
Protecting Baltimore's Water Supply from “Forever Chemicals”

By Rona Kobell and Van Smith

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Cover photo: Prettyboy reservoir and dam is one area where clean-water advocates worry about “forever chemicals” entering the drinking-water supply. Photo credit/Rona Kobell

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Foreward

The Wolmans and the Water: A History of Forethought

Baltimore's focus on clean and safe drinking water for its residents dates back almost two centuries, long before the creation of the Environmental Protection Agency and the passage of the federal Safe Drinking Water Act.

In 1787, the Maryland legislature authorized the Baltimore Insurance Company to supply the city with water. The company collected water from springs and conveyed it to area residences. But this effort ran into problems, as the water wasn't adequately treated and the company encountered resistance in laying its pipes. Cholera was an epidemic in American cities then, with unclean water a major source of outbreaks. The city had to find a better system, and it did, in the early 1800s, as it formed the Baltimore Water Company and began to construct a series of reservoirs that laid the foundation for our modern water system.¹

In 1862, as Maryland was in a Civil War that divided the state as well as the country, Baltimore's population continued to grow, and the need for clean water intensified. That year, the city built Lake Roland Dam and Reservoir, followed by Lake Hampden and the Mount Royal Reservoir. Druid Lake was finished in 1865, followed by the Druid Hill Reservoir in



Montebello's historical building is a curiosity for the many dog walkers, bikers, and runners in the area. Photo credit/Rona Kobell

1873. In 1881, the city added the Gunpowder as a source with the formation of the Loch Raven Reservoir. Eventually, a dam across Loch Raven Reservoir connected it with another reservoir at Lake Montebello, and a tunnel connected Loch Raven, Lake Montebello, and Lake Clifton. More tunnels followed to connect the county and city water supplies, adding both the Liberty and Prettyboy reservoirs. The city entered into agreements with the counties (Baltimore and

Carroll) to keep the land preserved so the water would remain protected.²

Quantity, then, wasn't a problem. But the water was still killing people, loaded as it often was with bacteria from human and animal waste. The city's attempts to protect Lake Roland's source water from pollution failed because of runoff from land uses, exposing a critical need to sharpen controls over upstream property. That underpinned the creation in 1911 of what is now the Baltimore Environmental Police, a law enforcement agency to protect the city's drinking water resources from threats ranging from homeowners removing greenery to illegal dumping. Advances in water treatment started in Chicago in 1908, as cities added chlorine to their water. But they worried the antidote could also be the poison; they didn't know how much chlorine to add.³

In 1919, Abel Wolman and Linn Enslow, two Johns Hopkins-trained scientists, figured out how much chlorine was needed to purify the water and protect public health. They developed a method to standardize this dose and ensure consistent, safe drinking water. Later as a Johns Hopkins faculty member, Abel Wolman oversaw the planning and construction of modern municipal and national water supplies, set bacterial standards for drinking water, and advised 50 foreign countries on safe water processes. What had been a huge source of deaths dropped dramatically after the methods of Abel Wolman were introduced, improving the conditions of drinking water supplies in cities and counties across the country and saving countless lives during the last century.⁴

The timing was good for their home city; construction had wrapped up on Montebello's first water filtration plant just four years earlier. In 1956, the city would add another filtration plant, this time at Ashburton. It built a pumping station in Deer Creek in 1966, as a backup system to withdraw water from the Susquehanna River in times of drought.⁵



Deneen Gordon, microbiologist at the Ashburton filtration plant in Baltimore, walks through the plant on a recent morning. Photo credit/Rona Kobell

In 1967, one of the most important pieces of water source protection came to pass in Baltimore County with the Urban-Rural Demarcation Line (URDL), a boundary that separates areas slated for development (and thus public water and sewer) with areas that are meant to be conserved.⁶ The area north of Cockeysville is zoned for largely conservation and agricultural lands. Though politicians have sought exceptions on occasion, the state and the county have held firm that the URDL was sacrosanct.⁷ Keeping development out of the top of the watershed for the Gunpowder protects the water supply for the city; it is one of the major symbols of city-county coordination that the line has held. The fact that the line has held is seen as a major symbol of regionalism's potential. Leaders from other jurisdictions speak admiringly of the "Ur-dle," as it's known, extolling the values of a foresight that has preserved the landscape and kept a rural feel to a fast-growing metro area.

In 1972, Congress established the Environmental Protection Agency to regulate both air and water quality in American cities. Two years later, Congress passed the Safe Drinking Water Act, which established maximum thresholds for metals, chemicals, bacteria, and other contaminants in water. Limits on arsenic, benzene, and lead not only saved countless lives, but also provided a standard for public health officials to measure across systems. If one water system was high in chemicals but another upstream was normal, they could more easily determine the source of contamination. The work that Wolman started in Baltimore found its way to Washington, and across the nation.⁸

In 1979, Maryland; the City of Baltimore; and Baltimore, Carroll, Howard, and Anne Arundel counties signed the first reservoir watershed management agreement. It established a coordinated board to handle any issues that arose regarding the management of the three reservoirs—Loch Raven, Liberty, and Prettyboy—and the city. The parties reaffirmed the agreement in 1984, 1990, 2003, and 2005. A watershed agreement to protect streams and rivers that the city and Baltimore County share was signed in 2002 and updated in 2006. The city relies on the counties; according to the Baltimore Department of Public Works, it owns only 8% of the watershed's land. The agreements seem to be holding up, though they are not as ironclad as they once seemed. Some Baltimore County elected officials are pushing to separate itself from the agreement and create its own authority, frustrated that the city doesn't prioritize county maintenance issues.⁹

After Abel Wolman died in 1989, at 96, his son, M. Gordon "Reds" Wolman, carried on the family water legacy. Reds spoke, and wrote, with an urgency about water protection. He had been instrumental in getting silt fences placed along developments to keep sediment out of streams. It was important, but he felt it wasn't enough. There were, he said, no teeth

in the water protection laws, and no guarantee the city and the state would both have enough water for their growing populations and that the water would be clean and safe.¹⁰

Reds Wolman served as chairman for the Advisory Commission on the Management and Protection of the State's Water Resources. He gave his final report, in 2008, an urgent title: "Water for Maryland's Future: What We Must Do Today." In it, he worried that, statewide as well as in Baltimore City, planning officials were not thinking critically enough. He urged Maryland to develop a water supply plan and the jurisdictions to coordinate. The Maryland Department of the Environment has followed some of the report's recommendations, including adding nine new positions to the Water Supply Program and forming a multi-agency Water Consortium to leverage partnerships to protect the state's water supply, according to an agency spokesperson. But other former state officials who served with Wolman said many of the things he said must be done haven't been done.¹¹

The trouble with water, as Reds often said, is that people tend not to think about it until they are in crisis. Water planning and allocation, he said, "are not easy decisions... but they're made more difficult, and less rational, by a lack of planning."¹²



Gunpowder Riverkeeper Theaux LeGardeur stands in front of the Prettyboy Reservoir in northern Baltimore County. A longtime clean-river advocate, he worries about the firefighter training center at the reservoir and the potential hazards from the foam that could reach the water supply. Photo credit/Rona Kobell

Introduction

Baltimore is recognized for having one of the best protected public drinking-water supplies in the nation. The city has a celebrated history of developing these systems, of protecting them from pollution and development through a network of reservoirs and pipes, and of delivering the water quickly and efficiently to millions of people in Baltimore City and surrounding counties. Any issue with the water supply—quantity and/or quality—could harm the lives of millions. Well-known threats from bacteria, algae, pesticides, fertilizers, lead, and road salt are difficult enough to mitigate, but now there are other emerging threats in the mix, such as microplastics and pharmaceuticals. Scientists have dubbed the resulting mixtures “chemical cocktails,” and the interactions among their constituent compounds are only beginning to be understood.¹³

Awareness and concern are rising about another ingredient in the cocktail: PFAS, a class of nearly 5,000 “forever” chemicals found in common household items. PFAS, or per- and polyfluoroalkyl substances, are a suite of chemicals with multiple uses because they are resistant to water, oil, and heat. They are labeled forever chemicals because they never break down in the environment, and they do not dissolve in groundwater or drinking-water supplies. Think of a household product, and it’s likely PFAS are in it. Food wrappings,

waterproofing sprays, fire retardants, carpeting and upholstery all include the chemicals. Ingestion of PFAS can lead to low birth rates, cancer, miscarriages, and thyroid problems. PFAS are in many water supplies, and they have also been discovered in our food supply and our soil, and even our air.¹⁴

It has been more than a generation since the federal government added any new chemicals to the list of regulated drinking-water contaminants. In that time, thousands of new chemicals have been manufactured, and states and localities have had to decide which, if any, of these emerging threats they should even test for, much less design regimes for abating. In the case of PFAS, mitigation has sometimes come via litigation, and at other times via localized responses to sudden discoveries of their prevalence in water supplies. Decisive federal guidance has come largely in the form of a non-enforceable health advisory for PFAS concentrations in drinking water, while incremental steps have been taken to assess and test for PFAS toxicity.¹⁵

Absent bold federal leadership, many water systems don’t test for concentrations of PFAS and other emerging threats, and therefore don’t have to confront whatever unmeasured risks may lurk in the drinking water. The pitfalls inherent to such a head-in-the-sand approach grow as time passes. In Maryland, efforts to measure PFAS have begun, including in Baltimore’s reservoirs, and the legislature



LEFT: The view just above the dam of Loch Raven. Photo credit/Rona Kobell

RIGHT: Signage in reservoir areas is sparse, and often doesn’t announce that drivers are travelling through the region’s drinking-water sources. Photo credit/Van Smith

is actively seeking ways to rein in the risk of PFAS contamination. But work still remains—especially at the federal level, where leadership on this issue is expected to provide guidance to state and local officials.

We have an opportunity now to address PFAS in a comprehensive manner that will protect our water supplies for generations, regardless of politics. In Baltimore, we have a new mayor. In Washington, we have a new president. Both have said they are committed to investing in infrastructure to help cities grow and prosper, with special attention to the parts of those cities that have suffered because of racial inequities. We have an opportunity to push for cleaner water and greater protections, but the window will not stay open indefinitely. We need to act quickly.

This report examines the threat of PFAS to Baltimore's highly regarded water supply, and what reforms at the local, state, and federal levels could protect us from the harm other states have faced while trying to protect theirs. Recommended approaches range from the transformative—science-based, forward-thinking ways of designing new regimes to control the chemical-cocktail threats—to the pedestrian, such as a straightforward ban on PFAS applications.

A Legacy of Forever Chemicals

PFAS are an umbrella group of chemicals that includes PFOS and PFOA. PFOS is perfluorooctanesulfonic acid, a substance most often associated with firefighting foam that companies began phasing out about two decades ago, according to the EPA—though much of the legacy substances remain at Department of Defense installations and city firefighting training facilities.

PFOA is perfluorooctanoic acid, the eight-chain carbon that DuPont put in Teflon; it has been linked to many cancers and blood disorders at the plant in and beyond Parkersburg, West Virginia, where workers made the products



Sediment gathers at Lake Montebello, which can sometimes emit an unpleasant smell. Several water officials are worried about levels, which can dip low. Photo credit/Rona Kobell

for decades and DuPont employees dumped waste in the rivers or buried it in soil. These chemicals impacted the health of more than 80,000 people, whose health the company continues to monitor as part of a lawsuit that could reach \$343 million. The story was made into the 2019 movie “Dark Waters.”

Despite all the publicity around the DuPont lawsuit, the fact that chemical companies can discharge waste into our waterways did not change how we regulate such practices for these emerging chemicals. There are advisory standards for the amount of PFAS in drinking water, but there is no mandatory limit, as there is for chlorides and bromides and the other chemicals that the Safe Drinking Water Act regulates. In 2016, the EPA set a voluntary, nonbinding advisory of less than 70 parts per trillion of PFAS in drinking water.

As water-quality pioneer Abel Wolman noted (see Foreword), a crisis—such as the lead poisoning of children in Flint or the discovery

of multiple cancers in DuPont employees in Parkersburg—tends to capture our attention and force us to act. But the PFAS contamination that has hit states over the last several years has been slow moving, spread out, and hard to pinpoint to a single cause. Multiple industrial sites around the state have spilled waste, which has infiltrated into the groundwater, and then entered the drinking water. In some cases, the site has been a tannery, or a chemical plant; in others, it's an old military base and the culprit is firefighting foam from training exercises.

Whichever the pathways, the health effects of PFAS mirror those from their already-banned cousin, polybrominated biphenyl, or PBB, a chemical that was added to fire retardants, plastics, home appliances, laptop computers, and textiles until its production was banned in 1976.¹⁶ PBB can lower a woman's chance of getting pregnant, interfere with hormones, increase cholesterol and diabetes, harm learning and growth in infants, and increase cancer risks.

The underlying nature of the chemicals doesn't change, even as certain ones found to pose a danger to human health are phased out. The banning of PBB led to the use of PFOA, and when that became problematic, manufacturers switched to other eight-chain carbons. And when those became problematic, they switched to GenX, a shorter-chain carbon with the same characteristics that chemical manufacturers believed were safer. Yet, soon GenX began appearing in water supplies downstream of the manufacturers that produced it, including the Cape Fear River in North Carolina in 2017.¹⁷

The feared ubiquity of PFAS in tap waters in communities across the country has caught the bottled-water industry's attention—because bottled water is where communities turn to when they don't trust what's coming through their pipes. Joseph Doss, executive director of the International Bottled Water Association, while giving an address about the industry's

role in emergency preparedness and disaster response at the annual Berkeley Springs International Water Tasting Competition in West Virginia in June 2021, explained that PFAS are part of what's driving the industry's relentless growth. "There are various communities right now that are urging their consumers to use bottled water rather than drink the tap water because of PFAS," and as the problem spreads, Doss said, "people increasingly see bottled water as their only alternative." Given the well-documented ecological price of bottled-water packaging—not to mention its sticker price for water consumers—this is an anticipated future that policymakers should seek to deter.

States Go It Alone

Because PFAS are in so many household products, and because they so readily survive post-consumer processing like wastewater treatment and incineration, scientists believe many of us have low levels in our bloodstream. Where the concern is highest, though, is not from a nonstick pan or candy wrapper but from the chemicals getting into water. Water, as it moves constantly and freely at a high volume throughout the ground and air, carries PFAS and other persistent contaminants throughout the environment, and it can push elevated concentrations into our waterways and eventually our taps.

This is precisely what happened in Lapeer, Michigan, a small town 21 miles east of Flint. In Lapeer, the wastewater plant once offered its sewage sludge to place on nearby farm fields. In doing so, it was not alone—many cities and counties encourage spreading this byproduct of treated sewage on farmland as a means of keeping it out of landfills and helping farmers save money.¹⁸ Half of the sludge produced in Maryland lands on agriculture fields, much of it on the Eastern Shore; some of it sits in piles, awaiting planting season, and passersby can see it from the road.¹⁹

In Lapeer, though, testing revealed that the sludge had high levels of PFAS. So, the city has to spend about \$3 million a year to have the waste treated elsewhere and then deposited in a landfill. Small cities in Wisconsin and Maine have done the same when PFAS were found in water and in cows' milk. New Hampshire officials, too, discovered high concentrations.²⁰

Once it seeps into the water supply, PFAS are stubbornly difficult to remove. Former Maryland Department of the Environment Secretary Robert Summers explains that "PFAS in our water supply from streams, rivers, lakes, reservoirs, and groundwater... move through our sewage treatment plants back into the water, both in the treated water that is discharged back to the streams and rivers that are used for water supply downstream, and in the sludge that is removed from the sewage by treatment, spread on land and leaches back into the groundwater."²¹

The sludge is a particularly tricky problem because the EPA's regulations only require testing for nine chemicals in sludge, all of them heavy metals. As a result, states are fending for themselves. The hodgepodge of regulations is creating a system where some states' water is more protected than others. This system is especially problematic because water doesn't respect political boundaries. Here in the Chesapeake Bay, several rivers cross more than one state, often with different rules. The Potomac, for example, crosses four: Maryland, Virginia, West Virginia, and Pennsylvania, as well as the District of Columbia.

States cannot be more lenient than EPA advisory standards, but they can be more strict. Between 2013 and 2017, eight states established guidelines for PFAS in drinking water and groundwater. North Carolina was first, in 2013, followed by Michigan, Delaware, Vermont, Maine, Minnesota, Texas, and New Jersey.²²

Since then, 12 states have considered even stricter PFAS standards. Three states—

Vermont, New Jersey, and New Hampshire—have established a maximum containment level, or MCL, which is an enforceable threshold for drinking water. Four more states—Michigan, Illinois, New York, and Massachusetts—have proposed MCLs.²³ Michigan and Illinois are both undergoing extensive testing of their water supplies and sludge. In addition, Connecticut, California, Colorado, Minnesota, and North Carolina issued new guidance—nonbinding, but still recommended—that either increased public notice for PFAS issues or lowered the amount allowed in drinking water. In Maryland, testing for PFAS so far has been limited but growing, and last year a ban on using PFAS for firefighting training was imposed. This year, the Maryland General Assembly failed to pass a proposed ban on using PFAS in food packaging, new rugs and carpets, and firefighting foams.²⁴

The Federal Response

The problems of PFAS contamination in Michigan, West Virginia, and New Hampshire prompted bipartisan calls for regulating PFAS at the federal level. In 2019, President Donald Trump signed into law the National Defense Authorization Act, which proposed adding 172 chemicals to the Toxic Release Inventory, a national database that maps chemical concentrations.²⁵ There are about 5,000 types of PFAS compounds in total.

The law also established protocols for the state and federal governments to cooperate on cleanups. But many legislators in both parties do not think the legislation went far enough, and thus proposed their own bills. Also, the Congressional Budget Office classified the legislation as an unfunded mandate, arguing it passed a lot of the costs for implementation to states, local governments, and private companies.²⁶

In 2019, Sen. Shelley Capito, a West Virginia Republican, introduced the PFAS Release

Disclosure Act, which would require companies to report information about the concentrations and locations of PFAS to the Toxic Release Inventory. Sen. Kirsten Gillibrand, a New York Democrat, introduced the Protect the Drinking Water from PFAS Act, which would set a maximum contaminant level (MCL) for PFAS. Anything over the level could trigger fines, enforcement actions, and cleanup mandates. And in New Hampshire, Sen. Jeanne Shaheen introduced the Safe Drinking Water Assistance Act, which would establish an interagency working group to improve detection, analysis, and treatment methods for these emerging contaminants.²⁷

Michigan Democrat Debbie Stabenow's PFAS Detection Act would establish a testing program to determine their concentrations in wetlands, rivers, and streams. The U.S. Geological Survey would conduct this work, which would cost about \$5 million annually. A separate bill introduced by Stabenow, the PFAS Accountability Act, would require the federal government to work quickly with any governor who requested assistance in regulating a federal facility within state borders that had PFAS-related contamination. Stabenow's colleague, Gary Peters, said the EPA needs more funding to oversee PFAS, including \$1.5 million to set an MCL for drinking water, \$1 million to support monitoring for PFAS, and \$15 million to help the states prevent discharges of PFAS.

"As you work to finalize appropriations for the Department of Interior and the Environmental Protection Agency (EPA) for fiscal year (FY) 2021, we encourage you to build upon the progress that was made in last year's appropriations bill by providing critical funding to expand PFAS monitoring, standards development and cleanup capabilities," Peters and his fellow senators wrote to the Subcommittee on Interior and Environment of Senate Committee on Appropriations. "To better understand the scope of the problem, it is critical that the EPA and the U.S. Geological

Survey (USGS) have the resources necessary to fully implement the new reporting and monitoring requirements that Congress passed as part of the National Defense Authorization Act (NDAA) for FY 2020."²⁸

President Joe Biden campaigned on a promise not only to list PFAS as hazardous under the Safe Drinking Water Act, subject to enforceable contamination standards, but also to underwrite a renewed push to nail down the science of any other threats these chemicals may pose. In addition, Biden plans to significantly increase federal support for drinking-water infrastructure improvements, which would help alleviate the threats from vulnerable, possibly contaminant-laden, pipes. Biden continues to make drinking-water infrastructure a central part of his plan to rebuild America, speaking about it more often than any president in recent memory. So far, the new administration's follow-through on PFAS promises has been rapid, with administrative moves being immediately undertaken to move toward a regulatory framework.²⁹

Yet, the culture and practice of many federal agencies, including the EPA, is to collaborate with industry to attain voluntary withdrawals of problematic chemicals over the course of several years, and sometimes decades. During that time, the chemical companies can make a new synthetic compound that will achieve the same goal but—and it is a hope—become less harmful and less long-lasting in the environment. It may be that the next-generation chemicals are indeed less harmful, or it may be that we are merely trading one risk for another. We have seen that trajectory with pesticides and herbicides that tend to kill bees and butterflies—chemicals banned in Europe but long allowed here. And we have seen it in industries like shipping, where new standards to reduce emissions or invasive species take more than 20 years of collaboration between the government and industry, only to be outdated as soon as they become finalized.

“Right now, what we’re doing is chemical by chemical, trying to regulate, which is definitely not feasible,” said Carsten Prasse, assistant professor at the Johns Hopkins University Department of Environmental Health and Engineering. “There are, what, 83,000 chemicals in use, so it’s impossible to go through them one by one, and the chemists are very creative in coming up with new ones constantly,” he explained.

Instead, Prasse suggests authorities institute a program that focuses on “assessing the toxicity of chemical mixtures” found in the environment, so that “instead of looking for specific chemicals, you use bioassays to determine the effects that these mixtures have on cells—genotoxicity, immunotoxicity, endocrine-disrupting potential—and once you find the effect, then you look into, okay, what are the chemicals that are causing this. It would help us better regulate what the chemical industry is actually producing, based on these assays.”

In the case of PFAS, Prasse said his suggested regulatory scenario would mean PFAS as a group would be described based on their general molecular structure and toxic effects, and before they could be used or released, they would undergo a full review to assess the risks they pose to human health and the environment. That would mean that a company could not so easily get away with rebranding a product after slightly changing it.

Prasse considers the EU’s REACH program one way of approaching the ongoing problem of compounds finding their way into use and becoming persistent threats prior to sufficient study and control. Under REACH, he said, “the industry is virtually forced to evaluate these compounds, and it’s pretty extensive. There are always holes, or exemptions you can get, so it is not a perfect system, but it is in the right direction”—and it is much better than simply letting the chemicals flow into waterways without regulations. European regulation of

PFAS also includes setting a limit value of 0.65 nanograms per liter (ng/L) in inland surface waters and 0.13 ng/L in seawater,³⁰ levels that have been far exceeded in Maryland tests, where the Maryland Department of the Environment (MDE) has recorded levels ranging from 2.3 to 13.5 ng/L in the St. Mary’s and Patuxent rivers and Fishing Bay.³¹

“It’s just mind-blowing that we have these compounds like PFAS, we don’t know anything about their toxicity, and there is no regulation, so we just tolerate that,” Prasse said. “The goal of drinking-water regulation should be the protection of the customers. In my opinion, that’s absolutely not happening.”

Maryland’s Possible Moves

More and more, the solution to PFAS is resembling the path taken to tackle microplastics, the tiny particles that once were part of consumer products and now are impacting marine life and birds that ingest them. Though microplastics are a global problem, the EPA has not banned microfibers, microbeads, and other byproducts of these chemicals. Faced with evidence of accumulation in fish, on Bay grasses, and along beaches, cities, counties, and states are passing their own laws, ranging from plastic bag bans to laws against microbeads in cosmetics. Urgency over Maryland’s PFAS situation grew with the recent discovery by the nonprofit Maryland Pesticide Network that a sample of the pesticide Permanone 30-30, used by the Maryland Department of Agriculture for the state’s effort to control mosquitoes, contained 3,500 parts per trillion (ppt) of PFOA, a shockingly high reading that has turned regulatory heads in Maryland and at the federal level.³²

The Chesapeake Bay Commission is a tri-state legal body that advises the legislatures of Virginia, Maryland, and Pennsylvania to coordinate air and water protections across the 64,000-square-mile watershed. (Delaware,

New York, and the District of Columbia are also part of the commission, though their role is more advisory.) Typically, the commission will take up an environmental pollution issue, determine if scientists need more research, and recommend legislation following further study. The commission has taken those steps with efforts to keep livestock out of streams and protect waterways as well as to coordinate state bans on microbeads in personal care products. The commission is currently looking at options regarding PFAS.³³

In Maryland, the legislature in 2020 banned the use of PFAS during firefighters' training exercises but cemented their legality to use in fighting actual fires. Hearings on the measure clarified that firefighters would prefer to see a ban, putting that on the table for future sessions, yet in 2021, a proposed ban languished in committees. Still, Maryland could take the lead of other states. It cannot make a law that is stronger than the EPA's; however,

the EPA is not now regulating PFAS with an MCL, and that leaves the door open for states to do so. As previously noted, several states already have.³⁴

In order to draft an MCL, Maryland needs a year of monitoring data. According to MDE, all water systems that served more than 10,000 residents were tested for six PFAS compounds between 2013 and 2015, including Baltimore City's. Scientists detected a positive sample at only one location—near Aberdeen Proving Ground's fire training facility. In September 2020, MDE sent letters to 137 of what it considered the most vulnerable drinking-water treatment systems to sample for PFAS. MDE said the samples will have greater ability to detect smaller amounts than the samples from five to seven years ago. Once the data is collected, MDE must prepare a detailed assessment and cost-benefit analysis, and then an MCL could be adopted after a public process. As other states have shown, with the will and the time to complete the process, an MCL can be established.³⁵

Baltimore's Best Protections

As for Baltimore, the city's Department of Public Works (DPW) is in charge of the water system, from dam to tap. Deborah Pitts oversees the operation, and says that MDE has tested for PFAS twice. "We actually were below detection" in the first test, she explains, and the results for the second, which was conducted in the fall of 2020, are pending.

"Because we do have an excellent water source"—the city's three reservoirs, which collect upstream water from the Gunpowder and Patapsco rivers—"I'm not kept up at night" worrying that the city's water will suffer PFAS contamination. "But we will definitely make sure that we meet any state and federal regulation" over PFAS in the city's water system.



Firefighters practice a rescue exercise at the Prettyboy Reservoir. Clean-water advocates have long worried about firefighting foam chemicals entering the waterways, and have questioned why the training site continues to be there. Photo credit/Rona Kobell



Thurman Freeman, a Baltimore resident enrolled in Civic Works' first stormwater class, measures a drain near a North Baltimore McDonald's and records his results. Program participants are checking to see how well management practices are working. Photo credit/Rona Kobell

Baltimore City officials have chosen to wait for state and federal direction regarding testing its drinking water for PFAS. The reason, explains Kim Grove, DPW's head of compliance and research, is "so we can compare apples to apples" in terms of testing methodology. Going out ahead of what's required in the case of PFAS "is not the best use of our resources," she adds, "but when the regulations come out, we're on top of it." Many water utility managers feel the same; they are not looking to regulate chemicals that they're not required to regulate because they have many mandates and struggle for funds. But not every utility follows Baltimore's example. Among the most notable is the Washington Suburban Sanitary Commission, which serves Washington, D.C., and several large surrounding counties. WSSC does test for PFAS, even though no one requires them to do so.

The DPW also runs the wastewater side, where it produces discharged treated water and

sludge. The city tests the sludge for an array of contaminants, as required by its state permits, for its two wastewater treatment plants (WWTPs), but not for PFAS, according to Yosef Kebede, acting chief of DPW's bureau of water and wastewater. Kebede explains that the city is aware of the sludge-borne PFAS problem in Lapeer, and acknowledges that DPW's sludge-handling contract at its WWTPs results in the company, Synagro Co., making pellets that are sold "mostly for agricultural land applications in Virginia." Synagro Co. does "not currently test for PFAS" in the pellets, Kebede adds.

"The question of PFAS is one that utilities and regulators are still dealing with," Kebede explains, and the city's "engineers and scientists continue to participate in multi-stakeholder working groups that ultimately will form the body of knowledge on PFAS and other emerging contaminants," he adds. "Once we better understand the risks and recommended actions, we can better formulate a strategy that best protects public health."

A Way Forward

Foresight set Baltimore up to avoid a lot of the problems that have sickened residents in other cities in recent years. Baltimore's residents recently voted overwhelmingly to declare the "inalienability" of its sewerage and water-supply systems, a decision that will spare the city the misery of cities like Pittsburgh, which did allow a private company to manage its water supply and is now grappling with quality, quantity, and delivery problems.

But the city can't rest on its foundations, and neither can society as a whole. Safe and plentiful drinking water stays that way only thanks to constant, science-based vigilance that harnesses public awareness and community organizing to create a will for sustainability. There is plenty of work to be done. We should not wait until a crisis

like Lapeer's or Flint's to show us flaws in our system. We should be proactive to safeguard the health of all residents in the region.

Absent a strong federal role in achieving drinking-water safeguards, many states and municipalities remain in a holding pattern of inaction when it comes to emerging threats like PFAS. While Congress considers well-intentioned policies and appropriations that would start to gain a handle on PFAS, and help lower-level governments fashion appropriate responses, it would also be wise to think big: A federal regulatory framework shaped by scientists who, like Prasse, believe it advisable to abandon a chemical-by-chemical approach and instead define classes of compounds and tailor controls strategically based on their health and environmental impacts. The federal role in protecting public health and the environment eventually will need to adopt a holistic approach that transforms the chemical industry and the marketplace, so that corporate practices and consumer protection track rationally with good policy.

Maryland's recent ban on the use of PFAS in firefighting training is a small start.

This year's failed follow-through—banning PFAS in food packaging, new carpets, and firefighting foam—would have helped. But what's also needed is an MCL for PFAS in drinking water, and MDE's data-collection efforts form the basis of future action toward that end.

At the local level, Baltimore City should regularly test for PFAS not just in finished water sent to customers, but also throughout the source watersheds. The data would help prepare the city for what's coming down the pike: an MCL for PFAS.

Baltimore's leadership must push its federal leaders for a national solution to this problem, as well as the resources to protect water locally. As a cash-strapped municipality, Baltimore struggles to take on testing and mitigation that is not mandatory. But with funding, it can do some of the work that other cities and states have begun, both to know what's coming and understand what's already there.

Baltimore has never had a water-quality crisis the likes of the ones in Michigan. The city shouldn't wait for one to protect its most precious resource. It is what we must do now.

ABOUT THE AUTHORS

Van Smith's journalism career, nearly all of it spent helping to fill the pages of Baltimore's now-defunct City Paper, began after college in the 1980s. Since building his first sea kayak and getting his masters in environmental policy in the 1990s, he regularly has committed acts of water-focused journalism.

Rona Kobell has been a journalist for 25 years, spending the last 16 covering the Chesapeake Bay for both the Baltimore Sun and the Chesapeake Bay Journal. After two years of teaching at the University of Maryland's Philip Merrill College of Journalism, she is now earning her master's at the college with a concentration in history. This report is her fourth for the Abell Foundation.

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**Protecting Baltimore's Water Supply
from "Forever Chemicals"**

by Rona Kobell and Van Smith

About the Abell Foundation

The Abell Foundation is dedicated to the enhancement of the quality of life in Maryland, with a particular focus on Baltimore. The Foundation places a strong emphasis on opening the doors of opportunity to the disenfranchised, believing that no community can thrive if those who live on the margins of it are not included.

Inherent in the working philosophy of the Abell Foundation is the strong belief that a community faced with complicated, seemingly intractable challenges is well-served by thought-provoking, research-based information. To that end, the Foundation publishes background studies of selected issues on the public agenda for the benefit of government officials; leaders in business, industry and academia; and the general public.

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