



Committee on Transportation and Infrastructure
U. S. House of Representatives
Washington, DC 20515

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April 16, 2021

SUMMARY OF SUBJECT MATTER

TO: Members, Subcommittee on Water Resources and Environment
FROM: Staff, Subcommittee on Water Resources and Environment
RE: Subcommittee Hearing on “Sustainable Wastewater Infrastructure: Measures to Promote Resiliency and Climate Adaptation and Mitigation”

PURPOSE

On Wednesday, April 21, 2021, at 11:00 a.m. EDT, the Subcommittee on Water Resources and Environment will hold a hearing in the Rayburn House Office Building, Room 2167, and via Zoom, on sustainable wastewater infrastructure. The purpose of this hearing is to provide Members with additional information on policies and practices to encourage greater resiliency and sustainability of wastewater utilities in meeting the requirements of the *Federal Water Pollution Control Act*, more commonly known as the *Clean Water Act*. Witnesses will include representatives of academia, wastewater utilities, and other wastewater stakeholders who will testify on the benefits, capabilities, and considerations on the adoption of sustainable wastewater infrastructure practices.

BACKGROUND

America’s wastewater infrastructure is in significant need of increased financial investment, as detailed in the *Summary of Subject Matter* for the February 23, 2021, hearing of the Subcommittee, entitled “Building Back Better: The Urgent Need for Investment in America’s Wastewater Infrastructure.”

As a brief recap and update, according to the American Society of Civil Engineers (ASCE) *2021 Report Card for America’s Infrastructure*, the grade for wastewater treatment infrastructure has remained at a D+ since the 2017 report, and the new category of stormwater infrastructure has received a grade of D.¹ In addition, according to the most recent needs survey from the U.S. Environmental Protection Agency (EPA) (2012), communities have documented at least **\$271 billion** of investment over the next 20 years to bring their systems to a state of good repair; yet, as this assessment is almost a decade old, the current need may be higher.² However, the country’s urgent wastewater infrastructure needs also present a major opportunity

¹ <https://infrastructurereportcard.org/infrastructure-categories/>.

² <https://www.epa.gov/cwns/clean-watersheds-needs-survey-cwns-2012-report-and-data>.

to upgrade, modernize, and increase the efficacy and sustainability of the nation’s water-related infrastructure.

Sustainable Wastewater Infrastructure

In 2011, the EPA approved a *Clean Water and Drinking Water Sustainability Policy* that called for “increasing the sustainability of water infrastructure in the U.S. and the communities it serves.”³ This statement of policy establishes that “Federal investments, policies, and actions should support water infrastructure in more efficient and sustainable locations to best support existing communities, enhance economic opportunities, and promote affordable neighborhoods,” and highlights the importance of cost-effective, life-cycle planning, the efficient use of resources, the utilization of natural or green infrastructure systems, and addressing potential climate change impacts in achieving utility sustainability.⁴

In furtherance of its sustainability policy, the EPA has highlighted four factors for the “Path to Sustainable Water Infrastructure”: (1) water and energy efficiency, (2) asset management, (3) wastewater treatment clearinghouse, and (4) alternative technologies and assessment.⁵

Water and Energy Efficiency

Energy use can account for as much as 10 percent of a local government’s annual operating budget.⁶ A significant amount of this municipal energy use occurs at water and wastewater treatment facilities. With pumps, motors, and other equipment operating 24 hours a day, seven days a week, water and wastewater facilities can be among the largest consumers of energy in a community—and thus among the largest contributors to the community’s total greenhouse gas (GHG) emissions.⁷

Nationally, the energy used by water and wastewater utilities accounts for 35 percent of typical U.S. municipal energy budgets.⁸ Electricity use accounts for 25 to 40 percent of the operating budgets for wastewater utilities and approximately 80 percent of drinking water processing and distribution costs.⁹ Drinking water and wastewater systems account for approximately 3 to 4 percent of overall energy use in the United States, equivalent to approximately 56 billion kilowatts, and a cost of \$4 billion, and resulting in the emissions of more than 45 million tons of GHGs annually.¹⁰

According to the EPA, utilities can reduce the economic costs and environmental impacts of wastewater treatment by improving the energy efficiency of wastewater facilities’ equipment and operations, by promoting the efficient use of water, and by capturing the energy in wastewater to generate electricity and heat.¹¹ Improvements in energy efficiency allow the same work to be done with less energy and cost. The

³ <https://www.epa.gov/sites/production/files/2016-01/documents/clean-water-and-drinking-water-infrastructure-sustainability-policy.pdf>.

⁴ See id.

⁵ <https://www.epa.gov/sustainable-water-infrastructure/building-sustainable-water-infrastructure>.

⁶ See U.S. EPA, “Energy Efficiency in Water and Wastewater Facilities: A Guide to Developing and Implementing Greenhouse Gas Reduction Programs” (2013).

⁷ See id.

⁸ See id.

⁹ See id.

¹⁰ See id. See also, <https://www.epa.gov/sustainable-water-infrastructure/water-and-energy-efficiency-utilities-and-home>.

¹¹ See id. See also, <https://www.energy.gov/eere/slsc/wastewater-infrastructure>, which notes that, according to the U.S. Department of Energy, wastewater contains about five times more energy than is needed for its treatment in terms of untapped thermal energy, which can be captured and used to generate energy.

EPA estimates that, by incorporating energy efficiency practices into their water and wastewater plants, municipalities and utilities can save 15 to 30 percent on their operating costs, saving thousands of dollars with payback periods (or the amount of time required to pay back the cost of the upgrade through potential cost savings resulting from the upgrade) of only a few months to a few years.¹² Improvements in water use efficiency reduce demand for water, which in turn reduces the amount of energy required to treat and distribute water.

Water and wastewater facilities around the country are also adopting renewable energy technologies, including combined heat and power, sludge digester methane use, solar panels installation, and wind turbines. For example, capturing the energy in wastewater by burning biogas from anaerobic digesters in a combined heat and power system allows wastewater facilities to produce some or all of their own electricity and space heating, potentially turning them into “net zero” consumers of energy.

Local governments can also reduce energy use at water and wastewater facilities through measures such as water conservation, water loss prevention, reduction of stormwater into wastewater collection and treatment systems, and sewer system repairs to prevent ground water infiltration. Measures to reduce water consumption, water loss, and the creation of wastewater can lead to reductions in energy use, and result in savings associated with recovering and treating lower quantities of wastewater and treating and delivering lower quantities of potable public water.¹³

Asset Management

Asset management is a technique wastewater utilities can use to manage costs and make sure that planned maintenance can be conducted and capital assets (pumps, motors, pipes, etc.) can be repaired, replaced, or upgraded on time.

Asset management allows a utility to optimize management of infrastructure capital assets and minimize the total cost of owning and operating these assets while delivering the desired service levels. Many utilities use asset management to pursue and achieve sustainable infrastructure. A high-performing asset management program includes detailed asset inventories, operation and maintenance tasks, and long-range financial planning to cover operational, maintenance, and capital costs.¹⁴

Wastewater Treatment Clearinghouse

As required by section 4102 of the *America's Water Infrastructure Act of 2018*, EPA created a wastewater technology clearinghouse to provide utilities with information and resources on the cost-effectiveness and performance of innovative, alternative, and reuse technologies for wastewater.¹⁵ As communities continue to invest in our nation's wastewater infrastructure, the clearinghouse is intended to help fill a critical information gap on adopted innovative, alternative, and reuse technologies that can inform local utilities on potential wastewater management alternatives, particularly for communities with small, midsize, and decentralized wastewater systems.¹⁶

¹² <https://www.epa.gov/sustainable-water-infrastructure/energy-efficiency-water-utilities>.

¹³ See id at 8.

¹⁴ See <https://www.epa.gov/sustainable-water-infrastructure/asset-management-water-and-wastewater-utilities>.

¹⁵ P.L. 115-270.

¹⁶ See <https://ofmpub.epa.gov/apex/wfc/?p=259:1:10842554757134>.

Alternative Technologies and Assessment

The fourth element suggested by the EPA for greater sustainability is selecting the right solution to meet an identified wastewater need, including the evaluation of different alternatives, such as new technologies, an evaluation of centralized versus decentralized wastewater treatment systems, and the utilization of green infrastructure approaches to local water quality challenges.¹⁷

Section 502 of the *Clean Water Act* defines green infrastructure as “... the range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspire stormwater and reduce flows to sewer systems or to surface waters.”¹⁸

According to the EPA, green infrastructure can frequently provide a cost-effective, resilient approach to managing wet weather impacts that provides many community benefits.¹⁹ While single-purpose gray stormwater infrastructure—conventional piped drainage and water treatment systems—is designed to move urban stormwater away from the built environment, green infrastructure—such as downspout disconnections, green roofs, bioswales, and green streets—reduces and treats stormwater at its source while delivering environmental, social, and economic benefits.²⁰

Stormwater runoff is a major cause of water pollution in urban areas.²¹ When rain falls on roofs, streets, and parking lots in cities and their suburbs, the water cannot soak into the ground. Stormwater drains through gutters, storm sewers, and other engineered collection systems and is discharged into nearby water bodies. The stormwater runoff carries trash, bacteria, heavy metals, and other pollutants from the urban landscape. Higher flows resulting from heavy rains also can cause erosion and flooding in urban streams, damaging habitat, property, and infrastructure.²²

Green infrastructure is designed to use vegetation, soils, and other elements and practices to restore some of the natural processes required to manage water and create healthier urban environments.²³ At the city or county scale, green infrastructure is a patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water. At the neighborhood or site scale, stormwater management systems that mimic natural systems can soak up and store water.

Climate Resiliency

In addition to the four factors identified by the EPA for sustainable wastewater infrastructure, a growing concern is the resiliency of water and wastewater utilities to extreme weather events and the challenges posed by changing climate conditions.

¹⁷ See <https://www.epa.gov/sustainable-water-infrastructure/alternative-technologies-and-assessment-water-and-wastewater#green>.

¹⁸ See Section 502(27) of the Clean Water Act.

¹⁹ See <https://www.epa.gov/green-infrastructure/what-green-infrastructure>.

²⁰ See id.

²¹ See id.

²² See id. See also <https://www.nrdc.org/stories/green-infrastructure-how-manage-water-sustainable-way>.

²³ See id.

In 2017, a working group of water and wastewater experts, co-chaired by EPA, found that natural disasters are among the most significant risks to the nation’s drinking water and wastewater infrastructure.²⁴ Those natural disasters include acute disasters related to extreme weather events, such as floods and hurricanes, and chronic hazards related to climate change, such as drought and sea level rise.

Similarly, a 2009 study by a global engineering company reported that failure to plan for the potential impacts of climate change may lead to loss of water and wastewater treatment services for homes, municipalities, and industry with consequences to human health and the economy.²⁵

In January 2020, the U.S. Government Accountability Office (GAO) completed a study of the resiliency of water and wastewater utilities to climate change.²⁶ GAO recommended that: (1) EPA work with utilities to incorporate climate resilience into infrastructure projects, and (2) Congress should consider requiring that climate resilience be considered in planning for federally funded water infrastructure projects.²⁷

Statutory Provisions Related to Sustainable Infrastructure

In the past two decades, Congress has enacted several amendments to the *Clean Water Act* to promote the implementation of sustainable wastewater infrastructure.

In 2009, Congress enacted the *American Recovery and Reinvestment Act (Recovery Act)*²⁸ to stimulate the U.S. economy and address a range of other policy objectives. The *Recovery Act* provided \$4 billion for the Clean Water State Revolving Fund (SRF) for wastewater infrastructure projects. In addition, the *Recovery Act* authorized the so-called “green reserve,” which required states to use not less than 20 percent of *Recovery Act* grants “to the extent there are sufficient eligible project applications ... for projects to address green infrastructure, water or energy efficiency improvements or other environmentally innovative activities.” The green reserve has been carried forward each year since 2009 through enactment in the annual appropriations bills for the Clean Water SRF.²⁹

In 2014, Congress amended the *Clean Water Act*, to encourage further adoption of sustainable wastewater infrastructure practices by publicly owned utilities.³⁰ For example, Congress amended the requirements for utilities that receive funding from the Clean Water SRF to: (1) require that utilities certify they have selected alternatives that maximize the potential for efficient water use, reuse, recapture, and conservation, and energy conservation;³¹ (2) require that utilities develop and implement a fiscal sustainability plan;³² (3) allow states to offer financial incentives for the implementation of technologies to

²⁴ See Water and Wastewater Sector Strategic Roadmap Work Group, “Roadmap to a Secure and Resilient Water and Wastewater Sector” (2017).

²⁵ See CH2M Hill, Inc., “Confronting Climate Change: An Early Analysis of Water and Wastewater Adaptation Costs” (2009).

²⁶ U.S. GAO, “Water Infrastructure: Technical Assistance and Climate Resilience Planning Could Help Utilities Prepare for Potential Climate Change Impacts” ([GAO-20-24](#)).

²⁷ See id.

²⁸ Pub. L. 111-5.

²⁹ In fiscal year 2021, the green reserve required states to utilize “not less than 10 percent” of Clean Water SRF funds for “projects to address green infrastructure, water or energy efficiency improvements, or other environmentally innovative activities”. See Pub. L. 116-260.

³⁰ Pub. L. 113-121.

³¹ Section 601(b)(13) of the Clean Water Act.

³² Section 603(d)(1)(E) of the Clean Water Act.

address water-efficiency, energy-efficiency, and sustainable projects;³³ and (4) authorize the expenditure of Clean Water SRF funds for projects to reclaim or recycle wastewater and stormwater, to implement water conservation, efficiency or reuse, to increase the resiliency of wastewater utilities to extreme weather events and sea-level rise, and to reduce the energy consumption needs of wastewater utilities.³⁴

In the 116th Congress, the Committee on Transportation and Infrastructure approved H.R. 1497, the *Water Quality Protection and Job Creation Act of 2019*, by voice vote, and similar legislation was passed by the House as part of H.R. 2, the *Moving Forward Act*. These bills would have reauthorized and increased the authorized level of federal appropriations for the Clean Water SRF program at levels more commensurate with local water infrastructure needs, as well as reauthorized several existing *Clean Water Act* grant authorities. In addition, these proposals would have extended the existing green infrastructure reserve;³⁵ established a new grant authority to promote increased resilience of wastewater utilities; established set-asides of federal resources for rural and small communities; codified set-asides for Indian tribes and U.S. territories; and included several provisions to address the cost of wastewater service to low-income customers and households. No further action was taken on these proposals in the 116th Congress.

WITNESSES

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³³ Section 603(i)(1)(B) of the Clean Water Act.

³⁴ Sections 122 and 603(c) of the Clean Water Act.

³⁵ The Green Reserve in H.R. 1497/H.R. 2 would have required states, to the extent that there are sufficient projects or activities eligible for assistance, to utilize not less than 15 percent of their Clean Water SRF capitalization grant for projects to address green infrastructure, water or energy efficiency improvements, or other environmentally innovative activities.