome.

We also have Dr. Patrick Breyse, who is the Director of the National Center for Environmental Health and the Agency for Toxic Substances and Disease Registry, both of which are part of the Centers for Disease Control and Prevention. Thank you for being here.

Finally, Dr. Linda Birnbaum, who is the Director of the National Institute of Environmental Health Sciences and the National Toxicology Program, both of which are part of the National Institute of Health.

This is a very distinguished panel. I would like to remind the witnesses that your full testimony will be part of the record. Your written testimony, we will include all of that, so please try to keep your statements to give minutes so that we may have some time for questions.

We all look forward to hearing your testimony.

With that, I would invite you, Mr. Ross, to please begin.

STATEMENT OF DAVID ROSS, ASSISTANT ADMINISTRATOR, OFFICE OF
WATER, ENVIRONMENTAL PROTECTION AGENCY

Mr. Ross. Good morning, Chairman Barrasso, Ranking Member Carper, and members of the Committee. I am Dave Ross, EPA's Assistant Administrator for Water. Thank you for the opportunity to testify today regarding the growing public health concern associated with the release of PFAS chemicals into the environment.

Since my first day on the job, I have been advised by our dedicated career professionals and scientists on all aspects of the emerging PFAS problem, from understanding the potential adverse health effects to the fate and transport of these chemicals in the environment, to what we know and what we don't know about the identification, treatment, and monitoring of these substances. EPA's scientists and technical staff have been amazing, and Administrator Wheeler and I greatly appreciate their expertise and their counsel.

As we already heard, PFAS are a class of synthetic chemicals that have been widely used around the globe since the 1940s because of their stain-resistant, waterproof, and nonstick properties. We use them to floss our teeth, we use them when we hike in the rain, and we use them to protect public health and safety. Despite their everyday use, the body of science necessary to fully understand and regulate these chemicals is

not yet as robust as it needs to be.

Recognizing that, EPA is using and developing cutting-edge research and moving forward with regulatory mechanisms designed to protect public health and the environment. EPA's commitments on these fronts are outlined in our PFAS Action Plan. That Action Plan was authored by our career professionals and the recommended actions are a product of their expertise and counsel.

The Action Plan was also informed by extensive stakeholder engagement that the Agency formally initiated last year at our National Leadership Summit. EPA held listening sessions in several communities across the Country and reviewed approximately 120,000 written comments. The views on how to address PFAS are diverse and sometimes at odds, but EPA learned through this engagement that this is a multidimensional problem that requires multidimensional solutions.

The Action Plan commits EPA to take important steps that will improve how we research, detect, monitor, and address PFAS chemicals. Today I would like to highlight five of the most important areas in the Action Plan, but I encourage you all to read the Plan in its entirety.

First, EPA is committed to following the MCL rulemaking process for PFOA and PFOS as established by the Safe Drinking Water Act, a process that is designed to ensure public

participation, transparency, and the use of the best available science and other technical information. The Agency has committed to making a proposed regulatory determination for PFOA and PFOS, which is the next step in the regulatory process, by the end of this year. EPA will also evaluate whether a broader range of PFAS chemicals should be regulated under the Safe Drinking Water Act.

Second, EPA will continue our enforcement actions and will clarify our cleanup strategies. EPA has initiated the regulatory development process for designating PFOA and PFOS as hazardous substances under CERCLA and intends to issue interim groundwater cleanup recommendations for sites contaminated with those chemicals as soon as possible.

Third, EPA will expand its focus on monitoring and understanding PFAS in the environment. For example, the Agency will propose to include PFAS in the next round of drinking water monitoring under the Unregulated Contaminant Monitoring Program. This action will improve EPA's understanding of the frequency and concentration of PFAS occurrence in drinking water by using newer methods that will detect more PFAS chemicals at lower levels.

Fourth, EPA is expanding its research efforts and the scientific foundation for addressing PFAS by developing new analytical methods and toxicity assessments. Our goal is the

close of the gap on science as quickly as possible, especially as it relates to emerging risk. We are also working to develop new technologies and treatment options to remove PFAS from drinking water.

Finally, we will be working across the Agency and the Federal Government to develop a PFAS risk communication toolbox that includes materials that States, Tribes, and local partners can use to effectively communicate to the public. Additionally, the Agency remains steadfast in our commitment to support States, Tribes, and local communities to address PFAS contamination where and when it has been identified.

Again, thank you for the opportunity to testify today with our Federal partners. I can assure you that the emerging PFAS exposure concern is a top priority for the Agency and our Administrator.

I look forward to answering any questions that you may have.

[The prepared statement of Mr. Ross follows:]

Senator Barrasso. Thank you, Mr. Ross.

Ms. Sullivan?

STATEMENT OF MAUREEN SULLIVAN, DEPUTY ASSISTANT SECRETARY OF
DEFENSE FOR ENVIRONMENT, DEPARTMENT OF DEFENSE

Ms. Sullivan. Chairman Barrasso, Ranking Member Carper, and members of the Committee, I am Maureen Sullivan, the Deputy Assistant Secretary of Defense for Environment. My portfolio includes policy and oversight of DOD's programs to comply with environmental laws such as the Safe Drinking Water Act and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA).

I want to thank Congress for your strong support for the Department of Defense, our national security priorities, and for the funding we need to protect our Nation. Ensuring the health and safety of our servicemembers, the families living on our installations, and the surrounding communities is one of our top priorities.

I want to thank this Committee for the opportunity to discuss PFAS. We believe the Department has been leading the way to address these substances.

One commercial product that contains PFOS and PFOA is Aqueous Film Forming Foam, or AFFF. This highly effective firefighting foam has been used by DOD, airports, fire departments, and the oil and gas industry. However, it only accounted for approximately 3 to 6 percent of the PFOS production in 2000, and DOD is just one of many users.

Over the last three years, the Department has committed substantial resources and taken action to respond to concerns with PFOS and PFOA. When EPA issued the Lifetime Health Advisory (LHA) for PFOS and PFOA in May of 2016, DOD acted quickly to voluntarily test our 524 drinking water systems that serve approximately 2 million people on our installations worldwide. Twenty-four of these systems tested above EPA's LHA level. DOD followed the EPA's recommendation to include providing bottled water or additional water treatment.

CERCLA provides a consistent approach across the Nation for cleanup. The Defense Environmental Restoration Program statute provides authorities to DOD to perform and fund actions, and requires they be carried out in accordance with CERCLA. The first step is to identify known or suspected releases. DOD has identified 401 active and base realignment and closure installations with at least one area where there is a known or suspected release of PFOS or PFOA. The military departments then determined if there was exposure through drinking water. If so, the priority has been to cut off human exposure where drinking water exceeds EPA's LHA level.

Now that exposure pathway is broken, the military departments are prioritizing sites for further action, using the longstanding CERCLA risk-based process, worst first. These known or suspected PFOS and PFOA release areas are in various

stages of assessment, investigation, and cleanup.

As DOD moves through the CERCLA process, we will work in collaboration with our regulatory agencies and communities and share information in an open and transparent manner.

To prevent further releases into groundwater, DOD issued policy in January of 2016 requiring the military departments to stop using AFFF during maintenance, testing, and training. The policy also required the military departments to remove and properly dispose of supplies of AFFF containing PFOS. Currently, no fluorine-free versions of AFFF meet the military stringent performance requirements. We have funded research and demonstration projects to identify and test performance of fluorine-free AFFF. These efforts support the Department's commitment to finding an AFFF alternative that meets critical mission requirements, while protecting human health and the environment, and will represent \$10 million in research and development funding.

In summary, DOD is taking actions to reduce the risks from PFOS and PFOA. Our efforts reinforce DOD's commitments to meeting critical mission requirements while protecting human health. The Department recognizes that this is a national problem involving a wide array of industries and commercial applications, as well as many Federal and State agencies; therefore, it needs a nationwide solution.

We look forward to working with you as you move forward.

Thank you.

[The prepared statement of Ms. Sullivan follows:]

Senator Barrasso. Well, thank you so very much for your thoughtful testimony, Ms. Sullivan. We appreciate you being here today.

Dr. Breysse.

STATEMENT OF PATRICK BREYSSE, DIRECTOR OF THE NATIONAL CENTER FOR ENVIRONMENTAL HEALTH/AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY, CENTERS FOR DISEASE CONTROL AND PREVENTION

Mr. Breysse. Thank you, Chairman Barrasso, Ranking Member Carper, and distinguished members of the Committee. I am Patrick Breysse, the Director of the National Center for Environmental Health at the CDC, Centers for Disease Control and Prevention, and the Agency for Toxic Substances and Disease Registry. In addition to my role as Director, I have over 35 years of experience working as an environmental health scientist at the Johns Hopkins University Bloomberg School of Public Health.

I appreciate the opportunity to be here today and to discuss our role in investigating the exposure and possible health effects associated with per- and polyfluoro substances, otherwise known as PFAS.

CDC has measured PFAS chemicals in people's blood since 1999 as a part of the National Health and Nutrition Examination Survey, known as NHANES. Since that initial analysis, CDC has detected four PFAS chemicals in at least 98 percent of NHANES participants.

PFAS, as we have heard, are very persistent in the environment, requiring decades to break down. Because of their use and persistence in the environment, PFAS are found in the

blood in people and animals from around the world.

ATSDR is concerned about these potential exposures and are currently conducting work in more than 30 communities across the United States. For example, ATSDR and the State of Alaska were asked by the Navy to provide assistance near the Naval Arctic Research Laboratory in Lake Imikpuk where PFOA was found.

We also provided assistance to the City of Parchment, Michigan when they found their drinking water system had significant contamination with PFAS.

ATSDR is also providing technical support to the State of Vermont around PFOA in private drinking water wells in North Bennington, as well as other sites across the Country.

As a part of our work in communities, ATSDR developed tools to help State, local, Tribal, and territorial health departments conduct PFAS exposure assessments. We recently partnered with the Association for State and Territory Health Officials in the States of Pennsylvania and New York to test the exposure assessment tools and provide a basis for conducting further exposure assessments across the United States.

We have also developed guidelines for physicians to help them understand what PFAS is, how people are exposed, and the possible health effects associated with PFAS exposures.

In June of 2018, ATSDR published a draft Toxicological Profile on perfluoroalkyls for public comment and summarized the

information on PFAS toxicity that included oral minimal risk levels for four PFAS compounds. We are now in the process of reviewing those comments.

On February 21st, ATSDR announced that, in addition to the two initial exposure assessments in New York and Pennsylvania, there will be eight additional exposure assessment sites in communities near current and former military installations known to have past or a current exposure through their drinking water route. ATSDR will stagger the exposure assessments one after the other beginning later this year.

ATSDR will measure PFAS levels in blood and urine of community members and examine the environmental factors that have contributed to their exposure. ATSDR will use these results to make public health recommendations to communicate to people about how to decrease their exposure. We plan to actively engage communities by interacting early and often, by sharing information proactively, and tailoring our messages. We hope these efforts garner buy-in, encourage participation in our exposure assessments, and build relationships between ATSDR and the affected communities.

ATSDR is also conducting a proof-of-concept study in Pease International Trade Port, New Hampshire, known as the Pease Study. This will be a model site that will allow CDC/ATSDR to evaluate study procedures and methods before embarking on a

national multi-site health study.

The exposure assessments, the Pease proof-of-concept study, and our community engagement activity are all being conducted in order to help us plan for and develop the multi-site national health study. This study will examine the relationship between PFAS and health outcomes in multiple communities with contaminated drinking water. It will take into account the lessons learned from the exposure assessments, the engagement activities in Pease, as well as other activities.

In closing, I would like to leave you with a few thoughts. PFAS exposure through drinking water is widespread, having occurred for many decades, and human health studies are limited. Successfully addressing PFAS will take a collaboration with Federal agencies, and I look forward to participating in that collaboration and working together to address this problem.

ATSDR is working across the United States to learn more about PFAS exposure and its health effects, and we are passionate about this work. There are extensive community concerns and it is critical for ATSDR, local, State, Federal, and academia to work together to address these concerns.

Thank you again for the opportunity to discuss CDC's and ATSDR's role in investigating exposure and possible health effects associated with PFAS, as well as our current and future planned activities. I welcome your questions. Thank you.

[The prepared statement of Mr. Breysse follows:]

Senator Barrasso. Well, Dr. Breysse, thanks so much for that very thoughtful consideration in your testimony. We are very thankful that you are here today.

Dr. Birnbaum.

STATEMENT OF LINDA BIRNBAUM, DIRECTOR OF THE NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES AND THE NATIONAL TOXICOLOGY PROGRAM, NATIONAL INSTITUTES OF HEALTH

Dr. Birnbaum. Good morning, Chairman Barrasso, Ranking Member Carper, and distinguished members of this Committee. I am Linda Birnbaum, the Director of NIH's National Institute of Environmental Health Sciences, known as NIEHS, and the Director of HHS's National Toxicology Program, or NTP.

For nearly 40 years I have conducted scientific research to better understand the health impacts of environmental exposures. I am here today to provide a scientific perspective about the large and complex class of chemicals known as per- and polyfluorinated substances, or PFAS.

For nearly three decades NIEHS has conducted and funded research on health effects associated with human exposures to PFAS. NIEHS-supported research uses human observational studies, animal models, in vitro tissue and cell culture systems, in silicon computer approaches, and high throughput screening to study the effects of PFAS exposures. Research conducted to date reveals associations between PFAS exposures and a variety of specific adverse human health outcomes, including immune system dysfunction, endocrine disruption, altered obesity profiles, impaired child development, and cancer.

While knowledge about these associations has steadily expanded in recent years, many questions remain unanswered. Therefore, NIEHS and NTP, in coordination with other Federal agencies and State and local governments, continue to conduct research to enhance our understanding of the biological mechanisms and processes that may be altered or harmed by PFAS.

Currently, NIEHS funds more than 40 academic PFAS-related projects. In the past year alone, NIEHS has received a significant increase in the number of PFAS focus grant applications. As a result, we have competitively awarded more grants in this area.

Since September 2018, the last time I appeared at a Senate hearing on this subject, NIEHS has awarded 10 new PFAS research grants. Many of these projects are investigating early life exposures and long-term health effects. NIEHS-funded scientists have been extremely productive, publishing 28 manuscripts since September. A list of manuscripts is attached to my written testimony.

Apart from our support of external research grants, the NIEHS Superfund Research Program, which is under this Committee's jurisdiction, is studying how PFAS moves through the environment. The Superfund Research Program is translating scientific findings to establish best practices for PFAS management and developing novel technologies for remediation of

PFAS contamination.

Additionally, NTP is collaborating with EPA to study more than 100 unique PFAS compounds. This collaboration enables us to compare individual PFAS to identify common or overlapping patterns of toxicity.

While many research projects focus on a single or series of PFAS, current human exposures to PFAS involve complex mixtures, not individual chemicals. This reality complicates both the science of exposure measurement and the assessment of health risks. Current analytical techniques are limited for determining which specific PFAS are contained in a given complex mixture.

Furthermore, health impact information for combined PFAS mixtures remains incomplete. Additional research is needed to assess environmental exposures to mixtures of PFAS and to determine their combined effects.

Approaching PFAS as a class, rather than as thousands of individual compounds, is the best approach for assessing exposure and biological impact, and for protecting public health. PFAS are extremely persistent in our environment, they are transported globally with widespread human exposure, and we are learning more each day about PFAS toxicity. It is time we ask ourselves where are these widely used chemicals really needed? Does the value of PFAS use for modern day convenience

outweigh the risks to public health and related health care costs?

No matter how we answer that question, one thing is clear: scientific innovation is critical for shifting to safer alternatives.

In closing, let me state that NIEHS is well positioned to continue contributing essential scientific knowledge about this large and complex class of chemicals. Our research can help regulators make sound science-based decisions and informs the medical and public health communities about the potential health effects associated with exposure to PFAS.

I have submitted a more detailed statement for the record, and I welcome your questions. Thank you.

[The prepared statement of Dr. Birnbaum follows:]

Senator Barrasso. Thank you so much for your testimony and thank you also for your life's contribution to the body of work that you have done. Thank you.

Appreciate all of you being here.

We are going to start by asking some questions, and I will begin with questions and then we will go to other members.

Ms. Sullivan, yesterday I think you know Todd Parfitt, who is the Director of the Wyoming Department of Environmental Quality, sent three letters to the Department of Defense. They concern known and suspected PFAS pollution at active and former military facilities in Wyoming. I think the map that was just shown by my colleague, Senator Carper, showed the dot there in Wyoming in the Cheyenne area.

The Defense Department has found that the F.E. Warren Air Force Base and the Cheyenne Air National Guard Base have groundwater, surface water, and soil that have been contaminated with high levels of PFAS pollution. Could you explain to us what the status of the Department's efforts are to determine the nature and the extent of the contamination at those sites?

Ms. Sullivan. Yes, sir, I will give you a brief overview, and I would be glad to have the Air Force come in and give you a much more detailed briefing at your convenience.

The Air Force has completed the initial site investigation where they did find that there is the presence of PFOS and PFOA

in the groundwater. They have confirmed that all the drinking water is upstream and is not impacted, so they are moving into the next steps of the investigation process, which will start this year in cooperation with the States.

The same for the National Guard, that they are moving forward with the next phase of investigation now.

Senator Barrasso. Great. I believe that contaminated groundwater at the National Guard Base is likely to migrate off base. There are residential areas around, so I just want to know when we can expect the Department to test the groundwater outside of the involved facilities as well.

Ms. Sullivan. Absolutely. That is part of the entire investigation process, sir.

Senator Barrasso. One of Todd Parfitt's letters also mentioned Wyoming's formerly used Defense sites, specifically the former Atlas D and Atlas E missile sites and the former Casper Army Airfield facility. The State of Wyoming believes that PFAS pollution may also be present at these additional sites, so can we also expect the Department to test pollution at these sites?

Ms. Sullivan. Sir, the Corps of Engineers has done some research there and we are committed to addressing our environmental liabilities at these sites. Initial investigation shows that the sites were closed prior to the use of AFFF, so

they have done a certain amount of record search and they will continue to determine whether or not we use the foam at these locations and are therefore a source. But most of them closed prior to the use of the foam.

Senator Barrasso. Well, I appreciate that. I think it is critical that we do get these sites tested as well to confirm that there is no pollution there.

Mr. Ross and Dr. Breysse, there has been so much discussion that the EPA's Lifetime Health Advisories for the two types of PFAS that we are talking about, chemicals specifically, PFOA and PFOS, Lifetime Health Advisories seem to be inconsistent with the CDC's minimal risk levels for these chemicals.

I was just going to ask if both of you could maybe help explain the difference between the EPA's Lifetime Health Advisories and the CDC'S minimal risk levels so that we all get a better understanding.

Mr. Ross. I am happy to field that question first, Senator. They are different numbers and they are different agencies with different missions, with different programs that use this information for different purposes. For example, we should really be talking about reference dose levels that EPA uses versus the minimum risk levels at the ATSDR. You really, as you are talking about our health advisories, should be comparing and talking about the actual screening levels.

So the agencies use slightly different science for PFOA; we use a different endpoint, a different study. We look at kind of contaminant levels that come through multiple routes of exposure, whereas the ATSDR I think we can explain use different systems, they use different levels of uncertainty. So we use them to take a look and protect public health over a 70-year lifecycle and they use them for a different purpose, which I am sure the doctor can explain.

Senator Barrasso. Doctor?

Mr. Breysse. Thank you very much. So, minimal risk levels are part of what we call a toxicological profile, which is a document that we produce based on congressional legislation. We produced over 300 toxicological profiles with MRL levels in the past 20 years. We use them for a very specific purpose, and I think that purpose needs to be understood in order to characterize the differences we are talking about today.

We use them as screening values, so we establish values using appropriate safety factors that we think below which health effects are not likely, above which it is possible, but we don't know for sure. So it allows investigators at hazardous waste sites to come in and screen chemicals, whether they are above or below that, to focus on the chemicals that we think the greater risk might occur. Oftentimes at hazardous waste sites there are dozens of chemicals and the screening values allow us

to do that.

So, they are, by definition, perhaps, a little bit more conservative than what the long-term health advisory might be because of that unique role; they are used by health assessors, they are used by those health assessors in the States, the local health departments and our health assessors at ATSDR, whether they are in the field or in Atlanta.

Senator Barrasso. Thank you.

Finally, Dr. Birnbaum, by your testimony, you have been focused on this for an entire career. Can you talk about what the most urgent public health questions related to PFAS chemicals are that we need to answer?

Ms. Birnbaum. The PFAS are chemicals that, from the growing body of literature, affect multiple tissues in both males and females of multiple species at all developmental life stages. So I think that as the database grows and the research grows, we are beginning to understand more and more that it is not just cancer, it is not just affects on the immune system, it is not just affects, for example, on the kidney or the liver; it is also affects on development and reproduction and pretty much almost every system that you can think of.

Senator Barrasso. Thank you.

Senator Carper.

Senator Carper. I believe it was former U.S. Supreme Court

Justice Potter Stewart who said sometime in the mid-1960s he said these words, he said, talking about obscenity, he said, I know it when I see it. I know it when I see it.

Part of our hearing today is focused on the word not obscenity, but urgency, and I would like to say I know it when I see it. I don't feel it. I don't feel it with respect to EPA. As a retired Navy captain, I have concerns about a guy who has worked for years to BRAC-proof the Dover Air Force Base, for 30 years. I have a huge interest in this as a veteran. The Dover Air Force Base is beloved by our State, so for us this is personal.

Ms. Birnbaum, do you sense the kind of urgency? Maybe you see something I don't see. Is there a sense of urgency here demonstrated by EPA, or should we just sit back and say, well, it is going along just fine?

Ms. Birnbaum. We are working very closely with EPA's Office of Research and Development to study more than 100 different PFAS and to try to understand whether in fact they are all doing the same thing or maybe grouped into a number of specific classes. This is a program that we call REAC, which is a Rapid Experimental Advances. We hope to have results from that available within months, not years.

Senator Carper. That was not my question. You answered a different question. My question is do you sense an urgency from

EPA that I don't, that we don't.

Ms. Birnbaum. EPA appears to be interested in moving more rapidly than they have in the past on dealing with these PFAS chemicals, and I applaud that effort.

Senator Carper. Maybe you are seeing something that we done. I hope you are.

Mr. Ross, I said in my opening statement for an agency whose leader says that access to drinking water is the biggest environmental problem, PFAS Action Plan does not convey that same sense of urgency. My question is a brief one and I would ask for a brief response. After significant congressional pressure, the Agency has reversed itself and committed to setting an enforceable drinking water standard for PFOA and PFOS. We welcome that. When do you expect that rule will be finalized, please?

Mr. Ross. We intend to propose the first step in the process this year. When we finalize it is a factor of what is in the proposal --

Senator Carper. Just give us a rough idea. When do you expect the rule to be finalized?

Mr. Ross. We are going to move as expeditiously as we possibly can. At this point, I do not know how many comments we will get, I don't know the science, and to give you an estimate at this point really is a function of what the proposal will

look like and what the public engagement is like. My job is to move as expeditiously as we can.

To your sense of urgency, with all due respect, I know it when I see it and I see it every single day with the career employees who are working around the clock and, in fact, have pulled all-nighters on this issue. I have hundreds of people who are working at the Agency everyday who are dedicated to the mission of protecting public health and the environment, and when you say that EPA is not doing enough, that is a disservice to those people who are doing something every single day.

Senator Carper. To the folks who are working hard, all-nighters, the folks at EPA and other agencies, convey our thanks. We are doing oversight here. Got it? We are doing oversight. We are doing oversight here to make sure that you and the folks at EPA are doing your job. We have our constituents throughout this Country that are at risk, and we want to see a sense of urgency and feel it every day, so keep it up. For those who are conveying that sense of urgency, terrific; for those who aren't, peddle to the metal.

Mr. Ross. I agree with you, Senator.

Senator Carper. Ms. Sullivan, 32 percent of Americans' drinking water comes from groundwater. That is not even counting the 13 million households who get their drinking water from private wells. Why is the Department of Defense trying to

weaken the EPA cleanup guidance in a way that will leave hundreds of military sites contaminated at levels that are vastly higher than EPA's drinking water health advisory says is safe?

Ms. Sullivan. Sir, the Department takes our cleanup responsibilities seriously and we are not seeking a different or weaker standard. We support the use of the long-established CERCLA risk-based cleanup process established in EPA's implementing guidance.

Senator Carper. Is that all you have?

Ms. Sullivan. Well, the process is long established, it applies to all chemicals nationwide, and that is what we are trying to process. And, honestly, sir, I have been asking for the groundwater guidance since the Lifetime Health Advisory came out, so I am very interested in it being finalized myself.

Senator Carper. Thank you.

I think we will have another round of questions. I look forward to that. Thank you.

Senator Barrasso. Senator Rounds.

Senator Rounds. Thank you, Mr. Chairman.

Secretary Sullivan, in your testimony you discuss the three-pronged approach you have taken to address drinking water impacted by DOD releases. In my home State of South Dakota, 21 off-base groundwater wells affected by Ellsworth Air Force Base

have tested above the EPA's lifetime health advisory level.

By the way, the Ellsworth Air Force Base was just selected as being the bed-down site for the new B21 stealth bomber, and we will have the first training site as well as the first operational squadron there, so we have a long history ahead of us.

But 21 off-base groundwater wells have been affected by the Ellsworth Air Force Base and these have tested above the EPA's Lifetime Health Advisory level. While we know the DOD is providing bottled water weekly to impacted residents, can you offer your perspective in regard to how DOD can best address these contaminations with respect to the economic hardships caused to private property owners long-term?

Ms. Sullivan. Sir, I appreciate that. I am not familiar with the specifics of Ellsworth, but I am glad to get the Air Force up here to brief you. I can say that we are working diligently to get people off bottled water.

Senator Rounds. Look, here is the deal. It is not just Ellsworth.

Ms. Sullivan. It is everywhere.

Senator Rounds. Yes, it is. Another site in Sioux Falls, South Dakota with the 114th Squadron at Joe Foss Field, we are discovering PFAS there as well. Any place basically where we have firefighting requirements, there is a case of where we have

groundwater contamination.

Ms. Sullivan. Correct.

Senator Rounds. So nationwide. But when we come to this, any plans right now on how we want to address the long-term impacts for these private property owners in those areas? Do you know of any plans right now laid out at all?

Ms. Sullivan. At these locations, we are entering into cooperative agreements so we can reimburse the communities for the costs, so that we are paying the costs of the treatment from the Department of Defense Environmental Restoration Program and our Operations and Maintenance budgets.

Senator Rounds. So, fair to say that you believe that it is the intent of DOD to take responsibility for the cleanup of these sites wherever we find them where DOD has an obligation?

Ms. Sullivan. Where DOD is the known source, it is our responsibility to clean up the water and provide safe drinking water.

Senator Rounds. And I agree with you. Secretary Sullivan, last year I joined with my colleague, Senator Gillibrand, on the Senate Armed Services Committee in introducing an amendment to the fiscal year 2019 National Defense Authorization Act. This amendment would have allowed the National Guard to access environmental restoration financing under the Defense Environmental Restoration Fund.

While the rest of the military has access to this fund, the National Guard is required to fund environmental remediation through their Operations and Maintenance accounts.

As you know, diverting resources from O&M jeopardizes the readiness of our National Guard units. Unfortunately, our amendment was not adopted in the 2019 NDAA. As we examine the extent of PFAS contamination nationwide, much of which originated from PFAS containing firefighting foam mandated by the Department of Defense, do you believe that the National Guard installations should have the same access to these environmental cleanup resources?

Ms. Sullivan. Sir, this is a complicated legal question on fiscal law and I believe --

Senator Rounds. Now, wait a second. It is not a complicated question; it is real simple. Is DOD responsible for it? And why would we exclude the National Guard bases from having access to it?

Ms. Sullivan. Sir, they are under the control of the governor and, therefore, it has to come out of the Operations and Maintenance accounts. Sir, I appreciate your concern. We have ensured that there is money in the Operation and Maintenance accounts. It is a zero sum game; we either allocate it to the Environmental Restoration account or we allocate it to the O&M account. It is the same money.

Senator Rounds. I would accept that the governors will tell you that we have two different titles that we operate the National Guard under, but clearly the guidelines coming from DOD that have laid out what the firefighting equipment is and how it should be handled, including the chemicals being used, is not under the control of a governor and should not be expected to come out of O&M.

All I would ask is this. Would you help us in making darn sure that our National Guard bases have the resources, and not taken out of their other accounts, to fight to get these PFAS issues resolved one way or another and on an expedited basis?

Ms. Sullivan. We are fully supportive of putting the appropriate money in the account for the Air National Guard to be able to address this.

Senator Rounds. I look forward to working with you and I hope Senator Gillibrand will join me again this year in making certain that we have an account set up so that these National Guard bases have the same protections as any other DOD facility would have. I thank you for your efforts.

Ms. Sullivan. Look forward to working with you, sir.

Senator Rounds. Thank you.

Senator Carper. [Presiding.] Thank you, Senator Rounds.

Senator Cardin.

Senator Cardin. Thank you, Mr. Chairman.

I am going to follow up on the issues of responsibility for remedial actions.

Secretary Sullivan, I appreciate your answer in regard to DOD taking responsibility for cleanup where it is clear that they are responsible for the contamination. In Maryland, we know that we have at least four military sites that have been declared, including White Oak, Fort Meade, the Naval Academy, Naval Research Lab, Chesapeake Bay, all of which have been determined to have contamination.

I want to go a little bit broader than this, Mr. Ross, as to the responsibilities for cleanup under the Clean Water Act. You are looking at a declaration that could very well require some remedial activities within our drinking water supplies, including our wastewater treatment facility issues. And the source of the contaminant may not be as well understood coming into our general water supply. Our managers are already stressed on the cost of improvements to the wastewater treatment facility plants. I just recently visited with Administrator Wheeler an effort in Baltimore that we are doing in modernizing our wastewater treatment facility plants.

So can you just share with us how we can go about the remedial activities in holding those that are responsible for the contamination responsible, rather than putting additional burdens on our local governments or ratepayers that are already

stressed?

Mr. Ross. What you are getting at is the affordability issue, and that is an issue that I take very seriously. It is the affordability about just our wastewater, our drinking water, and our stormwater requirements as we grapple with aging infrastructure and all of those issues coming together. At the end of the day, it comes down to the single ratepayer, so we take our responsibility to think holistically about that ratepayer as we think about this.

Part of the answer to the question is a CERCLA answer and it is one of the reasons why we are looking at the hazardous waste listing. You said if it is a groundwater source and it is coming from a release, if we list those as hazardous substances, like PFOA and PFOS, that helps in the cost recovery aspects of the Federal Government or State and local government don't fund the cleanup and there is another recovery mechanism there.

We have the grant programs that we have, the WIFIA program that I think you participated with Administrator Wheeler. It is a great program. So those are the issues that we have to take a look at, a site-specific cleanup, can you find a way to pay for it for the responsible party, and that is one of the reasons that we are taking a hard look at CERCLA.

Senator Cardin. I appreciate that. Our first objective is public health and safety, so that is number one, and I

appreciate the fact that we are now looking at an assessment as to what is the appropriate level that we will tolerate and moving towards remedial actions for levels that are higher than that.

As we go forward in looking at how to assess that responsibility, our first order also should be to prevent further contamination, so I hope as part of what we are looking at in the policies is that we prevent further contamination where we can so that we don't have to go through the costs of remediation. But as we look at the remediation itself, holding responsible parties for the costs certainly needs to be part of the equation. We don't want to shortcut public safety, but we have to recognize the capacity of the ratepayers and of the local managers as to the issues that we are confronting.

So, I hope in your answer you weren't suggesting that we would use a cost analysis on public health, but a cost analysis as to how we are going to do the remedial work?

Mr. Ross. Actually, this is why we have a holistic action plan, it is to reduce exposure where we have it, it is putting in the mechanisms to make sure that we are protecting public health is always our first priority, so developing the drinking water standards, the cleanup standards that we are talking about. We are also looking, on the Clean Water Act side, whether or not we have technology-based effluent limitation

guidelines or water quality surface criteria. The Action Plan gets into all of that. Preventing future risk, our TSCA has a huge piece of the Action Plan as we are looking at new chemicals coming into the market.

I mentioned in my opening statement this is a multidimensional problem, and our Action Plan focuses on multidimensional solutions.

Senator Cardin. Thank you.

Thank you, Mr. Chairman.

Senator Barrasso. [Presiding.] Thank you very much.

Senator Capito.

Senator Capito. Thank you, Mr. Chairman.

Thank all of you for being here today.

My State, West Virginia, unfortunately is all too familiar with this issue. Our State faces PFAS contamination challenges from both a history of industrial emissions in Wood County, but also military use of firefighting foams in Berkeley County.

The Federal Government, in my opinion, needs a comprehensive approach to addressing this challenge. To be comprehensive, I think we need a three-pronged solution here. One is identifying and preventing potential emissions of PFAS into the environment in the first place; two is protecting the drinking water sources through technical assistance and a maximum contaminant at level adapted to the costs and challenges

of sampling and mitigating PFAS, particularly in small rural areas, which is where, in my State, this is occurring; and then cleaning up any kind of legacy contamination.

I am working with Ranking Member Carper and Senator Gillibrand to try to do legislative approaches to this.

I am encouraged that EPA, and we talked about this, Mr. Ross, on the Action Plan adapting a holistic approach, but I am concerned that we are falling slightly short here. I always equate it to, which I think we all do on a personal level, if this was the water that your children and grandchildren were drinking, what would be the emerging level of concern, rather than having it occurring somewhere else. And I know at the heart of everybody we all feel that way, but when it is directly affecting you it really takes on a stronger urgency, I would say.

I am going to start with Ms. Sullivan because I think you were asked in a House hearing about how much PFOA and how much PFOS the Department of Defense currently has stockpiled, and the estimate of the cost to remediate this. Could you answer that question?

Ms. Sullivan. Honestly, ma'am, I don't know how much we have stockpiled. I can tell you that in 2016 we directed the military departments to stop using AFFF for testing and training and maintenance. They are not using it. So we are only using

it where we actually have to fight a fire, which is a very limited circumstance. And in those occasions, we treat it as if it is a spill and contain it so it doesn't get into the groundwater.

We have taken all of the older versions of the foam that contained PFAS and removed them from the supply system and disposed of them.

Senator Capito. Disposing of them. Are you burning them?

Ms. Sullivan. Yes, we are.

Senator Capito. And what kind of air exposure do we have with burning PFAS?

Ms. Sullivan. We send it to EPA permitted hazardous waste incinerators that have the appropriate temperature and dwell time.

Senator Capito. Would that be one in East Liverpool, Ohio?

Ms. Sullivan. I honestly don't know, ma'am. I am not sure.

Senator Capito. The report is that that is where you are burning it. Then is there testing in the air? Is that EPA's --

Ms. Sullivan. That is EPA's permitting process. I would defer to them.

Senator Capito. Right.

I know, Mr. Ross, you are not air, but do you have a response to that.

Mr. Ross. I don't know that specific facility, but I do know that we are, as part of our research strategy, taking a look at, particularly our Office of Research and Development scientists, on how to monitor stack emissions and taking a look at -- because I worry about the lifecycle of these chemicals. You take them out of water supply. Are we just transferring the media to which we have a problem? So our research scientists are taking a look at emissions testing and figuring out how we can monitor for that --

Senator Capito. Is that part of the Action Plan that came forward?

Mr. Ross. It is part of the Action Plan. It is part of our holistic approach, yes.

Senator Capito. And I think some of the criticism of the Plan that was put forward, that there was no time certain as to when you would be getting maximum exposure levels. I am sorry I missed the beginning of the hearing; I was chairing another subcommittee. Could you expound on that for me, please?

Mr. Ross. Yes, I am happy to. In the Action Plan, we commit to proposing a regulatory determination this year. There is interest in us giving a very specific timeline on when we are going to finish that, and my commitment to Senator Carper and to you now is that we are going to move through that process as expeditiously as possible. We have very specific requirements

in the Safe Drinking Water Act that Congress gave us that ensure public participation, scientific integrity, all those issues. It is a long process, to be frank, but it is designed to make sure that we use the best science possible to make sure that we are making the right decisions, and my job is to make it as defensible as possible.

Senator Capito. Are you telling me, then, that now we don't have adequate science to make a judgment?

Mr. Ross. Well, part of this panel is holistically we certainly need more science across the entire realm of the PFAS world. For PFOA and PFOS, we have occurrence data that we gathered as part of our unregulated contaminated monitoring rule from 2013 to 2015. That is our base data. We are gathering the new information that the States are gathering, New Jersey, Pennsylvania, Michigan, New York, others, as Senator Carper showed on his chart, taking all that information to figure out how do we grapple with a nationwide regulation.

So we have the data, we are working through the data, and the science is constantly evolving, so our scientists are taking into account all that new information.

Senator Capito. Thank you.

Senator Barrasso. Thank you, Senator Capito.

Senator Van Hollen.

Senator Van Hollen. Thank you, Mr. Chairman.

Thank all of you for your testimony today. My colleague from Maryland, Senator Cardin, mentioned that in Maryland we have four DOD sites, either because they are currently active or previous sites, where you found PFAS contamination, so my question is when you make those findings, is that information made available to the surrounding community, and in what form?

Ms. Sullivan. Thank you, sir. Yes, we have to make that information available. It is available through multiple formats. Most of these installations have what we call restoration advisory boards, which are citizen groups, so the information is presented to them at their board meetings, as well as we post it on the websites for each of the military departments.

Senator Van Hollen. So all of that. Okay.

Ms. Sullivan. All of that is posted.

Senator Van Hollen. Because we have heard from some citizens groups they have had trouble accessing the results of some of the testing. Not in Maryland, but elsewhere.

Ms. Sullivan. We always have challenges with some of our web-based systems because of security controls, but that is just something we work through on a day-to-day basis.

Senator Van Hollen. Thank you.

Mr. Ross, DOD is obviously undertaking these studies and tests of their facilities. For other Federal facilities, and

right now I am thinking of a NASA facility. We have Wallops facility in Virginia. A lot of Marylanders work there. For other Federal facilities, are they each responsible for detecting contamination on their sites, or is that something in the purview of EPA?

Mr. Ross. Well, if they are Federal military facilities, the Department of Defense --

Senator Van Hollen. All others I am thinking of.

Mr. Ross. All others? There is a combination of both State oversight and Federal oversight. We rely on our regional offices to work primarily with the States, so if those facilities are not under the Department of Defense control, there will be a combination of State and Federal work together, and our regional offices basically provide the technical assistance to the States to do a lot of that work.

Senator Van Hollen. So, in the case of Wallops, which is a NASA facility over near Chincoteague but right near the Maryland-Virginia border, we have had concerns raised by Federal employees who work there. Would that be something that EPA was directly involved in monitoring and informing the community about the risks?

Mr. Ross. I don't know a lot about the details, but I am aware of the facility there and I know that our EPA regional staff are working with the State and the local community to

evaluate and provide the technical assistance, so I do know that we have people on the ground there at that facility.

Senator Van Hollen. Got it. Now, with regard to the best way to measure the results, and I am learning from all of you, some of the earlier testimony indicated that you use a minimal risk level. I believe that DOD used something called the Long Range Health Assessment, the LHA. Is that correct?

Ms. Sullivan. EPA is the Lifetime Health Advisory.

Senator Van Hollen. Lifetime, all right.

Ms. Sullivan. Lifetime Health Advisory that they have issued.

Senator Van Hollen. Right. So there are obviously differences in how you measure risks between the two. Is there any consensus within the scientific community about whether one measure is a better measure of risk to human health than the other? Is this part of the ongoing discussion? I am just interested to hear that there are these two different systems; one seems to be more, as you described it, doctor, conservative than the other. Could you just describe which you think is the best way to measure the potential harm to human health?

Mr. Ross. With a couple of PhDs on this, I would certainly defer to the PhDs. Part of this is the challenge is it depends on what you are looking at. So, for EPA, if you are looking at drinking water systems, we have our methodologies that we do to

provide, in this instance, a health advisory, a Lifetime Health Advisory that will protect the most sensitive population over 70 years of consumptive use.

So, in that circumstance, as the drinking water experts and the toxicologists and our scientists do that work, that may be the most appropriate. In other circumstances, screening levels, our Superfund program, they work carefully with the ATSDR, there are different methodologies that will go after the screening levels to be more conservative.

So, I think where we look for the commonalities is the core science, the studies that we all rely on, the different endpoints, the health effect responses within each of the individual compounds, that is where I think is the commonality amongst all the Federal agencies.

And correct me if I am wrong, please.

Mr. Breysse. I think that is right. I think one important point we all need to note is that the science around these compounds, as Dr. Birnbaum mentioned, is emerging rapidly, so almost as we establish a benchmark for whatever purpose it might be established for, in a matter of months it may be out of date based on the new science that is emerging. We have States that are establishing benchmarks that are different than the Federal health advisories, that are different than our minimal risk levels, so there is a landscape of uncertainty around these

chemicals that we are having to deal with today, and that is all the more important that we work together as a Federal group of people to understand that landscape, work within that landscape.

It is okay to talk to people about uncertainty and what that uncertainty translates into. That is, unfortunately, part of the science where we are right now. It makes our job harder, but it also means that we need to focus better on how we all work together, communicate things.

So ATSDR's mission is to address community health concerns around these chemicals. We stand in front of communities on a weekly basis to talk about these issues and we discuss all the various benchmarks that might be and what they might mean and, from our experience, when you address these concerns in an honest way, they understand it and they get it. They like to use whatever is most conservative. That is understandable. They like to have clean drinking water. That is understandable. And that is what we should all be working towards.

Senator Van Hollen. Got it. Thank you.

Mr. Ross, we may follow up with you on the Wollops facility specifically in Maryland just because there are continuing concerns, I think.

Thank you.

Senator Barrasso. Thank you so very much.

Senator Duckworth.

Senator Duckworth. Thank you, Mr. Chairman. Sorry for my voice; my daughter brings home every cold from preschool, which is a Petri dish over there.

Ms. Sullivan, while testifying before the House Committee on Oversight and Reform Subcommittee on Environment, you stated that the total cost of cleaning up PFAS pollution could reach approximately \$2 billion and that cleanup could take years. Is that correct?

Ms. Sullivan. Yes, ma'am, it is correct.

Senator Duckworth. That is a staggering amount of money, and our military families really can't afford to wait for action and they certainly can't wait for \$2 billion, first to find \$2 billion to try to fix the problem. I have proposed that every family on every base that has been found to exceed EPA's health advisory limit receive a point of entry water filtration system that is capable of removing PFAS contamination.

Ms. Sullivan, I believe this solution would cost much less than the \$2 billion and could deliver results for families now. Would you support my request and do you agree that this is a cost-effective and swift solution in the near term?

Ms. Sullivan. Ma'am, actually, no one on our military installations is drinking water above the LHA. We addressed that problem in 2016. The \$2 billion is associated with cleaning up the groundwater, not the drinking water. The

drinking water has already been addressed; we have already expended the monies to address drinking water. Again, no one on our military installations is drinking water above the Lifetime Health Advisor, and that hasn't happened since 2016.

Senator Duckworth. What about other exposure?

Ms. Sullivan. Well, the various exposures are from products that they use that are the same as any other commercial products at this point.

Senator Duckworth. I would love to see the data on that, if you could provide that to my office.

Ms. Sullivan. Absolutely.

Senator Duckworth. Thank you.

Far too many communities worry about the quality of their drinking water in this Country. EPA and DOD have failed to understand the scope of the PFAS problem and they have failed to determine how to dispose of the chemicals which persist in the environment and our bodies and regulate the chemical.

Mr. Ross, I am concerned that EPA has been captured by chemical interests who do not want to be regulated and that is why EPA has been slow to act. The PFAS Action Plan says that EPA will begin the process, will begin the process of determining whether any PFAS chemicals should be listed on the Toxic Release Inventory, which will provide communities with information about when these chemicals are released into the

environment.

How long will it take to finalize a rule that lists one or more PFAS chemicals on the Toxic Release Inventory?

Mr. Ross. Well, the Toxic Release Inventory, the TRI, under EPCRA Section 313, is one of the many tools that we mention. The TSCA program is focused a lot on using the TSCA authorities in the market entry.

For that particular one, to list something on the TRI you have to take a look at whether or not you have the data to list and then whether or not it is still in commerce, so for PFOA and PFOS, for example, we have the data, we have the hazard data, but those are the older compounds of the legacy chemicals that have been then cycled out, and I think that is what Ms. Sullivan was talking about in the military world.

Part of the analysis under the TRI is which compounds have sufficient data to match the TRI listing criteria, and right now they are doing the evaluation on how to and whether to move forward on TRI.

Senator Duckworth. Okay. So, is finalizing this rule subject to the same arbitrary Trump Administration Executive Order that says we can't implement a new rule until two old rules are eliminated?

Mr. Ross. All of our rulemaking is dictated by and controlled by all the executive orders, so, for example, we go

through Office of Management and Budget and do cost-benefit analyses for a major rulemaking because of executive order. So, should we move forward with the TRI rulemaking, we have a robust amount of regulatory actions that have been de-reg and regulatory, so, for the PFAS world I am not overly concerned about being able to move forward with the regulation if and when we need to.

Senator Duckworth. Recent press reports describe a dairy farm in Maine whose milk was found to have levels of PFAS of more than 1,400 parts per trillion. The source of contamination ended up being a sewage sludge that the owners had been spreading on their fields as fertilizer for years. It turns out that using sludge as fertilizer is a common practice in all 50 States, raising the concern that there could be widespread PFAS contamination of milk, farmland, and drinking water caused by this practice.

Mr. Ross, what plans does EPA have to provide guidance to the providers or users of these types of fertilizers to regulate their use to ensure that similar instances of contamination don't happen elsewhere?

Mr. Ross. Part of our PFAS Action Plan, one of the actions is doing the risk assessment on PFOA and PFOS in bio-solids. I am familiar with the Maine scenario and also there is a dairy down in New Mexico, so we have already met with USDA and we are

working on setting meetings with FDA to make sure the Federal family coordinates. But the sludge issue, the bio-solids issue is part of our Action Plan and we are taking a look at the risks associated with potential contaminants in bio-solids.

Senator Duckworth. If you could keep us updated on those actions, I would appreciate it.

Mr. Ross. I would be happy to.

Senator Duckworth. Thank you.

I yield back, Mr. Chairman.

Senator Barrasso. Thank you very much.

Senator Gillibrand.

Senator Gillibrand. Thank you, Mr. Chairman.

Can you also submit that to the full Committee so that we all have the feedback on exactly what you are doing in terms of the farms?

Mr. Ross. Oh, sure. I am happy to. Thank you, Senator.

Senator Gillibrand. Thank you.

Thank you, Mr. Chairman and Ranking Member Carper for holding this hearing. Addressing PFAS contamination is an urgent matter in my State. My constituents in New York, all across the Country, I have been to so many States in the last year and they have the same crucial issue; Michigan, New Hampshire, less so in Iowa, but New Hampshire, yes. It is a huge problem and I learned about it from my backyard.

People are very worried, they are angry, and they desperately want leadership out of this Committee and leadership out of our Country. Mothers and fathers in Hoosick Falls, New York, right down the road from my home, are crippled with fear about whether their children will be safe, whether the water that they bathe their children in, whether the water they cook food for their families in has created a toxin in their bodies, in their blood that they won't be able to recover from. It is a huge issue.

Dr. Breyse, you sat with me at the auditorium in Hoosick Falls High School nearly three years ago and we heard the most heart-wrenching, powerful testimony from these families.

PFAS is also hurting families near Stewart and Gabreski Air National Guard bases in New York because for years, obviously, as we heard from earlier testimony from Senator Rounds, it has been required that our firefighting training, our foam actually contains these chemicals.

Access to clean drinking water is a right, and protecting clean water must be central to the work we do for all of us. This is not a partisan issue. I am working across the aisle with Senator Capito, as she said, to draft legislation to address PFAS in our drinking water, which we will be announcing soon.

Dr. Birnbaum, I would like to start with you, because the

health risks are really what certainly my constituents in the audience want to hear more about. We know there are serious adverse health risks associated with PFAS chemicals. The science is abundantly clear, as I have heard from the families affected. This is such an important and powerful issue. Could you talk about some of the health risks associated with exposure to short chain PFAS chemicals like GenX, which the industry has developed to replace PFOA and PFOS?

Ms. Birnbaum. So, there are a huge number of short chain chemicals. GenX, the industry has actually conducted studies which have shown that these chemicals impact the liver and other tissues and actually cause tumors in both rats and mice in those studies. That is GenX. GenX is eliminated from the human body quite rapidly, but it essentially is never eliminated from the environment. The problem with all of these chemicals is that the carbon fluorine bond is extremely difficult to break down, so these are chemicals that are essentially forever in the environment, even if not in our body.

Some of the other short chain chemicals, recent results from the National Toxicology Program have shown that some of the short chain chemicals like PFBS, which is a four-carbon chain sulfonated chemical, is associated with essentially the same effects as the PFOS and the PFHXS. There are papers published literally almost everyday showing effects of many of the

different short chains, as well as the long chains.

Senator Gillibrand. Can you tell us some of those effects from PFAS exposure, particularly for pregnant women and for children?

Ms. Birnbaum. There were papers that were just published this week showing impacts, for example, on increased risk of Type 2 diabetes in the offspring and increased risk in obesity in the children following in utero exposure. Also, evidence that gestational diabetes can be associated in the mother with exposure to some of the shorter chain compounds.

Senator Gillibrand. Do you think it is possible to develop a total PFAS or total organic fluorine method for testing and monitoring PFAS in our drinking water and groundwater?

Ms. Birnbaum. There are methods that are being developed to look at total organic fluorine. It is very important, if you are dealing with water, that you are able to distinguish between the inorganic fluoride that is added to many of our drinking water systems for dental health from the organic fluorides, and there are several methods that are currently being used and being further developed.

I think it is also interesting that there are methods that are being used to measure organic fluorides in products and in human blood and serum.

Senator Gillibrand. Well, I would love some

recommendations for the Committee on that, if you could put that in writing.

Ms. Birnbaum. Sure.

Senator Gillibrand. Dr. Breysse, I only have few minutes left, but what can the Federal Government do to prepare the victims of PFAS exposure for the serious health consequences, like cancer and kidney disease, that will expect to develop? And I ask specifically because through the 9/11 health bill we developed a medical monitoring program that is actually saving lives and making sure there aren't misdiagnoses, to making sure we have experts in the field who understand what these risks are so they can diagnose these illnesses early.

What do you think the Federal Government can do or should do?

Mr. Breysse. Giving advice to the clinical community is crucial going forward. When we go into communities and we measure PFAS levels in people's blood for whatever reason they might be doing that, the first thing they do is they go to their doctor.

So we have an aggressive clinical outreach program as part of our work when we go into communities. We have guidelines for physicians we publish on our Web page. We support, along with EPA, the Pediatric Environmental Health Specialty Units, which are clinical facilities that are designed specifically to answer

questions like this, so we constantly refer the local medical community to our PEHSUs to get those concerns. We hold ground rounds to clinicians when we come into communities, and we are reaching out aggressively to communities about these issues.

Senator Gillibrand. Thank you.

Mr. Breysse. The medical communities.

Senator Gillibrand. Mr. Chairman, can I just ask for unanimous consent to include some statements from two of my constituents in the record, Mark Favors and Laurine Hackett, who is here, describing the experiences of their families resulting from the exposure to PFAS chemicals in their drinking water? As I said, these stories are heart-breaking, and I just hope that all of my colleagues will take the opportunity to read them so they know the real intense, personal impact this issue is having on people's lives.

Senator Barrasso. Without objection.

Senator Gillibrand. Thank you, Mr. Chairman.

[The referenced information follows:]

Senator Barrasso. Senator Markey.

Senator Markey. Thank you, Mr. Chairman.

PFAS substances have been silent terrors to communities across the Country for too long. Residents of Westfield, Air, Devens, Hyannis, and several other towns across Massachusetts are haunted by the threat these chemicals pose to their health and the health of their children.

Mr. Chairman, I would like to submit to the record statements from Massachusetts residents concerned about the impact of PFAS exposure.

Senator Barrasso. Without objection.

[The referenced information follows:]

Senator Markey. Thank you.

We have Kristin Mello from Westfields who is in the audience here today.

EPA Administrator Andrew Wheeler recently stated that climate change isn't his top priority; the most serious environmental threat we face is access to clean water.

First, addressing climate change is inextricably linked to access to clean water. The more pollution we have in the air, the more we have in the water, the less available the water is for drinking, our recreation. That is just a fact scientifically.

Second, EPA has identified more than 1,000 PFAS chemicals historically approved for use in U.S. commerce, yet the EPA has narrowed its major actions to focus on just two of these chemicals present in drinking water; not 1,000 chemicals, two.

Third, just two weeks ago EPA submitted its budget request for 2020 that cuts funding for clean water by almost 40 percent. Cuts the budget for clean water by 40 percent; the Trump Administration. Apparently, EPA's hypocrisy knows no bounds.

Mr. Ross, testing and cleaning up PFAS contamination is very expensive for States and localities. Just cleaning up contaminated wells in Barnstable, Massachusetts cost nearly \$3 million. Do you agree that fewer EPA resources for clean water may put more financial burden on States and towns that are

worried about PFAS contamination?

Mr. Ross. Related to PFAS contamination, of the action items within the Office of Water, under the proposed budget, I will have the resources I need to implement the Action Plan items. And our loan programs, the Drinking Water Revolving Funds, are very, very powerful tools. There is a very significant corpus in those loan programs that States can tap into to provide both technical assistance and infrastructure developments.

Senator Markey. So no city, no State will have to worry that the funding won't be there for them, is that what you are saying?

Mr. Ross. That is not what I said, Senator. What I said, like today --

Senator Markey. You are saying for the plan that you have for them. But the problem is your plan doesn't match the magnitude of the problem. That is the point that we are making. A vision without funding is a hallucination. To say you have a plan, but we are not going to do all the chemicals, to say we have a plan, but we are not going to have the same amount of money, you wind up saying the plan will not be adequate.

So that ultimately becomes the problem, because despite Andrew Wheeler's stated commitment to clean water, EPA acted faster than William Barr declaring no collusion when it came to

dismantling the clean water protections under the Waters of the United States Rule. The EPA even denied a request from 36 Senators and 160 Congresspeople to extend the public comment period for this disastrous action. But when it comes to cleaning up our water from toxins like PFAS, lead, copper, and other toxic contaminants in water, the EPA slows to a snail's pace.

The recently announced EPA Action Plan on PFAS is unfortunately more an inaction plan since it lacks any real deadlines or timeliness for protections.

Mr. Ross, could new PFAS-forever chemicals be brought to market and put into our environment even as EPA struggles to address and understand the current scope of contamination?

Mr. Ross. Right now those new chemicals to market go through the TSCA program, which was enhanced in 2016 with amendments to the TSCA program.

Senator Markey. So you can add.

Mr. Ross. What I am aware of is as they go through the screening process in the new chemicals program, they look at the hazard data that is submitted, they take a look at exposure assessments. At this point I think only one chemical in the last two years has come through and into the market, but there are a lot of variety effects of that.

Senator Markey. So, total, how many new PFAS chemicals has

EPA approved?

Mr. Ross. Under this Administration, I am aware of one.

Senator Markey. One. So, two years ago the EPA set a Lifetime Health Advisory level of 70 parts per trillion for two chemicals in the PFAS family. Since then, several States have set or proposed their own limits, almost all of which are lower than the EPA's.

Ms. Sullivan, will the Department of Defense commit to meet lower State cleanup levels when working to remediate Federal facilities contaminated with PFAS?

Ms. Sullivan. Sir, first of all, I grew up in Massachusetts, so I am very concerned about what is going on there. We will meet any properly promulgated standard that is issued by the State and roll it into our cleanup program.

Senator Markey. Okay. And on the issue of emails obtained last year by Politico which revealed a rift between Federal scientists at the Agency for Toxic Substance and Disease Registry and political staff at the White House, EPA and the Department of Defense political staff allegedly sought to suppress a study that would show PFAS dangerous to human health at levels much lower than EPA has previously called safe. In emails the White House called the release of this study a "public relations nightmare."

Mr. Ross, Ms. Sullivan, yes or no, can you commit right now

that you will not hide scientific information from the public for fear of political costs of bad PR?

Ms. Sullivan. We never actually saw the ATSDR document. I never asked that it be suppressed.

Senator Markey. Will you promise never to hide the science from the public?

Ms. Sullivan. Correct. Yes, sir.

Senator Markey. Mr. Ross?

Mr. Ross. EPA believes in public transparency for scientific information, yes.

Senator Markey. So you will never hide it?

Mr. Ross. We will never hide it.

Senator Markey. Okay, good. Thank you.

Thank you, Mr. Chairman.

Senator Barrasso. Thank you.

Senator Carper. Again, our thanks to each of you for joining us today and responding to our questions, and we will have some more questions for the record. Maybe one or two to close out with Ms. Sullivan.

I want to call you Maureen O'Sullivan. EPA has said that it is unsafe to drink water that has more than 70 parts per trillion of PFAS in it. EPA has also said that military and Superfund sites with PFAS contamination should be cleaned up also to at least to a level that does not exceed 70 parts per

trillion.

But as I understand, the Department of Defense is refusing to clean up contamination where it exceeds 400 parts per million, according to the information that my office and staff have received. If that is true, why does the Department of Defense think it is appropriate to subject servicemembers, their families, and the surrounding communities to a higher level of PFAS than EPA believes is safe?

Ms. Sullivan. Sir, first of all, we have already stepped out and addressed drinking water. Where DOD is the known source of PFOS and PFOA in drinking water, we have ensured that it is below the 70 parts per trillion, so no one is drinking water above the Lifetime Health Advisory where DOD is the known source.

For the long-term strategy for cleanup, we are following the already established EPA CERCLA risk assessment process that applies to all chemicals, and that is the way we are proceeding under our responsibilities under the Defense Environmental Restoration Program statute and in full compliance with CERCLA.

Senator Carper. So the concern I am pointing to here is one that says EPA says it is not safe to drink water with levels that exceed 70 parts per trillion. DOD is up here, as I have been told, has been up here saying we are not going to pay for anything on a cleanup unless it exceed 400 parts per trillion.

That leaves a pretty big gap.

Ms. Sullivan. Sir, I don't want to --

Senator Carper. Again, I just want to make sure that I am not missing something here.

Ms. Sullivan. Right. I don't want to confuse groundwater with drinking water. As I have stated, we have already addressed the drinking water that is above 70 parts per trillion, and we will continue to maintain that commitment, the drinking water of 70 parts per trillion, the EPA's Lifetime Health Advisory.

The groundwater is where we are having discussions and trying to figure out how this actually applies using the existing CERCLA process that applies for all chemicals.

Senator Carper. My staff just handed me a note that says 32 percent of Americans get drinking water from groundwater.

Ms. Sullivan. That is true, sir.

Senator Carper. Keep that in mind. We will come back. We will have some more questions.

Ms. Sullivan. No, I agree --

Senator Carper. My time is about to expire, so let me ask you one more, and that is you say that since 2016 no military member is drinking contaminated water with PFAS above the Health Advisory level. Are you able to make the same kind of assurance for all the surrounding communities at these bases? Are all

these citizens also protected from contamination caused by the Department of Defense?

Ms. Sullivan. Yes, sir, we have been very aggressive to go out and look where we are the known source off the base, and if we are the known source off the base, we are in fact installing treatment systems, hooking homeowners up to municipal treatment systems, so, yes, off-base and on-base.

Senator Carper. Thank you.

Let me just conclude by saying I want to again continue to convey a sense of concern, really, in some cases a sense of alarm at what we sense is a lack of urgency that we have heard about this issue, leading up to today and even to some extent at this hearing. It took mere months for EPA to announce and begin the process of repealing scores of Obama rules, ranging from the Clean Water Rule to the Clean Car Rule to the Clean Power Plan, and EPA is well along the process for finalizing replacements for all those rules with weaker, I think less protective, alternatives.

Yet, when it comes to the issue that Mr. Wheeler himself says is the biggest environmental issue we face, that is, access to clean drinking water, we are told that EPA can't even begin to guess when even a single step to protect Americans is finalized, and that is just not acceptable if it is true. If this Administration will not, I think Congress needs to, and I

hope to work with all of our colleagues in the House and Senate to let on legislative initiatives that will address the threats that these chemicals pose. And to the extent we can find common ground in its efforts with the Administration and others, we want to do that, but this is an oversight hearing. Part of our job is oversight, and it is something that we take seriously, and we hope that you recognize that too.

Thank you all for being here.

Senator Barrasso. Thank you, Senator Carper.

Before we close, I do also have a number of letters from a variety of organizations, as well as statements from members of communities which have PFAS pollution, and I ask unanimous consent to enter these documents into the record. Without objection, they are entered.

[The referenced information follows:]

Senator Barrasso. I want to thank all of you for being here today. I am very grateful for your time and your testimony. Members may submit follow-up written questions for the record. The hearing record will then be open for the next two weeks.

So, anyway, thank you so much. We appreciate your efforts and your interest and your testimony today.

The hearing is adjourned.

[Whereupon, at 11:38 a.m. the committee was adjourned.]