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Water Infrastructure Funding: Review and Analysis of Current Issues

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Summary

For the first time in several years, infrastructure issues that face wastewater and drinking water systems are drawing attention of policymakers and legislators. The renewed attention is due to a combination of factors. These include financial impacts on communities of meeting regulatory requirements; the need to repair and replace existing infrastructure; and existence of a budgetary situation that encouraged a variety of interests to advocate increasing the federal commitment to water infrastructure.

The federal government has a lengthy history of involvement with wastewater and drinking water systems, with the Environmental Protection Agency (EPA) having the most significant role, both in terms of regulation and funding. In addition, the U.S. Department of Agriculture plays an important role in rural communities through its water and wastewater loan and grant programs. These infrastructure programs generally have been popular; however, states, communities, utility officials and others have noted various program gaps and limitations that may be diminishing their potential effectiveness. They also point to the emergence of new infrastructure needs and issues.

A number of interest groups and coalitions recently have issued reports on infrastructure funding needs and related policy issues. The Water Infrastructure Network cites an estimated $23 billion annual gap in funding for needed water and wastewater infrastructure over the next 20 years and has called for legislation creating a long-term source of federal funding through loans and grants. In contrast, the H2O Coalition argues that water utilities need to become self-sustaining and that, in most cases, loans are a more appropriate form of assistance than grants.

This report identifies a number of issues likely to receive attention in connection with water infrastructure. It begins with a brief review of federal involvement, describes the current debate about funding needs, and then examines key issues, including what is the nature of the problems to be solved; who will pay, and what is the federal role; and questions about mechanisms for delivering federal support, including state-by-state allotment of federal funds.

Congress has begun examining the issues discussed in this report, partly in response to urgings of stakeholder groups. Hearings have been held on this topic in the House and Senate, and some legislation has been introduced; however, activity on specific proposals is not expected until later in the 107th Congress. It is unknown whether such proposals might address water infrastructure in stand-alone legislation or in comprehensive amendments to the Clean Water Act and Safe Drinking Water Act, as has been the case historically. The Bush Administration's views on these issues are not yet known. This year, several groups are urging Congress to focus on water infrastructure issues alone and not include regulatory or other amendments that could dilute the focus or break coalitions within the groups. Thus far, congressional oversight hearings have focused narrowly on infrastructure.

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Introduction

Drinking water and wastewater treatment systems treat and safeguard the nation's water resources. Drinking water utilities have the task of supplying safe potable water to customers in both the proper quantity and quality. Wastewater utilities operate facilities that clean the flow of used water from a community. The federal government has had significant involvement with these systems for many years, both through setting standards to protect public health and the environment and through funding to assist them in meeting standards. For the first time in several years, water infrastructure issues are drawing attention of policymakers and legislators. While funding has been addressed annually through the congressional appropriations process, policy and program issues concerning funding were last considered in 1996 (for drinking water infrastructure) and 1987 (for wastewater infrastructure). The renewed attention to water infrastructure is due to a combination of several factors.

- **Meeting Regulatory Requirements**. Financial impacts of meeting regulatory requirements–some new, some long-standing–are a continuing issue for many communities. In the case of drinking water systems, the most pressing rules are new, either recently issued, pending, or anticipated, as the result of standard-setting by the Environmental Protection Agency (EPA) to implement the Safe Drinking Water Act Amendments of 1996 (many of these rules were initiated under the 1986 Amendments). These include rules limiting arsenic in drinking water, microbials and disinfection byproducts, radioactive contaminants and radon, among others. For wastewater systems, principal regulatory requirements mandated by the Clean Water Act have not changed since 1972, and the majority of communities have achieved or are in the process of achieving compliance. The newer issue for wastewater systems is the cost of controls and practices to manage urban stormwater runoff. These requirements are old in the sense that most wastewater utilities have not addressed long-standing stormwater management problems, but they also are new because in many communities, specific measures are only now being identified and constructed.

- **Financing Infrastructure Replacement**. A more recent focus by stakeholders is on the need to repair and replace infrastructure that has been in place for decades and will soon fail, many believe. According to the American Water Works Association, "We stand at the dawn of the replacement era...replacement needs are large and on the way. There will be a growing conflict between the need to replace worn-out infrastructure and the need to

invest in compliance with new regulatory standards."[1] Over the long term, these stakeholders say, a higher level of investment than is occurring today is required. For both wastewater and drinking water systems, a key concern is that EPA's funding programs, the largest sources of federal assistance, do not, in the main, support repair and replacement; their focus is upgrades and new construction needed to achieve wastewater and drinking water standards.

- **Problems that Do Not Fit Existing Solutions**. For some, an interest in water infrastructure legislation derives from concern that traditional federal programs and financing approaches do not fit well with some current types of needs.[2] Points at issue vary, but the common thread is that certain needs are not being well met by programmatic solutions that now exist. In some cases (metropolitan drinking water systems, for example), there is a perception that EPA's programs are more geared to aiding small systems than large ones. In other cases, the concern is how to fund types of projects that include mixed elements–e.g., developing new community water supplies and treating that water, especially in rural areas–that do not meet traditional program definitions or are seemingly spread across jurisdictions of multiple federal agencies. Another concern is that of small, dispersed communities where on-site treatment systems may be preferable to centralized facilities; however on-site treatment generally is not eligible for federal aid. At issue for Congress is whether to modify existing programs to address such needs or to address them in legislation individually and case-by-case.

- **Momentum of Recent Legislative Activity.** Recent legislation for other types of infrastructure has suggested a possible model for approaching water infrastructure funding. The Transportation Equity Act for the 21st Century (TEA21, P.L. 105-178) authorized federal highway, highway safety, and mass transit aid programs through FY2003 and established new budgetary treatment for core programs. Likewise, the Aviation and Investment Reform Act for the 21st Century (AIR21, P.L. 106-181) reauthorized programs which provide grants to airports for capital improvements. Supporters of both laws sought to assure funding at fully authorized levels and ensure to a greater degree than in the past that trust fund revenues from fees and taxes which support these programs would be fully spent on authorized activities. Some proponents of water infrastructure spending, concerned about a gap between needs and available funds, believe that a Water21-type initiative would conceptually be a logical follow-on to TEA21 and AIR21. According to that view, passage of those measures could give momentum to enacting new budget authority for water infrastructure spending, as well. Still, differences are apparent, especially the fact that there is no comparable dedicated trust fund for water infrastructure, as there are for surface transportation and aviation. While these

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[1] American Water Works Association. *Dawn of the Replacement Era, Reinvesting in Drinking Water Infrastructure*. May 2001: 5. (Hereafter, AWWA Report) Text of this report is available at: [http://www.awwa.org/govtaff/infrastructure.pdf]

[2] For background, see CRS Report RL30478, *Federally Supported Water Supply and Wastewater Treatment Programs.*

recent laws may offer momentum, they also may be imperfect models for water.

- **Changed Dynamics at the Federal Level about "Who Should and Can Pay."** For many years, a focus on federal deficit reduction constrained the federal government from making major new investments in water infrastructure or other new programs. However, at the beginning of 2001, a more favorable projection of the budgetary situation (especially a surplus projected by the Congressional Budget Office (CBO) in January to be $5.6 trillion over the next 10 years) encouraged a variety of interests to advocate increasing the federal commitment to water infrastructure. Still, many acknowledged that, even in the best of budgetary circumstances, there will be competition among different interests, including Medicare and Social Security spending, education, national defense, and other priorities. Estimates of the 10-year surplus declined in the spring and summer, as the economy appeared to be slowing. Following enactment of a $1.35 trillion tax cut law (P.L. 107-16) in June, CBO estimated in its mid-year budget estimate in August that the total surplus from 2002-2011 will be $3.4 trillion, or $2.2 trillion less than projected earlier in the year. Similarly, the Office of Management and Budget projected the 10-year surplus in April to be $3.4 trillion and revised its estimate to $3.1 trillion in August. How water infrastructure spending will fare in this altered budgetary environment remains to be seen.

This report identifies a number of issues likely to receive attention in connection with water infrastructure. It begins with a brief review of federal involvement, describes the current debate about funding needs, and then examines key issues, including what is the nature of the problems to be solved; who will pay, and what is the federal role; and questions about mechanisms for delivering federal support, including state-by-state allotment.

Congress has begun examining the issues discussed in this report, partly in response to urgings of stakeholder groups. The Senate Environment and Public Works Committee held a hearing on March 27; and in the House, separate hearings were held on March 28 by the Transportation and Infrastructure Committee and by the Energy and Commerce Committee. Some legislation has been introduced, but activity on specific proposals is not expected until later in the 107th Congress. The Bush Administration has addressed water infrastructure only in a general way and has not yet offered proposals of its own or responded to interest groups' recommendations.

One factor in Congress' attention to these issues may be a strategic decision to consider water infrastructure in stand-alone legislation, rather than comprehensive amendments to the Clean Water Act and Safe Drinking Water Act, as has been the case historically. More recently, Congress has preferred to enact legislation affecting individual statutory programs, thus avoiding controversies of broader policy issues that can arise during reauthorization debates. (For discussion, see CRS Report RL30908, *Clean Water Act: Issues and Legislation in the 106th Congress*.) This year, several groups are urging Congress to focus on water infrastructure issues alone and not include regulatory or other amendments that could dilute the focus or break coalitions within the groups.

Background: Federal Involvement

The federal government has a lengthy history of involvement with wastewater and drinking water systems. The history of financial assistance is longer for wastewater than for drinking water, however. EPA has the most significant role, both in terms of regulation and funding.

Wastewater

The Water Pollution Control Act of 1948 (P.L. 80-845) was the first comprehensive statement of federal interest in clean water programs. While it contained no federally required goals, limits, or even guidelines, it started the trickle of federal aid to municipal wastewater treatment authorities that grew in subsequent years. It established a grant program to assist localities with planning and design work and authorized loans for treatment plant construction, capped at $250,000 or one-third of construction costs, whichever was less. With each successive statute in the 1950s and 1960s, federal assistance to municipal treatment agencies increased. A construction grant program replaced the loan program; the amount of authorized funding went up; the percentage of total costs covered by federal funds was raised; and the types of project costs deemed grant-eligible were multiplied.

In the Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500, popularly known as the Clean Water Act), Congress totally revised the existing federal clean water law, including with regard to wastewater systems. At the time, there was widespread recognition of water quality problems nationwide and frustration over the slow pace of industrial and municipal cleanup efforts under existing programs. In the 1972 law, Congress strengthened the federal role in clean water and established national standards for treatment, mandating that all publicly owned treatment works achieve a minimum of secondary treatment (defined in regulations by EPA as removing 85% of incoming wastes), or more stringent treatment where necessary to meet local water quality standards, and set a July 1, 1977, deadline for meeting secondary treatment. A number of new conditions were attached to projects constructed with grants. In exchange, federal funds increased dramatically. The federal share was raised from 55% to 75%, and annual authorizations were $5 billion in FY1973, $6 billion in FY1974, and $7 billion in FY1975.

The grant program was reauthorized in 1977 for a five-year period; annual authorizations were $5 billion for each of the last three years (P.L. 95-217). Some restrictions were imposed, including requirements that states set aside a portion of funds for innovative and alternative technology projects and for projects in rural areas. In addition, the types of eligible projects were limited in order to focus use of federal funds on projects with environmental benefits in preference to projects aiding community growth. Although the program was again reauthorized in 1981 (P.L. 97-117), Congress and the Administration agreed to significant restrictions, out of concern that the program's wide scope was not properly focused on key goals. Budgetary pressures and a desire to reduce federal spending also were a concern. Annual authorizations under this act were $2.4 billion, the federal share was reduced to 55%, and project eligibilities were limited further.

The 1972 law required a "needs survey" every two years to adjust the statutory allotment formula by which grant funds were divided among the states. In this survey, EPA compiles state data to estimate capital costs for water quality projects and other activities eligible for support under the Clean Water Act. From an initial estimate of $63 billion in 1973, the survey figure went to a high of $342 billion in 1974, dropped to $96 billion in 1976, rose to $106 billion in 1978, $120 billion in 1980, declined to $80 billion in 1990, and was assessed at $139.5 billion in 1996, the twelfth and most recent survey. Inconsistencies and variations have been ascribed to several factors, including the lack of precision with which needs for some project categories could be assessed and the desire of state estimators to use the needs survey as a way of keeping their share of the federal allotment as high as possible.[3]

By the mid-1980s there was considerable policy debate between Congress and the Administration over the future of the construction grants program and, in particular, the appropriate federal role. Through FY1984, Congress had appropriated nearly $41 billion under this program, representing the largest nonmilitary public works programs since the Interstate Highway System. The grants program was a target of the Reagan Administration's budget cutters, who sought to redirect budget priorities and sort out the appropriate governmental roles in a number of domestic policy areas, including water pollution control. Thus, for budgetary reasons and belief that the backlog of wastewater projects identified in 1972 had largely been completed, the Reagan Administration sought a phase-out of the Act's construction grants program by 1990. Many states and localities, which continued to support the Act's water quality goals and programs, did support the idea of phasing out the grants program, since many were critical of what they viewed as burdensome rules and regulations that accompanied the receipt of federal grant money. However, they sought a longer transition and ample flexibility to set up long-term financing to promote state and local self-sufficiency.

Congress' response to this debate was contained in 1987 amendments to the Act (P.L. 100-4). It authorized $18 billion over 9 years for sewage treatment plant construction, through a combination of the traditional grant program and a new State Water Pollution Control Revolving Funds (SRF) program. Under the new program, federal capitalization grants would be provided as seed money for state-administered loans to build sewage treatment plants and, eventually, other water quality projects. Cities, in turn, would repay loans to the state, enabling a phaseout of federal involvement while the state builds up a source of capital for future investments. Under the amendments, the SRF program was phased in beginning in FY1989 and entirely replaced the previous grant program in FY1991. The intention was that states would have greater flexibility to set priorities and administer funding, while federal aid would end after FY1994.

While municipalities have made substantial progress towards meeting the goals and requirements of the Act, state water quality reports continue to indicate that discharges from wastewater treatment plants are a significant source of water quality impairments nationwide. The authorizations provided in the 1987 amendments

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[3] For discussion of several of these factors, see Water Pollution Control Federation (now, the Water Environment Federation). *The Clean Water Act with Amendments.* 1982: 14.

expired in FY1994, but pressure to extend federal funding has continued, in part because estimated funding needs remain so high. Thus, Congress has continued to appropriate funds, and the anticipated shift to full state responsibility has not yet occurred.

Drinking Water

Public drinking water supplies are regulated under the federal Safe Drinking Water Act (SDWA) of 1974 (P.L. 93-523), as amended (42 U.S.C. 300f-300j). Congress enacted this law after nationwide studies of community water systems revealed widespread water quality problems and health risks resulting from poor operating procedures, inadequate facilities, and uneven management of public water supplies in communities of all sizes. The 1974 law gave EPA substantial discretionary authority to regulate drinking water contaminants and gave states the lead role in implementation and enforcement.

In contrast to the 40-plus years of federal support for financing municipal wastewater treatment facilities, Congress only recently, in 1996, established a program under SDWA to help finance projects needed to comply with federal drinking water regulations. Funding support for drinking water only occurred more recently for several reasons. First, until the 1980s, the number of drinking water regulations was fairly small, and public water systems often did not need to make large investments in treatment technologies to meet those regulations. Second and relatedly, good quality drinking water traditionally has been available to many communities at relatively low cost. By comparison, essentially all communities have had to construct or upgrade sewage treatment facilities to meet the requirements of the 1972 Clean Water Act.

Over time, drinking water circumstances have changed as communities have grown and commercial, industrial, agricultural, and residential land-uses have become more concentrated, thus resulting in more contaminants reaching drinking water sources. Moreover, as the number of federal drinking water standards has increased, many communities have found that their water may not be as good as once thought and that additional treatment technologies are required to meet the new standards and protect public health. Between 1986 and 1996, for example, the number of regulated drinking water contaminants grew from 23 to 83, and EPA and the states expressed concern that many of the nation's 52,000 small community water systems were likely to lack the financial capacity to meet the rising costs of complying with the Safe Drinking Water Act.

Congress responded to these concerns by enacting the 1996 SDWA Amendments (P.L. 104-182) which authorized a drinking water state revolving loan fund (DWSRF) program to help systems finance projects needed to comply with SDWA regulations ant to protect public health. This program, fashioned after the Clean Water Act SRF, authorizes EPA to make grants to states to capitalize DWSRFs which states then use to make loans to public water systems. Appropriations for the program were authorized at $599 million for FY1994 and $1 billion annually for FY1995 through FY2003. States are required to match 20% of their federal capitalization grant, and must make available 15% of their grant for loan assistance to small systems.

Congress added several new features to the DWSRF program to reflect experience gained under Clean Water Act program and differences between the drinking water and wastewater industries. A key difference in the DWSRF is that privately owned as well as publicly owned systems are eligible for funding. Another distinction is that states may use up to 30% of their DWSRF grant to provide additional assistance, such as forgiveness of loan principal or negative interest rate loans, to help economically disadvantaged communities.[4]

Paralleling the Clean Water Act, the SDWA requires EPA to assess the capital improvement needs of eligible public water systems. Needs surveys must be prepared every four years, and EPA must distribute the DWSRF funds among the states based on the results of the latest survey. Eligible systems include approximately 55,000 public and private community water systems and 21,400 not-for-profit noncommunity water systems.

In February 2001, EPA issued the second needs survey which indicated that public water systems need to invest $151 billion over 20 years. This is up from the first needs survey (in 1997) which estimated that systems needed to invest $138 billion over 20 years. Part of the increase is attributable to the promulgation of new regulations. However, EPA estimated that the largest needs category in the current survey – installation and rehabilitation of transmission and distribution systems – accounts for $83 billion (more than half) of total 20-year needs. With the number of regulated drinking water contaminants now exceeding 90, and with more rules pending, these needs are expected to continue to grow. Consequently, stakeholders are urging Congress to increase appropriations for this program.

USDA Assistance Programs

While EPA administers the largest federal water infrastructure assistance programs, the U.S. Department of Agriculture (USDA) also provides funding. It administers grant and loan programs available to communities with populations of 10,000 or less, thus benefitting small communities, many of which have had problems obtaining assistance through the CWA and SDWA loan programs. Many small towns have limited financial, technical and legal resources and have encountered difficulties in qualifying for and repaying loans. They often lack opportunities for economies of scale or an industrial tax base and thus face the prospect of high per capita user fees to repay a loan for the full cost of a sewage treatment or drinking water project.

USDA's grant and loan programs were authorized by the Rural Development Act of 1972 (P.L. 92-419). The purpose of these programs is to provide basic amenities, alleviate health hazards, and promote the orderly growth of the nation's rural areas by meeting the need for new and improved rural water and waste disposal facilities. Loans and grants are made for projects needed to meet health or sanitary standards, including clean water standards and Safe Drinking Water Act requirements. In recent years, USDA officials have increased their coordination with state clean water and drinking water officials in administering their programs. They have done

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[4]For more information, see CRS Report 97-677, *Safe Drinking Water Act: State Revolving Fund Program.*

this both to better meet health and environmental goals and to minimize program redundancies and/or inconsistencies. In P.L. 106-387, providing FY2001 appropriations for USDA and related agencies, Congress provided $644.4 million for USDA's water and waste disposal grant and loan programs. According to USDA, this funding will support $1.4 billion in program activity. (For additional information, see CRS Report RL30478, *Federally Supported Water Supply and Wastewater Treatment Programs.*[5])

Context for the Water Infrastructure Debate: Funding Needs

Some of the factors that have led to increased attention to water infrastructure reflect long-standing concerns (for example, how cities will meet regulatory requirements), while others are recent (such as, new analyses of broader funding needs, including maintenance and repair of older systems). A number of interest groups – many with long-standing involvement as well as new groups and coalitions – have assisted in bringing attention to these issues. Among the coalitions are the Water Infrastructure Network (WIN), a coalition of 29 state, municipal, environmental, professional, and labor groups organized in 1999, and the H_2O Coalition, organized in 2001, which consists of the National Association of Water Companies, the Water and Wastewater Equipment Manufacturers Association, and the National Council for Public-Private Partnerships. WIN has issued reports on funding needs and policy that have received attention, and the H_2O Coalition has responded to some issues in the WIN reports. In April 2000, the WIN group issued a report estimating a $23 billion annual gap for the next 20 years for municipal wastewater and drinking water systems to address new problems and system deterioration.[6] A second WIN report recommends a multibillion dollar investment program in water infrastructure.[7]

EPA's contribution to the debate over needs is primarily its wastewater and drinking water needs surveys. The most recent drinking water needs survey, issued in February 2001, estimates that drinking water systems will need $151 billion for infrastructure work over the next 20 years, as noted above. Of the total, $31 billion is required for compliance with current and pending regulations. Approximately $48

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[5]In addition to providing support through these EPA and USDA programs, Congress is increasingly being asked to provide direct authorizations for individual projects developed by the Department of the Interior's Bureau of Reclamation and the U.S. Army Corps of Engineers. A key practical difference between these *projects* and EPA and USDA *programs* is that with individual project authorizations, there is no predictable assistance, or assurance of funding once a project is authorized. (See CRS Report RL30478 for more discussion.)

[6] Water Infrastructure Network. *Clean & Safe Water for the 21st Century, A Renewed National Commitment to Water and Wastewater Infrastructure*. April 2000. Text of the report is available at: [http://www.win-water.org/win_reports/pub1/pub1.html]

[7] Water Infrastructure Network. *Recommendations for Clean and Safe Water in the 21st Century*. February 2001. (Hereafter, WIN Recommendations) The text is available at: [http://www.win-water.org/win_reports/pub2/pub2.html]

billion of the total need is reported as future needs (projects for routine rehabilitation), while $103 billion is needed now to protect public health and maintain existing systems.[8]

The most recent wastewater survey, issued in 1997, estimates that $140 billion is needed through 2016 for projects and activities eligible for Clean Water Act assistance, consisting of $128 billion for wastewater treatment projects and $12 billion for other eligible water quality projects.[9] Neither EPA survey explicitly accounts for infrastructure needs due to population increases, since growth-related projects are not eligible for EPA funding.

Beyond the needs surveys, EPA has been working for some time on a new study, called the Gap Analysis, to assess the difference between current spending and total funding needs. Drafts of this analysis, based on needs surveys and updated information and which EPA expects to issue later this year, reportedly indicate that, over the next two decades, the United States needs to spend $350 billion on existing and new water infrastructure systems. EPA's $350 billion estimate is well below recent estimates by other groups. By comparison, WIN's 2000 report (see footnote 6) estimates that about $740 billion in capital spending is needed over 20 years, plus about $200 billion more to finance those investments. It also estimates that local governments will require about $980 billion for operating and maintenance (O&M) costs. Neither financing nor O&M costs are eligible for federal assistance, and interest groups are not recommending that they be made eligible. The WIN group explains that the large difference in capital cost estimates (EPA's $350 billion and its $740 billion) is because EPA estimates only the costs of complying with statutory and regulatory requirements, while WIN also accounts for investments to fully replace aging and failing infrastructure, which are not federally eligible (see discussion below).[10]

References to large funding needs for water infrastructure have drawn attention but also some criticism. For example, in testimony to a House subcommittee in March, analysts for the Congressional Budget Office questioned the reliability of needs estimates such as WIN's because they rely on judgments and assumptions, in the absence of real data. Making 20-year estimates involves extrapolations of what would happen under current and currently anticipated trends, CBO said, resulting in an analytic problem that is compounded by a shortage of data.

> [T]he existing estimates of how much investment will be needed over the next 20 years are very uncertain and may be too large. The lion's share of the investment will be used to rehabilitate or replace water and sewer pipes, but there is no national inventory of pipes' ages and conditions on which to base estimates of

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[8] U.S. Environmental Protection Agency. *Drinking Water Infrastructure Needs Survey, Second Report to Congress.* February 2001. EPA 816-R-01-004. 85 p.

[9] U.S. Environmental Protection Agency. *1996 Clean Water Needs Survey Report to Congress*. September 1997. EPA 832-97-003. 1 vol.

[10] "Commonly Asked Questions and Answers about the WIN Report *Water Infrastructure Now*." p. 2. (Hereafter, WIN Questions and Answers) Text is available at: [http://www.win-water.org/win_news/questions.html]

> investment needs. In the absence of such an inventory, analysts have to rely on rough national assumptions, which add significantly to the uncertainty inherent in any 20-year projection.[11]

CBO also examined the fact that EPA's and WIN's analyses apparently are similar with respect to estimating the gap between current spending and needs. WIN and EPA independently estimate that, over the next 20 years, there is a $23 billion annual gap between current spending and needs for both wastewater treatment and drinking water systems. According to CBO's analysis, WIN's and EPA's$23 billion figure means different things in the two cases. "In the WIN analysis, it is the 20-year average of a gap that grows year by year; whereas in EPA's preliminary analysis it is the gap at the end of the 20-year period ."[12]

Issues

While the enormous estimates of funding needs have become a focal point for discussion, some argue that trying to focus on precise needs estimates is not as important as recognizing the general need. Whether water infrastructure needs over the next 20 years are $200 billion or $1 trillion, they are very large, and the federal government is unlikely to provide 100% of the amount. At issue are, what is the precise problem to be solved; who will pay, and what is the federal role in that process; and how to deliver federal support.

Priorities: What Are the Problems to be Solved?

Defining the scope of the water infrastructure problem is a key issue. As described above, traditionally the CWA and SDWA have assisted projects needed to upgrade and improve wastewater and drinking water systems for compliance with federal standards. There still are significant funding needs for those core projects: for example, EPA estimates that one-fifth of the $151 billion needed for drinking water systems is required for compliance with regulatory standards, and the number of standards that systems must meet is growing.

Infrastructure Replacement. While not disregarding needs for compliance-related projects, stakeholders now are focusing on the problem of projects that have not traditionally been eligible under federal aid programs -- major repair and replacement of existing systems. Currently, federal funds may be used for projects that involve minor system repairs (such as correcting leaky pipes that allow infiltration or inflow of groundwater into sewer lines) but may not be used for major rehabilitation, or extensive repair of existing sewers which are collapsing or are structurally unsound. In many cities, systems that currently meet standards and provide adequate service are, according to advocacy groups, reaching the end of their service-life and will

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[11] Beider, Perry. "CBO Testimony on Estimates of Needs for Investment in Wastewater and Drinking Water Infrastructure." U.S. House. Committee on Transportation and Infrastructure. Subcommittee on Water Resources and Environment. Water and Wastewater Infrastructure Needs. Mar. 28, 2001: 11.

[12] Ibid.: 6.

require substantial investment in the near future. The American Water Works Association (AWWA) recently issued a report focusing solely on the need to reinvest in aging drinking water infrastructure. It estimates that nationally over the next 30 years, $250 billion may be required to replace worn out facilities and systems.

The replacement problem is occurring not because of neglect or failure to do routine maintenance, AWWA and others say, but because water infrastructure facilities and pipes installed decades ago are now wearing out. Most pipes were installed and paid for by past generations in response to population growth and economic development booms of the 1890s, World War I, 1920s, and post-World War II. The oldest cast iron pipes, dating from the late 1800s, have an average useful life of about 120 years, while pipes installed after World War II have an average life of 75 years. AWWA says, "Replacement of pipes installed from the late 1800s to the 1950s is now hard upon us, and replacement of pipes installed in the latter half of the 20th Century will dominate the remainder of the 21st century."[13] Treatment plant assets are more short-lived than pipes, with typical service lives of 25 to 40 years. Thus, many that were built in response to environmental standards in the 1970s and 1980s also will begin to be due for replacement in a few years.

This concern over infrastructure deterioration may recall an earlier period when infrastructure became a hotly debated topic. Twenty years ago there was much debate among policymakers about an infrastructure funding gap and the need for federal solutions to the perceived problem that America's public facilities were wearing out faster than they were being replaced. Some said that, because of declining public investment, America's infrastructure was in ruins. Analysts proposed strategies for planning, financing, and managing investments to address decay of the nation's public works infrastructure.[14] After a period of publicity and attention, debate about an "infrastructure crisis" waned. Congress did not enact legislation creating substantially new federal approaches to infrastructure but did reauthorize funding for several existing programs, including wastewater.

Today, analysts may differ over whether an infrastructure crisis did, in fact, exist at the time or whether local officials made choices sufficient to defer the issue for a later day. In the end, this earlier infrastructure debate resulted in little obvious action and without the breakdowns some had warned of. However, the current concerns may reflect a new situation: AWWA says that the replacement problem being debated today is not that utilities are faced with making up for a historical gap in the level of replacement funding. Rather, it is that utilities must ramp up budgets to prevent a replacement gap from developing in the near future, i.e., to avoid getting behind.

Funding Other Priorities. There are numerous other proposals for expanding the scope of activities eligible for SRF funding, in addition to meeting major replacement needs, raising numerous tradeoff questions for policymakers.

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[13] AWWA Report: 11.

[14] *See*, for example: Choate, Pat and Susan Walter. AMERICA IN RUINS. Council of State Planning Agencies. 1981. 97 p. *and* Vaughan, Roger J. and Robert Pollard. REBUILDING AMERICA, PLANNING AND MANAGING PUBLIC WORKS IN THE 1980S. Council of State Planning Agencies. 1984. Vol. 1. 182 p.

Wastewater SRF funding is used for construction of publicly owned municipal wastewater treatment plants, implementing state nonpoint pollution management programs, and developing and implementing management plans under the National Estuary Program.[15] Drinking water SRFs may provide assistance for expenditures that will facilitate compliance with national drinking water regulations or that will "significantly further the health protection objectives" of the Safe Drinking Water Act. Interest groups' proposals for expanded eligibility include pollution prevention projects, watershed protection measures, and projects to manage wastes from animal feeding operations. All, arguably, could benefit water quality protection and improvement, as do traditional infrastructure investments, and supporting them through the popular mechanism of SRFs would help ensure comparatively secure funding. But, expanding the scope of eligibility also arguably dilutes the current focus of these programs, at a time when traditional needs remain high. This tension already exists with the wide range of set-asides authorized under the drinking water SRF, where, in addition to funding infrastructure projects, states may reserve up to 31% of their grant for a range of other purposes. For example, states may use up to 10% of their grant for implementing wellhead protection programs and another 10% for funding local source water protection initiatives. (See discussion below of set-asides under Delivering Federal Support).

Many argue that major investments in managing nonpoint sources of water pollution would especially benefit public health and water quality. According to state data compiled by EPA, polluted runoff is the major source of water quality problems in the United States. Water quality survey data indicate that 40% of surveyed U.S. waterbodies are impaired by pollution (waters that fail to meet applicable standards) and that surface runoff from diffuse areas such as farm and ranch land, construction sites, and mining and timber operations is the chief cause of impairments, while municipal point sources contribute a much smaller percentage of water quality impairments.[16] The possible cost of practices and measures to address the nonpoint pollution problems has not been documented. Nevertheless, it is conceivable that investments in nonpoint pollution abatement (e.g., grants for nonpoint pollution management projects under the Clean Water Act, technical and financial assistance to farmers through USDA, Safe Drinking Water Act grants to protect sources of drinking water) could have equal or greater environmental benefit to water quality than investments in water infrastructure. For example, New York City is funding an extensive watershed protection program, including areas far from the metropolitan area, in an effort to avoid the need to build a filtration plant that would cost the city several billion dollars.

Growing populations in many areas of the country are placing increasing demands on water supplies and wastewater treatment facilities. Yet, even without new growth, many people in existing small and rural communities do not have access

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[15] According to EPA, 28 clean water SRF programs have funded nonpoint source pollution control and estuary protection projects, providing $1.2 billion in SRF funding, mostly over the last five years.

[16] U.S. Environmental Protection Agency. Office of Water. *The Quality of Our Nation's Waters, A Summary of the National Water Quality Inventory: 1998 Report to Congress*. June 2000. EPA841-S-00-001. 20 p.

to public sewers or water supply and, thus, are using alternative systems to help them comply with environmental laws and to solve public health problems. Local officials face a challenge of striking a balance between ensuring that water and wastewater services are affordable, but also providing sufficient revenue for system needs. To deliver these services, they often face challenges arising from economic, geographic, and technological impediments. Outside of EPA's and USDA's traditional programs, it appears that Congress is increasingly being asked to authorize direct financial and technical assistance for developing or treating water, including rural water supply projects to be built and largely funded by the Bureau of Reclamation, Department of the Interior, water recycling projects built and partially funded by the Bureau, and pilot programs for water supply and wastewater treatment projects funded by the U.S. Army Corps of Engineers. To yet another group of stakeholders, these, too, reflect priority problems in need of legislative attention and federal solutions.

Policymakers face decisions about priorities and tradeoffs, since spending decisions are essentially a zero-sum game, that is, what priority should be given to traditional infrastructure projects needed to comply with standards, versus the emerging problem of infrastructure replacement, versus nonpoint pollution management or other competing activities also having environmental benefits? Since not all can be supported, do some have greater priority than others? What should the federal government support? Should eligibility for SRF funding be expanded to include less traditional activities? Is there clearly a federal role for some or all activities or a larger federal role for some than for others?

The Federal Role

Many stakeholders are seeking substantially increased federal spending on water infrastructure for reasons described in the Introduction to this report. Among those groups involved in water infrastructure (states, cities, equipment manufacturers, the construction industry), a long-standing issue is the gap between funding needs and available resources from federal, state, and local sources.

Local government officials estimate that, on average, ratepayers currently pay about 90% of the total cost to build their drinking water and wastewater systems (through direct local financing or loan repayments to SRFs); federal funds provide the remainder (small rural systems depend more on government aid than do large systems).[17] According to the National League of Cities, these capital costs, plus operations and maintenance for which localities also are responsible, total about $60 billion annually for drinking water and wastewater systems.[18] Cities also say that they have been raising water and sewer rates to accommodate increases in operating and maintenance costs, which, according to EPA, are rising at 6% above inflation

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[17] U.S. House. Committee on Transportation and Infrastructure. Subcommittee on Water Resources and Environment. Meeting Clean Water and Drinking Water Infrastructure Needs. Hearing, 105th Congress, 1st session. Apr. 23, 1997. (105-18): 307.

[18] Tobey, Bruce. Statement on behalf of the National League of Cities on Water and Wastewater Infrastructure Needs. U.S. House. Committee on Transportation and Infrastructure. Subcommittee on Water Resources and the Environment. Water and Wastewater Infrastructure Needs. Mar. 28, 2001: 3.

annually.[19] Municipal officials contend that increased local fees and taxes alone cannot solve all funding problems. This is true, they say, both with respect to costs of meeting future needs (e.g., new treatment requirements) and costs of reinvesting in aging infrastructure, an issue of more recent concern. Water and wastewater officials acknowledge that they will continue to cover the majority of water infrastructure needs but believe that doing so presents a significant challenge in keeping water affordable. This is especially true in small cities, rural areas, and cities with shrinking populations and/or local economies where a possible doubling or tripling of water and sewer rates to meet all needs could be required. If some cities then are unable to finance replacement or improvement of their water infrastructure, declining service levels, violations of water quality requirements, and threats to public health and the environment could occur, officials say.[20]

Those assertions about financial impacts and affordability are at the heart of many stakeholders' efforts seeking greater federal support. The Water Infrastructure Network, for example, says that local sources alone cannot be expected to meet the challenge of large water and sewer needs and that the benefits of federal help accrue to the nation as a whole, since water moves across political boundaries. Moreover, WIN says, "clean and safe water is no less a national priority than are national defense, an adequate system of interstate highways, or a safe and efficient aviation system." Highways and aviation currently "enjoy sustainable, long-term federal grant programs," WIN says, supported by trust fund revenues, while water infrastructure does not.[21] WIN recommends a five-year, $57 billion authorization above current funding beginning in FY2003 for loans, grants, loan subsidies and credit assistance to capitalize state-administered grant and loan programs which it believes would cover about one-half of the estimated five-year capital funding shortfall of $115 billion. WIN estimates that, even with that level of additional investment, average household water and sewer rates would increase over the next 20 years, but in WIN's projections, average rate increases would be 100%, compared with 123% without such a boost in federal support.[22]

Some analysts dispute that a water infrastructure funding gap is inevitable or that federal funding solutions are essential. According to this view, perceived funding problems are in many cases due to the failure of local communities to assign a high priority to water and wastewater services and, consequently, failure to set local water rates and other user charges at levels that cover capital and operating expenditures. This problem is especially true in the case of municipally- or publicly-owned utility systems which, unlike investor-owned systems, often do not support the full cost of service through rates. Publicly-owned systems predominate in the wastewater industry (constituting more than 95%). In the drinking water industry, approximately 33% of public water systems are privately owned; however, most of these systems are small, serving roughly 15% of the U.S. population. The H_2O Coalition, another group in the water infrastructure debate, believes that it is not possible to state with any

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[19] Ibid.: 4.

[20] WIN Questions and Answers: 5.

[21] WIN Recommendations: 3.

[22] WIN Questions and Answers: 3.

confidence what is unaffordable to customers and therefore what the magnitude of government support should be, because few utilities have done detailed long-term needs projections and analyzed ways of addressing these needs through rates.[23] "Rate shocks" which result from large rate increases can be managed to a degree, analysts say, by financing, ratemaking, and conservation strategies. If water services continue to be subsidized by federal funds, subsidies should not reward utilities' inefficiency but should be used strategically and equitably. Some advocate using needs-based subsidies to help low-income households by providing direct payment assistance or funding a lifeline rate.[24]

The WIN group seeks to double the level of federal support for water infrastructure in FY2003 and increase it from current levels by 500% by FY2006. Others, including the H_2O Coalition, doubt that increased federal support of that magnitude is necessary or appropriate. However, even if policymakers agree that there is a federal role, questions about defining that role and agreeing on priorities, discussed above, remain. These differing views are likely to be on display as the policy debate progresses.

Delivering Federal Support

The question of how federal financial support is delivered to water infrastructure projects involves several issues, including the state-level mechanism for administering funding, composition of aid (loans and grants), and assistance for private as well as public entities. Related issues are impacts of other federal requirements, use of set-asides, and how funds are allotted to states.

Administrative Entity. Financial aid provided through the clean water and drinking water SRFs is administered by state-level agencies designated in agreements signed by EPA and individual states. Many evolved from the agencies that previously administered the Clean Water Act construction grant program that preceded the SRF program. In many states, SRFs are managed by the state environmental agency or branches of that agency responsible for implementing the CWA and the SDWA. In other states, they are managed by separate financing authorities or offices. About 30 states currently administer the two SRF programs jointly; the remainder administer parallel SRF programs. State officials say that, where administration of the two is not joined, there are good reasons for maintaining the separation. The 1996 SDWA amendments included a provision allowing states to transfer a portion (up to 33%) of a capitalization grant between the two programs to give states funding flexibility. So far, five states have used this provision to transfer funds from their clean water to

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[23] "Comparison of Recommendations of the WIN and the H_2O Coalition." Feb. 16, 2001. See: [http://www.nawc.org/h2O.html]

[24] Beecher, Janice. Statement on behalf of the National Association of Water Companies. U.S. House. Committee on Transportation and Infrastructure. Subcommittee on Water Resources and the Environment. "Water and Wastewater Infrastructure Needs." Mar. 28, 2001.

their drinking water SRF programs, and EPA has recommended that Congress extend the transfer authority, which is due to expire on Sept. 30, 2001.[25]

The WIN group recommends that the SRF concept be replaced with an alternative mechanism called State Water and Wastewater Infrastructure Financing Authorities which would work with state clean water and drinking water programs but would handle the infrastructure banking aspects for both. WIN says that this would be highly efficient, enabling a single state agency to determine priorities and appropriate financial assistance instruments. Most state officials now involved with the two SRF programs object to this proposal, believing that it would de-construct what exists and is working well now, in their view. It would also substitute a new organizational entity for that which individual states have determined works best for them, including the 20 states that prefer separate SRF programs. Also, by giving decisionmaking authority to a new entity, the WIN concept would take authority from existing state agencies. WIN supporters believe that differences between their proposal and the views of state program officials are not vast, but those state officials disagree.

The Type of Assistance Provided: Grants and Loans. One issue that divides the water infrastructure stakeholder groups is whether to provide assistance through grants, as well as loans, with cities and the WIN group favoring a significant place for grants, and states and the H_2O Coalition favoring loans in preference to grants.

Both SRF programs authorize states to make loans at or below market interest rates, including zero interest loans. However, for several years, both small and large cities have urged Congress to explicitly authorize water infrastructure grants, in addition to loans, to provide flexible assistance best suited for particular community and state needs. Thus, the drinking water SRF, enacted nine years after the clean water SRF program, allows up to 30% of capitalization grants to be used to provide loan subsidies to disadvantaged communities. Grants that do not require repayment obviously are preferred by communities. For example, some small communities that lack an industrial tax base or means to benefit from economies of scale find it difficult to repay a loan for 100% of the cost of water infrastructure projects. Some larger cities also seek grants, on the basis that water infrastructure is just one of numerous costly capital needs that they must meet, and a partial subsidy in the form of a grant would help make those costs affordable for ratepayers.

Small and disadvantaged communities' financing problems also have been addressed by permitting a longer loan repayment period. By spreading out repayment, communities can reduce the amounts due on an annual basis, thus lessening the amount of rate increases needed to finance the repayment (although total financing costs over the life of the loan will be higher). Under both SRF programs, annual principal and interest repayments begin one year after project completion and are to be fully amortized 20 years after project completion. Under the drinking water

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[25] U.S. Environmental Protection Agency. Office of Water. *Implementation of Transfers in the Clean Water and Drinking Water State Revolving Fund Programs*. EPA 816-R-00-021. October 2000. 23 p.

SRF, however, states may allow economically disadvantaged communities up to 30 years to repay loans. The Clean Water Act does not currently permit 30-year repayments, but House Appropriations Committee report language accompanying EPA's FY1998 appropriations bill (P.L. 105-175) encouraged EPA to allow states to issue bonds allowing for clean water SRFs with repayment terms of greater than 20 years. A few states (e.g., Massachusetts, West Virginia, Maryland) now are issuing 30-year clean water SRF loans.

Many state officials are reluctant to use a portion of the SRF to award grants, principally because, to the extent that part of the SRF is used for making grants, the corpus of the loan fund and its ability to be a self-sustained long-term source of funding are diminished. States acknowledge that a loan "buy down," in the form of granting forgiveness of a portion of the SRF loan principal, can be a useful option for dealing with disadvantaged communities. However, many states prefer to limit the use of grants as much as possible and would oppose being obliged to make grants. State water quality officials who previously administered the Clean Water Act's construction grant program and others believe that grants can undermine efficient investments by leading to substitution of federal funds for state and local funds and distorting choices between spending on capital and spending on operations and maintenance.[26] According to EPA, states are being conservative in using the principal forgiveness authority under the drinking water SRF: only 12 states have done so.

The WIN group recommends that states be required to provide 25-50% of each year's federal capitalization grant as grants for up to 55% of eligible project costs. In the case of disadvantaged communities, grants could cover up to 75% of costs. In addition, WIN recommends that states be required to allocate 10-25% of each year's capitalization grant to loan subsidies, including principal forgiveness and negative interest rate loans. These proposals, according to WIN, would enhance states' flexibility in providing assistance while addressing the problems that many water and wastewater systems face in financing all of their needs through local rates.[27]

Members of the H_2O Coalition favor limited and targeted federal assistance, so that utilities are encouraged to attain and maintain business-like operations. If federal assistance is provided, the Coalition, like many state officials, advocates that it should be primarily in the form of low-interest or zero-interest rate loans. The Coalition supports assistance for low-income families to supplement their water and sewer bills, where necessary, either paid to the low-income families or directly to the utility. Some loan forgiveness (as under the drinking water SRF) or grants (with at least 50% local cost share) are options that the Coalition supports in rare cases, and only so long as assistance produces long-term solutions and ensures that federal monies are used cost-effectively. Except in cases where virtually all of a utility's customers are impoverished, assistance for low-income households should be favored over grants or loans, this group says. According to the Coalition, grants or loans with substantial

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[26] U.S. Congressional Budget Office. "Budget Options; Chapter Three, Investing in Physical Capital and Information." February 2001. (Hereafter, CBO Budget Options)

[27] WIN Recommendations: 8.

forgiveness subsidize all customers' rates, even those that are able to afford the full cost of service, and therefore are not an efficient use of scarce federal assistance.[28]

Federal Funds for Private Infrastructure Systems. Currently under the drinking water SRF program, eligible loan recipients include community water systems, both publicly and privately owned, and not-for-profit noncommunity water systems (e.g., schools with their own water supply). Eligible loan recipients for wastewater SRFs are any municipality, intermunicipal, interstate or state agency, but not privately owned utilities. A number of stakeholders are advocating that SRF funds be made available to privately owned wastewater systems, as well. This would "level the playing field" between the two programs, it is argued, and also would encourage public-private partnerships and privatization.

Another issue involving the private sector concerns the Internal Revenue Code. Under federal tax law, certain activities financed by the issuance of state and local bonds have a special status because the interest earned is exempt from federal income taxation. Tax-exempt financing enables state and local governments to borrow at a lower interest rate than either private business or the federal government must pay on taxable debt. In general, tax-exempt status applies to activities broadly defined as having public purpose. Some specific activities considered to have both public and private purposes are eligible for tax-exempt financing. However, these public/private activities are subject to a cap which limits the volume of private activity bonds (PABs) that state and local governments may issue annually. PABs for water infrastructure are subject to the volume cap, and tax-exempt financing can be done if the project is able to secure an allocation from the volume cap. Because private water bonds compete under this cap with other private bond uses such as housing and student loans, some groups favor legislation that would exempt all PABs for water infrastructure from the volume cap. A bill to authorize such a change has been introduced in the 107th Congress (H.R. 2207). Current law provides such an exemption for solid-waste-to-energy projects. Opponents will argue that restrictions on tax-exempt financing should be maintained, because of the costs to the federal government, in terms of income tax revenues foregone. (For information, see CRS Report RL30638, *Tax-Exempt Bonds: A Description of State and Local Government Debt*.)

Other Federal Requirements. Under both SRF programs, a number of federal authorities, executive orders, and government-wide policies apply to projects and activities receiving federal financial assistance, independent of program-specific statutory requirements, and many stakeholders favor repealing their applicability to water infrastructure projects. These include environmental laws (e.g., Clean Air Act, Endangered Species Act), social legislation (e.g., Age Discrimination Act, Civil Rights Act), and economic and miscellaneous laws (Davis-Bacon Act, Uniform Relocation and Real Property Acquisition Policy Act of 1970, and procurement prohibitions under environmental laws and Executive Order 11738). These federal cross-cutting requirements apply only to projects funded directly by the federal capitalization

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[28] H_2O Coalition. "What is the Water Infrastructure Problem and What are the Solutions?" Issue Paper. Feb. 26, 2001: 7-11.

grants, but not to SRF activity made from loan repayments, interest earned, or other state monies contained in the SRF.

In addition, the clean water SRF attaches 16 specific statutory requirements to activities funded directly by federal capitalization grants that are carryover ("equivalency") requirements from the prior construction grant program (e.g., specific project evaluation requirements).

Under both SRF programs, projects that a state finances with funds directly made available by federal capitalization grants are subject to Environmental Impact Statement requirements of the National Environmental Policy Act. Projects funded by other monies in the SRF must also undergo an environmental review; however, a state may select its own method for conducting environmental reviews, if approved by EPA.

Many stakeholders believe that these other federal cross-cutting requirements are burdensome and costly and, in many cases, only ancillary to benefits of water infrastructure projects. One particularly contentious issue is compliance with the Davis-Bacon Act which requires that not less than the locally prevailing wage be paid to workers employed under federal construction contracts and on many federally-assisted projects. Critics of Davis-Bacon say that it unnecessarily increases public construction costs and hampers competition (with respect to small and minority-owned businesses). Supporters say that the law helps stabilize the local construction industry by preventing competition from firms that could undercut local wages and working conditions and thus compete unfairly with local contractors. Inclusion of its requirements in the CWA and SDWA programs has been a controversial issue. (For information, see CRS Report RL31063, *Davis-Bacon Act: Issues and Legislation in the 107th Congress*.)

Set-asides. The utility of set-asides that allow for using a portion of SRF capitalization grants for program purposes other than directly constructing infrastructure is likely to be debated, especially if Congress endorses WIN's recommendation to consolidate the existing water infrastructure SRFs, because set-asides are one difference between the two programs. Under both programs, states may reserve up to 4% of their federal capitalization grants annually for the reasonable costs of administering the SRF. Under the clean water SRF, states must reserve the greater of 1% of its capitalization grant or $100,000 each year to carry out specified planning requirements under the CWA. Under the drinking water SRF, states may use up to 31% of their grant for specified SDWA programs including supervision of public water systems, operator certification, compliance capacity development, and state and local source water protection initiatives (some uses require a 50% state match). Reserving a large amount of funds, even for related implementation activities, necessarily limits the funds available to the state for making infrastructure project loans. Also, several of the set-aside activities have their own funding authority; thus, a concern for states is that Congress may rely on the SRF to fund other SDWA requirements instead of providing the authorized appropriations, and the overall funding for drinking water activities may be diminished. Drinking water program officials acknowledge this problem, but many believe that set-asides are a useful means of ensuring that monies will be available for activities that might otherwise not have a secure source of funds. Because states have some flexibility, in fact, few are

using the full amount that could be reserved under the set-asides. According to EPA, only three states are using the full 31% that the law allows, and most are reserving from 12-18%.

Many state water quality officials have a different view of set-asides, based on experience administering the previous construction grant program which for a time required states to reserve a portion of federal funds for specified types of projects. Because of problems encountered in spending those set-aside funds (e.g., finding beneficial projects on which to spend all the required reserved funds) and extensive oversight by EPA, many of them now oppose the reservation of core funds (especially mandatory set-asides), except for covering SRF administrative costs.

Allotment of Funds. Another issue of interest is how federal funds are allocated among the states. Capitalization grants for clean water SRFs are allotted according to a state-by-state formula in the Clean Water Act. It is a complex formulation consisting basically of two elements, state population and capital needs for wastewater projects. Because the allocation formula is 14 years old and needs and population have changed, the issue of state-by-state distribution of federal funds is likely to be an important topic when legislation is considered. In contrast, capitalization grants for drinking water SRFs are allotted among the states by EPA based on the proportional share of each state's needs identified in the most recent national drinking water needs survey, not according to a statutory allotment formula. (For information, see CRS Report RL31073, *Allocation of Wastewater Treatment Assistance: Formula and Other Changes*.) Among the questions likely to be discussed are, should a single formula apply to both programs? Should allocation follow from a statutory or administrative formula? Do EPA's needs surveys provide an accurate basis for state-by-state distribution? If programs are expanded to include eligibility for new activities, such as pollution prevention and watershed protection, how should they be reflected in state-by-state allocations? Crafting an allotment formula has been one of the most controversial issues debated during past reauthorizations of the Clean Water Act. The dollars involved are significant, and considerations of "winner" and "loser" states bear heavily on discussions of alternative formulations.

A related issue is whether a portion of federal water infrastructure funds will continue to be allocated on the basis of earmarked appropriations, which have become increasingly prominent. In recent years, congressional appropriators have dedicated a significant portion of annual water infrastructure assistance as grants earmarked for specific communities, both small and large. The federal share of costs under these grants is 55%. For example, for FY2001 (P.L. 106-377 and P.L. 106-554), Congress appropriated $1.35 billion for clean water SRF capitalization grants, $823 million for drinking water SRF grants, and $466 million in earmarked grants for 244 listed projects. Appropriations earmarked for identified communities enable legislators to assist communities otherwise unable to fully qualify for state-administered programs or those seeking a grant rather than a loan that must be repaid. State officials that administer the SRF programs oppose earmarked grants because such congressional actions deny states the ability to determine priority for project funding.

Research on New Technologies

While there have been advances in technology to meet recent drinking water mandates, the basic technologies used by communities to meet wastewater and drinking water needs have changed little for several decades, in part because utility officials often favor using conventional, familiar systems and technologies. This is particularly the case in the wastewater sector where regulatory requirements have been relatively static for years. Although this has long been true in the drinking water sector as well, the situation is changing as recent and pending regulations are requiring many public water systems to apply new technologies.

Federal support for research and development (R&D) of new drinking water and wastewater technologies is limited. In the 1996 SDWA Amendments, Congress noted the need for more research to support drinking water regulations and authorized additional funding for drinking water research over 7 years. While much of EPA's drinking water research is focused on health effects studies, the identification of feasible treatment technologies is a central component of EPA's drinking water standard setting process, and technology research has received support. However, EPA's water research budget often has fallen short of its regulatory needs, and consequently, competition for available funding has been considerable.[29]

According to the Water Infrastructure Network, technology R&D is supported at the federal level mainly by programs of EPA's Office of Research and Development and EPA's Environmental Technology Verification (ETV) Program. Also, Congress has directed that EPA provide appropriated funds to nonprofit research foundations including the Water Environment Research Foundation ($4 million in FY2001) and the American Water Works Association Research Foundation ($4 million in FY2001). The ETV Program began in 1995 to verify the performance of innovative technology developed by the private sector and to accelerate the entrance of new technologies in all media. In the water and drinking water areas, technologies have been verified for a number of packaged drinking water systems especially needed for small community water supplies. Pilots also are underway to evaluate source water protection technologies and urban wet weather flow control technologies. None of these programs focuses specifically on infrastructure, according to WIN.[30] This group recommends that Congress authorize $250 million annually to support the development and use of innovative technologies that would reduce the cost of meeting drinking water and clean water requirements and replacing water infrastructure. The CBO also has noted that one option to increase federal support for water infrastructure would be increased federal spending on R&D that could reduce water systems' costs and improve efficiency.[31]

In the past, Congress has attempted to advance new and innovative technologies in other ways, in addition to R&D activities. Beginning with the 1977 amendments

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[29] See, for example, the report by the General Accounting Office, *Drinking Water Research: Better Planning Needed to Link Needs and Resources*. GAO/RCED-99-273. September 1999. 30p.

[30] WIN Recommendations: 12.

[31] CBO Budget Options.

to the Clean Water Act, Congress authorized specific incentives for such technologies, in particular by increasing the federal share under the construction grant program for innovative and alternative technology projects that reuse or recycle wastewater and sludge, reduce costs, or save energy consumption. The Act also provided for 100% modification or replacement of innovative or alternative systems in the event of technological failure or significantly increased operating costs, as a safety measure to reduce the potential uncertainty of building using risky or unproven wastewater treatment technologies.

The federal funding bonus, together with the potential for full replacement if a system failed, were seen by states and cities as significant incentives for using technologies other than conventional wastewater treatment systems. However, these incentives were funded as set-asides from construction grants, which was not universally popular among state officials at the time. In 1989, EPA estimated that, compared with conventional treatment processes, for every dollar invested in designing and constructing an innovative project, 40 cents was saved over the life of the facility. Many now believe, however, that under the clean water SRF program, without the incentive of bonus funds or 100% replacement grants, few communities are constructing projects that utilize unproven or unfamiliar technology.

The Safe Drinking Water Act has no such incentives, but regulatory pressures and population growth are forcing both water and wastewater utilities to assess the potential of alternative treatment technologies. In this regard, issues for congressional consideration could include possible financial incentives or regulatory incentives (such as allowing some additional compliance flexibility) for use of innovative technology, as well as increased federal support for technology R&D.

Concluding Thoughts: Funding the Federal Share

The preceding discussion identifies a number of issues that Congress, the Administration, and stakeholders are likely to address in debating water infrastructure needs and concerns. Many of them already are the subject of advocates' recommendations and policy positions. So far, however, none has addressed the long term challenge of actually paying for the larger federal financial commitment that many of them seek. Some may wish to fund the $57 billion program recommended by WIN (or other program involving significant additional federal spending) entirely out of general revenues in the U.S. Treasury, but that faces substantial hurdles and competition with other government priorities. At this point, none of the stakeholders has discussed financing alternatives that might be employed to supplement or replace general revenue funding. WIN recommends that Congress establish a formal process (perhaps a commission) to evaluate alternatives for a longer-term and sustainable financing approach, but suggests that a commitment to a larger federal role should precede such a process.

Much analytic work has already been done on these questions, including research by academics and by interest groups.[32] EPA also has contributed analyses in the form

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[32] For example, Clean Water Council. *America's Environmental Infrastructure: A Water and* (continued...)

of a study requested by Congress in the mid-1990s that examined financial mechanisms to enhance the capability of governments to fund mandated environmental goals.[33] Among the options explored have been various types of water-related fees that could be dedicated to water infrastructure and other water quality projects, including one based on water withdrawals or use, permit fees, effluent fees, chemical feedstock fees, and environmentally "green" product fees. Each has economic impacts, spillover effects, and questions about administration that need thorough assessment. Increased public/private partnerships are advocated by some, and other options also may merit exploration. As difficult as it may be for policymakers to resolve the many issues discussed in this report, resolving how to pay for water infrastructure is no less important and will be a continuing challenge

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[32](...continued)
Wastewater Investment Study. 1990. 46 p.

[33] U.S. Environmental Protection Agency. *Alternative Funding Study: Water Quality Fees and Debt Financing Issues, Final Report to Congress*. June 1996. Text is available at: [http://www.epa.gov/efinpage/altsum.htm]