Congressional Research Service
Informing the legislative debate since 1914

Paying for Drinking Water: Background and Issues for Congress

November 19, 2024

Congressional Research Service
https://crsreports.congress.gov
R48271

CRS REPORT
Prepared for Members and
Committees of Congress

Congressional Research Service
Informing the legislative debate since 1914

SUMMARY

R48271

November 19, 2024

Elena H. Humphreys
Analyst in Environmental Policy

Paying for Drinking Water: Background and Issues for Congress

For decades, the affordability of drinking water services has been a concern of Congress, dating back to the 1974 enactment of the Safe Drinking Water Act (SDWA). Over time, system costs to maintain or improve existing infrastructure have increased, potentially straining the financial capacity of the system. At the same time, an individual's water service costs have also increased, and such increases may affect an individual's ability to afford or pay for basic services. A 2024 American Water Works Association (AWWA) survey found that about 73% of the participating systems self-reported that they plan to increase water rates in the upcoming year.

Water affordability can be considered in different ways. One involves identifying what is affordable for a community, namely the system's financial capacity. Another pertains to what is affordable to an individual or household.

Congress is weighing various approaches to support drinking water systematically or individually and the extent to which water affordability is a federal or a nonfederal responsibility. Congress has amended the SDWA to improve systems' financial capacity by encouraging water system planning and by establishing federal financial assistance programs to make capital infrastructure projects more affordable. Congress provided appropriations for a Department of Health and Human Services-administered water rate assistance program for low-income individuals during the COVID-19 pandemic. Further, Congress authorized a grant program administered by the Environmental Protection Agency (EPA) for water systems to provide household water rate assistance.

Households, businesses, and other residences that pay for water are served typically by a *community water system*. These systems by definition regularly serve at least 25 individuals year-round. Almost 50,000 community water systems operate in the United States. Most systems are relatively small; 81% of community water systems serve 3,300 or fewer individuals. Of the nearly 50,000 systems, about half are owned by a local government. Almost all of the remaining half are owned by a private entity. Of these private systems, more than 95% are relatively small, serving 3,300 or fewer individuals.

The two main categories of water system costs are operations and maintenance (O&M) costs and capital expenses, which include the costs to upgrade, repair, or replace capital infrastructure (e.g., transmission and distribution lines or treatment technologies). Generally, O&M covers the activities needed to (1) ensure the system produces and distributes treated water, and (2) ensure that the treatment plant and other equipment is working. Both O&M and capital costs are generally recouped, to some degree, through customer water rates. An EPA 2008 guidance document recommended that the pricing of water services cover both O&M costs and capital expenses.

There are several ways to evaluate the factors that change the cost to provide water. One way is to identify and analyze factors that may affect any one water system. Water system costs may vary depending on factors specific to a system, such as its location, age, and energy source. External factors, such as changes in equipment and material costs or labor costs, may also affect water system costs. Whether all costs are included in water rates or how costs are spread across the customer base varies among systems. In an AWWA 2024 survey, roughly 20% of the 600 participating water systems stated that they were "fully able to cover costs [e.g., annual operations and maintenance expenses, capital costs] through rates." Other systems may not implement full cost recovery pricing for a variety of reasons.

Water systems may take actions to address household water rate affordability, or actions to reduce water system costs, which then may affect rates. For example, a system may establish an assistance program to help low-income customers afford their water bills and/or share water system expenses (e.g., joint purchasing of chemicals or sharing an operator) to keep costs lower. Whether a system takes these actions or not likely depends on the specific circumstances of the system as well as potential local and state requirements that apply.

Questions over whether and, if so, how to address water affordability at both the system and individual level are likely to continue, particularly due to the increased need for drinking water infrastructure projects, and other regulatory actions. Trade-offs exist involving the various approaches and specific policy objectives. Given water systems' varying characteristics, challenges exist to crafting a singular national-level program to address water affordability. As such, an incentive may exist to continue addressing water affordability through existing mechanisms rather than by establishing new programs.

Contents

Figures

Contacts

Introduction

For decades, the affordability of drinking water services has been a concern of Congress, dating back to the 1974 enactment of the Safe Drinking Water Act (SDWA).[1] Balancing federal requirements for health protection and costs is a primary focus of the act.

Over time, system costs to maintain or improve existing infrastructure have increased, potentially straining the financial capacity of the system. In addition, regulatory costs have increased with the establishment of new—and revision of existing—SDWA regulations for contaminants. Cost increases associated with regulations are not a new concern, as at least three decades ago, stakeholders projected water bill increases related to proposed federal regulations.[2] More recently, a 2024 survey found that 73% of the participating water systems self-reported that they planned to increase water rates in 2024.[3]

At the same time, an individual's water service costs have also increased, and such increases may affect an individual's ability to afford or pay for basic services.[4] From 1998 to 2024, Bureau of Labor Statistics (BLS) data indicate that household payments for water and sewer services have increased at more than double the rate of inflation.[5] In response to an optional survey of selected water systems by the Department of Health and Human Services, these systems reported that an average of 20% of their customers fell behind on water payments in 2022.[6]

Congress is weighing various approaches to support drinking water systematically or individually and the extent to which water affordability is a federal or a nonfederal responsibility. Water affordability can be evaluated at the water system level (i.e., a system's financial capacity) or at the household level (i.e., a household's ability to afford water service).

Congress has primarily addressed water affordability through authorities and programs intended to support water systems' compliance with federal SDWA regulations. Accordingly, the federal role in addressing water affordability has largely been defined in the context of regulatory compliance. The 117th Congress provided increased appropriations for some drinking water

[1] Safe Drinking Water Act of 1974 (SDWA; P.L. 93-523), enacted December 16, 1974. SDWA is codified at 42 U.S.C. §300f et seq.

[2] In 1994, the Congressional Budget Office (CBO) estimated that then-proposed federal drinking water regulations may double or triple household water bills. Congressional Budget Office (CBO), *A Preliminary Analysis of Unfunded Federal Mandates and the Cost of the Safe Drinking Water Act*, Washington, DC, September 1994. In 2012, the American Water Works Association (AWWA) estimated that the costs to address aging drinking water infrastructure may as much as triple household water rates in some cases. AWWA, "Buried No Longer," 2012, p. 10.

[3] AWWA, *State of the Water Industry 2024*, https://www.awwa.org/Professional-Development/Utility-Managers/State-of-the-Water-Industry#SOTWI_Report.

[4] To assess community affordability, the U.S. Environmental Protection Agency (EPA) generally uses a threshold for water bills of 2.5% (or 4.5% for both water and wastewater services) of the area's median household income. National Drinking Water Advisory Council, *Recommendations of the National Drinking Water Advisory Council to U.S. EPA on Its National Small Systems Affordability Criteria*, July 2003, https://www.epa.gov/sites/default/files/2015-09/documents/recommendations-of-the-ndwac-to-us-epa-on-its-nssa-criteria.pdf. Some researchers estimate that 10%-14% of households have water and wastewater expenditures above 4.5% of annual household income. See the following publications: Diego S. Cardoso and Casey J. Wichman, "Water Affordability in the United States," *Water Resources Research*, vol. 58, no. 12 (December 2022); Lauren A. Patterson, Sophia A. Bryson, and Martin W. Doyle, "Affordability of Household Water Services Across the United States," *PLOS Water*, vol. 2, no. 5 (May 10, 2023).

[5] CRS analysis of Bureau of Labor Statistics (BLS) data for the following series: CUUR0000SEHG01, CUUR0000SA0, and CUUR0000SEHG.

[6] The Department of Health and Human Services (HHS) Office of Community Services, *Understanding Water Affordability Across Contexts: LIHWAP Water Utility Affordability Survey Report*, February 2024, https://www.acf.hhs.gov/sites/default/files/documents/ocs/LIHWAP%20Survey%20Report%20v5.pdf.

infrastructure assistance programs.[7] Over time, increases in the identified estimates of needed water infrastructure improvements raise questions over the effect of the existing programs as well as the effect of a water system's financial practices on a system's operational sustainability. In the 118th Congress, legislative activity includes proposals to authorize programs to assist low-income households with water bills.[8]

This report provides an overview of the nation's water systems and the costs of providing water service and analyzes factors that may affect those costs. This report's discussion of these factors is meant to be illustrative; as such, it does not estimate the relative contribution of the specific factors to a water system's costs or rates. In addition, it covers the primary mechanisms that Congress has used to address water service affordability in the past and provides considerations and trade-offs for policymakers.

Community Water System Characteristics

Households, businesses, and other residences that pay for water are served typically by a community water system.[9] These systems by definition regularly serve at least 25 individuals year-round.[10] Almost 50,000 community water systems operate in the United States.[11] Most are relatively small; 81% of community water systems serve 3,300 or fewer individuals. Of the nearly 50,000 systems, about half are owned and operated by a local government,[12] and about half are owned and operated by a private entity.

Roughly 47% of the population that receives water from a water system is served by a water system serving more than 100,000 individuals. Most of these systems are owned by local governments, and most use surface water as their source. In contrast, water systems serving 3,300 or fewer individuals serve 7% of the population. Most of these systems are owned by a private entity, and most use groundwater as their source.

Water System Costs

This section identifies the main costs associated with providing water service and analyzes what factors may affect these costs. The two main categories of water system costs are operations and maintenance (O&M) and capital investments. Generally, O&M covers the activities needed to (1) ensure the system produces and distributes treated water, and (2) ensure that the treatment plant

[7] See CRS Report R46892, *Infrastructure Investment and Jobs Act (IIJA): Drinking Water and Wastewater Infrastructure*, by Elena H. Humphreys and Jonathan L. Ramseur, for more information.

[8] See, for example, H.R. 5793, H.R. 8032, H.R. 10150, and S. 3830 of the 118th Congress. In addition, the Senate Subcommittee on Fisheries, Water, and Wildlife held a hearing on small system assistance and water affordability. U.S. Congress, Senate Environment and Public Works Committee, Fisheries, Water, and Wildlife, *Water Affordability and Small System Assistance*, 118th Cong., 2nd sess., May 31, 2023.

[9] In addition, EPA established two other categories of public water systems. A *nontransient noncommunity water system* (NTNCWS) regularly supplies water to at least 25 of the same people at least six months per year but not year-round (e.g., schools, factories, office buildings, and hospitals that have their own wells). *Transient noncommunity water systems* (TNCWS) provide water in places where people do not remain for long periods, such as gas stations and campgrounds.

[10] SDWA §1401(14); 42 U.S.C. §300f(14).

[11] EPA, Safe Drinking Water Information System (SDWIS) database, accessed July 15, 2024, https://sdwis.epa.gov/ords/sfdw_pub/r/sfdw/sdwis_fed_reports_public/1?clear=1.

[12] About 5% of community water systems are owned by tribal, state, or federal governments or through public-private partnerships.

and other equipment is working.[13] Capital investments include projects to replace or upgrade the system's physical infrastructure (e.g., pipelines, pump stations, or treatment technologies). These costs are spread across the system's customer base as water rates (further discussed in "Water Rates and Considerations"), though capital improvement costs may be financed with federal or other support.

Operations and Maintenance (O&M) Costs

While water systems differ, several core components comprise a water system's O&M costs. Examples of typical operations costs include the cost to purchase energy (e.g., electricity or fuel) to run treatment technologies and to maintain pressure within the distribution system, and to purchase chemicals needed for treatment. Paying the water system operators, technicians, and other staff are also operational costs. Other costs may involve the costs associated with sampling and monitoring for contaminants, such as laboratory testing fees, as well as reporting activities. Operations costs include these and other costs that are ongoing and exist as a function of the water system's operation.

The cost to maintain the system's existing *vertical infrastructure*, consisting of its treatment infrastructure, water source, pumping stations and storage facilities, as well as the *horizontal/linear infrastructure*, namely its transmission and distribution network, make up a system's maintenance costs. These costs generally include repairs to the existing infrastructure as well as replacement of parts and other components. Maintenance can be planned, to prevent damage or to mitigate infrastructure deterioration, or be unplanned, such as repairs to a broken water main.

Costs for Capital Improvements

A water system's capital assets consist of the system's source water (e.g., reservoir), treatment, storage, and transmission and distribution infrastructure. Capital improvement costs include the costs to upgrade, replace, or improve a water system's capital infrastructure. The need for capital improvements, and accordingly the costs to complete these projects, typically occur on a longer time frame than O&M costs. Further, the costs for such projects can be higher, and as such, water systems may finance capital improvements by using bonds, loans, or other long-term debt instruments.

SDWA requires the Environmental Protection Agency (EPA) to assess the "capital improvement needs of eligible public water systems" every four years.[14] EPA has published seven reports on the nation's drinking water infrastructure needs, divided by categories of capital infrastructure (i.e., source, treatment, storage, and transmission and distribution infrastructure).

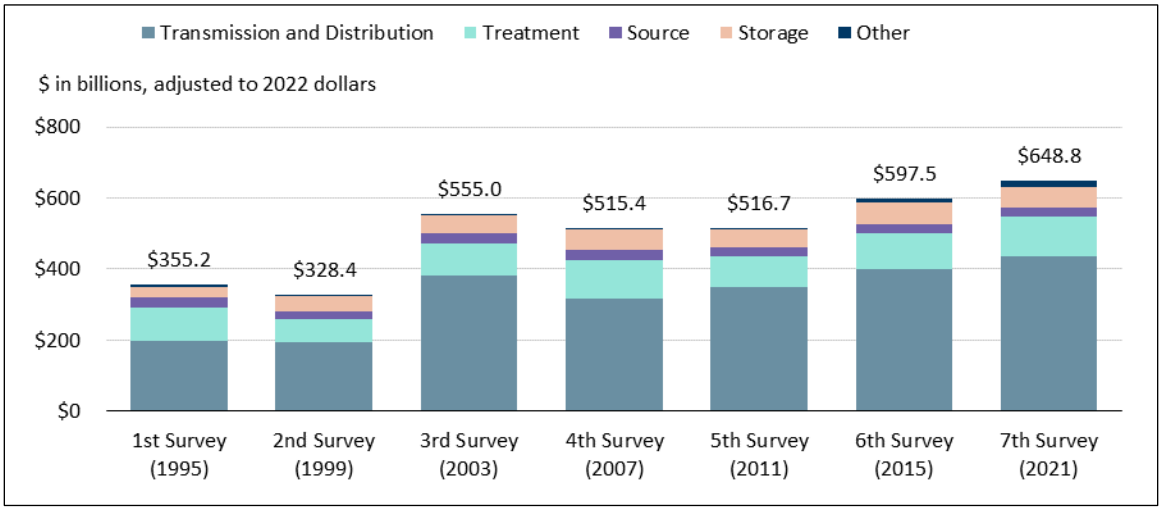
After adjusting for inflation, **Figure 1** identifies that EPA's estimates of drinking water capital infrastructure needs have generally increased over the seven surveys. However, making comparisons between surveys is complicated, as EPA's implementation of these surveys has

[13] EPA, *The Clean Water and Drinking Water Infrastructure Gap Analysis*, EPA-816-R-02-020, Washington, DC, September 2002.

[14] SDWA §1452(h); 42 U.S.C. §300j-12(h). EPA must report each needs assessment to Congress. Concurrently, and in consultation with the Indian Health Service within the U.S. Department of Health and Human Services and Indian tribes, EPA is required to assess needs for drinking water treatment facilities that serve Indian tribes and Alaska Native villages. This report does not discuss tribal and Alaska Native drinking water infrastructure needs.

changed over time.[15] Specifically, the first survey included estimates for dam and raw water reservoir projects, and did not survey nonprofit noncommunity water systems. In the third survey, EPA first made changes intended to encourage systems to evaluate their assets, and estimate what rehabilitation and replacement projects would be needed over the long term. EPA continued these changes in subsequent surveys.

Figure 1. EPA's Estimates of 20-Year Drinking Water Capital Infrastructure Need



Source: Calculated by CRS from EPA, *Drinking Water Infrastructure Needs Survey: First Report to Congress*, 1997; EPA, *Drinking Water Infrastructure Needs Survey: Second Report to Congress*, 2001; EPA, *Drinking Water Infrastructure Needs Survey: Third Report to Congress*, 2005; EPA, *Drinking Water Infrastructure Needs Survey and Assessment: Fourth Report to Congress*, 2009; EPA, *Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress*, 2013; EPA, *Drinking Water Infrastructure Needs Survey and Assessment: Sixth Report to Congress*, 2018; EPA, *Drinking Water Infrastructure Needs Survey and Assessment: Seventh Report to Congress*, 2023; and the U.S. Bureau of Economic Analysis (BEA), "Table 5.9.4. Price Indexes for Gross Government Fixed Investment by Type," accessed October 17, 2023.

Notes: Values may not total due to rounding. CRS adjusted for inflation using BEA's Table 5.9.4 price index data from line 42, "water systems." BEA Table 5.9.4 includes estimated needs for states and territories. The first survey included estimates for dam and raw water reservoir projects, and did not survey nonprofit noncommunity water systems. In the third survey, EPA made changes intended to encourage systems to evaluate their assets, and estimate what rehabilitation and replacement projects would be needed over the long term.

Factors Affecting Water System Costs

An analysis of the relative effect of each factor in annual water system costs is beyond the scope of this report. Water systems' annual costs vary, and data are limited for the average annual water system costs. It is possible to divide factors into those that are specific to a system and those that are externally driven. Given this, the following section provides a general overview of the factors that may affect a water system's costs.

Water-System-Specific Cost Factors

Water system costs may vary depending on factors specific to a system, such as its location, age, and energy source. For example, the location of a water system generally determines the source

[15] See CRS Report R47878, *Drinking Water Infrastructure Needs: Background and Issues for Congress*, by Elena H. Humphreys, for more information on these surveys.

of water for that system. A water source's availability and quality may vary by location. For example, in groundwater, the presence of naturally occurring contaminants (e.g., arsenic or radionuclides) varies depending on geology.[16] Other contaminants' occurrence may vary depending on industrial or agricultural activities that take place or took place in the location. As such, location plays a role in determining what a system requires in terms of treatment to comply with drinking water regulations.

Further, location may determine whether a system is affected by changes to source water quality or in availability due to changes in hydrologic patterns (e.g., drought). A system that, based on its location, would need to secure an alternative or additional water source or treat degraded source water would likely incur costs to do so. For example, if a system relied on groundwater that had degraded over time, the system may need to install additional treatment or an alternative source, which could change both capital and O&M costs.

A water system's location may also play a role in whether that system is affected by an event that damages infrastructure. Natural hazards, such as hurricanes, floods, wildfires, and earthquakes, vary by location and may damage a water system's infrastructure, resulting in costs to repair or replace damaged infrastructure. An individual system's costs would likely depend on the degree to which a water system's infrastructure is resilient to damage from such events.

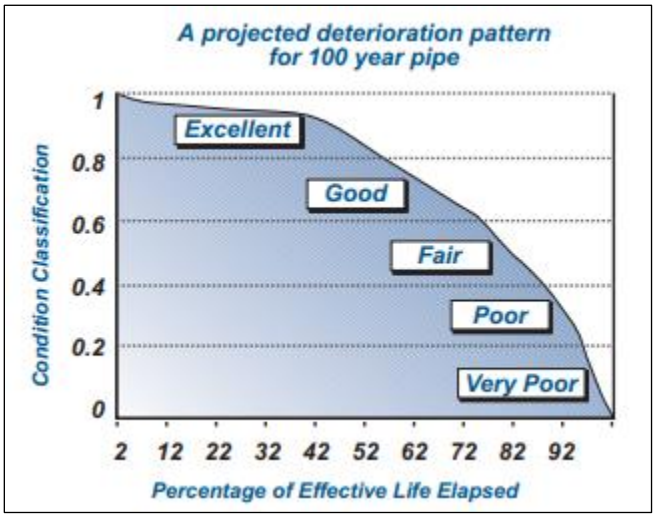
Another water-system-specific factor is the system's infrastructure age. A newer system with newer vertical and/or horizontal/linear infrastructure would likely cost less to maintain than an older system's infrastructure, as the need for repairs increases with age.[17] EPA has mapped this relationship, known as a *deterioration curve*; see **Figure 2**. Accordingly, after installation, the cost to maintain the infrastructure may be low as the infrastructure is likely less deteriorated. Later in the infrastructure's useful life, it may deteriorate more rapidly, require more repairs, and accordingly cost more to maintain, or eventually require replacement.[18] The total duration of the infrastructure's useful life depends on multiple site-specific factors.

[16] EPA, *Getting Up to Speed: Ground Water Contamination,* https://www.epa.gov/sites/default/files/2015-08/documents/mgwc-gwc1.pdf.

[17] EPA, *The Clean Water and Drinking Water Infrastructure Gap Analysis.*

[18] EPA, *The Clean Water and Drinking Water Infrastructure Gap Analysis*.

Figure 2. Pipeline Deterioration Curve



Source: U.S. Environmental Protection Agency, *The Clean Water and Drinking Water Infrastructure Gap Analysis*, EPA-816-R-02-020, Washington, DC, September 2002.

Notes: This graph is illustrative of a general pattern, though this specific timeline may not apply to all infrastructure material types.

In 2003, EPA reported that the majority of the nation's transmission and distribution systems were constructed after the 1960s.[19] Much of this transmission and distribution network is at some point on the deterioration curve. As stated by EPA, pipes of the same material can last anywhere from 15 years to more than 200 years based on the characteristics of the soil.[20] Thus, the costs would likely also depend on these system-specific characteristics.

Another factor affecting costs specific to a system is the costs of the system's energy. Location may affect a water system's energy costs. For example, the U.S. Energy Information Administration (EIA) reported that, in 2022, the annual average electricity price ranged from 39.85 cents per kilowatt hour (kWh) in Hawaii to 8.24 cents per kWh in Wyoming.[21] EIA stated that Hawaii's prices are higher relative to other states as a result of its electricity being generated with imported petroleum fuels. EIA lists the factors affecting electricity prices as fuel (and fuel price), power plant costs, cost for the transmission and distribution system, weather conditions, and regulations.[22]

Further, an individual system's energy costs may depend on the energy intensity of the water system's treatment technologies. Activities or technologies that change energy consumption may affect a system's operating costs. EPA finds that energy costs may be up to 40% of the operating costs of a typical drinking water system.[23]

[19] EPA, *Using DWSRF Funds for Transmission and Distribution Infrastructure Needs*, EPA 816-F-03-003, Washington, DC, February 2003.

[20] EPA, *The Clean Water and Drinking Water Infrastructure Gap Analysis*.

[21] U.S. Energy Information Administration, *Electric Power Monthly*, Table 5.6.B, February 2023, preliminary data.

[22] U.S. Energy Information Administration, *Electricity Explained: Factors Affecting Electricity Prices*, Washington DC, June 29, 2023, https://www.eia.gov/energyexplained/electricity/prices-and-factors-affecting-prices.php.

[23] EPA, *Energy Efficiency for Water Utilities*, last updated June 2024, https://www.epa.gov/sustainable-water-infrastructure/energy-efficiency-water-utilities/.

External Factors

External factors, such as new federal or state regulations, may also affect water system costs. For example, in 2024, EPA finalized a drinking water regulation to address per- and polyfluoroalkyl substances (PFAS) and revised the regulation to address lead (and copper), which requires the replacement of lead service lines (i.e., pipes) within 10 years.[24] EPA's final PFAS drinking water regulation states that between 6% and 10% of water systems subject to the rule would have to take steps to comply with the rule's drinking water standards.[25] Specifically, after completing initial monitoring, the rule requires water systems with detections exceeding the rule's PFAS standards to implement solutions to reduce PFAS in their public water supplies.[26] For the systems needing to take steps to comply with the rule, EPA estimates that, depending on a system's characteristics, their average annual costs to treat or change their water source would range from $19,918 for systems serving 100 or fewer individuals to $3,022,150 for systems serving more than 100,000 individuals (in 2022 dollars).[27] For household costs, EPA estimates that the average increase would be $915 for those served by smaller systems and $32 for those served by larger systems (in 2022 dollars).[28] In addition, such capital infrastructure improvements can change the costs for a water system to operate. For example, installing advanced treatment technologies may result in higher O&M costs, as such technologies may require more energy to operate or could generate waste material that would require disposal in specific landfills.[29]

Examples of external factors that may affect water system costs include changes in the costs of equipment, material, and/or labor. For example, between 2019 and 2023, BLS data indicate that the average annual wage (not adjusted for inflation) for workers in the water sector increased by more than 19%.[30] While BLS forecasts that water utility employment will decline over 10 years, the agency projects that, due to job changes or retirements, roughly 10,500 jobs will open each year over the same period.[31] The extent to which more experienced employees are replaced by new employees with different salaries may change a water system's labor costs.

[24] EPA, "EPA's Lead and Copper Rule Improvements October 2024," October 8, 2024, https://www.epa.gov/system/files/documents/2024-10/final_lcri_fact-sheet_general_public.pdf.

[25] EPA, "PFAS National Primary Drinking Water Regulation," 89 *Federal Register* 32600, April 26, 2024. To address PFAS, a system may take a nontreatment step, like installing a new well or alternative water source or integrating or consolidating service with another system. EPA assumes that a small number of water systems would be taking nontreatment actions in lieu of installing treatment.

[26] EPA, "PFAS National Primary Drinking Water Regulation," 89 *Federal Register* 32600, April 26, 2024.

[27] EPA, *Economic Analysis for the Final Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation Appendices*, EPA-815-R-24-002, April 2024, https://www.epa.gov/system/files/documents/2024-04/pfas-npdwr_final-rule_ea_appendices.pdf.

[28] EPA, *Economic Analysis for the Final Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation Appendices*, EPA-815-R-24-002, April 2024, https://www.epa.gov/system/files/documents/2024-04/pfas-npdwr_final-rule_ea_appendices.pdf.

[29] See, for example, EPA, *Work Breakdown Structure-Based Cost Model for Granular Activated Carbon Drinking Water Treatment*, March 2023, https://www.epa.gov/system/files/documents/2022-03/gac-documentation-.pdf_0.pdf.

[30] After adjusting for inflation, the purchasing power of a water utility employee's salary stayed roughly level over the same period. BLS, "National Industry-Specific Occupational Employment and Wage Estimates for Water, Sewage and Other Systems," https://www.bls.gov/oes/current/naics4_221300.htm; https://www.bls.gov/oes/2019/may/naics4_221300.htm. CRS adjusted for inflation by following BLS guidance from "Measuring Real Change in the ECI: Constant Dollar Estimates" at https://www.bls.gov/eci/factsheets/eci-constant-dollar-factsheet.htm.

[31] BLS, *Occupational Outlook Handbook: Water and Wastewater Treatment Plant and System Operators*, last modified April 2024, https://www.bls.gov/ooh/production/water-and-wastewater-treatment-plant-and-system-operators.htm#:~:text=in%20May%202023.-,Job%20Outlook,on%20average%2C%20over%20the%20decade.

Certain chemicals needed by water systems may be affected by specific production capacity challenges. One example is the chemicals needed to disinfect water. In 2006, EPA estimated that more than 80% of systems use chemical disinfectants (e.g., chlorine, chloramines, or chlorine dioxide) to kill harmful microbes.[32] EPA reported in 2022 that chlorine production in the United States had decreased approximately 10%, contributing to regional shortages.[33] In 2024, the American Water Works Association (AWWA) cited these production capacity issues, as well as other issues, as contributing to a reported 120% increase in the cost of this chemical.[34] Chlorine prices may be affected by other disruptions, such as logistics.[35] The effect on a specific water system's annual costs would depend on the system's use of these chemicals, and the magnitude of their cost relative to other water system costs.

Water Rates and Considerations

Typically, systems charge their customers a rate to support the costs to provide water service. Whether all costs (i.e., O&M and capital improvements) are included or how costs are spread across the customer base varies among systems. In an AWWA 2024 survey, roughly 20% of the 600 water systems that participated stated that they were "fully able to cover costs [e.g., annual operations and maintenance expenses, capital costs] through rates and fees."[36]

Systems use different rate structures. These include uniform rates for all users or tiered rates, which can encourage water conservation. While publicly available water rate data are limited,[37] rate information from an AWWA survey provides some information on a subset of water systems' rate-setting practices.[38] This survey relies on water rate data submitted by roughly 400 water systems that are members of AWWA. These systems comprise less than 1% of the total number of community water systems. While AWWA notes that "small, medium, and large" systems participated in the water rate survey,[39] the survey may not represent the rate setting practices of water systems, given the proportion of water systems that serve 3,300 or fewer individuals.

Of the approximately 400 water systems participating in the 2022 and 2023 survey, roughly half used an increasing block rate structure. Under an increasing block rate structure, a system would

[32] EPA, *Economic Analysis for the Final Stage 2 Disinfectants and Disinfection Byproducts Rule*, Washington, DC, December 2005, pp. ES-9, https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1005OOX.txt; EPA, *Basic Information About Drinking Water Disinfection*, Washington, DC, February 24, 2009, https://www.epa.gov/sites/default/files/2015-09/documents/q3.pdf; EPA, *Basic Information About Drinking Water Disinfection*, Washington, DC, February 24, 2009, https://www.epa.gov/sites/default/files/2015-09/documents/q5.pdf.

[33] EPA, *Status of Chlorine Product Availability and Pricing*, May 2022, https://www.epa.gov/waterutilityresponse/status-chlorine-product-availability-and-pricing.

[34] AWWA, *State of the Water Industry 2024*, https://www.awwa.org/Professional-Development/Utility-Managers/State-of-the-Water-Industry#SOTWI_Report.

[35] For example, in 2024, EPA reported that Canadian rail carrier labor negotiations may result in a shutdown of rail transport of chemicals, including chlorine, and that no viable alternative to rail exists for shipment of chlorine in the volumes needed for water treatment. EPA, *Canadian Rail Service Disruption: Current Status and Potential Impact on Supply Chains for Water Treatment Chemicals*, August 15, 2024, https://www.epa.gov/waterutilityresponse/canadian-rail-service-disruption-current-status-and-potential-impact-supply.

[36] AWWA, *State of the Water Industry 2024*.

[37] Some water rate information exists publicly. Specifically, the Environmental Finance Center at the University of North Carolina, Chapel Hill, provides water rate information for utilities that voluntarily submitted such data from a subset of states. Other states collect rate information for all or a subset of drinking water systems.

[38] AWWA/Raftelis/University of North Carolina, Chapel Hill, Environmental Finance Center, *Water and Wastewater Rate Survey*, 2022 and 2023.

[39] AWWA, "AWWA Launches Online Platform for Water/Wastewater Rate Information," press release, July 12, 2023, https://www.awwa.org/AWWA-Articles/awwa-launches-online-platform-for-waterwastewater-rate-information/.

charge a higher rate for each specific portion of water used than the previous portion, so that a consumer is incentivized to promote water conservation.[40] AWWA's survey identified that roughly 32% of surveyed systems used a uniform rate, where all customers pay the same price per unit of water. One system reported using a flat fee, where customers pay the same rate regardless of the amount of water used.[41]

In addition to rate structures, data from AWWA's 2022 and 2023 rate survey indicate that water rates vary by region. For example, for the set of systems included in the survey, participating systems in Western states charge on average 25% more than the national average water rates, which was $36.55 for 5 centum cubic feet (CCF).[42] Average water rates in the South and Midwest were 12% and 15% less, respectively, than the national average water rates.[43] Between the 2022 and 2023 survey, the national average water rate increased roughly 2%.[44] Some of the factors influencing costs, such as water availability and quality, may explain the regional differences in water rates.

Over a longer time frame, looking at household payments for water and sewer, BLS data indicate that these payments have increased as compared to other goods.[45] **Figure 3** displays the increase in household payments for water and sewer services between 1998 and 2024, as compared to the consumer price index (CPI) for all items. BLS data indicate that household payments for water and sewer have increased at roughly twice the rate of the CPI.[46] Further, over this same period, average and median wages have increased at a slightly higher rate than the CPI.[47] This indicates that over this time period, individuals are spending proportionally more of their income on household water and sewer services.[48]

[40] EPA, "Understanding Your Water Bill," https://www.epa.gov/watersense/understanding-your-water-bill#.

[41] AWWA/Raftelis/University of North Carolina, Chapel Hill, Environmental Finance Center, *Water and Wastewater Rate Survey*.

[42] CRS analyzed data from the 2023 and 2024 AWWA rate survey for 5/8-inch, ¾-inch, and 1-inch residential water meter sizes. In the survey, western states include California, Oregon, Washington, Arizona, Idaho, Utah, Montana, Colorado, Wyoming, and New Mexico; southern states include Texas, Oklahoma, Arkansas, Louisiana, Mississippi, Alabama, Tennessee, Kentucky, Georgia, Florida, South Carolina, North Carolina, Virginia, West Virginia, and Maryland; and midwestern states include Ohio, Indiana, Illinois, Michigan, Wisconsin, Iowa, Missouri, Minnesota, North Dakota, South Dakota, Nebraska, and Kansas.

[43] CRS analyzed data from the 2023 and 2024 AWWA rate survey for 5/8-inch, ¾-inch, and 1-inch residential water meter sizes.

[44] CRS analyzed data from the 2023 and 2024 AWWA rate survey for 5/8-inch, ¾- inch, and 1-inch residential water meter sizes.

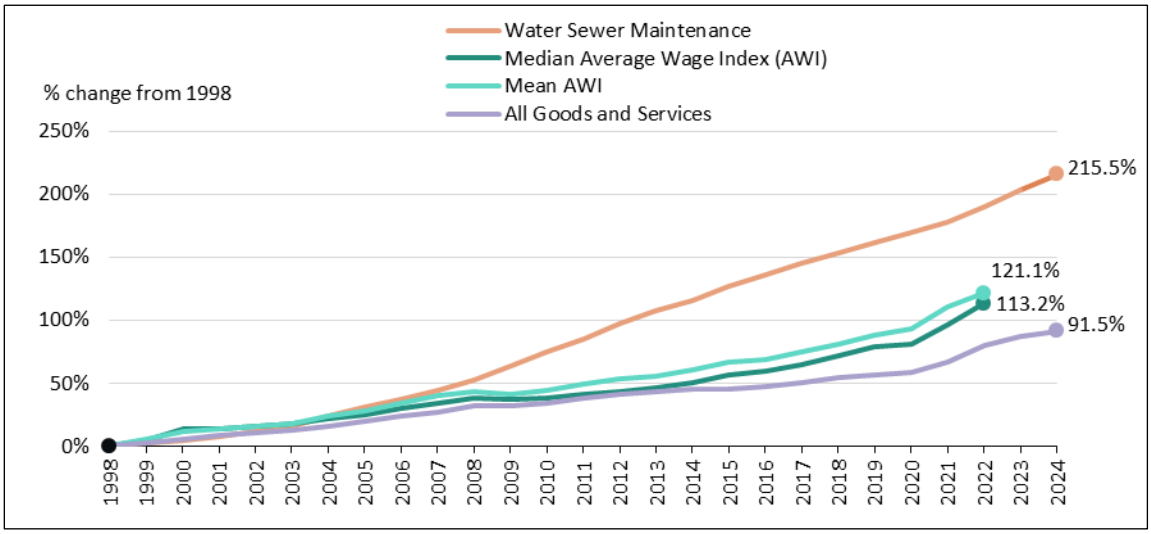
[45] CRS analysis of Bureau of Labor Statistics (BLS) data for the following series: CUUR0000SEHG01 and CUUR0000SA0.

[46] CRS analysis of Bureau of Labor Statistics (BLS) data for the following series: CUUR0000SEHG01 and CUUR0000SA0.

[47] CRS analysis of Social Security Administration data for the following series: national average wage index (AWI).

[48] CRS analysis of Social Security Administration data for the following series: national average wage index (AWI), and CRS analysis of Bureau of Labor Statistics (BLS) data for the following series: CUUR0000SEHG01 and CUUR0000SA0.

Figure 3. Household Water and Sewer Payments Versus Other Goods



Source: CRS analysis of Bureau of Labor Statistics (BLS) data on Consumer Price Index (CPI) for all urban consumers for the following series: CUUR0000SEHG01 and CUUR0000SA0. Data rebased to calendar year 1998. CRS analysis of Social Security Administration data for the series: national average wage index (AWI).

Notes: The CPI "all urban consumers" represents changes in prices of all goods and services purchased for consumption by urban households, which BLS states represents 90% of the U.S. population. BLS CPI for water sewer maintenance represents the changes in user payments for those services.

Several factors may affect a system's water rate. One factor is the size of the population served by that system. Due to economies of scale, water systems that serve larger populations have a larger customer base from which to support costs, which may result in a lower rate per customer. Given this, population change may affect a system's water rate. A water system that serves a community with a declining population may increase water rates so that the remaining customers' payments could continue to support the system's costs. For a rapidly growing community, a water system may lower rates, as the costs to provide water service would be supported by more customers. In some circumstances, however, a water system serving a growing community may raise rates to finance capital improvements needed to extend the transmission and distribution network to new customers. The extent to which these factors drive changes to water rates depends on the specifics of the system and community.

Different mechanisms control a water system's rate-setting practices. Generally, the water rates of publicly owned systems are subject to direct government control. For privately owned systems, other controls may exist, such as through local or state requirements, or through other mechanisms, some of which are discussed in the next section.

Public Versus Private Ownership

Discussions of water rates often draw distinctions between rates set by publicly owned and privately owned systems. Given that water systems are generally considered natural monopolies—no alternative provider exists, leaving customers with a single choice—increases in water rates could be linked to concerns that water systems, particularly those that are privately owned, may be taking advantage of customers' lack of choice.[49]

[49] U.S. Government Accountability Office, *Private Water Utilities: Actions Needed to Enhance Ownership Data*, GAO-21-291, March 2021, https://www.gao.gov/assets/d21291.pdf.

Among those that are privately owned, water systems may be operated as for-profit, not-for-profit, or part of another business. Of the privately owned systems operating in the United States, roughly 96% serve 3,300 or fewer individuals.[50] For these smaller systems, a customer may pay for water service as an ancillary part of another bill, such as part of trailer home park rent or as a part of homeowners' association dues, depending on the system's billing practices.

Generally, concerns regarding water rates and rate increases involve larger privately owned water systems, and particularly the ones that are operated for-profit. One study evaluated the difference between the water rates charged by the 500 water systems serving the largest populations, and found water rates of privately owned systems to be higher than those of similar-sized publicly owned water systems, particularly in "states with regulation that favors private investors."[51]

All states except Georgia, Michigan, Minnesota, North Dakota, and South Dakota regulate certain private entities that own water systems through state public utility commissions (PUCs) or state public service commissions (PSCs).[52] Among PUCs/PSCs, their regulatory authority for the rates of water systems varies. For example, Wisconsin's PSC regulates the rates of all water systems. In addition to jurisdiction over private systems, the PUCs/PSCs in Alaska, Indiana, Maine, Maryland, Mississippi, New Jersey, Pennsylvania, Rhode Island, and West Virginia have varying jurisdiction over publicly owned water systems.[53] For example, in Pennsylvania, the PUC has jurisdiction over publicly owned water systems providing service outside the boundaries of their municipality.[54]

PUCs/PSCs may apply different requirements to the systems they regulate—for example, through a key principle called *full cost recovery*, which is a pricing practice of setting rates at a level to fully recover costs. In addition to full cost recovery, PUCs/PSCs typically allow for some amount of return for investors.[55] Full cost recovery is intended to ensure that water rate revenues are used to cover the water system's costs, supporting O&M and capital costs to ensure sustainable water service. Requiring privately owned systems to fully recover costs may mean that water rates are higher for such systems than for publicly owned systems, which could set rates below the total cost of service.

Publicly owned water systems, which generally are not subject to state PUC/PSC rate regulation and are instead directly owned and operated by a governmental entity, generally establish their

[50] EPA, Safe Drinking Water Information Systems, Water System Summary report, generated on July 15, 2024.

[51] This study focused on rate affordability rather than other aspects of system performance, such as providing water that meets federal drinking water standards. This study identified that the average annual water bill is $186 higher in the larger privately owned water systems than in the larger publicly owned water systems. The study also identified that, in communities with privately owned water systems, low-income households spend 1.55% more of their income on their water bills. X. Zhang et al., "Water Pricing and Affordability in the US: Public vs. Private Ownership," *Water Policy*, vol. 24, no. 3 (March 1, 2022). Regarding water quality, another study evaluated drinking water quality regulatory compliance of systems serving 500 or more individuals, identifying that "[p]rivately owned utilities appear to be less vulnerable to violations than public ownership, which agrees with previous findings." Maura Allaire, Haowei Wu, and Upmanu Lall, "National Trends in Drinking Water Quality Violations," *Proceedings of the National Academy of Sciences of the United States*, vol. 15, no. 9 (February 12, 2018).

[52] Janice A. Beecher, *Potential for Economic Regulation of Michigan's Water Sector: Policy Brief for the Incoming 2019 Gubernatorial Administration*, Michigan State University Extension, East Lansing, MI, November 7, 2018, https://www.canr.msu.edu/michiganpolicyguide/uploads/files/11-21%20waterecon%20beecher%20final.pdf.

[53] Janice A. Beecher, *Potential for Economic Regulation of Michigan's Water Sector: Policy Brief for the Incoming 2019 Gubernatorial Administration*.

[54] Janice A. Beecher, *Potential for Economic Regulation of Michigan's Water Sector: Policy Brief for the Incoming 2019 Gubernatorial Administration*.

[55] Janice A. Beecher, *Economic Regulation of Utility Infrastructure*, Lincoln Institute of Land Policy, May 2013, https://www.lincolninst.edu/app/uploads/legacy-files/pubfiles/economic-regulation-of-utility-infrastructure_0.pdf.

own rates. Publicly owned systems may be subject to rate-setting requirements intended to support the sustainable operation of a water system. Charging a rate below the costs of service may decrease the system's financial capacity to afford O&M and/or capital costs needed to provide sustainable water service that meets regulatory requirements. Reasons vary as to why a system may not establish rates at a level to fully recover costs. A system may not set rates at a level to fully recover costs, including capital improvements, to keep rates stable or due to an outdated and insufficient understanding of the system's current or future costs. Systems may keep rates stable to address water service affordability for customers or may face pressure to keep rates below the cost of service.

Other municipal activities may also play a role in a publicly owned water system's financial capacity. Local governments may use water rate revenue to offset other municipal activities or, alternatively, use other municipal revenue (e.g., local sales tax revenue) to support water system costs. A municipality's ability to do this may depend on state and local laws, which vary in terms of budgetary controls for municipal governments.

PUCs/PSCs and Water Service Continuity

Beyond rate-setting, PUCs/PSCs have authority over certain activities of the water systems they regulate. For example, during the Coronavirus Disease 2019 (COVID-19) pandemic, most state public utility commissions directed private/investor-owned utilities (and, in some cases, other regulated systems) to continue service to nonpaying customers.[56] Some of these states also required water systems to reconnect service to residences where water had been shut off for nonpayment.[57] Other states reached voluntary agreements with water systems not to disconnect services during the pandemic.[58]

Private entities may benefit from efficiencies in ways that public systems cannot. For example, a private entity may be able to purchase chemicals needed for treatment in bulk or to regionalize water rates among several systems, as allowed by a PUC/PSC, which would create economies of scale.[59] While publicly owned system regionalization may be achieved through partnership agreements, it may be administratively challenging to coordinate municipal functions, or systems may face legal challenges in doing so.[60]

Addressing Rate Affordability

A water system may take different actions to address affordability. Whether or not a system takes such actions likely depends on the specific circumstances of the system as well as potential local and state requirements. For example, a system may share water system expenses (e.g., joint purchasing of chemicals or sharing an operator) to reduce costs.[61] Other systems could employ

[56] Dan Lauf and David Peters, *State Moratoriums on Utility Shut-offs and Related Actions During the COVID-19 Pandemic*, National Governors Association, April 30, 2020, https://www.nga.org/wp-content/uploads/2020/05/State-Actions-on-Utility-Disconnections-May-2020.pdf.

[57] Dan Lauf and David Peters, *State Moratoriums on Utility Shut-offs and Related Actions During the COVID-19 Pandemic.*

[58] Dan Lauf and David Peters, *State Moratoriums on Utility Shut-offs and Related Actions During the COVID-19 Pandemic.*

[59] Janice A. Beecher and Jason A. Kalmbach, "Structure, Regulation, and Pricing of Water in the United States: A Study of the Great Lake Region," *Utilities Policy*, vol. 24 (August 2012).

[60] Environmental Finance Center at UNC Chapel Hill (EFC), *Navigating Legal Pathways to Rate-Funded Customer Assistance Programs: A Guide for Water and Wastewater Utilities*, Chapel Hill, NC, 2017, https://efc.sog.unc.edu/wp-content/uploads/sites/1172/2021/06/Nagivating-Pathways-to-Rate-Funded-CAPs.pdf.

[61] EPA, *Gaining Operational and Managerial Efficiencies Through Water System Partnerships*, EPA 816-R-09-005, Washington, DC, October 2009, https://www.epa.gov/sites/default/files/2017-07/documents/p1006md0.pdf.

"smart" technology, such as artificial intelligence, that may lessen operational costs, though such technology may pose certain other risks.[62]

Water systems may choose to address affordability of water service through capital infrastructure projects that lower operating costs. For example, installing technologies to reduce energy usage or replacing sources with renewable energy may lower costs for a water system, particularly if that system has access to low-cost financing for the project.[63] In addition, other projects, such as installing "smart" water meters or leak detection technologies,[64] may allow for a different rate structure or mitigate the loss of treated water, and as such, either increase revenues or lower costs for a water system.

Water systems may establish customer assistance programs (CAPs) to help low-income customers afford their water service. Whether a system can establish a CAP depends in part on where the system is located, as the state legal frameworks for such programs vary.[65] Further, state requirements for CAPs may vary by system.[66] In 2017, the Environmental Finance Center at the University of North Carolina, Chapel Hill, compiled the legal frameworks by state for CAPs, highlighting the variation in approaches.[67] Local government charters may provide further requirements pertaining to the use of water rates to support CAPs.

Postponing or deferring maintenance activities may allow the water system to keep rates lower or to lower rates in the short term. Without maintenance, the capital infrastructure's deterioration rate is likely to accelerate, potentially leading to increased O&M costs or the need for a capital infrastructure project if the deterioration is extensive. Similarly, a water system may address rising costs without raising rates by deferring capital infrastructure projects, and using funds set aside for these purposes to pay for O&M. EPA finds that deferring capital projects may further drive costs upward, as deteriorating infrastructure likely requires more investment (relative to making repairs before deterioration) to maintain levels of service.[68] The extent to which a water system could defer maintenance or capital infrastructure projects may also depend on whether the system is regulated by a PUC/PSC, as a PUC/PSC may require water systems to include such costs in a rate.

[62] Catherine E. Richards et al., "Rewards, Risks and Responsible Deployment of Artificial Intelligence in Water Systems," *Nature Water*, vol. 1 (May 2023), pp. 422-432.

[63] EPA, "Reducing Operating Costs and Energy Consumption at Water Utilities," https://www.epa.gov/sites/default/files/2017-04/documents/water_utility_heat_pump_brochure_508.pdf.

[64] U.S. Department of Energy (DOE), "Water-Efficient Technology Opportunity: Distribution System Leak Detection," https://www.energy.gov/femp/water-efficient-technology-opportunity-distribution-system-leak-detection.

[65] EFC, *Navigating Legal Pathways to Rate-Funded Customer Assistance Programs: A Guide for Water and Wastewater Utilities.*

[66] For example, in California, the public utility commission (PUC) has express authority to require regulated privately owned systems to establish rate-funded customer assistance programs (CAPs). Approved by California voters in 1996, Proposition 218, also called the "Right to Vote on Taxes Act," establishes different requirements for publicly owned systems. It requires property-related fees for property-related services, such as water, to not be greater than the cost of service. As such, it limits a publicly owned water system's use of rate revenue to cross-subsidize another customer's water bill through a CAP. California State Water Resources Control Board, *Equity/HR2W*, https://www.waterboards.ca.gov/drinking_water/safedrinkingwaterplan/docs/SDW-HR2W-FS-2021-web.pdf.

[67] EFC, *Navigating Legal Pathways to Rate-Funded Customer Assistance Programs: A Guide for Water and Wastewater Utilities.*

[68] EPA, *The Clean Water and Drinking Water Infrastructure Gap Analysis*.

Congressional Action to Address Water Affordability

Congress has generally recognized the trade-off between increased public health protection and the cost to communities to meet public health objectives. In 1996, Congress first authorized a federal financial assistance program to support municipal drinking water improvements in the Safe Drinking Water Act Amendments of 1996 (P.L. 104-182), which included revisions to the act's regulatory development provisions.[69] The 1996 SDWA amendments followed roughly a decade of increased regulation that the House Committee on Commerce found in 1996 had resulted in increased compliance costs, particularly for small water systems, without a commensurate increase in public health protection.[70]

Accordingly, the primary way that Congress has addressed municipal water affordability is through financial assistance programs intended to make drinking water capital improvement projects, particularly those needed for statutory compliance, more affordable.[71] In addition, Congress has amended SDWA to improve water system financial capacity to comply with the act's requirements.

This section discusses the Drinking Water State Revolving Fund (DWSRF), the main federal program to support water infrastructure improvements needed for public health protection. Congress has authorized other drinking water grant programs that are targeted to specific categories of projects or targeted to assist specific communities. For more information about these other grant programs, see CRS Report R46471, *Federally Supported Projects and Programs for Wastewater, Drinking Water, and Water Supply Infrastructure*, coordinated by Jonathan L. Ramseur.[72]

Drinking Water State Revolving Fund (DWSRF)

In 1996, Congress amended SDWA to add the DWSRF, a program to provide primarily subsidized loans for capital improvements needed to comply with drinking water regulations or further public health protection goals. Since FY1997, Congress has provided regular appropriations for the DWSRF through annual appropriations acts, and on occasion, Congress has provided supplemental DWSRF appropriations. For example, the Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58) provides five fiscal years of supplemental appropriations for the DWSRF. The IIJA appropriations represent a significant increase over annual DWSRF appropriations; see **Figure 4**.

[69] CRS Report R46652, *Regulating Contaminants Under the Safe Drinking Water Act (SDWA)*, by Elena H. Humphreys, contains information about the history of the act's regulatory development provisions.

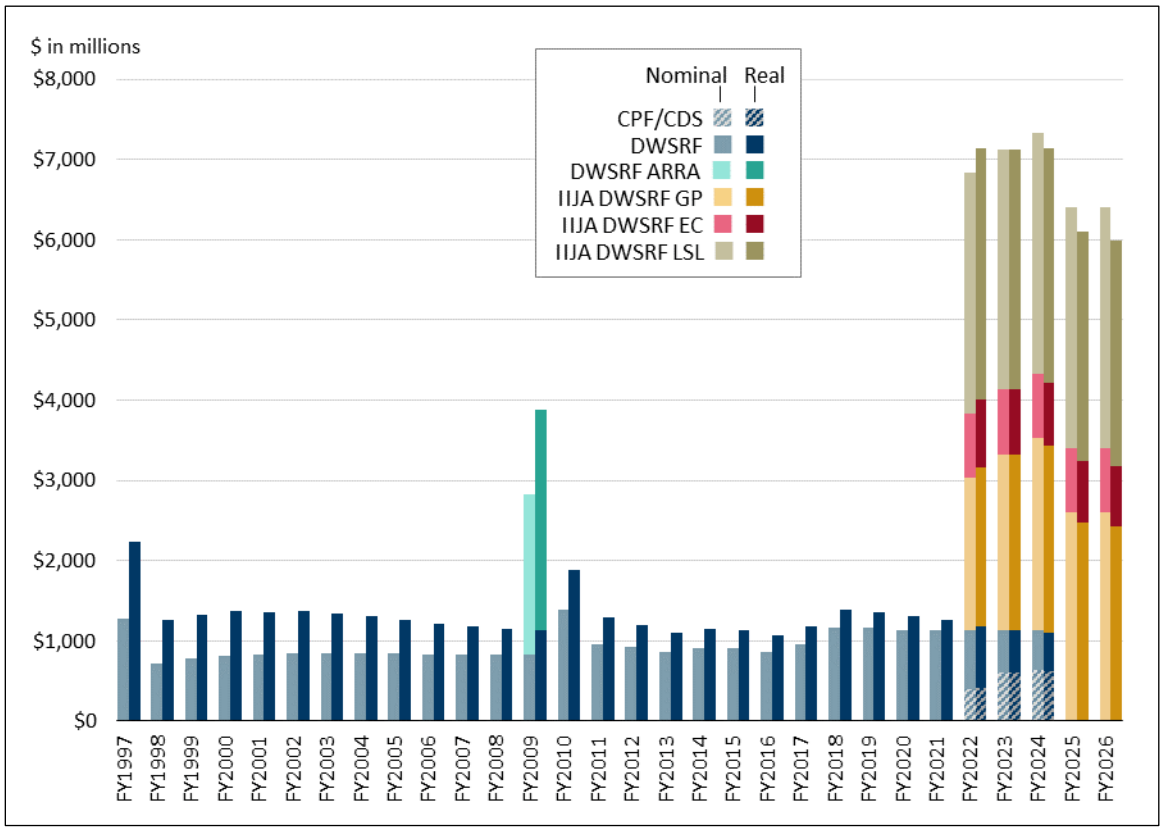
[70] H.Rept. 104-632, p. 10.

[71] Further, Congress has also established SDWA infrastructure grant programs to address specific issues, such as lead in drinking water, or specific communities. Compared to the DWSRF, appropriations for these grant programs have been relatively smaller. See CRS Report R46471, *Federally Supported Projects and Programs for Wastewater, Drinking Water, and Water Supply Infrastructure*, coordinated by Jonathan L. Ramseur, for more information.

[72] See, for example, CRS In Focus IF12617, *U.S. Environmental Protection Agency (EPA) Water Infrastructure Programs and FY2024 Appropriations*, by Elena H. Humphreys and Jonathan L. Ramseur.

Figure 4. Drinking Water State Revolving Fund Appropriations

(in nominal and real dollars)



Source: Prepared by CRS using information from annual appropriations acts, committee reports, and explanatory statements presented in the *Congressional Record*.

Notes: Amounts reflect applicable rescissions and supplemental appropriations, including $4.0 billion in P.L. 111-5 and $52.5 million in P.L. 116-20. "Real" or 2023 dollars calculated from Office of Management and Budget, Table 10.1, "Gross Domestic Product and Deflators Used in the Historical Tables: 1940–2026," https://www.whitehouse.gov/omb/historical-tables/. The deflator values used for FY2024 through FY2026 are estimates. "ARRA" denotes supplemental appropriations provided by the American Recovery and Reinvestment Act (P.L. 111-5). "IIJA" denotes supplemental appropriations provided by the Infrastructure Investment and Jobs Act (P.L. 117-58). "EC" denotes DWSRF supplemental appropriations dedicated to projects to address emerging contaminants. General Program, or "GP," denotes supplemental appropriations provided through the DWSRF for the range of statutory eligibilities. "LSL" denotes supplemental appropriations provided to the DWSRF for lead service-line (LSL) replacement projects and related activities. "CPF/CDS" denotes the portion of DWSRF appropriations dedicated to community project funding/congressionally directed spending. The funding levels for FY2025 and FY2026 are likely to change, reflecting funding for the DWSRF through annual appropriations.

Using these appropriations, EPA allots the funds as grants to states, and states use their federal grant to capitalize a revolving loan fund.[73] SDWA requires each state to provide a state contribution of at least 20% of its annual capitalization grant, and develop an intended use plan (IUP) each year indicating how the allotted funds will be used.[74] The act requires states to give funding priority to projects that

[73] States use their grant to provide primarily subsidized loans to communities, and communities repay the loan to the state fund. As such, the assistance revolves back into the state fund to be available in the future to provide to other communities for projects.

[74] SDWA §1452(e); 42 U.S.C. §300j-12(e); SDWA §1452(b); 42 U.S.C. §300j-12(b).

- address the most serious human health risks,
- are necessary to ensure compliance with drinking water regulations and other SDWA requirements, and
- assist systems most in need on a per-household basis according to state affordability criteria.[75]

Community water systems, both publicly and privately owned, are eligible for DWSRF assistance.[76] Projects eligible for DWSRF assistance include capital infrastructure projects, such as the installation and replacement of treatment facilities, distribution systems, and certain storage facilities. Projects to repair and replace aging infrastructure are also eligible, as are those that EPA determines, through guidance, will facilitate compliance with SDWA or further the act's public health protection goals. DWSRF funds may be used for preconstruction activities. They may not be used to pay for O&M activities or for projects needed primarily to accommodate growth.[77]

Congress has amended SDWA in various ways to increase the affordability of DWSRF assistance. For example, America's Water Infrastructure Act of 2018 (AWIA; P.L. 115-270) amended SDWA DWSRF provisions to extend the loan repayment period for disadvantaged communities from 20 years to 35 years, which the Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58) further extended to 40 years.[78] In addition to subsidized loans, SDWA authorizes states to provide additional subsidization (e.g., principal forgiveness, grants, or negative-interest-rate loans) to disadvantaged communities.[79] This type of assistance is not repaid, and as such, it is more affordable for communities.

Congress has authorized and directed states' use of additional subsidization under SDWA as well as through DWSRF appropriations. Under SDWA, the percentage of additional subsidization that states are authorized to provide has changed over time.[80] SDWA DWSRF provisions authorize states to use 35% of their capitalization grant amount for additional subsidization, while conditionally requiring states to use a minimum of 12% of their grant for this purpose. In recent years, regular DWSRF appropriations required states to use 14% of their capitalization grant amounts for this additional subsidization.

Further, IIJA directed states to use a portion of their IIJA DWSRF capitalization grants for additional subsidization. The act provides a total of $11.7 billion for FY2022-FY2026 for the DWSRF, as well as a total of $15.0 billion for FY2022-FY2026 in DWSRF appropriations specifically dedicated to lead service line (LSL) replacement projects. For these IIJA DWSRF appropriations, states are required to provide 49% of their capitalization grants as additional subsidization. IIJA also provides a total of $4.0 billion for FY2022-FY2026 through the DWSRF for projects to address emerging contaminants, and the act requires states to use 100% of their capitalization grants for this purpose for additional subsidization.

[75] SDWA §1452(b)(3); 42 U.S.C. §300j-12(b)(3).

[76] In addition, not-for-profit noncommunity water systems are also eligible for DWSRF assistance. Noncommunity water systems regularly provide water to people but not year-round (e.g., schools and workplaces with their own wells).

[77] SDWA §1452(g)(3)(C); 42 U.S.C. §300j-12(g)(3)(C).

[78] SDWA §1452(f); 42 U.S.C. §300j-12(f).

[79] SDWA §1452(d); 42 U.S.C. §300j-12(d).

[80] CRS Report R47935, *Changes to the Drinking Water State Revolving Fund (DWSRF) Program*, by Elena H. Humphreys, contains more information about this program.

Community Project Funding/Congressionally Directed Spending Items

The 117th Congress restarted the practice of providing funding directly for specific water infrastructure projects through community project funding/congressionally directed spending (CPF/CDS) items, commonly called *earmarks*. Beginning in FY2022, Congress dedicated a portion of the DWSRF appropriation for such items, which effectively reduces the amount of the regular appropriation for the DWSRF. Yet, at the same time, the IIJA DWSRF appropriations mean that state DWSRF programs received increased funding as compared to the years prior. This practice of providing earmarks from the DWSRF appropriation differs from Congress's prior practice, in which such items were funded through a separate appropriation. Earmarks may be another way that Congress is addressing the affordability of specific communities' capital infrastructure projects. For more information on earmarks, see CRS Report R47633, *The Role of Earmarks in CWSRF and DWSRF Appropriations in the 117th Congress*; and CRS Report R48066, *The Role of Earmarks in SRF Appropriations in the 118th Congress*.

Other Provisions That Address Affordability

Specific SDWA provisions are intended to improve a water system's financial capacity, including through asset management initiatives. According to EPA, asset management is a budgetary and planning process that public water systems may undertake to evaluate their capital assets and plan the maintenance of their infrastructure (e.g., pumps, motors, and piping) to ensure that the water system can fund the costs.[81] EPA states that asset management planning allows for water systems to minimize the total costs of owning and operating their capital infrastructure by managing their capital assets, ensuring that they deliver service to their customers.[82]

SDWA Section 1420 established requirements for states to develop strategies to improve the financial, as well as technical and managerial, capacity of water systems, so that the system has the capacity to comply with the act's requirements.[83] In 2018, AWIA amended SDWA Section 1420 to direct states to revise their capacity development strategies to include a description of how they will encourage water systems to develop asset management plans, and required states to demonstrate their process in providing technical assistance to help systems develop asset management plans.[84]

Low Income Household Water Assistance Program (LIHWAP)[85]

The Low Income Household Water Assistance Program (LIHWAP) was established in response to the COVID-19 pandemic and provided funding to states, tribes, and territories to operate drinking water and wastewater assistance programs. The program was funded through appropriations in the FY2021 Consolidated Appropriations Act (P.L. 116-260) and the American Rescue Plan Act (P.L. 117-2), which appropriated $638 million and $500 million, respectively.[86] The two laws also established how the program was to operate. LIHWAP was administered by the Department of Health and Human Services (HHS), and followed many of the program rules associated with the Low Income Home Energy Assistance Program.[87] The program assisted low-income households with rates

[81] For more information, see EPA, "Asset Management: A Best Practices Guide," April 2008, http://nepis.epa.gov/Exe/ZyPDF.cgi/P1000LP0.PDF?Dockey=P1000LP0.PDF.

[82] EPA, "About Asset Management," https://www.epa.gov/dwcapacity/about-asset-management.

[83] 42 U.S.C. §300g-9. Nontransient noncommunity water systems, such as schools or factories, have their own water supplies and generally serve the same individuals for more than six months but not year-round. Most drinking water regulations apply to these systems.

[84] In 2019, EPA published a report, *State Asset Management Initiatives*, that outlines the various efforts of states to incentivize asset management planning among the water systems. This report can be found at https://www.epa.gov/sites/default/files/2019-03/documents/asset_management_initiatives_document_508.pdf.

[85] Libby Perl, CRS Specialist in Housing Policy, contributed this text box.

[86] See Division H, Title V, Section 533 of P.L. 116-260, and Section 2912 of P.L. 117-2.

[87] P.L. 116-260 provided that HHS and grantees "shall, as appropriate and to the extent practicable, use existing (continued...)

charged for drinking water and wastewater as well as account arrearages. Payments were made by grantees, (i.e., community action agencies or eligible entities on behalf of states, the District of Columbia, the Commonwealth of Puerto Rico, U.S. territories, and federally and state-recognized Indian Tribes and tribal organizations) directly to owners or operators of public water systems or treatment works on the behalf of eligible customers. Grantees were required to expend funds by June 30, 2024,[88] and, as of the date of this report, no additional funds have been appropriated for LIHWAP. Through the second quarter of 2024, HHS reported that LIHWAP had assisted 1.7 million households.[89]

In addition, IIJA authorized a grant program for water systems that may have a higher proportion of low-income households. Section 50109 of the act directs EPA to establish a grant program to provide household drinking water and/or wastewater rate assistance. IIJA did not include an authorization of appropriations to support this grant program, and Congress has not provided appropriations for this grant program. The act defined the eligible uses of the funds to include direct household assistance, lifeline rates (e.g., providing a subsidized rate for low-income customers), bill discounting (e.g., crediting funds to offset certain customers' bills), percent-of-income billing (e.g., billing for water as a percent of a household's income), and special hardship provisions.[90] Under this program, EPA is directed to make no more than 40 grants, which are to be awarded to certain entities (e.g., water or wastewater systems, including "medium water service providers," "large water providers serving between 100,001 to 500,000 individuals," and systems serving disadvantaged communities, or states).

Considerations

Concerns about the affordability of water service continue amidst increases in household water and sewer payments (**Figure 3**) and increases in needs estimates for drinking water infrastructure improvements (**Figure 1**). Stakeholders have raised concerns over projected increases in the costs of water for at least the past three decades, giving rise to questions over what entity has responsibility for water affordability. Congress has generally focused federal financial assistance at the system level to projects needed to address the most serious health risks and necessary for compliance with federal requirements, for those systems most in need.

Congress has used specific approaches to address water affordability. For system-level affordability, Congress has amended SDWA to improve systems' financial capacity by encouraging water system planning and by establishing federal financial assistance programs to make capital infrastructure projects more affordable. Congress provided time-limited appropriations for an HHS-administered water rate assistance program for low-income individuals during the COVID-19 pandemic, and subsequently, authorized a similar program at EPA, which has not received appropriations.

IIJA's supplemental DWSRF appropriations warrant consideration. IIJA DWSRF appropriations may reduce the costs of capital infrastructure projects for water systems that received assistance

processes, procedures, policies, and systems in place to provide assistance to low-income households, including by using existing programs and program announcements, application and approval processes…" For more information about LIHEAP, see CRS Report RL31865, *LIHEAP: Program and Funding*.

[88] U.S. Department of Health and Human Services, Office of Community Services, *LIHWAP IM-2023-04 FAQs on LIHWAP Deadlines and Close Out Activities NCE Update FY2023*, September 19, 2023, https://www.acf.hhs.gov/ocs/policy-guidance/lihwap-im-2023-04-faqs-lihwap-deadlines-and-close-out-activities-nce-update.

[89] See the LIHWAP Data Dashboard Quarterly Reports, https://lihwap-hhs-acf.opendata.arcgis.com/pages/quarterly-snapshot, accessed August 15, 2024.

[90] Examples provided from EPA, *Drinking Water and Wastewater Utility Customer Assistance Programs*, Washington, DC, April 2016, https://www.epa.gov/sites/default/files/2016-04/documents/dw-ww_utilities_cap_combined_508.pdf.

though their effect on system-level costs. Results on system-level affordability from this increased funding may take time to materialize. Specifically, under SDWA, DWSRF appropriations are available for obligation for two years (i.e., the year that such appropriations were authorized and the following fiscal year).[91] These appropriations support capital improvement projects, which may lower system-level water costs over a longer time frame.

Questions remain when evaluating approaches to address water service affordability. One primary question pertains to the objective—for example, whether efforts to address affordability are focused on specific issues (e.g., deferred maintenance or capital improvement projects or lead service line replacement or emerging contaminant projects), focused on those low-income individuals most challenged to afford water service, or focused on addressing system-level costs to lower rates for all. This section presents considerations for addressing affordability at the individual level compared to the system level.

Efforts to address low-income individuals most challenged to afford water service would support their access to basic water service, which is important for protecting public health. In addition, water systems may also benefit from efforts targeting low-income individuals, as fewer households may miss water payments. Efforts to address system-level costs would have an effect on all consumers; subject to state and local requirements, some systems may implement programs to specifically address their customers who are most challenged to pay. Without such a program, the proportionality of benefits may be another consideration, as efforts to address system-level costs may affect customers who can pay as well as customers who may be challenged to pay. Targeting a specific objective would inform the choice of policy option, though the options to achieve these objectives present trade-offs.

When considering household affordability, certain trade-offs pertain to program design. For example, a 2023 report supported by several water stakeholder groups identified that developing and implementing a program that specifically supports low-income households' water payments may be more complex than expanding an existing program to include additional funds and missions. Measuring the extent to which expanded benefits are specifically used to support water payments would be difficult. Targeting funds to households that are most challenged to afford water may be administratively challenging, particularly for small systems, which could limit their participation.[92] In addition, the report identified that an agency's experience administering an income-based program, such as HHS' experience with LIHWAP, may result in faster implementation.[93] In contrast, the report raised concerns that EPA lacked implementation experience with an "income-qualified household assistance program,"[94] though EPA has experience with water service providers.

Other considerations arise regarding system-level affordability. For example, if a system defers a project to keep rates stable, and then receives DWSRF assistance for that project, there may be little effect on water rates even though such assistance would reduce costs that the water system may eventually incur, as the rates previously did not account for the costs for such projects. States' implementation of SDWA's definition of a *disadvantaged community* poses another

[91] SDWA §1452(a)(1)(C); 42 U.S.C. §300j-12(a)(1)(C).

[92] Stacey Isaac Berahzer et al., *Low-Income Water Customer Assistance Program Assessment*, AWWA, Association of Metropolitan Water Agencies, National Association of Clean Water Agencies, National Association of Water Companies, and Water Environment Foundation, April 10, 2023, https://www.amwa.net/system/files/linked-files/liwcap—final-report-4-24-23.pdf.

[93] Stacey Isaac Berahzer et al., *Low-Income Water Customer Assistance Program Assessment*.

[94] Stacey Isaac Berahzer et al., *Low-Income Water Customer Assistance Program Assessment*.

consideration.[95] States use different affordability criteria, and, in some states, water systems serving larger communities with discrete areas of deep poverty may not meet state criteria. For such systems, dedicating more DWSRF assistance to additional subsidization for disadvantaged communities would not have an effect on costs.

Another consideration pertains to the addition of certain requirements as a condition of receiving support to improve water affordability. Congress has previously applied conditions to funding intended to incentivize certain activities, such as developing capacity development strategies, or requiring states to provide a higher proportion of additional subsidization to make projects more affordable. Applying conditions to funding may support certain policy objectives (e.g., sustainable water rates), though such funding conditions may reduce of the number of participants. Accordingly, this presents a trade-off between the relative benefits of achieving the objectives versus the effect that reduced participation would have on addressing affordability.

Questions over whether, and if so, how, to address water affordability are likely to continue, particularly due to the increased need for drinking water infrastructure projects, and other regulatory actions. Several trade-offs exist involving the various approaches and specific policy objectives. Given water systems' varying characteristics, challenges exist to crafting a national-level policy to address water affordability. As such, an incentive may exist to continue addressing water affordability through existing mechanisms rather by establishing new programs.

Author Information

Elena H. Humphreys
Analyst in Environmental Policy

Acknowledgments

Amber Hope Wilhelm, Visual Information Specialist, provided graphics support for this report. Michael M. McCarthy, Publications Editor, provided formatting and editorial support.

Disclaimer

[95] SDWA; §1452(d)(3); 42 U.S.C. §300j-12(d)(3).