

GAO

Report to the Chairman, Committee on  
Environment and Public Works, U.S.  
Senate

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January 1999

# SAFE DRINKING WATER ACT

## Progress and Future Challenges in Implementing the 1996 Amendments



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**Resources, Community, and  
Economic Development Division**

B-281377

January 14, 1999

The Honorable John H. Chafee  
Chairman, Committee on Environment and Public Works  
United States Senate

Dear Mr. Chairman:

The Safe Drinking Water Act Amendments of 1996 sought to address numerous long-standing problems impeding the nation's primary drinking water protection program. In doing so, the amendments (1) required that new contaminant limitations be based on the risk to human health and on sound science and that the cost of compliance be taken into account, (2) placed greater focus on the prevention of pollution by requiring that all waters serving as drinking water sources for public water systems be assessed for their susceptibility to contamination, (3) added requirements to help ensure that customers are fully apprised of the quality of their drinking water, (4) addressed the problems associated with thousands of "nonviable" small water systems that have often had difficulty ensuring the safety of their water, (5) established a Drinking Water State Revolving Fund program to help water systems finance infrastructure improvements, and (6) authorized additional resources to help the Environmental Protection Agency (EPA) and the states implement the drinking water program.

Less than 3 years have elapsed since the amendments were enacted. While it is too early to fully assess their implementation, sufficient time has passed for us to obtain some indication of the progress being made by EPA and the states and to identify some of the key challenges that lie ahead. Accordingly, as agreed with your office, this report provides information on each of the key changes identified above and discusses (1) the status of efforts and progress made by EPA and the states in addressing them and (2) the future challenges facing EPA and the states in their efforts to do so.

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**Results in Brief**

EPA and the states have made progress in meeting the initial requirements of the Safe Drinking Water Act Amendments of 1996. Of particular note, EPA has met all of its statutory requirements to develop regulations and guidelines. For their part, the states have made important strides in setting up their drinking water revolving funds and are working to meet other initial requirements to prepare needed strategies and programs. Yet, as noteworthy as these initial efforts have been, the most difficult challenge

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deals with the longer-term question of implementation—implementation of the new contaminant standards (including monitoring water systems' compliance with the standards), the provisions to ensure the viability of thousands of smaller water systems, and the numerous other requirements associated with this complex statute. Meeting these longer-term challenges will call for a sustained effort by EPA, the states, and the nation's public water systems and will warrant continuous oversight by the Congress.

Developing New Contaminant Limitations. EPA is working to meet the amendments' requirements to complete many contaminant standards that were in process at the time of reauthorization, including standards for arsenic and radon. Many of these standards—which could impose significant costs for some drinking water systems—may be questioned by the regulated community as being inadequately supported by the research on health effects. EPA drinking water officials maintain that ongoing and planned research, if completed, will be sufficient to support these regulations. They acknowledge, however, that it will be challenging for the agency to simultaneously conduct all the programmatic and research activities needed to support subsequent statutorily required regulations. In addition, EPA has yet to determine how it will address the amendments' mandate to review and revise the over 80 existing standards that have been promulgated in past years.

Assessing Drinking Water Sources. The states are presently working to develop statewide “source water assessment programs” that identify sources of public drinking water and show how a state will determine the vulnerability of the sources to contamination. While the states are required to develop these programs by February 1999, only one state thus far has an approved program. Moreover, EPA and state officials agree that the states will be particularly challenged in meeting the act's additional requirement that the states assess each of the nation's more than 170,000 public water systems by May 2003 for their vulnerability to contamination. The task will be particularly challenging in the case of large surface water sources and aquifers that cross state or international borders because the assessments will depend heavily on the degree of cooperation between neighboring states or countries.

Informing Customers of Drinking Water Quality. EPA issued regulations on August 19, 1998, that call on public water systems to issue annual consumer confidence reports. These reports are to inform customers of the source of their drinking water, violations of any federal drinking water

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standards, and contaminants that were detected and their related health effects. However, EPA and state regulators will be challenged to achieve consensus as to what constitutes an adequate report. Specifically, while a broad range of stakeholders (including federal and state officials, and industry and environmental groups) has expressed support for the principle of providing better information to customers about their drinking water quality, some environmental and consumer groups have questioned whether EPA's August 1998 regulations will be sufficient to accomplish this purpose.

Addressing Nonviable Small Water Systems. The states have made progress in implementing the capacity development requirements for new systems and in reporting on existing systems with a history of noncompliance. These requirements, together with the requirement for the states to develop capacity development strategies, are intended to address the long-standing problems associated with the viability of thousands of small public water systems. Both EPA and state officials agree, however, that the challenge will be in the actual implementation of these strategies. In particular, the states will need to make judgments about the financial and managerial capability of new systems, tasks that have not traditionally been part of the drinking water program. The states will also need to develop and implement strategies to assist existing systems in acquiring and maintaining technical, managerial, and financial capacity.

Developing State Drinking Water Revolving Funds. Both EPA and the states have made progress in launching the Drinking Water State Revolving Fund program. Specifically, EPA issued final program guidelines by its February 1997 deadline, and the states completed all of the activities associated with establishing and operating their funds by September 30, 1998, the statutory deadline for receiving and obligating their initial grants. A total of \$1.25 billion in fiscal year 1997 funds was awarded to the states and Puerto Rico. These funds can be expected to provide substantial assistance to many water systems that cannot afford the capital investments required to provide safe drinking water. The greatest challenge, however, will be in addressing the particular infrastructure needs of the nation's smaller water systems—which EPA estimates will cost over \$37 billion through 2014.

Improving EPA's and the States' Capacity to Administer the Program. The 1996 amendments took important steps to address serious resource shortages affecting EPA's and the states' capacity to meet basic program needs—steps that EPA and state officials agree have helped to put the

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program on a sounder footing. Of particular note, the statute substantially increased the state program grants and provided the states with access to money from the revolving fund for program administration. Yet the statute also challenges EPA and the states with significant new responsibilities. The net effect of these changes on their capacity to implement the drinking water program has yet to be determined.

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## Background

The Congress enacted the Safe Drinking Water Act in 1974 to protect the public from the risks of contaminated drinking water. Under the act, EPA is required, among other things, to (1) set standards or treatment techniques for contaminants that may adversely affect human health and (2) establish requirements for monitoring the quality of drinking water supplies and for ensuring that water systems are properly operated and maintained. EPA is authorized to grant primary enforcement authority for the drinking water program, commonly referred to as “primacy,” to the states that meet certain requirements. Among the key requirements are that the states (1) adopt drinking water regulations that are no less stringent than EPA’s national primary drinking water regulations and (2) adopt and implement adequate procedures to carry out the program’s requirements and enforce the regulations.

In a series of reports and testimonies leading up to the 1996 amendments, we cited a number of problems that seriously impeded EPA’s and the states’ drinking water programs.<sup>1</sup> We noted, for example, that EPA had fallen behind the statutory timetable for promulgating new regulations and cited substantial resource constraints that made it difficult for EPA, the states, and the nation’s public water systems to comply with basic requirements of the statute. Among other things, we (1) identified the particularly difficult problems many smaller water systems had in complying with the act and in ensuring a safe water supply and (2) found that the public was often inadequately informed of both the health risks posed when water systems violated contaminant limits and the appropriate preventive measures that should be taken.

The Safe Drinking Water Act Amendments of 1996 sought to address many of these issues. Of particular note, the statute eliminated the requirement that EPA set standards for at least 25 additional contaminants every 3 years (regardless of the health risks they posed) and replaced it with a 5-year regulatory cycle that requires that new regulations be based on the risk to human health and on sound data and science and allowed EPA to consider

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<sup>1</sup>A list of our past reports on drinking water is at the end of this report.

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costs and benefits as factors in setting the standards. The statute addressed the severe resource constraints experienced by EPA, the states, Indian tribes, and water systems with increased funding for research and the Public Water System Supervision program (the program that largely supports the states' key drinking water oversight activities) and through the creation of the Drinking Water State Revolving Fund program for infrastructure improvements at water systems. Among other things, the amendments also (1) attempted to resolve the particularly challenging problems associated with small water systems; (2) sought to focus greater attention on preventing the contamination of water supplies at their source, rather than solely on the purification of water at treatment plants; and (3) encouraged greater consumer awareness by requiring water systems to inform their customers about the source and quality of their drinking water supplies.

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## Development of New Contaminant Limitations

The 1996 amendments replaced the requirement to regulate 25 additional contaminants every 3 years with a new selection process that explicitly allows EPA to identify contaminants that warrant regulation on the basis of the adverse health effects of the contaminants, their frequency of occurrence in public water systems, and the projected risk reduction to be achieved in regulating them. EPA was required to publish, by February 1998, a list of high-priority contaminants not currently regulated. (EPA calls this the "Contaminant Candidate List.") Rather than automatically requiring 25 new contaminants to be regulated every 3 years, beginning in August 2001 (and in 5-year cycles thereafter), the amendments require EPA to determine whether to regulate at least 5 of the contaminants on the list. A determination to regulate is to be based on the best available public health information and data concerning the occurrence of the contaminant.

The replacement of the requirement to regulate 25 new contaminants every 3 years was an important step in addressing both the resource problems affecting EPA and key regulatory problems affecting the drinking water industry. Nonetheless, the cost and technical issues associated with new regulations will continue to challenge both regulators and the regulated community. In particular, the 1996 amendments required that EPA complete the development of most of the regulations that were in process at the time of reauthorization. Specifically, they require the agency to (1) finalize standards for certain contaminants for which proposed

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regulations were in place (i.e., standards for disinfection by-products<sup>2</sup> and cryptosporidium<sup>3</sup>); (2) issue new or updated standards for certain contaminants that were previously required to be regulated under the 1986 amendments to the Safe Drinking Water Act (i.e., arsenic and radon) and determine whether to regulate others (i.e., sulfate); and (3) finalize regulations requiring filtration treatment for surface water systems and disinfection treatment for groundwater systems (i.e., the Enhanced Surface Water Treatment Rule and Ground Water Disinfection Rule).

Pursuant to these requirements, the first new drinking water standards in over 6 years (and the first since the 1996 amendments) were promulgated by EPA in December 1998—the Interim Enhanced Surface Water Treatment Rule and the Disinfectants/Disinfection By-Products Stage 1 Rule. Other regulations currently under development include those dealing with arsenic, radon, and other radionuclides, disinfectants/disinfection by-products (stage 2), long-term enhanced surface water treatment, filter backwash, and groundwater. These regulations are scheduled to be issued over the next 3 to 5 years. Other efforts will focus on (1) updating the Total Coliform Rule and regulations on atrazine, aldicarb, and nickel; (2) regulating contaminants chosen from the Contaminant Candidate List; and (3) reexamining existing standards for 80 other contaminants.

Compliance costs associated with some of the new regulations will be significant. For example, EPA has estimated that the total annual compliance costs associated with the Disinfectants/Disinfection By-Products Stage 1 Rule will be about \$700 million per year for community<sup>4</sup> and nontransient noncommunity water systems.<sup>5</sup> Furthermore, the revised arsenic standard could impose high costs on water systems; estimates by EPA and the American Water Works Association indicate that the total annual compliance costs could be as high as \$2.1 billion or \$4.1 billion, respectively.<sup>6</sup>

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<sup>2</sup>Conventional water treatment practices require the addition of disinfectant chemicals to the water that, while effective in controlling many harmful microorganisms, combine with organic and inorganic compounds in the water and form potentially harmful disinfection by-products. The Disinfectants/Disinfection By-Products Rule will address how to minimize risks from these by-products and still control microbial contaminants.

<sup>3</sup>Cryptosporidium is a microorganism commonly found in lakes and rivers that is highly resistant to disinfection. It can cause gastrointestinal illness with symptoms that include diarrhea, nausea, and stomach cramps.

<sup>4</sup>Community water systems serve the same population year-round.

<sup>5</sup>Nontransient noncommunity water systems supply water to at least 25 of the same people at least 6 months per year but not year-round. Some examples are schools, factories, office buildings, and hospitals that have their own water systems.

<sup>6</sup>The estimates are for complying with a standard based on 2 micrograms per liter.



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Compliance costs are typically much greater for customers of small water systems because these systems have fewer customers to share the costs. Overall, according to estimates by EPA and the Congressional Budget Office, the cost of complying with existing regulations averages less than \$20 per household annually for systems serving more than 10,000 people. For systems serving between 25 and 100 people, however, the average annual household cost is \$145.

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### Concerns Over Adequacy of Underlying Science and Data

The expense associated with drinking water regulations underscores the need to have a sound scientific and information basis underlying them. Achieving that scientific basis for the full range of required regulations by the new statutory deadlines, however, will pose an enormous challenge. According to officials from EPA's Office of Ground Water and Drinking Water, the ongoing and planned research is sufficient to support the regulations currently under development but cannot adequately support the work required for future regulations within the timetables prescribed by the amendments. Citing an Office of Water needs assessment (which was coordinated with the Office of Research and Development), the Director of the Standards and Risk Management Division said that the new demands cannot be met by shifting resources without sacrificing quality or missing statutory deadlines. Initial EPA estimates are that the annual funding shortfall for research and data collection will be in the range of \$10 million to \$20 million per year for fiscal years 1999 through 2005.

Consequently, without additional resources, EPA will be faced with a difficult choice: (1) fall behind the statutory timetable for considering contaminants for possible regulation to advance public health protection, (2) focus on meeting its timetable—but risk greater challenges to the adequacy of the proposed regulations' underlying quality and science, or (3) shift research and program resources from other high-priority activities. The Contaminant Candidate List regulations and activities are a case in point. EPA is required to make regulatory determinations based on the list by 2001 and concurrently initiate research and data collection to support subsequent Contaminant Candidate Lists and rules. But agency officials indicate that current resources are almost fully devoted to the development and completion of ongoing priority rulemaking efforts and cannot be shifted to new projects.

Industry organizations we contacted also expressed concern over EPA's ability to conduct all of the research necessary to support new regulations. Officials from the American Water Works Association and the Association

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of Metropolitan Water Agencies told us that the scientific studies supporting EPA's rulemakings are one of the issues of greatest concern to them about the implementation of the 1996 amendments. They expressed particular concern about the science supporting some of the near-term regulations. An Association of Metropolitan Water Agencies official told us that her association is particularly concerned that EPA may be under pressure to set standards for some contaminants regardless of whether the scientific data needed to support the rulemakings are ready in time. An American Water Works Association official expressed similar concerns.

Such concerns prompted these organizations to file a lawsuit seeking an order compelling EPA to comply with a statutory requirement (under section 1452 of the Safe Drinking Water Act) to set aside funds from the Drinking Water State Revolving Fund program's appropriation, beginning in fiscal year 1995, for health-related research studies. EPA contends that the appropriation in question did not include monies for earlier years and was limited to capitalization grants for Drinking Water State Revolving Fund programs and grants for assistance to Indian tribes to support the financing of water infrastructure. EPA instead received \$10 million, the amount authorized to be set aside by section 1452, from a separate fiscal year 1997 appropriation for health effects research. The water associations see a danger in year-by-year funding for health effects research. They believe that if funds were set aside for section 1452, there would be a constant flow of funds for research. Instead, EPA must depend on additional appropriations from the Congress every year, which may not yield the same amount of money as a permanent set-aside. A ruling confirming EPA's legal position was issued in October 1998.

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## Requirement to Review Existing Regulations

In addition to requiring the completion of the standards currently "in the pipeline" and the consideration of new ones, the 1996 amendments require EPA to review the dozens of existing standards that have been promulgated in past years. Specifically, the amendments require EPA to review and revise, as appropriate, the existing national primary drinking water regulations at least every 6 years, with the first such review due in 2002. Officials in the Office of Ground Water and Drinking Water said that they had only made preliminary projections of what would be required to address this activity.

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## Assessing the Safety of Drinking Water Sources

Although it is widely recognized that the most cost-effective approach to protecting drinking water is to prevent its contamination at the source, the nation's drinking water program has historically focused on finding and treating contaminants. Efforts focusing on preventing contamination were limited by the absence of funding and dealt primarily with groundwater sources.

The 1996 amendments significantly expanded the focus within the drinking water program on preventing contamination. The amendments created a source water assessment program that further emphasizes preventing groundwater contamination and that expands the scope of the prevention efforts to include surface waters such as rivers, lakes, and streams used for drinking water. The states are now required to develop statewide source water assessment programs that identify sources of public drinking water and show how the states will determine the sources' vulnerability to contamination. According to EPA guidance, among other things, the programs must describe how the states will (1) assess the vulnerability of waters that are used by the states' public water systems and that originate within the states' borders and (2) coordinate with adjoining states, tribes, or countries for assessments of sources outside the states' borders. According to agency officials, the states must inventory the contaminants and prepare "susceptibility determinations" that evaluate and rank the threats that the inventoried contaminants pose to the water sources. For example, contaminants could be ranked as posing a high, medium, or low threat to the water source on the basis of the contaminants' health effects (acute or chronic) and their distance from the source.

The states are required to develop their source water assessment programs by February 1999. While EPA headquarters officials expect most states to meet this deadline, the EPA headquarters, regional, and state officials we interviewed told us that the states will be considerably more challenged to meet the statute's additional requirement that the states individually assess the nation's more than 170,000 public water systems for their vulnerability to contamination. Specifically, the states are required to complete source water assessments for each system within their jurisdiction by May 2003 and make them available to the public.

Completing the source water assessments could be complex for many groundwater and surface water systems, but it will be especially complex for surface water systems because surface waters move faster and generally cover a larger area. The task is further complicated by the fact

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that surface water sources, as well as large aquifers, sometimes cross state or international borders. In such cases, a state may face additional challenges both in conducting the assessment and in enacting preventive measures when contamination (or the threat of contamination) originates in another state. In such cases, source water assessment and protection will depend heavily on the degree of cooperation that can be developed with neighboring states and countries.

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## Improving Consumer Awareness

To ensure that the public was aware of water systems' problems, the Safe Drinking Water Act of 1974 required water system operators to notify their customers each time their systems failed to meet one of the drinking water standards for regulated contaminants or to test their supplies as required by the regulations. According to a 1973 House Committee report, these requirements were intended to inform the public of any actual or potential drinking water hazards and to educate the public in order to increase public support for correcting drinking water violations. In 1992, we reported that (1) there were high rates of noncompliance with the public notification regulations, (2) the regulations were difficult for operators to understand and implement, and (3) notices often did not clearly convey the appropriate information to the public concerning the health risks associated with a violation and the preventive action to be taken.<sup>7</sup> Among other things, we noted that the language EPA specified for notices sometimes confuses customers because it is technical and provides little guidance on key matters, such as preventive measures to take in response to the violations. We also noted that allowing operators to consolidate notices for less serious violations and for educational matters into a semiannual or annual report would differentiate more clearly between public notification for serious or potentially serious violations and for lesser violations or educational matters.

The 1996 amendments addressed many of these concerns by requiring that the consumers of public water supplies be given more accurate and timely information about violations and that this information be in a form that is more understandable and useful. EPA is currently revising its Public Notification Rule to reflect these changes and expects to issue the proposed rule in March 1999 and to promulgate the final rule in December 1999. The 1996 amendments also sought to enhance the provisions of the drinking water program concerning the public's right-to-know by requiring that community water systems issue annual consumer confidence reports

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<sup>7</sup>Drinking Water: Consumers Often Not Well-Informed of Potentially Serious Violations (GAO/RCED-92-135, June 25, 1992).

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that include information on the source of the water, violations of any federal drinking water standards, and contaminants that were detected and their related health effects. The law required that reports be prepared in plain language and provided (or made available through other means) to all customers of a water system. EPA issued its final regulations on consumer confidence reports on August 19, 1998, and water systems are required to issue their first reports in October 1999. Stakeholders we interviewed praised EPA's efforts to include their input in the development of its regulations.

A wide variety of stakeholders have expressed broad support—in principle—for a requirement to better inform consumers about the quality of their drinking water. In particular, senior officials from EPA, major water industry associations, and environmental groups all agree that such a requirement is useful in obtaining greater public support for the measures necessary to protect water supplies, such as the enactment of utility rate increases and the implementation of difficult corrective measures. Officials of the Association of Metropolitan Water Agencies, which represents the larger systems, and the American Water Works Association, which represents systems of all sizes, added that large and medium-size systems should be able to meet the reporting requirements without too much difficulty.

The challenge, however, has been in achieving consensus as to what constitutes an adequate consumer confidence report. While supportive of the concept, a number of environmental and consumer groups have criticized EPA's implementing regulations, noting, among other things, that (1) all consumers will not receive the reports because the reports must be sent to ratepayers rather than to households (including the tenants of ratepayers), (2) all consumers may not understand the reports because the reports are not required to be published in languages other than English, and (3) the reports will not contain information on all contaminants detected in the water, but rather information only on currently regulated contaminants and unregulated contaminants for which monitoring is required. Conversely, the Association of Metropolitan Water Agencies contends that the rule balances the need to relay accurate information about water quality and the need to keep the reports simple and inviting to read.

In addition to the disagreement over what constitutes an adequate consumer confidence report, another potentially difficult issue is the possible inconsistency between the information the public receives from

these reports and the information in EPA's primary database for drinking water compliance—the Safe Drinking Water Information System. The database contains information on water systems' violations of drinking water standards as well as other information and is available to the public on EPA's World Wide Web site. The states submit quarterly reports on violations of drinking water standards to EPA, and EPA, in turn, loads the information into the database. Industry officials told us, however, that the database sometimes contains inaccurate or outdated information on violations and enforcement actions. Consequently, it may conflict with information in consumer confidence reports. The Director of the Office of Ground Water and Drinking Water said that EPA recently undertook an effort, in consultation with a work group consisting of state and local officials, utilities, environmental groups, and other stakeholders, to define the scope of the problem and to develop a "data reliability action plan" to address it.

Finally, while medium and large systems should be able to implement the requirements for consumer confidence reports without much difficulty, some state officials we interviewed expected small systems to have problems. One state official told us that small systems will be reluctant to submit annual reports to the public about drinking water quality because system officials believe that they will be opening themselves up to criticism. Another state official noted that small systems have had problems in the past in notifying the public of water quality problems and that these problems will likely continue in the future.

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## Improving the Capacity of Small Systems to Deliver Safe Water

In 1994, we reported that EPA and the states were increasingly recognizing that the heart of the noncompliance problem lies with the sheer volume of small water systems that do not have the financial, technical, or managerial capacity to comply with current and future requirements of the drinking water program.<sup>8</sup> Accordingly, several states turned toward "viability programs" and restructuring strategies that consolidated nonviable systems<sup>9</sup> with larger water systems through management and/or ownership changes to provide a more comprehensive solution. Viability programs, in general, are designed to (1) assess water systems' ability to consistently meet current and prospective regulatory requirements and (2) determine the best solutions for bringing nonviable systems into

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<sup>8</sup>See *Drinking Water: Stronger Efforts Essential for Small Communities to Comply With Standards* (GAO/RCED-94-40, Mar. 9, 1994).

<sup>9</sup>In general, nonviable water systems lack the technical, financial, or managerial capabilities to remain in long-term compliance with drinking water regulations.

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compliance. However, we found that the states lacked the resources needed in the near term to develop and implement these programs and that the states also had difficulty obtaining from the state legislatures the authority needed to put the programs in place.

The 1996 amendments addressed many of the issues associated with small systems' viability and placed specific requirements on EPA and the states. EPA was required to publish a report on the states' existing capacity development programs by February 1997 and to issue guidance by August 1998 to help the states implement the capacity development provisions. The states were required to (1) prepare, periodically update, and submit to the EPA Administrator a list of water systems with histories of significant noncompliance; (2) have the legal authorities and other means to ensure that new water systems have the technical, financial, and managerial capability to comply with drinking water regulations; (3) develop and implement a strategy for capacity development to assist existing systems in acquiring and maintaining capacity; (4) report to the EPA Administrator and the states' governors on the success of their capacity development programs; and (5) certify the operators of community and nontransient noncommunity public water systems. The amendments authorized funds for training the operators of small systems and strengthened the overall program by providing the states with financial incentives for achieving these requirements. Specifically, under the Drinking Water State Revolving Fund program, EPA must withhold allotments to the states that (1) have not acquired, by September 1999, the actual authority to require new systems to demonstrate capacity; (2) have not adopted and are not implementing operator certification programs by February 2001; or (3) are not developing and implementing a capacity development strategy by October 2000.

To date, EPA and the states have made progress in establishing the necessary framework for addressing the long-standing problem of small systems' capacity. Specifically, EPA met its requirements to report on existing programs and to develop guidelines in conjunction with stakeholders.<sup>10</sup> Stakeholders praised EPA's efforts to include their input in developing guidelines and program requirements. States have filed their initial reports on systems in significant noncompliance, and according to EPA, as of the end of fiscal year 1998, 35 states had indicated to EPA that they believed they had the necessary legal authority to address new

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<sup>10</sup>Notice of Availability of Final Guidance on Implementing the Capacity Development Provisions of the Safe Drinking Water Act Amendments of 1996, and Information for States on Implementing the Capacity Development Provisions of the Safe Drinking Water Act Amendments of 1996 (Federal Register, Aug. 10, 1998, pp. 42632-33).

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systems' capacity. State officials we interviewed told us that they generally expected to meet the deadline for developing and implementing strategies for capacity development. State officials also told us that they expected to meet the deadline for adopting and implementing operator certification programs.

Yet while progress has been made in fulfilling key preliminary activities (e.g., acquiring legal authorities, completing required reports, developing necessary strategy documents), both EPA and state officials agree that the actual implementation of strategies to ensure adequate capacity among all public water systems will pose significant challenges to the states. In particular, it will require that professional judgment be exercised on matters that have not traditionally been part of the drinking water program. Officials in Massachusetts and Illinois noted, for example, that they must now make decisions on the financial and managerial capability of new systems. The official in Massachusetts also said that the program there will have to hire staff with financial backgrounds. Moreover, according to EPA, the states will also need to develop and implement strategies to assist existing systems in acquiring and maintaining technical, managerial, and financial capacity.

The need for capacity development strategies and programs will also create challenges for EPA's regional offices. The Chief of the Drinking Water Program in EPA's San Francisco regional office said that significant effort will be required to ensure that the states are adequately implementing all aspects of their capacity development programs and that the regional office's monitoring of capacity development will be made more difficult because the states' programs vary.

Although all of the states have operator certification programs, expanding these programs to cover all water systems will be a challenge for many. This is especially true for the states that have a large number of small water systems and nontransient noncommunity water systems whose operators previously were not required to be certified. For example, some states will have to certify as many as 6,000 additional operators. One official noted that his state expects a four- to fivefold increase in the number of small system operators that must be certified and that the state lacks the resources to meet this increased workload.



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## Implementing the New Drinking Water State Revolving Fund Program

In a September 1993 report entitled Technical and Economic Capacity of States and Public Water Systems to Implement Drinking Water Regulations: Report to Congress, EPA estimated that the capital expenditures needed nationwide to comply with the existing requirements of the Safe Drinking Water Act totaled more than \$8.6 billion.<sup>11</sup> EPA recognized that meeting the needs of small water systems would be particularly challenging. The report noted that as a result of their inherent management and financial weaknesses, small water systems had “a significant degree of infrastructure deterioration” that added greatly to their total financing needs. Moreover, EPA’s cost estimates did not include projections for new rules under development, such as standards for disinfection by-products, arsenic, radon, and groundwater disinfection, that could impose substantial additional costs.

Recognizing that many systems will not be able to finance treatment facilities to comply with both new and existing requirements, the Congress authorized \$9.6 billion, to be appropriated over a number of years, to establish a Drinking Water State Revolving Fund program. As in the case of the state revolving fund program authorized by the Clean Water Act,<sup>12</sup> EPA provides grants under the drinking water program to capitalize the states’ funds. The states, in turn, identify investment priorities and manage the loan program. As loans are repaid, the fund is replenished, and loans can be made for other eligible projects. The drinking water program allows the states to set aside up to 31 percent of their funds for certain activities, including (1) 2 percent to provide technical assistance to small systems for purposes such as selecting the correct treatment technology; (2) 4 percent for the administrative costs associated with the Drinking Water State Revolving Fund program;<sup>13</sup> (3) 10 percent for the management of various state drinking water program activities, such as the public water system supervision program or operator certification program; and (4) 15 percent for several other categories of activities, such as the establishment and implementation of a wellhead protection program to protect groundwater sources of drinking water.

Both EPA and the states have made considerable progress in launching the Drinking Water State Revolving Fund program. EPA issued the final program guidelines in February 1997, and the states completed all of the

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<sup>11</sup>EPA 810-R-93-001, Office of Water (Sept. 1993).

<sup>12</sup>We discussed issues associated with this state revolving loan fund program in a 1992 report, Water Pollution: State Revolving Funds Insufficient to Meet Wastewater Treatment Needs (GAO/RCED-92-35, Jan. 27, 1992).

<sup>13</sup>This set-aside can also be used for providing technical assistance to public water systems.

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activities associated with establishing and receiving their fiscal year 1997 capitalization grants by September 30, 1998. As part of their capitalization grant applications, the states were required to describe how their programs would conform with specific statutory requirements, including providing assurances from the states' attorneys general, or other appropriate parties, that the states had the authority to establish and operate their revolving funds in accordance with the Safe Drinking Water Act. The states also completed intended use plans that identified how they intended to distribute available funds among various set-asides and loans, including priority listings of projects the states expected to fund. Moreover, according to the Project Manager of EPA's Drinking Water State Revolving Fund program, the states sought public review and comment, as required, on funding decisions described in their intended use plans. The states successfully completed all of these required activities by September 30, 1998, the statutory deadline for receiving and obligating their fiscal year 1997 capitalization grants. The total amount of fiscal year 1997 funding awarded to the 50 states and Puerto Rico was \$1.25 billion. The set-asides for the states and Puerto Rico totaled \$241.8 million, or more than 19 percent of their available funds.<sup>14</sup>

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## Meeting the Needs of Small Systems

As we have noted, the Drinking Water State Revolving Fund program can be expected to provide substantial relief to many water systems that cannot afford the capital investments required to provide safe drinking water.<sup>15</sup> It will not, however, meet all of the infrastructure needs over the long term. According to EPA's most recent needs survey, for the 20-year period from 1995 through 2014, a total of \$138.4 billion will be needed to build new and upgrade the existing infrastructure of the nation's water systems.<sup>16</sup> It will be particularly challenging for the fund to satisfy one of the Congress's primary objectives in authorizing the state revolving fund program—addressing the needs of the nation's smaller water systems. The infrastructure of these systems has long been problematic. In 1993, for example, we reported on the basis of a 50-state survey that 15 to 20 percent of the nation's small community water systems needed "major improvements" in their water treatment facilities, water storage facilities,

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<sup>14</sup>Grants to the states are available for obligation in the fiscal year for which the funds are authorized and the following fiscal year. This means that the states had to receive their fiscal year 1997 grants by September 30, 1998. Set-aside funds must be maintained outside of the revolving fund account.

<sup>15</sup>Drinking Water: Safe Drinking Water Act Reauthorization Issues (GAO/T-RCED-96-35, Nov. 1, 1995).

<sup>16</sup>Drinking Water Infrastructure Needs Survey: First Report to Congress, EPA 812-R-97-001, Office of Water (Jan. 1997).

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and water distribution systems.<sup>17</sup> According to EPA's needs survey, the total infrastructure investment needed by these systems through 2014 is \$37.2 billion.

In establishing the Drinking Water State Revolving Fund program, the Congress added a number of important provisions in recognition of the special needs associated with small water systems. For example, the states are required to include affordability considerations in their criteria for setting priorities among loans and are allowed to use up to 30 percent of their allotments to provide loan subsidies for "disadvantaged" communities (including many small water systems). The law also provides that at least 15 percent of each state's revolving fund (which includes repayments, state match, and leveraged funds) must be loaned to systems serving populations of less than 10,000 and that 2 percent may be set aside for providing technical assistance to these systems. Officials from the National Rural Water Association view these provisions very positively because, unlike the situation with the Clean Water State Revolving Loan Fund, the states have the flexibility to address state-specific issues, including the problems experienced by small systems.

While the Drinking Water State Revolving Fund program's effectiveness in meeting small systems' needs remains to be proven, major associations representing public water systems point to the inherent advantages that large systems have in competing for these funds. For example, the Executive Director of the Association of Metropolitan Water Agencies (which represents larger systems) told us that a fair number of large systems will probably apply for revolving fund money, noting that large systems will be in a position to "get the fund moving" by getting more money to revolve in and out of the fund. Officials from the National Rural Water Association, which represents smaller systems, predicted that the states will be less likely to provide substantial monies from the revolving fund to small systems because it is easier to administer fewer large loans than it is to administer many small loans and loans to larger systems are also less likely to adversely affect the states' bond ratings.

National Rural Water Association officials did note, however, that states have already used, or intend to use, the set-aside provisions, especially the 2-percent set-aside for technical assistance to small systems. Available

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<sup>17</sup>Drinking Water: Key Quality Assurance Program Is Flawed and Underfunded (GAO/RCED-93-97, Apr. 9, 1993). Five of the 50 states reported that they were unable to respond to our questions about the condition of public water systems under their jurisdiction, while two other states were able to respond to only some of the questions. Additionally, nine states reported that some of the elements we asked about were not applicable for one or more categories of water systems in their jurisdictions.

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information on the program indicates that the states are using the revolving fund to provide technical assistance and loans to small water systems. According to EPA data, during fiscal year 1997, almost all of the states took advantage of the 2-percent set-aside for technical assistance—43 states took the full set-aside, 3 took less than 2 percent, and 4 took nothing. In total, the states and Puerto Rico took \$20.2 million for this set-aside.

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## Additional Resources Provided to Improve EPA's and the States' Capacity

Prior to the 1996 amendments, we reported serious deficiencies in EPA's and the states' capabilities to ensure that even the most basic regulatory requirements were being met. The problem was attributed largely to a shortage of resources. The 1996 amendments took important steps to address this problem; they substantially increased program grants for the states and provided access to revolving loan fund money to pay for program administration. Yet the statute also increased EPA's and the states' responsibilities in new ways. The net effect of these changes on the capacity of EPA and the states to implement the drinking water program has yet to be determined.

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## Provisions of the 1996 Amendments to Improve EPA's and the States' Capacity

Prior to the 1996 amendments, one of the most serious problems facing the nation's drinking water program had been the capability of the states and EPA to administer an increasingly complex and demanding set of responsibilities. Among other things, the states' drinking water staffs were typically responsible for performing physical inspections of drinking water facilities, providing technical assistance, ensuring water systems' compliance with contaminant limits and other program requirements, and taking enforcement action against violators. However, resource shortages left state programs deficient to the point that many were unable to meet some of their most basic requirements.<sup>18</sup> Similarly, EPA had fundamental problems in carrying out its responsibilities to promulgate complex new regulations and oversee state programs.

The 1996 amendments addressed these resource problems in a number of important ways. First, they authorized substantially increased funding for the states' Public Water System Supervision program grants, which totaled \$70 million in fiscal year 1995 and were authorized at \$100 million annually

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<sup>18</sup>For example, see *Drinking Water: Widening Gap Between Needs and Available Resources Threatens Vital EPA Program* (GAO/RCED-92-184, July 6, 1992), which reported that to ensure that certain statutory requirements were being addressed, scarce resources were being shifted away from key quality assurance activities (such as sanitary surveys) that had traditionally formed the backbone of the states' programs.

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through 2003. The new law also authorized the states to use a portion of their Drinking Water State Revolving Fund money to help them (1) administer their programs for loans, public water system supervision, operator certification, and source water assessment; (2) develop and implement capacity development strategies; and (3) provide technical assistance to small systems. The states set aside more than \$100 million of their total fiscal year 1997 funds for these purposes. The states also set aside more than \$100 million to conduct the source water assessments required by the 1996 amendments. The law authorized additional funds for research and removed (or substantially modified) some of the most burdensome aspects of the previous law—most notably the requirement that EPA develop standards for 25 additional contaminants (for which the states would then monitor water system compliance) every 3 years. The law also simplified EPA's process for taking action against systems that violate drinking water standards and strengthened EPA's authority to assess administrative penalties.

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## Impact on the States' Capacity

EPA and state officials agree that the 1996 amendments have gone a long way toward putting the drinking water program on a sounder footing. Citing a variety of reasons, however, they warn that resource constraints will still make it difficult to achieve all the requirements of the new statute. The Executive Director of the Association of State Drinking Water Administrators, for example, indicated that while the additional funds will help the states catch up with preexisting responsibilities, the new law also contained additional requirements that will place demands on finite state resources. She noted that the requirements associated with the source water protection program and with capacity development were particularly burdensome for the states. She added that future contaminant regulations—such as those on disinfectants/disinfection by-products, which will require monitoring and adjustments of the treatment process to balance control of microbial contaminants and disinfection by-products—will require the states to work closely with water systems, provide more technical assistance, and ensure that system operators have adequate training.

The Director of EPA's Office of Ground Water and Drinking Water acknowledged that although the 1996 amendments provided the states with more resources, the states will also face a substantially greater workload over the next few years. She noted in particular that the states have had a hiatus in terms of dealing with new regulations because EPA has not issued any new standards in more than 6 years. However, with new EPA

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regulations being developed, she expected a substantial increase in the states' workload in about 2 years.

EPA and state officials also pointed out that the added challenges facing the states' drinking water programs were qualitative as well as quantitative in nature, in some cases addressing new issues and requiring new skills among the states' drinking water staffs. As noted earlier, state and EPA officials said that the Drinking Water State Revolving Fund program in particular requires a level of financial expertise that was previously unnecessary and unavailable among most drinking water staffs. EPA officials in the Chicago regional office also noted that improving the capacity of small systems requires that the states make judgments about the financial, technical, and managerial abilities of water systems and that the states have little experience in developing such programs or making such judgments. They also noted that some states cannot hire additional staff and will therefore have difficulty acquiring the expertise needed to meet these new program requirements.

While the potential exists for a shortfall in the states' resources, it is difficult to predict its probability or potential magnitude. In the years preceding the 1996 amendments, an estimate was made of the shortfall in the states' resources, and it was actively considered in developing the 1996 amendments.<sup>19</sup> Association of State Drinking Water Administrators and EPA officials said that they are planning to estimate the states' resource needs associated with the new requirements.

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## Impact on EPA's Capacity

EPA officials have also expressed concern about their agency's own capacity, both at headquarters and among the regional offices, to support and oversee the states' programs. As noted earlier, EPA is required to develop and provide implementing guidance for complex and controversial new contaminant regulations while at the same time implementing an array of existing contaminant regulations. The officials emphasized that the challenge of developing and implementing new regulations during the next few years is augmented by other significant support and oversight responsibilities, including those for operator certification programs, guidelines for capacity development programs, and others.

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<sup>19</sup>Specifically, on the basis of a "resource needs" model developed by EPA and the Association of State Drinking Water Administrators, EPA estimated in 1993 that the gap between the states' program needs and the available resources was approximately \$162 million.

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Agency officials also expressed concern about EPA's ability to institutionalize new programs and procedures among its regional offices. Each new contaminant regulation or new program requirement places significant implementation burdens on the EPA regional offices as well as on the states. As contaminant regulations or other program requirements become final, the regional offices must provide the states with training on, and interpretations of, the new requirements. They must also review and approve the related state regulations and programs. At the same time, the regional offices play a more direct role in the case of regulations that have not been adopted by individual states and that thus cannot be enforced by those states.

The Executive Director of the Association of State Drinking Water Administrators echoed the concerns about the ability of EPA's regional offices to handle the increased workload. The official noted that many regional staff members are new to the drinking water program and do not have a historical perspective on the program and that existing expertise had been lost as a result of reorganizations. The official also expressed concern that such staffing constraints could lead EPA to take a "one size fits all" approach and limit the states' flexibility.

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## Observations

EPA and the states have made progress in meeting the initial requirements of the Safe Drinking Water Act Amendments of 1996. Of particular note, EPA has met all of its statutory requirements to develop regulations and guidelines, and other stakeholders (including the states, representatives of the regulated industry, and environmental groups) have credited the agency with effectively involving them in this process. For their part, the states have made important strides in addressing one of their most important initial objectives—setting up their drinking water revolving funds—and are working to meet other initial requirements to prepare needed strategies and programs. Yet as noteworthy as these initial efforts have been, the most difficult challenge deals with the longer-term question of implementation—implementation of the new contaminant standards (including monitoring water systems' compliance with the standards), the new requirements to augment consumer awareness, the provisions to ensure the viability of thousands of smaller water systems, and the numerous other requirements associated with this complex statute. Meeting these longer-term challenges will call for a sustained effort by EPA, the states, and the nation's public water systems and will warrant continuous oversight by the Congress.

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## Agency Comments

We provided copies of a draft of this report to EPA for its review and comment and discussed the agency's response with the Director of the Office of Ground Water and Drinking Water and her staff. The EPA officials expressed general agreement with the information in the report, indicating that it was an important gauge of the progress made by EPA, the states, and communities in the early implementation stages of the requirements of the Safe Drinking Water Act Amendments of 1996. The officials also suggested a number of technical clarifications and corrections, which have been incorporated as appropriate.

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## Scope and Methodology

To accomplish our objectives, we interviewed officials in EPA's Office of Ground Water and Drinking Water, Office of Research and Development, Office of Enforcement and Compliance Assurance, and Office of General Counsel and obtained and reviewed related legislation and program regulations, guidance, and reports. We also interviewed drinking water officials in EPA's Boston, Chicago, and San Francisco regional offices and interviewed state program managers in six states within these regions—Arizona, Illinois, Maine, Massachusetts, Minnesota, and Nevada. Criteria for selecting these states included diversity in geographical location, size, and the extent of the progress they had made in implementing the new requirements of the 1996 amendments. In addition, we interviewed officials of the Association of State Drinking Water Administrators, the American Water Works Association, the Association of Metropolitan Water Agencies, the National Rural Water Association, the National Association of Towns and Townships, and the Natural Resources Defense Council. We conducted our review from March 1998 through January 1999 in accordance with generally accepted government auditing standards.

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As arranged with your office, unless you announce its contents earlier, we plan no further distribution of this report until 7 days after the date of this letter. At that time, we will make copies available to interested congressional committees and the Administrator, EPA. We will also make copies available to others on request.



If you have any questions about this report, please contact me at (202) 512-6111. Major contributors to this report were Ellen Crocker, Teresa Dee, Steve Elstein, and Lena Natola.

Sincerely yours,

A handwritten signature in black ink, appearing to read "P. F. Guerrero". The signature is stylized with a large, looped initial "P" and a long, sweeping tail.

Peter F. Guerrero  
Director, Environmental  
Protection Issues

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# Related GAO Products

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Drinking Water: Some Households Rely on Untreated Water From Irrigation Systems (GAO/RCED-98-244, Sept. 3, 1998).

Drinking Water: Information on the Quality of Water Found at Community Water Systems and Private Wells (GAO/RCED-97-123, June 12, 1997).

Flexibility in the Safe Drinking Water Act (GAO/RCED-96-12R, Nov. 21, 1995).

Drinking Water: Safe Drinking Water Act Reauthorization Issues (GAO/T-RCED-96-35, Nov. 1, 1995).

Drinking Water: Combination of Strategies Needed to Bring Program Costs in Line With Resources (GAO/T-RCED-94-152, Mar. 14, 1994).

Drinking Water: Stronger Efforts Essential for Small Communities to Comply With Standards (GAO/RCED-94-40, Mar. 9, 1994).

Drinking Water Program: States Face Increased Difficulties in Meeting Basic Requirements (GAO/RCED-93-144, June 25, 1993).

Drinking Water: Stronger Efforts Needed to Protect Areas Around Public Wells From Contamination (GAO/RCED-93-96, Apr. 14, 1993).

Drinking Water: Key Quality Assurance Program Is Flawed and Underfunded (GAO/RCED-93-97, Apr. 9, 1993).

Drinking Water: Widening Gap Between Needs and Available Resources Threatens Vital EPA Program (GAO/RCED-92-184, July 6, 1992).

Drinking Water: Consumers Often Not Well-Informed of Potentially Serious Violations (GAO/RCED-92-135, June 25, 1992).

Observations on Compliance and Enforcement in EPA's Drinking Water Program (GAO/T-RCED-91-47, May 10, 1991).

Drinking Water: Compliance Problems Undermine EPA Program as New Challenges Emerge (GAO/RCED-90-127, June 8, 1990).

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