

DRINKING WATER

D+

2010 Report Card for Pennsylvania's Infrastructure

Pennsylvania faces a required investment of \$15.5 billion over the next 20 years to replace aging facilities and comply with safe drinking water regulations. Although waterborne outbreaks are currently near zero, the number of drinking water systems in violation of regulations is on the rise. Funding research into new wastewater treatment technology and reducing water waste and consumption will help reduce costs, but construction and repair of drinking water facilities will require a steady source of funding. Drinking water systems must adopt full-cost pricing in water billing to reflect operational and maintenance costs as well as raising funds for eventual replacement. If funding needs are not met, the state risks reversing the public health, environmental and economic gains that have been made over the past three decades. The D+ reflects a more than \$15.5 billion funding gap, incomplete data at the state level, increasing violations, and potential threat to public health, the environment and the economy.

BACKGROUND

In 1900, the average residential usage of potable water in Pennsylvania was five gallons per day per person; today that number is 62 gallons per day per person. One million Pennsylvania households rely on 450,000 individual wells, and more than nine million people rely on the 323 largest community drinking water systems alone. The Pennsylvania Department of Environmental Protection (PADEP) regulates nearly 10,000 community drinking water systems which serve more than 10 million people. While the majority of the public water systems draw from ground water sources, the 575 public water systems that use surface water as their source serve more than 75 percent of the 9 million residents of the commonwealth.

Currently, water remains relatively inexpensive, comprising less than one percent of household income. Because most water systems do not adequately account for investment needs, residents are receiving water at rates that are below cost, and the systems are not generating sufficient revenue to finance investment.

CONDITIONS

Although improved water quality regulations that were enacted under the 1984 Safe Drinking Water Act have reduced the occurrence of waterborne outbreaks to nearly zero, the number of community drinking water systems in violation of the regulations is trending upwards. According to PADEP, in the 2007 calendar year, DEP staff completed 8,476 enforcement actions across the state with 91 penalties being assessed.

In 2009, the U.S. Environmental Protection Agency (EPA) updated their national survey of drinking water infrastructure needs on a state-by-state basis for the 2007 year (Fourth Report to Congress EPA 816-R-09-001, March 2009.) The survey results concluded that approximately \$11.38 billion would be needed over 20 years to repair, replace and upgrade the commonwealth's 340 largest community drinking water systems.

The Funding Gap

Federal assistance has not kept pace with demand for drinking water infrastructure improvements. Since the 1997 fiscal year, Congress has appropriated only between \$700 million and \$850 million annually for the Safe Drinking Water Act's State Revolving Loan Fund (SRF) program, which was enacted in 1987. The funding level for FY 2005 was \$850 million, less than 10 percent of the total national requirements. The Bush Administration proposed an appropriation of \$850 million for FY 2009. The FY 2010 allocations for the SRF are expected to be \$1.5 billion with \$43 million designated for Pennsylvania.

Despite an extra \$2 billion allocation for drinking water in the American Recovery and Reinvestment Act of 2009 (ARRA), yearly appropriations are expected to remain near the 2010 levels.

According to the Governor's Sustainable Task Force on Infrastructure's report, published in November 2008, the estimated capital investment for improvements to Pennsylvania's drinking water system is estimated to be \$11.5 billion over the next 20 years (estimated in 2007 dollars). This estimate falls in line with the EPA's estimates listed above.

The total cost of improving the state's drinking water infrastructure, including current needs, capital, operations and maintenance, and debt retirement service, will cost approximately \$38.9 billion over the next 20 years assuming a modest 2 percent increase due to inflation.

When current usage rates are compared with available funding from state and federal agencies over the next 20 years, a funding gap of \$15.5 billion dollars appears with the largest percentage of funding required for the smaller water systems. The funding gap between projected water investment needs and current spending levels is dependent upon the growth of user rates. The gap largely disappears if Pennsylvania municipalities increase water rates at a rate of 2.5 percent higher than the rate of inflation.

The gap analysis provides a starting point for the magnitude of our drinking water infrastructure funding issues. While the data available represents a reasonable effort to quantify the funding gap, more detailed statewide data would further assist in more accurately quantifying the problem and projecting the impact of potential remedies.

Bridging the Gap

In 1988, Pennsylvania created the Pennsylvania Infrastructure Investment Authority (PENNVEST) to help communities finance infrastructure investments. PENNVEST serves as the financing agency for the federal drinking water SRF authorized by the 1996 Safe Drinking Water Act amendments. Since 1988, PENNVEST has funded more than \$1.25 billion in water supply infrastructure improvement projects.

Pennsylvania voters approved a referendum authorizing an additional \$400 million for water and wastewater projects over three years, which will be distributed to projects across the state. PENNVEST is also in the process of facilitating an additional \$44 million for water projects via ARRA funds.

Increased federal subsidies for drinking water needs would help finance required investment, but federal support cannot be expected to address the entire need. Operation and maintenance costs are not eligible for federal funding and must be borne entirely by local utilities. Therefore, water system customers will be forced to pay for the vast majority of the needed investments not funded by the federal or state governments.

Clean and safe water is a public good; therefore, the central question becomes, to what extent can and will ratepayers pay for needed investment? While rate increases will not adversely affect most households, many low-income families may not be able to afford the added expense.

POLICY OPTIONS

New solutions are needed for what amounts to more than \$15.5 billion dollars in critical drinking water investments that Pennsylvania will require over the next two decades. If investment needs are not met, the state risks reversing the public health, environmental and economic gains that have been made over the past three decades.

Without a significantly enhanced federal role in providing assistance to drinking water infrastructure, the role of critical investments will fall to Pennsylvania. The case for state assistance to address the unprecedented needs is compelling. In many locations, public water systems cannot be expected to meet this challenge alone or these communities face losing competitive economic advantage to neighboring communities, other regions and states due to inordinately high utility rates. Additionally, because source waters are shared across local boundaries, the benefits of state help will accrue to entire regions of Pennsylvania.

Equally compelling is the case for flexibility in the forms of state investment, including grants, loans and other forms of assistance. Increasingly, grants will be needed for many communities that simply cannot afford to support the cost to meet public health, environmental and/or service-level requirements. Loans and credit enhancements may be sufficient for public water systems in communities with greater economies of scale, wealthier populations and/or fewer assets per capita to replace. Other possible investment solutions include trust funds and incentives for private investment.

Pennsylvania can stretch assistance dollars further by encouraging public water systems to adopt some of the following measures. First, infrastructure must be proactively maintained. In many cases, the approach toward public infrastructure is reactive. Systems are built and operated with minimal maintenance until they wear out. Water systems need to conduct a full accounting of the costs to manage their assets both for current operations and future infrastructure needs. By appropriately managing its assets, a system may be able to reduce the overall investment required.

Second, public water systems should adopt new technology. State government should support research, development, testing and evaluation of new technologies, as well as state-funded research into water and wastewater treatment technology. Regulators, engineers and drinking water operators tend to be conservative when it comes to adopting new technologies. New technologies exist to clean and repair old pipes, providing low-cost alternatives for replacement of distribution mains. New pipe materials can also reduce water leaks, thereby reducing demand. In order to gain acceptance by the drinking water industry, these new technologies must be supported by full-scale demonstrations. Third, public water systems should introduce Smart Technology to water metering. Water meters are the direct link between the distribution system, the consumer and the billing department. Over time, the aging meters begin to wear down and allow unbilled water to pass by the meter without being read. Estimates from a current meter replacement program from the Manheim Borough Authority in Lancaster, Pennsylvania, show that they could be under-billing customers by as much as 35 percent due to slow meter readings. With the advances in metering technology, and the introduction of meters without moving parts, customers can be more accurately billed for the water they use and distributors will be better able track water usage to determine the presence of a leak. Proper billing can help to reduce the funding gap without an official rate increase.

RECOMMENDATIONS

The Pennsylvania sections of the American Society of Civil Engineers encourage the commonwealth to support much needed water infrastructure funding going forward. By increasing state and/or federal funding on drinking water infrastructure improvements, the demand of usage rate increases can be lessened.

In addition, the sections support the following recommendations:

- **Issue state bonds**

With decreasing federal funding for the State Revolving Loan Fund (SRF) program, Pennsylvania should leverage the remaining federal dollars as collateral for the issuance of state bonds, effectively doubling the amount of capital available for infrastructure investments.

- **Create an infrastructure needs inventory**

ASCE supports the establishment of a statewide infrastructure needs inventory to be administered by the state's municipal planning organizations. This inventory would serve as a mechanism to differentiate between expenditures for current consumption and long-term investment and would reduce major inefficiencies in the planning, design and construction process for long-term investments. An infrastructure needs inventory would also help increase public awareness of the problems and needs facing the state's

physical infrastructure and would help the state legislature focus on programs devoted to long-term growth and productivity. We recommend including a five-year projection of future needs on the current permit renewals process in order to accurately generate an infrastructure needs inventory utilizing an existing permitting process.

- **Focus on technology**

State government can play an essential role in promoting research, development, testing and evaluation of new technologies and the dissemination of information about proven technologies. ASCE supports state-funded research into water and wastewater treatment technology, which may reduce capital expenditures as well as operation and maintenance costs. By creating research partnerships with universities throughout the state, Pennsylvania may reap additional economic benefits through public-private partnerships and licensing of new technologies.

- **Promote sustainable infrastructure initiatives**

In order to close the funding gap, state governments can take several actions. They must support programs that will make infrastructure more sustainable and promote better asset management techniques that will reduce long-term costs and improve performance. They must encourage strides in water efficiency, which will reduce drinking water consumption and the volume of wastewater to be treated and advocate for full-cost pricing of water and wastewater treatment. Finally, they must support the reduction of non-point-source pollution of water sources.

- **Full-cost pricing**

Consider advocating full-cost pricing on water billing to ensure that future repairs, distributions needs and future treatment are accounted for in current billings.

- **Provide reduced rates to the disadvantaged**

In order to cushion the impact of rate increases on low-income households, the state should either encourage municipalities to use lifeline rates for low-income households or develop a rate reduction program similar to the federal low-income Energy Assistance Program.

- **Protect water sources in farming communities**

Continue to fund low-interest loans to farmers, so that they may implement best management practices for land management and manure handling and storage to protect drinking water sources.

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- ASCE Policy Statement 422: [Watershed Management \(PS 422\)](#)
- ASCE Policy Statement 453: [Federal Capital Budgeting \(PS 453\)](#)
- ASCE Policy Statement 480: [Waste-, Storm-, and Drinking-Water Infrastructure and Facilities Construction Funding \(PS 480\)](#)