TESTIMONY OF
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UNITED STATES HOUSE OF REPRESENTATIVES

HEARING ENTITLED
"REINVESTMENT AND REHABILITATION OF OUR NATION'S SAFE DRINKING WATER DELIVERY SYSTEMS"
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SUMMARY

- The safe drinking water we all take for granted in the U.S cannot be considered a given.

- Much of our nation's water infrastructure is like a century-old house with a leaking roof, crumbling foundation, termites, and broken windows. It's still standing, but unless we act soon and make the investments we need to fix it, there is a risk that it will collapse.

- An estimated 19.5 million Americans are sickened *every year* by drinking pathogen-contaminated tap water, and that doesn't include the impacts of lead or other toxics. Also, tens of millions are served by water systems violating EPA's drinking water standards.

- We cannot be ostriches with our heads in the sand about the mounting drinking water crisis. Deferred maintenance of our drinking water systems is a ticking time bomb that harms public health, imposes enormous costs, and erodes public trust in government.

- This is having devastating impacts on people. Flint resident Melissa Mays testified here last month about the shattering effects on her family of the city's ongoing water contamination problems. And East Chicago, Indiana's "system-wide" lead in tap water problem has upended Krystle's family. Two of her kids under the age of five have been diagnosed with blood lead above the CDC reference level. She's distraught because lead may have seriously, perhaps permanently, harmed her young children.

- The health risks stem from: weak enforcement; outdated and inadequate drinking water treatment technology; deteriorating and often lead-laced water distribution pipes; inadequate protection of source waters; decaying and insufficient wastewater and storm water infrastructure. Often low-income areas lack any access to safe piped drinking water.

- Infrastructure investment creates good jobs.

- Protecting water sources helps to safeguard health and reduces treatment costs.

- There are increasing challenges to water infrastructure from extreme weather, droughts.

Recommendations:

1. Fix Flint.
2. Fix Our Lead in Water, Including the Lead & Copper Rule, and Lead in Schools.
3. Fix the Standard-Setting Process Under the Safe Drinking Water Act.
4. Fix our National Water Infrastructure, Paying Special Attention to the Needs of Lower Income and Disproportionately-Affected Communities.
5. Increase Federal Water Infrastructure Funding.
6. Protect Source Water to Reduce Infrastructure Costs.
7. Protect Water Infrastructure from Extreme Weather Events & Possible Terror Attacks.
8. Invest in Advanced Water Technologies, Including Real-Time Monitoring.
9. Let Citizens Act Immediately Against Imminent & Substantial Endangerment to Health.
10. Vigorously Enforce the Safe Drinking Water Act.

Introduction

Good morning Chairman Shimkus, Ranking Member Tonko and members of the Subcommittee. I am Erik D. Olson, Director of the Health and Environment Program at the Natural Resources Defense Council (NRDC). I have worked on Safe Drinking Water Act issues for over 30 years, beginning with my service as an attorney in the U.S. Environmental Protection Agency's Office of General Counsel in the 1980's, and continuing as a former member of the EPA's National Drinking Water Advisory Council and as a member of numerous EPA advisory committees relating to drinking water. I also served as an advisor to the Government Accountability Office's experts' assessment of how to improve water system security after 9/11.[1] I appreciate the opportunity to testify today.

As the drinking water crisis in Flint, Michigan, and more recently in East Chicago, Indiana and other communities have highlighted, the safe drinking water we all take for granted in the United States cannot be considered a given. And unfortunately, it's not just about lead. Much of our nation's water infrastructure is like a century-old house with a leaking roof, crumbling foundation, termites, and broken windows. It's still standing, but unless we act soon and make the investments we need to fix it, there is a risk that it will collapse.

Deferred maintenance and the steady deterioration of the nation's water and wastewater infrastructure have been a serious challenge for decades.[2] Indeed, NRDC published a report 23 years ago calling for the modernization of our aging and outdated drinking water treatment and distribution systems, noting that "Victorian water treatment" was "taking us into the 21st Century."[3] Unfortunately, here we are in the 21st Century, and progress since our 1994 report has been slow. Similarly, we have long known that our wastewater and storm water treatment and collection systems badly need updating.

Our inadequate drinking water infrastructure is posing very real health risks to millions of Americans. The Centers for Disease Control and Prevention (CDC) has noted that there are an estimated 19.5 million Americans who are sickened *every year* by drinking pathogen-contaminated tap water from community water systems.[4] And that's just from microbiological threats—it doesn't include the devastating impacts of lead contamination,

or from the numerous other cancer-causing and other toxics in our water supplies. NRDC published a report last June documenting that about 18 million Americans were served in 2015 alone by community water systems violating EPA's Lead and Copper Rule, with violations including failing to treat their water to reduce lead levels, failing remove lead service lines, and not testing for lead or reporting lead levels as required.[5] We found about 4 million Americans were served by systems that exceeded EPA's Lead Action Level in 2015. And communities across the country are dealing not only with lead contamination, but also problems with regulated and unregulated contaminants ranging from arsenic to dangerous pathogens. These problems require improvements to our system of funding our infrastructure, and of regulating and enforcing against violations.

We cannot remain ostriches with our heads in the sand about the mounting drinking water crisis. Deferred maintenance of our drinking water systems is a ticking time bomb that harms public health, imposes enormous costs, and erodes public trust in government.

The Human Costs of Our Inadequate Drinking Water Infrastructure

For many of us, these infrastructure problems may be out of sight and out of mind, but they are having devastating impacts on real people every day. As this subcommittee heard from Flint resident Melissa Mays in her moving testimony just one month ago today, that people of Flint still lack water that is safe to drink. This remains so over 1,000 days after state-appointed "emergency manager" made the fateful decision to save a few bucks by switching to the polluted and corrosive Flint River as the city's water source. That ill-advised decision, combined with deteriorating water infrastructure (including thousands of lead service lines in Flint), failure to use corrosion control as required, and the lack of appropriate state and US EPA oversight led to the contamination of thousands of Flint citizens' tap water. It has been linked to elevated blood lead levels in many children across the city[6] and reportedly to a Legionella outbreak that killed a dozen people.[7]

And Flint isn't the only town suffering; other water threats continually come to the fore. Another recent example is the lead-contaminated tap water in East Chicago Indiana, which

NRDC and our colleagues have recently petitioned EPA to address on behalf of local residents because it poses an "imminent and substantial endangerment" to public health.[8] EPA conducted a pilot water study in East Chicago, released in December, 2016, that revealed that lead levels in East Chicago's drinking water are well above the action level set by EPA that triggers corrective action by public water systems. The data showed a "system-wide" problem in the drinking water for this city of 29,000. Similar to the water crisis in Flint, inadequate corrosion control and the existence of lead service lines resulted in elevated levels of lead in drinking water. [9] Unfortunately, there also is lead in the local soil from past industrial activity, and possibly from lead paint, posing cumulative lead risks to East Chicago's kids.

One of the local residents is Krystle, a mother of four children, aged ages 8, 6, 4, and 2. She lived in East Chicago, in the West Calumet Public Housing Complex from 2012 until July 2016. In late 2015, Krystle's child – then two years old – was diagnosed with an elevated blood lead level of 11 micrograms of lead per deciliter of blood (μg/dL), more than double the level at which CDC recommends that action be taken to protect a child. Shortly after receiving this distressing news, Krystle reported this by providing a copy of her child's blood lead level results to the housing authority. She was not informed about the lead contamination that characterized homes in her building, and no steps were taken to provide her family a lead-free source of drinking water.

In May 2016, Krystle's then one year-old son was also tested for lead. Her son's doctor said that he would likely test positive for elevated blood lead levels as a result of the "known" lead and environmental contamination in the area. When his results came back, her son was diagnosed with an elevated blood lead level of 7 μg/dL. Like his sibling, his blood lead level also above the CDC reference level of 5 ug/dL. Krystle was distraught because she realized lead could be seriously – and perhaps permanently – harming her young children. Krystle moved out of the West Calumet Public Housing Complex in the middle of July to keep her children safe. As of September 2016, Krystle and her children were living with a relative whose home is in foreclosure.

Widespread Health & Environmental Risks from Inadequate Water Infrastructure

There are thousands of stories like this in East Chicago, Flint, and many other cities and towns across the country. Melissa Mays' and Krystle's experiences, and those of innumerable other Americans, illustrates the perils of failing to invest in solving our water infrastructure challenges.

The health risks stem from several problems:

- ***Often outdated and inadequate drinking water treatment technology*.** Most large drinking water systems still use basic coagulation, sedimentation, sand filtration, and chlorination as treatment. This technology has reduced waterborne disease and served us well since before World War I a century ago, but is not up to the task of removing many of today's contaminants like industrial chemicals, pesticides, nitrates and many other pollutants. The public health threat from our failure to invest in our water infrastructure is enormous. We remain at risk from lead, arsenic, bacteria and other pathogens, cancer-causing disinfection byproducts, the rocket fuel component perchlorate, and many other regulated and unregulated contaminants. America needs to switch to 21st Century water infrastructure. Treatment technology such as granular activated carbon, membranes, and ultraviolet light or ozone for disinfection, still has been installed by only small minority of water systems. Moreover, while some water systems are effectively using optimized corrosion control treatment, as Flint and East Chicago illustrate, many others are not doing so, posing serious health risks.
- ***Deteriorating and often lead-laced water distribution pipes.*** Many of the underground pipes in our drinking water distribution systems are 100 years old or more, often operating well beyond their design life. In addition, 6 to 10 million lead "service lines" connect the water main to residences of up to 22 million Americans.[10] There are about 240,000 water main breaks a year due to crumbling pipes.

- ***Inadequate Protection of Source Waters.*** The best and least expensive way to avoid drinking water contamination is to prevent pollution of the surface water or ground water used as a water source in the first place. Unfortunately, many water pollution sources still are poorly controlled, such as runoff from large industrial farms, mining waste, and untreated or poorly-treated sewage. We anticipate that these problems could be made worse by proposed or enacted rollbacks of the Stream Protection Rule that was intended to protect communities from water contaminated by coal waste, and of EPA's Clean Water Rule.
- ***Decaying, outdated and insufficient wastewater and storm water infrastructure.*** Our wastewater and storm water collection and treatment systems are too often not up to the task. Combined sewer overflows (CSOs) are common, when domestic sewage mixes with collected storm water in combined sewers and during precipitation events, causes raw or minimally treated sewage to flow into lakes and streams. CSOs are, according to EPA, "a major water pollution concern for the approximately 772 cities in the U.S. that have combined sewer systems." These CSOs and other shortcomings in our wastewater and storm water systems are often causing sewage contamination of drinking water source waters, beaches, and sensitive ecosystems.
- ***Underserved, often low-income areas lacking access to safe piped drinking water*.** While most Americans take piped drinking water systems for granted, in many areas, particularly lower-income rural areas and Native American lands, lack access to safe and sufficient piped drinking water. Areas ranging from the *Colonias* in Texas near the border, to parts of the Central Valley of California, to rural Alaskan Native villages, to parts of Appalachia simply don't have access to safe and sufficient tap water.

The Safe Drinking Water Act

We need to improve the Safe Drinking Water Act to ensure the quality of our tap water.

The Safe Drinking Water Act requires the EPA to establish standards for drinking water safety. EPA is required to set a health-based Maximum Contaminant Level Goal (MCLG) for each regulated drinking water contaminant, at a level that is fully protective of health.[11] The agency is then required to establish maximum allowable levels of the contaminant called Maximum Contaminant Level (MCL) as close to the MCLG as is feasible, considering technological limitations and costs. EPA has identified about 100 contaminants that pose health risks and are regulated in our drinking water.[12]

If EPA finds that it is not feasible to ascertain the level of a contaminant in drinking water, the agency must establish a "treatment technique" instead of an MCL. A treatment technique sets required methods of treating the water to make it safe to drink.[13] Public water systems are responsible for meeting the requirements of an MCL or treatment technique, subject to the supervision of state drinking water officials, and ultimately the oversight of the federal EPA.

The Lead and Copper Rule

In 1991, EPA established a complex treatment technique to control lead levels in tap water, known as the Lead and Copper Rule (LCR).[14] Under the LCR, all large water systems (serving more than 50,000 people) must treat their water to optimize corrosion control, or demonstrate that they don't need to do so because their water isn't corrosive and they have no lead problems. The LCR also generally requires water systems to control corrosion by adding chemicals, since corrosive water can cause the release of lead from pipes and fittings. Many systems use a corrosion inhibiter, such as orthophosphate, which coats the inside of the pipes with a thin film that can reduce the amount of lead that leaches into the water.

All water systems also are required to test a specified number of drinking water taps in high-risk areas (with lead service lines that bring water from the water main under the street to a residence, or areas with a lot of homes that are likely to have lead in their household plumbing or fixtures). The bigger the system, the more taps must be tested.

Under the LCR, if more than 10 percent of the tested taps contain lead above an "action level" of 15 parts per billion, the water system must take measures to reduce lead levels. These measures include removing lead service lines over a specified time period. Unfortunately, under the LCR there are unintended but significant incentives for water systems to monitor the lead levels in ways that fail to detect lead problems (such as using monitoring techniques that are less likely to find lead).[15] In the wake of the Flint crisis, in late February 2016, EPA issued a guidance intended to discourage the tricks some utilities have used to avoid finding lead problems.

Lead-contaminated drinking water remains a major problem around the country. The EPA's Lead and Copper Rule (LCR)—and the way states and EPA implement and enforce it—needs a major overhaul.

EPA began developing long-term revisions to the LCR. In 2014, the National Drinking Water Advisory Council (NDWAC) established a Working Group to address these revisions. Between March 2014 and June 2015, the Working Group met and discussed a set of recommendations for revising the LCR. EPA has indicated that it intends to propose revisions to the LCR in 2017. The Flint crisis provides a blueprint for the types of improvements that are needed.

It is critical that the revisions to the LCR, at a minimum, include the following: (1) a mandate to fully replace all lead service lines; (2) improved corrosion control requirements; (3) robust monitoring requirements that fully and fairly monitor problems, and prohibit gaming the system to avoid detecting or reporting lead contamination problems; and (4) a mandate for clear, ongoing, and culturally appropriate public education and notification of lead problems.

Full Lead Service Line Replacement

No matter how optimally a corrosion control system is run, there will always be lead contamination issues, as long as lead service lines are in the ground. The problem of lead service lines is enormous and exists nationwide. While there is no comprehensive national inventory of all of the lead service lines in the country, experts have estimated that 6 to 10

million lead service lines are being used in the United States, serving 15 to 22 million Americans.[16] Most were installed 50 or more years ago. So it is critical that the revised LCR contain an enforceable requirement to fully replace lead service lines on a strict timeline. It is also critical that the service lines be replaced fully; that is, replacement of the service line up to the customers' home or residential building, including on the homeowner's property.

We applaud the American Water Works Association (AWWA), the nation's largest drinking water utility trade association, for its support for complete removal of lead service lines across the country, recently announced by its Board of Directors.[17]

Need for a Far More Robust Monitoring Program

Under the current LCR, it is too easy to develop a monitoring program that avoids finding problems. Flint stands as a marked example of this ability to fly entirely under the radar, since the system reported no violations of the LCR, despite its disastrous lead contamination problems. EPA knows where these gaps exist and should ensure that the LCR is revised to close these gaps. At a minimum, EPA should codify its sampling protocol recommendations to stop the protocols that some utilities have used to "game the system." Specifically, states and water authorities should ensure that every test is valid by prohibiting water sampling instructions to: (a) remove aerators from faucets before testing, since they often capture particulate lead and can be responsible for substantial lead contamination of tap water; (b) pre-flush their tap water 6 hours before the testing, which can reduce the levels of lead detected; or (c) use narrow-necked bottles that make it difficult or impossible to test water rushing out of a faucet at high velocity (as consumers often do when pouring water for a drink or for cooking), when lead levels may be high due to shaking loose of particulate lead.[18]

In addition, the monitoring program should sample more frequently. It should retain and enforce the existing requirement that tap-water sampling target high-risk homes (e.g., those connected to lead service lines or where composition of service lines is unknown.)

Improved Public Notification and Education

The revised LCR should require clear public education notices and notification provisions to ensure customers are aware of elevated levels of lead in the system's drinking water. This should include public education encouraging all homeowners to get their water tested, even if they are not part of the utility's sampling program.

Widespread Violations of the Lead and Copper Rule Threaten Health

NRDC published an extensive report in June 2016 that illustrates the extraordinary geographic scope of America's lead crisis.[19] We found that in 2015, 18 million people were served by water systems with lead violations. These violations were recorded because the systems were not doing everything that they are required to do to protect the public from lead issues, which could include failure to treat to reduce lead levels in the water (health violations), failure to monitor the water for lead as required (monitoring violations), or failure to report lead results to the public or the government (reporting violations). About 4 million people were served by systems exceeding EPA's Lead Action Level of 15 ppb.

Even more surprising: Flint doesn't even show up as having violations for lead in the EPA database. This glaring omission illustrates the serious problem of underreporting and gaming of the system by some water supplies to avoid finding lead problems, suggesting that our lead crisis could be even bigger.

EPA Has Stalled on New Drinking Water Standards

In the 20 years since the Safe Drinking Water Act was amended, EPA has not set one single new drinking water standard without an act of Congress. Rather than being an indication of the safety of the U.S.'s drinking water, this is an abject failure of the process and a demonstration of the numerous barriers to getting contaminants out of our water.

Prior to the 1996 Amendments to the Safe Drinking Water Act, EPA established MCLs for about 100 contaminants. The amendments created a new process requiring EPA to develop a list of unregulated contaminants that are known or anticipated to occur in public water

systems. This Candidate Contaminant List, or CCL, is published every five years. Once a CCL is finalized, EPA must make a "Regulatory Determination" whether or not to regulate five of the contaminants on the CCL every five years. A determination to set a drinking water standard for a contaminant is based on the following findings:

(1) The contaminant may have an adverse effect on the health of persons;
(2) The contaminant is known to occur or there is substantial likelihood the contaminant will occur in public water systems with a frequency and at levels of public health concern;
(3) In the sole judgment of the Administrator, regulation of the contaminant presents a meaningful opportunity for health risk reductions for persons served by public water systems.

Since 1998, EPA has published three CCLs and a draft CCL4, which all told include more than 100 chemicals and microbiological contaminants. Since 2003, EPA has made three preliminary determinations on 26 contaminants: the agency determined to take no action on 24 of them, delayed final determination on one (strontium), and determined to set a drinking water standard for only one: perchlorate.

Perchlorate—a chemical commonly used in rocket fuel, fireworks, and explosives – contaminates the drinking water of as many as 16 million Americans. Even at low levels, perchlorate contamination in drinking water may be harmful to human health. Exposure is particularly dangerous for infants, young children, and pregnant mothers, and may cause developmental delays, reduced growth, and impaired learning capabilities.

In 2011, EPA determined that perchlorate met the three criteria under the SDWA for setting a national primary drinking water standard. The Act requires EPA to propose a drinking water standard within 24 months and publish a final standard within 18 months of the proposed rule. Despite the concerns about the impact of perchlorate on fetuses, it has been more than six years since EPA's determination to develop a standard for perchlorate, and EPA has not even proposed a standard. The agency recently agreed to propose a standard for perchlorate by 2018 and to issue a final standard in 2019—more than eight

years after it determined that a standard is needed, and 23 years after this subcommittee took the lead and helped to enact the 1996 Amendments.

In fact, EPA identified during the CCL3 process more than 7,000 potential chemical and microbial contaminants – and still not one single drinking water standard has come out of this process.

All the while, communities drink water contaminated with hexavalent chromium, pharmaceuticals, algal toxins, PFOA and PFOS, perchlorate, and many other widespread unregulated contaminants. As we continue to produce tens of thousands of industrial chemicals that can end up in our drinking water sources, we need our drinking water regulations to keep up. The system in place does not allow any standards for unregulated contaminants to develop in a timely way.

Weak Enforcement of the Safe Drinking Water Act

On the flip side, violations of regulated contaminants standards rarely lead to enforcement actions either by EPA or the states. States with primacy under the SDWA (all states except Wyoming) are supposed to carefully oversee drinking water systems to ensure that they are in compliance with any EPA requirements such as the LCR. As part of this requirement, primacy states are to regularly report violations and certain other information to EPA. Under the Act, if EPA finds that a water system is in violation in a state with primacy, EPA is to notify the water system and state of the violation. If the state fails to take enforcement action within 30 days, EPA is legally required to issue an administrative order or file an enforcement case in court against the violator.[20] EPA and states often ignore these important mandates in the law.

Flint is but one example where neither state authorities nor EPA took enforcement action until literally years after the problem began. But lack of enforcement in Flint was not anomalous. In fact, according to NRDC's June 2016 report analyzing EPA's enforcement data, states and the EPA took formal enforcement action against just 11.2 percent of the over 8,000 Lead and Copper Rule violations that occurred in 2015—leaving nearly 9 in 10 violations free from any formal enforcement action.[21] Formal enforcement actions were

taken against less than one in five health-based violations (17.6 percent). Furthermore, penalties were sought or assessed for only a tiny fraction (3 percent) of violations. This lack of accountability sends a clear message to water suppliers that knowingly violate the Lead and Copper Rule, with state and federal complicity: There is no cop on the beat.

Weaknesses in the Safe Drinking Water Act's Enforcement Provisions

The Safe Drinking Water Act includes a provision authorizing EPA to immediately issue an administrative order or to bring a case in court if a contaminant "may present an imminent and substantial endangerment to the health of persons," even if no violation of the law is proven.[22] Unlike some other laws (like the Resource Conservation and Recovery Act[23]), however, the Safe Drinking Water Act does not allow *citizens* to bring an action in such cases to protect their health from an imminent and substantial endangerment—a major shortcoming that should be rectified.

The Safe Drinking Water Act does authorize citizens to sue public water systems that have violated the requirements of the Act, but only after providing 60 days advance notice to the violator, the state, and EPA. Unfortunately, this can mean substantial delays while there is an ongoing health threat. Moreover, unlike the citizen suit provisions in the Clean Water Act and Clean Air Act, under the drinking water law, no penalties are available, so there is little incentive for violators to come into compliance until ordered to do so by a court. In Flint, NRDC brought such an action on behalf of local citizens including Concerned Pastors for Social Action and other local residents.

Regrettably, as we have noted, stories of contaminated water are not limited to Flint and are not limited to lead. Drinking water contamination incidents are all too common. According to EPA's most recent annual compliance report for public water systems, there were 16,802 "significant violations" of EPA's drinking water standards.[24] The most common of these more than 16,000 violations were:

- Total coliform bacteria contamination, representing 48 percent of the significant health standard violations;
- Chemical contamination with synthetic organic, volatile organic, inorganic (except lead and copper) and radioactive contaminants, representing 22 percent of significant health standard violations;
- Lead and copper treatment technique violations, representing 5 percent of the significant violations;
- Disinfection byproduct contamination, representing 13 percent of the significant violations;
- Surface water treatment requirements (to control pathogens like *Cryptosporidium* and *Giardia*), representing 7 percent of the significant violations; and
- Ground water treatment requirements (to control for pathogens and fecal contaminants such as certain bacteria and viruses), which comprise 6 percent of the significant violations.[25]

Disproportionate Impacts of Infrastructure Inadequacies in Low-Income Communities, and Communities of Color

As is well-known, the Flint community is predominantly African American (57%) and has a high percentage of residents living at or below the poverty line (over 40%), or who are working but struggling to make ends meet. State officials were "callous and dismissive" of the concerns these citizens raised about the water, according to the governor's independent Task Force on Flint.[26]

The obfuscation by government officials, and the denigration of community members and experts who raised concerns, illustrates a pressing nationwide problem. Low-income communities and communities of color all over this country often bear the burden of environmental contamination and the resulting health problems.

In recent years a series of peer-reviewed studies also have documented that unsafe drinking water often is disproportionately associated with lower-income communities of color.[27] Examples include nitrate and other contaminants in drinking water in California's

San Joaquin Valley, contamination and substandard water infrastructure in U.S.–Mexico border *Colonias* and some minority communities in certain Southern rural areas, and bacteriological and chemical contamination on some Native American lands.[28] Balazs et al. have established that in areas of California "race/ethnicity and socioeconomic class were correlated with exposure to nitrate and arsenic contamination and noncompliance with federal standards in community water systems."[29]

The Flint case is not an anomaly. There is a wide array of factors, including lack of access of lower-income communities of color to resources and government political attention, that help to create a disproportionate and "persistent drinking water burden" in these communities.[30] In sum, researchers have found that "unequal access to infrastructure drives unequal access to safe drinking water."[31]

There are clear challenges to ensuring that every American gets safe drinking water. We don't want to create a two-tiered system where the wealthy get water that is clean and safe for their families, and the less well-to-do get second-class water that poses risks to their health.

Thus, we need to create an infrastructure investment and structuring system that ensures that communities that cannot afford to upgrade their water infrastructure get a helping hand. The National Drinking Water Advisory Council's Affordability Work Group report on how to address affordability concerns provides an important resource.[32] Among other ideas, the Work Group recommended the creation of a Low Income Water Assistance Program (LIWAP), modeled after the Low Income Heating and Energy Assistance Program (LIHEAP), which would help lower-income people afford their water bills if needed. Thus, rather than providing substandard water, all consumers should get top quality tap water, with some assistance to low income people if necessary. Access to clean, safe, affordable drinking water should be available to everyone.

The Backlog of Overdue Investments in Infrastructure

There is a huge backlog of overdue investments in the nation's water infrastructure. The American Society of Civil Engineers (ASCE) has been ringing the alarm bell about our water infrastructure since at least 2001[33], with its troubling report cards giving our water and wastewater infrastructure a grade of "D" or worse every four years.[34] The engineers highlight serious problems that result from the lack of investment in our water infrastructure, noting that pipes and mains are often 100 years old and nearing the end of their useful life, causing frequent pipe failures and other problems.

The evidence of these problems is widespread. For example, there are about 240,000 water main breaks per year due to deteriorating and poorly-maintained underground drinking water pipes.[35] Even more water is lost to unseen leaks and breaks that never reach the surface. Water losses waste not only enormous amounts of this precious resource, but they also can cause serious damage to roads and property, they can pose significant public health risks. For example, particularly when water mains are close in proximity to sewer lines, fecal contamination can get into the drinking water after a rupture or pressure loss, posing a threat of causing a waterborne disease outbreak.

In many cities, underground pipes are often a century old or more, and in too many cases municipalities are on track to take 200 years to replace their aging pipes.

We routinely lose an average of 14 to 18 percent of our drinking water to leaking underground pipes,[36] although this is just an estimate, since standardized auditing and reporting of water loses is not required in most states.[37] In some cases, such as Flint, water loss rates of 40 percent or more have been estimated. These leaks represent an enormous waste of water, energy, treatment chemicals, and money used to collect, treat, and pump the water. Moreover, points of leakage of any size can provide pathways for contaminants to enter the water system during short-term pressure fluctuations, known as "transients." Thus, leaks can cause water pressure losses, which can, much like catastrophic pressure failures from water main breaks, allow pathogens to get into the drinking water, posing health risks. Improved pressure management is an important component of both infrastructure stewardship and public health protection.

The American Water Works Association estimates that it will cost $1 trillion dollars to upgrade, repair, and maintain our drinking water infrastructure to serve the population as it grows over the next 25 years.[38] Unfortunately, funding for drinking water infrastructure is not keeping pace with the needs. In recent years, Congress has appropriated about $2.37 billion a year for water and wastewater infrastructure combined, funding a tiny fraction of the work needed.[39] While states and localities will need to bear much of the water infrastructure costs as they have for generations, the current federal investment is not making a dent in the problem.

Infrastructure Investment Creates Good Jobs

The good news is that investing in our water infrastructure not only helps to rebuild the base of the nation's economy, which is highly dependent upon reliable, safe drinking water and wastewater service. But major investment in water infrastructure also will create hundreds of thousands or even millions of good-paying jobs.

For example, in passing the bipartisan Water Resources Development Act, the U.S. Senate found that for every one million dollars in state revolving loan fund spending, 16.5 jobs were created.[40] Furthermore, $34.7 billion on federal capitalization grants for the DWSRF would create 506,000 jobs.[41]

A more aggressive investment in water infrastructure would yield more jobs. For example, a recent study found that an investment of $188.4 billion in water infrastructure (an EPA estimate of wastewater-related infrastructure needs) spread equally over five years would generate $265.6 billion in economic activity and create close to 1.9 million jobs.[42] The study found, based on the economics literature, that such infrastructure investments "create over 16 percent more jobs dollar-for-dollar than a payroll tax holiday, nearly 40 percent more jobs than an across-the-board tax cut, and over five times as many jobs as temporary business tax cuts."[43]

Protecting Water Sources Helps to Protect Health and Reduces Treatment Costs

We need a greater focus on source water protection. Uncontrolled and poorly controlled source water pollution from polluters remains a serious problem. Unregulated or poorly-controlled sources that can pose substantial pollution threats include agricultural runoff and factory farm pollution, groundwater and surface water pollution from oil and gas exploration and development, coal and mineral mining, certain industrial sources, and spills and leaks from above-ground hazardous substance tanks. State authorities and EPA could substantially reduce the public health and environmental threats from such polluters, and could reduce the costs of drinking water treatment, by better controlling these pollution sources.

The experience of Des Moines Water Works, which serves 500,000 Iowans with their tap water, is illustrative of how state or EPA intervention to ensure that source water is protected from upstream agricultural pollution could help to keep rates more affordable. As a recent statement from Des Moines Water Works notes,

> Des Moines Water Works meets or exceeds regulatory requirements for drinking water established by the United States Environmental Protection Agency…. However, the costs and risks in doing so are increasingly high as Iowa's surface waters demonstrate dangers levels of pollutants.
>
> The increase in river nitrate levels is attributable to upstream agricultural land uses, with the largest contribution made by application of fertilizer to row crops, intensified by unregulated discharge of nitrate into the rivers through artificial subsurface drainage systems.
>
> "Iowa's political leadership, with influence from industrial agriculture and commodity groups, continue to deny Iowa's water quality crisis," said Bill Stowe, CEO and General Manager, Des Moines Water Works. "Defending the status quo, avoiding regulation of any form, and offering the illusion of progress and collaboration places the public health of our water consumers at the mercy of upstream agriculture and continues to cost our customers millions of dollars."
>
> Des Moines Water Works seeks relief against upstream polluters and agricultural accountability for passing production costs downstream and endangering drinking water sources. In addition, Des Moines Water Works is

> actively planning for capital investments of $80 million, a cost funded by ratepayers, for new denitrification technology in order to remove nitrate and continue to provide safe drinking water to a growing central Iowa.[44]

While Des Moines may be unusual for its candor, its problems with unregulated or poorly-regulated upstream pollution are hardly so. Problems ranging from routine spills of industrial pollutants on the Ohio River that have led Cincinnati and Louisville to install advanced water treatment facilities at significant expense to ratepayers, are also illustrative.

Similarly, EPA has failed to effectively regulate runoff of the widely used herbicide atrazine which has caused drinking water systems across the country to find the chemical in their water, often at levels in excess of EPA's standard during peak runoff season.[45] In light of EPA's and states' failure to control this problem, a large group of water suppliers sued Syngenta, the manufacturer of atrazine, because they were routinely being required to spend significant amounts to remove the chemical from their tap water.[46] They reportedly settled the case for $105 million dollars, and according to lawyers involved as many as 3,000 water utilities may be eligible to recoup at least some of their treatment costs.[47]

Another example was the spill/leak of toxic chemicals from a huge above-ground tank at Freedom Industries that contaminated the drinking water of 300,000 people in Charleston, West Virginia in January, 2014.[48] EPA had been charged in the 1972 Clean Water Act with issuing rules to prevent spills and leaks from above-ground tanks storing hazardous substances, but has still not done so. Citizen organizations and NRDC recently entered into a consent decree with EPA to have the agency finally issue those long-overdue rules[49], though the list of hazardous substances required to be covered by such rules still has not been updated to include the chemicals that caused the Charleston disaster.

Many other municipalities have been forced to quietly install treatment to remove or protect against potential contamination from other contaminants from upstream polluters, without recourse against the polluters. A far better approach would be for Congress, EPA

and states to crack down on uncontrolled or poorly regulated pollution sources such as agricultural runoff and factory farms, mining, and oil and gas activities, to save ratepayers the expense of cleaning up after the polluters.

Protecting Waters of the United States Will Help Control Infrastructure Costs

As a result of confusing court decisions, millions of miles of streams and tens of millions of acres of wetlands lacked clear protection under the Clean Water Act. As a result, water sources that feed drinking water supplies for 117 million Americans were vulnerable to pollution. So were wetlands that filter contaminants and recharge groundwater supplies, while also providing important flood protection and wildlife habitat. If these waters are not protected against pollution by the Clean Water Act, downstream drinking water systems will have a very heavy burden of cleaning up the water to remove the contaminants, costs that—as in the case of Des Moines and so many other utilities—will be borne by ratepayers rather than the polluters.

EPA and the Army Corps of Engineers finalized the "Clean Water Rule" in May 2015, which helps to clarify which waters are protected under the act—about 60 percent of the nation's bodies of water. The new rule helps to protect a variety of streams, ponds, and wetlands, including those streams that one in three Americans relies on for drinking water. It is important that we continue to protect these waters for current and future generations. Unfortunately, President Trump recently issued an Executive Order on February 28, 2017 requiring EPA and the Army Corps of Engineers to reconsider the rule.[50]

Increasing Challenges to Water Infrastructure from Extreme Weather, Droughts

With increasing challenges from extreme precipitation events, droughts, groundwater depletion, and saltwater intrusion in many coastal areas, our water infrastructure faces

new and often unprecedented risks. We see this in the impacts of the California and Midwestern droughts, the steady depletion of the Ogallala Aquifer, and the intrusion of saltwater into the wells used for drinking water in many coastal areas in Florida and California, for example.

It has become crucial for water utilities to plan for these challenges by integrating their water and wastewater planning through approaches such as using "integrated water resources management" or IWRM. Some have referred to this approach as "sustainable integrated water management." IWRM is "a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems."[51] Such integrated planning will become crucial as the impacts of climate change and other challenges become increasingly serious.

Recommendations

There is an emerging bipartisan consensus that we need to increase our investment in infrastructure. NRDC has several recommendations for improving federal water infrastructure investments and controlling costs of such investments:

1. **Fix Flint.** Flint's water infrastructure must be immediately repaired and replaced, and safe, reliable water (i.e. bottled water delivered to residents until tap water is fully confirmed as reliably safe) must be supplied in the meantime. The Water Resources Development Act, enacted in late 2016, will make some of the needed investments, but clearly will not fully cover the full costs of all of the needed infrastructure upgrades in Flint. In addition, we support the recommendations of the independent Flint Water Advisory Task Force, including the recommendation that there be a tracking system to ensure ongoing health protection for those exposed and follow-up studies, treatment, and educational and nutritional intervention, among other important steps.[52]

2. **Fix Our Lead in Water, Including the Lead & Copper Rule, and Lead in Schools.** To help address our lead in drinking water crisis, we should:

- *Overhaul the EPA's Lead and Copper Rule (LCR)*—and the way states and EPA implement and enforce it. At a minimum, the LCR should be fixed to:
    - Require all lead service lines to be fully replaced in a timely fashion;
    - Strengthen corrosion control requirements;
    - More fully and fairly monitor problems, and prohibit gaming the system to avoid detecting or reporting lead contamination problems; and
    - Require clear, ongoing, and culturally-appropriate public education and notification of lead problems.
- *Address Lead Problems in School Drinking Water.* Tens of millions of children spend their days in school, often drinking from fountains that deliver lead-contaminated water. We need a national effort to ensure that lead tests are conducted for school drinking water, that the results are shared with parents and explained, and that swift remedial action is taken to ensure the protection of children from lead in school pipes, fountains and fixtures.

3. **Fix the Standard Setting Process Under the Safe Drinking Water Act.** When criteria to set a drinking water standard has resulted in no new standards in 20 years, despite the proliferation of drinking water contaminants, there is a problem. Revisions to the cost and feasibility analysis as well as the criteria could streamline the process and allow EPA to move in a timelier manner.

4. **Fix our National Water Infrastructure, Paying Special Attention to the Needs of Lower Income and Disproportionately-Affected Communities.** We need major investment in our water infrastructure, including:
    - Accelerated replacement of deteriorating water distribution piping;
    - Improvements to the processes that utilities use for treating our drinking water;
    - Additional targeted funding for disadvantaged communities, including for restructuring or consolidation of troubled systems, which can help improve water quality and compliance, and reduce per capita costs;

- Adoption of standardized water loss auditing and reporting methods, as developed and endorsed by the AWWA,[53] to provide the foundation for cost-effective loss reduction and repair strategies.

5. **Increase Federal Water Infrastructure Funding.** Current Congressional funding of $2.37 billion dollars per year *combined* for Clean Water and Drinking Water infrastructure is paltry by comparison to the enormous need. As noted, we must invest in clean water infrastructure to better protect the source waters of our drinking water supplies, in addition to making investments in our drinking water infrastructure. These investments must be substantially increased, at least to the approximately $8 billion per year combined level funded under the American Recovery and Reinvestment Act of 2009. I note that Mr. Tonko has proposed legislation (HR. 4653) that would more than triple Drinking Water and Clean Water SRF funding, a move we strongly support. As part of the funding strategy, EPA and state agencies managing these investments should prioritize funding (including grants) for water infrastructure improvements in low-income communities and communities of color since they are so often most at risk and have the greatest problems affording new investments. In addition:
    - As part of this reinvigoration of the federal infrastructure investment, more flexibility (grants, loan forgiveness) in the SRF is needed for communities that don't have the ability to meet the criteria to pay back the loans but have serious health threats.
    - States and municipalities also must play a significant role and join in the investment.

6. **Protect Source Water to Reduce Infrastructure Costs.** The better we prevent source water pollution from a wide array of sources ranging from agricultural runoff, to factory farm pollution from manure, to oil and gas-related pollution, the less ratepayers will need to pay to clean up their drinking water. As we have seen repeatedly in cases like Des Moines, the hundreds of water systems forced to sue the manufacturer of atrazine due to poor regulatory controls on runoff that caused

widespread water contamination, and many other examples, an ounce of prevention is worth a pound of cure. A strong Clean Water Rule to protect waters of the United States is an important component of this strategy.

7. **Protect Water Infrastructure from Extreme Weather Events and Possible Terror Attacks.** Improved vulnerability assessments are needed, and actions required to protect our water systems from threats from extreme weather events that are becoming more frequent with climate change, and to identify and address vulnerabilities to potential terror attacks.

8. **Invest in Advanced Water Technologies, Including Real-Time Monitoring.** We need to invest in modernizing our treatment and monitoring technologies. For example, if real-time monitoring for contaminants could be perfected and widely deployed, it could lead to far more effective identification of problems before they become a public health crisis, could help to identify unforeseen problems, and could help citizens hold their water systems accountable if their water is subpar.

9. **Let Citizens Act Immediately in Cases of Imminent & Substantial Endangerment to Health and Provide for Penalties in Citizen Suits.** In cases such as Flint, citizens whose drinking water may present an imminent and substantial endangerment to health should be authorized under section 1431 of the Safe Drinking Water Act to immediately bring an action for relief when the government has failed them. Moreover, the Act's citizen suit provision should provide for penalties like the Clean Water Act and Clean Air Act, to provide compliance incentives.

10. **Vigorously Enforce the Safe Drinking Water Act.** States and the EPA should invest resources and staff to ensure far more robust enforcement of the SDWA.

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