

Report to Congress: Small Systems Arsenic Implementation Issues

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I. Introduction

This report to Congress addresses EPA's national-level affordability criteria and small systems implementation issues related to achieving compliance with the Arsenic in Drinking Water Rule. As part of the 2002 appropriations process, Congress directed EPA to "begin immediately to review the Agency's affordability criteria and how small system variance and exemption programs should be implemented for arsenic" as well as to "recommend procedures to grant an extension of time in meeting the compliance requirement for small communities when a community can show…that compliance by 2006 poses an undue economic hardship on that community." [Conference Report 107-272, page175] Congress further directed the Agency to prepare a report "by March 1, 2002 on its review of the affordability criteria and the administrative actions undertaken or planned to be undertaken by the Agency, as well as potential funding mechanisms for small community compliance and other legislative actions, which, if taken by the Congress, would best achieve appropriate extensions of time for small communities while also guaranteeing maximum compliance." [Conference Report 107-272, page 175] (See Appendix 2 for the full text of conference report provisions on affordability.)

EPA shares Congressional concerns regarding small system compliance with drinking water regulations, in general, and with the recently promulgated arsenic rule, in particular. The Agency recognizes the special challenges faced by small water systems and is committed to using the suite of tools and mechanisms provided under the 1996 Safe Drinking Water Act Amendments (SDWA) to help address small system implementation issues. The arsenic regulation is one of the first rules under the 1996 SDWA to significantly impact a substantial number of small systems. However, it is by no means the only drinking water public health requirement likely to impact small systems over the next several years. Thus, measures taken to facilitate compliance by small systems with the arsenic rule are expected to be broadly applicable in future rule contexts, as well.

Among the issues Congress has asked EPA to address in this regard, small system variances and affordability issues have generated substantial input and the most concern on the part of stakeholders and small systems. In particular, EPA is aware of concerns regarding the methodology presently used for making a national level determination of affordability. During the comment period for the arsenic rule, many small communities expressed concern over the high costs of the rule and the difficult compliance challenges it would pose. EPA estimated that average household compliance costs for systems that are above the MCL and serve 100 or fewer people could exceed $300 per household per year. Some commenters questioned whether it was appropriate for EPA to determine, at a national level, that compliance costs would be affordable for all affected systems. The Agency also recognizes that there are disagreements among stakeholders about the unavailability of small system variances under the arsenic rule. EPA appreciates and recognizes these concerns and is fully committed to a public process (described

in further detail in Section VI. of this report) for exploring the range of issues that have been raised in connection with this subject. As part of this process, the Agency is committed to re-evaluating the present approach and considering feasible alternatives. In this regard, EPA is committed to exploring approaches for providing greater State flexibility to address their needs.

In developing national-level affordability criteria, EPA established an affordability threshold of 2.5% of median household income (MHI). As EPA explained in its August 6, 1998, *Federal Register* notice listing affordable compliance technologies for all previously regulated contaminants, EPA believed that the national-level affordability criteria should describe the characteristics of median systems and should not address extreme situations where costs might be extremely low or excessively burdensome. Some commenters have argued that systems with high-baseline water bills, high treatment costs, low household incomes, or other characteristics that are atypical, face unique challenges that are not reflected in data on median systems.

Under the SDWA, EPA's determination of national-level affordability criteria is an important step in the decision as to whether or not a particular system should obtain a variance. Another important step is that the State drinking water program must assess the financial capability of the particular system and ensure that there are no affordable options for compliance, which include treatment, alternate water sources, and regionalization, before a variance can be granted. Some commenters have argued that by relying on the current national-level affordability criteria, EPA has eliminated the opportunity for States to make these assessments and determine the best approach for disadvantaged systems to provide safe, affordable drinking water on a site-specific basis. As part of the review of its national-level affordability criteria, EPA will consider the interrelationship between the national and State level assessments and their relationship to national-level affordability criteria.

Small systems are being asked -- in some cases for the first time -- to grapple with a whole new set of public health challenges. This situation poses enormous implementation, timing, resource, technical, and capacity challenges for public water systems across the country. (Please refer to Appendix 1 for more information about small systems and their demographics.) For instance, small system infrastructure may be outdated and in poor condition. Source water available to small systems may be of poor quality and limited quantity. Technical water system planning and operations expertise necessary to evaluate and install new treatment technologies may also be lacking. In addition, small systems face considerable financial challenges in that they have a small customer base and, thus, often lack the opportunity to benefit from economies of scale. The primary responsibility for addressing these challenges rests with the State drinking water programs, who administer the SDWA in 49 States. EPA has worked to support State and local communities in this effort, and taken a number of steps under the 1996 SDWA provisions to address these small system issues. Progress has been made, but much remains to be done.

EPA estimates that 3,341 small systems out of a total of an estimated 75,000 potentially affected systems nationally will have to make improvements or take other measures (e.g., locate a different source of water) to meet the new arsenic standard. This represents a substantial number of small systems, particularly ground water systems, that will need to make treatment changes. As noted above, these systems face a difficult challenge. The Agency looks forward to continuing to work with State and local government, drinking water systems, and stakeholders to address these issues.

The balance of this report discusses small system implementation issues in more detail including small system authorities and mechanisms under the 1996 SDWA (Section II); small system exemptions (section III); small system variances (section IV); affordability (section V); and additional steps the Agency plans to take in addressing Conference Report issues and continuing its partnership with States, local government, and stakeholders in providing support to small systems (Section VI).

II. Small Systems and the 1996 SDWA Amendments

The 1996 SDWA amendments include a number of provisions specifically intended to help minimize the impact that new regulations will have on small systems. The major ones, briefly summarized below, include exemptions (compliance extensions); affordability, variances and variance technologies; and small system technical, managerial, and financial capacity.

Exemptions - Section 1416 of SDWA authorizes compliance period extensions of up to nine years (beyond the maximum of five years provided under Section 1412(b)(10)) for small systems with service populations of no more than 3,300 (systems serving 3,300 or more may receive extensions of up to three years (beyond the maximum of five years provided under Section 1412(b)(10)). To provide such extensions, the State or primacy agency must find that the small system cannot comply due to "compelling" economic factors (among other reasons) and has entered into an agreement to obtain financial assistance. The State must provide public notice and an opportunity for a public hearing, and also make a finding and provide a basis for the conclusion that the extension "will not result in an unreasonable risk to health."

Small System Compliance Technologies - Section 1412(b)(4)(e) requires EPA to include a list of affordable small system compliance technologies with each rule that the Agency promulgates.

Small System Variance Technologies - Where EPA is unable to identify a compliance technology that is affordable for small systems in a particular size category or with a particular source water quality, the Agency is required under Section 1412(b)(15) to identify a small system "variance technology." SDWA provides that, although a "variance technology" may not assure compliance with a maximum contaminant level (MCL) or treatment technique requirement, it must "achieve the maximum reduction or inactivation that is affordable considering the size of the system and the quality of the source water." Section 1412(b)(15) specifies that EPA may not list a variance technology unless the Agency determines that it is

"protective of public health."

Small System Variances - For small systems with a service population of less than 10,000, Section 1415 authorizes a State or primacy agency to grant a variance from compliance with an MCL or treatment technique for the useful life of the variance technology. A small system may receive such a variance under a particular national primary drinking water regulation (NPDWR) only if EPA has determined that there are no nationally affordable compliance technologies for small systems in the corresponding size category and with comparable source water quality, the final regulation has identified an applicable variance technology, and the system actually installs, operates and maintains the specific technology in question. In granting this variance, a State or primacy agency must provide public notice and an opportunity for a public hearing. It must also make two additional determinations: first, that the system cannot otherwise comply through using an alternative source of water supply or restructuring or consolidation and, second, that the terms of the variance will ensure "adequate protection of human health".

III. Exemptions

Exemptions are essentially extensions of the time allowed for systems to come into compliance with an MCL or treatment technique. The Conference Report directs the Administrator of EPA to "recommend procedures to grant an extension of time in meeting the compliance requirement for small communities when a community can show to the satisfaction of the Administrator that being in compliance by 2006 poses an undue economic hardship on that community. In developing these procedures, the Administrator should consider those actions which can be taken administratively by the Agency and those which will require the enactment of legislation." The conferees asked for EPA's recommendations because they believed that "the current waiver and exemption provisions found in sections 1415 and 1416 of the Safe Drinking Water Act, as amended, may not provide sufficient flexibility for the small communities to receive additional time to reach compliance."

The SDWA lists several conditions for granting an exemption. The conditions are as follows:

- The public water system must be unable to comply with the MCL or treatment technique or implement measures to develop an alternative source of water supply due to compelling factors (which may include economic factors such including qualification of the public water system as a system serving a disadvantaged community);
- The public water system was in operation on the effective date of the MCL or treatment technique. A system not in operation by that date can only be granted an exemption if no reasonable alternative source of drinking water is available to the new system;
- Granting the exemption will not result in an unreasonable risk to health; and
- Management or restructuring changes (or both) cannot reasonably be made that will result in compliance with the Act.

The 1996 amendments provided that small systems (defined as those serving fewer than 10,000 people) may receive an extension of 3 years, beyond the 5-year compliance period potentially available for all systems. The SDWA provides a minimum of 3 years for compliance for all systems, with a possible two year extension for systems needing to make capital improvements to comply. In addition, a State may renew an exemption for up to three additional 2-year periods, for systems serving 3,300 people or fewer, if the system establishes that it is taking all practical steps to meet the requirements of the statute. In sum, a system serving fewer than 3,300 people could potentially have up to 14 years to comply with new regulatory requirements if all of the above-described options were made available to them.

Historically, States have not extensively used the exemption process for any of the regulated contaminants. State officials have given various reasons for this, including the complexity of the exemption process, the lack of a definition for "unreasonable risk to health" (URTH), and the fact that States must make an independent State-level URTH finding for each system requesting an exemption.

EPA is developing training and guidance on exemptions that will address each of these issues as part of the Small Community Drinking Water Assistance Plan discussed under section VI below. These tools are designed to make exemptions a more useful tool that can be used in appropriate cases to provide small systems with more time to come into compliance with drinking water regulations.

EPA believes that it is possible to increase the number of exemptions States grant. About 2,388 community water systems (CWSs) (2,287 of which are small) and 1,057 non-transient, non-community water systems (NTNCWS) (of which 1,054 are small) are projected to have a mean arsenic concentration exceeding the MCL and will need to install treatment or take other measures to comply. Exemptions provide an opportunity to extend the period of time during which a system can achieve compliance, thus providing needy systems with additional time to qualify for financial assistance.

IV. Small System Variances

Small system variances may be used when EPA cannot identify an affordable compliance technology for a particular source water quality in one or more of the small system size categories (25 - 500, 501 - 3,300, and 3,301 - 10,000). They were included in the statute to address the concern that small systems may experience high treatment costs to meet the standard, compared to larger systems, due to the quality of the source water and the poorer economies of scale associated with smaller water systems.

In short, small system variances under the SDWA would work as follows. First, EPA must determine, at a national level that, for a particular system size category with certain source water quality characteristics, there are no affordable treatment technologies available to comply with the regulatory standard. The Agency would then determine whether or not there were

variance technologies applicable to this circumstance that, while not able to achieve compliance with a particular drinking water regulation, would still be capable of ensuring adequate protection of public health (i.e., a less stringent level than the regulatory standard). Next, the State in which a small system applying for a variance is located must apply its own state-level affordability criteria to determine whether a system was eligible for a variance. The State would then determine whether a particular system, after considering treatment, alternative sources of water supply, and restructuring can afford to comply with the drinking water standard. Where the State finds that these alternatives are not available, the State may grant a small system variance. As a condition of its small system variance, the system must install, operate, and maintain the specified variance technology. The State must also make its own finding that the variance technology will be adequately protective of health, and may attach conditions to the variance to insure that it is.

V. Affordability

As noted above, the availability of small system variances is tied to the concept of "affordability". Findings must be made at both the federal and State level that compliance technologies are not affordable for small systems before a variance can be granted. Under the 1996 SDWA, EPA must determine and make available to the public the criteria it uses to assess the affordability of compliance technologies available for a given drinking water regulation. EPA calls these criteria "national-level affordability criteria" to distinguish them from the affordability determinations performed by States under other sections of the SDWA.

EPA's national-level affordability criteria consist of two major components: an expenditure *baseline* and an *affordability threshold*. The *expenditure baseline* (derived from annual median household water bills) is subtracted from the *affordability threshold* (a share of median household income (MHI) that EPA believes to be a reasonable upper limit for these water bills) to determine the *expenditure margin* (the maximum increase in household water bills that can be imposed by treatment and still be considered affordable. EPA currently uses an affordability threshold of 2.5% of MHI. EPA compares projected compliance costs for the median household within a particular small system size category to the available expenditure margin to make the affordable technology determinations and derives available expenditure margins separately for each of the three specified system size categories (i.e., 25 - 500, 501 - 3,300, and 3,301 - 10,000). Under the statute, EPA does not make site-specific affordability determinations for systems within a system size category.

In August 1998, EPA published the national-level affordability criteria and the list of affordable compliance technologies for contaminants regulated before 1996. EPA used these 1998 criteria to make technology assessments for three rules finalized after 1998: disinfection by-products, uranium and arsenic. Using the afore-mentioned approach, EPA identified affordable compliance technologies for pre-1996 and newer regulations for all system size categories and source water qualities, thus, variance technologies were not listed and small system variances were not authorized. While EPA identified at least one affordable compliance technology for all size categories for all regulations, all technologies were not found affordable

for all size categories. For example, arsenic treatment technologies such as reverse osmosis and coagulation/microfiltration were not found to be affordable for systems in the 25 - 500 size category. The affordable technology determination process conservatively assumes that the customers will pay for all treatment costs and that there is no financial assistance to reduce customer burden. This assumption was made to simplify the analysis; however, many small systems can and do receive financial assistance from the Drinking Water State Revolving Fund or the United States Department of Agriculture Rural Utilities Service to purchase capital equipment.

EPA identified an affordability threshold of 2.5% of median household income (MHI). Since much of the debate regarding affordability has focused on the basis for the present baseline threshold, a brief description of the data and analytical steps taken to derive this figure is set forth below. The document entitled "Variance Technology Findings for Contaminants Regulated before 1996" provides a more detailed explanation of the basis for selecting 2.5% MHI as the affordability threshold. This document also describes the process for making affordable technology determinations and the rationale for why variance technologies were not listed for any contaminant regulated before 1996.

EPA used two primary data sources in developing the baseline components of the national-level affordability criteria: The Community Water System Survey (CWSS) and the U.S. Census. CWSSs are conducted to obtain financial and operational data on the water industry to develop drinking water regulations. The 1995 CWSS provided data from 1,980 systems of various sizes on water bills, household consumption, and zip codes served by the system. The median household income data by system size were derived by linking the CWSS data with data in the 1990 Census using zip codes.

Median household income was selected as the metric for the affordability criteria since EPA wanted to base its evaluation on the typical or average situation, rather than a worst case scenario. The value of 2.5% for this metric was chosen after comparing the cost of public water supply for households with other household expenditures and risk-averting behavior. National expenditure estimates were derived to illustrate the allocation of household income across a range of general household expenditures. An initial range of 1.5 to 3% of the median household income (MHI) for the affordability threshold was based on comparative household expenditures including other utilities such as telephone bills and energy and fuel bills. The selection of 2.5% from this range was based primarily upon the costs of risk-reduction activities. Costs were derived for risk-reduction activities that could be conducted at the household-level in lieu of treatment being performed by the water utility. These risk-reduction activities included point-of-use and point-of-entry treatment options and home delivery of bottled water. (Both the affordability metric and the value of the metric chosen will be important topics to be evaluated by EPA as a part of its affordability review discussed in more detail in the next section.)

Two approaches will be evaluated to update the baseline data used for rules promulgated after 1996 . EPA planned to conduct CWSSs about every five years. The new CWSS data would be used to calculate revised expenditure baselines to account for compliance and other

costs incurred since the previous CWSS. For rules with compliance costs incurred between CWSSs, a second approach will be evaluated. EPA will consider adjusting baseline water bill data by taking the projected costs for the affected systems and averaging them over all systems within the system size/source water quality combination. However, EPA is aware of significant stakeholder concerns with this approach and will consider alternative approaches to updating the baseline in the absence of CWSS data.

EPA plans to review and reconsider the criteria described above in response to Congressional and stakeholder concerns that small systems may not be able to come into regulatory compliance. EPA's plan is discussed in more detail below.

VI. Ongoing Affordability Review and Next Steps to Address Small System Challenges

A. Review of Small System Affordability

EPA has received substantial input on the national-level affordability criteria used to make affordability determinations for the arsenic rule. At EPA's request, the National Drinking Water Advisory Council (NDWAC) evaluated the costing methodology for the arsenic rule in mid 2001. NDWAC found EPA's cost estimates to be credible, but they noted that there may be a number of small water systems and populations that will be unable to afford compliance both with the arsenic rule as well as future drinking water rules. They also concluded that national compliance cost estimates may not always reflect the local challenges faced by some small water systems and their customers. Although the NDWAC report does not include specific solutions, it does present a range of tools and approaches related to system and ratepayer affordability that EPA will be considering as part of the broader public stakeholder process.

EPA has also received a variety of comments related to affordability during the comment period for the arsenic rulemaking. Many commenters expressed the concern that the arsenic standard would not be affordable to households served by small systems, and made some recommendations for changing EPA's affordability criteria. The suggested revisions can be divided into several major categories. First, some commenters suggested that an alternative to the median household income metric should be used as the basis for a threshold that better reflects the plight of disadvantaged communities. Suggested options for a different affordability metric included the lowest decile, the lowest quartile, and the poverty level incomes, rather than median household income. Second, several commenters urged the Agency to consider using a lower affordability threshold such as 1.5% or 2% instead of 2.5% of MHI. Approaches that rely on metrics other than household income were also suggested by commenters, such as using the magnitude of rate increases rather than an upper limit on water bills. Third, as noted above, some commenters advocated that a different approach be used to update the baseline water bills in between Community Water System Survey updates. In this regard, commenters werconcerned that such a national averaging approach may tend to "wash out" the more severe impacts on individual systems. Fourth, several commenters suggested that the affordability criteria should be determined on a geographic basis rather than on a nationwide level, considering the areas most likely to be impacted. These commenters pointed out that certain geographic areas may be

hard hit by particular regulations and suggested that their affordability circumstances should be considered separately.

EPA has initiated a review of its national level affordability criteria that will include an analysis of the issues raised by the NDWAC Arsenic Cost Working Group and commenters on the arsenic proposed rulemaking (June 2000) and on the reproposal (July 2001). This process will include consultations with EPA's Science Advisory Board (SAB) and input from stakeholders. The Agency plans, as part of this review, to explore a number of areas related to affordability. The specific analyses outlined below include those suggested by commenters and others during the arsenic rulemaking process.

- *Evaluate alternatives to the median as the income level for the affordability threshold and determine the effect of such alternatives on the existing affordable technology determinations.* Among the alternatives to the median that will be evaluated are the poverty level (approximately the 5th percentile of household income) as well as the 10th, and 25th percentiles of household income. EPA will also evaluate other options suggested in the review process.

- *Evaluate alternatives to 2.5% as the income percentage for the affordability threshold and determine the effect of such alternatives on the existing affordable technology determinations.* Among the alternates to 2.5% of income that will be evaluated are 1.0% 1.5%, and 2% EPA will also evaluate other options suggested in the review process.

- *Update the baseline data on water bills to account for the new rules and update from 1995 dollars to most recent; consider different approaches to evaluating the impact of water bills:* The procedure described earlier in this report as one mechanism EPA plans to evaluate to update the "baseline" may be used to revise the baseline for rules whose compliance costs will be incurred after the existing CWSS data were collected. EPA will also consider other approaches that may be suggested as a part of the upcoming review process. EPA will also consider different ways of calculating the impact of water bills that will evaluate a range of water bills, such as the 90th percentile of bills.

- *Evaluate whether separate affordability criteria should be developed for ground water and surface water systems*. While surface water systems have installed treatment to address a range of drinking water rules, many small systems that rely on ground water are being impacted for the first time by drinking water rules promulgated after the 1996 SDWA Amendments. Since the existing treatment infrastructures and future needs are likely to differ significantly, EPA will examine approaches such as developing separate national-level affordability criteria for each size category for both ground and surface water sources.

- *Evaluate the impact of financial assistance on affordability:* EPA will consider how mitigating factors such as loans can reduce household burden.

- *Evaluate the possibility of making affordable technology determinations on a regional basis rather than a national basis.*

- *Update and compare median household income for each size category from 1995 to most recent*. EPA will used data from the 2001 CWSS, and 2000 Census data to estimate income levels for systems based on their service area zip codes.

- *Evaluate options for criteria to determine whether a particular variance technology will be protective of public health for the expected useful life of the technology* and to assist States in determining whether variances provide adequate protection of public health at the system level.

As noted above, EPA will ask the Agency's SAB for advice on economic issues associated with the national-level affordability criteria. EPA will also seek additional input from stakeholders once it has completed the first phase of its review. A public stakeholder process will also be used to obtain input on potential funding mechanisms for small community compliance as well as possible legislative actions, which, if taken by Congress, would best achieve appropriate extensions of time for small communities while also helping assure maximum compliance.

B. Small Community Drinking Water Assistance Plan

EPA is initiating a small community drinking water assistance plan that will enhance access to financial assistance, expand technical assistance and training, improve system capacity and effectiveness, and simplify program implementation through the use of exemptions.

Enhancing Access to Financial Assistance

Currently, there are two major Federal financial assistance programs: the Drinking Water State Revolving Fund (DWSRF) and the United States Department of Agriculture Rural Utilities Service (RUS) grant and loan program.

The DWSRF has received federal appropriations averaging $880 million per year for the past six years (from fiscal year 1997 to fiscal year 2002). Through FY 2002, a total of $5.3 billion has been appropriated. Of this $5.3 billion, through June 30, 2001, $3.6 billion has been awarded to States through capitalization grants. With the addition of state matching funds of $773 million and other funds, including proceeds from issuance of bonds, the total funds made available for projects have so far exceeded $5 billion. Of these available funds, states have entered into nearly 1800 loans with systems totaling over $3.8 billion. This program ensures a continuing source of funding for every state, as loan repayments can be used to finance additional projects.

Treatment projects account for 43% of the assistance dollars provided through June 30, 2001; transmission and distribution for 32%; storage for 9% ; source water projects for 5%; and

other (including planning, design, and restructuring) for 11% In each of the past two years, more than $550 million has been spent for treatment projects related to SDWA objectives. SDWA requires that states direct a minimum of 15% of available funds to small systems serving fewer than 10,000 people. To date, States have exceeded this target, providing 41% of funds to small systems. In fact, 22% of all funds have gone to systems that serve fewer than 3,300 people.

The Rural Utilities Service (RUS) program provides an average of $492 million per year in loans and $260 million per year in grants for drinking water projects. About 60% of this funding supports construction of new systems or expansion of existing systems. The remaining 40%, or about $300 million supports installation of additional treatment and repair or replacement of existing infrastructure. All of this assistance is targeted towards small systems (i.e. systems with populations less than 10,000).

RUS and EPA share the objective of ensuring safe, reliable and affordable drinking water for the residents of rural America. Both agencies recognize that small systems serving rural areas face great challenges in providing the additional public health protection benefits envisioned in the Safe Drinking Water Act (SDWA). EPA and RUS are developing a formal Memorandum of Agreement (MOA) which will help coordinate activities to ensure that the significant assistance is available to small systems needing help in achieving compliance with the arsenic standard. The objective of this MOA is to help EPA and RUS better serve the American people through coordinated technical and financial assistance programs.

The agencies will continue to seek to jointly offer significant support to small water systems in complying with the new public health standard for arsenic in drinking water. EPA and RUS are committing to full coordination and cooperation among their regulatory and water infrastructure financing programs at the Headquarters, Regional, and State levels. The agencies will use their technical assistance and financial assistance resources to assist eligible systems in obtaining the technical, financial, and managerial capacity necessary to realize the public health protection benefits of compliance with the new standard.

Expand Technical Assistance and Training

EPA has undertaken an extensive effort to develop and deliver technical assistance and training both directly and through partnerships with third party providers to entities affected by the rule. The agency is focusing on providing assistance in the areas of:

- Rule interpretation and implementation;
- Treatment technology selection, design, construction, and operation;
- Total system optimization including achieving competitive efficiency; and
- Financial assistance.

The National Drinking Water Advisory Council's Small Systems Implementation Working Group (a broad-based group of stakeholders which advised USEPA) concluded that capacity development for small water systems is essential and capacity can be achieved in a

variety of ways. The working group recognized the value of continuous improvement as a goal for all water systems. Capacity development is best understood as a process for continuous improvement over time.

The 1996 SDWA explicitly recognized that more effective protection of public health requires water systems to have adequate managerial, technical, and financial capacity. Improved managerial capacity will improve the ability of a water system to conduct its affairs in a manner enabling the system to achieve and maintain compliance with SDWA requirements. Managerial capacity refers to the system's institutional and administrative capabilities. Technical capacity is the physical and operational ability of a water system to meet SDWA requirements. Technical capacity refers to the physical infrastructure of the water system, including the adequacy of source water and the adequacy of treatment, storage, and distribution infrastructure. It also refers to the ability of system personnel to adequately operate and maintain the system and to otherwise implement requisite technical knowledge. Financial capacity is a water system's ability to acquire and manage sufficient financial resources to allow the system to achieve and maintain compliance with SDWA requirements.

Through the use of technical assistance resources, EPA and RUS will help systems comply with the new public health protection standard for arsenic. This assistance builds technical, financial, and managerial capacity of systems to enable them to achieve and consistently maintain compliance. RUS and EPA will work with the National Rural Water Association (NRWA) and Rural Community Assistance Program (RCAP) through each agency's agreement with the respective service to provide a combination of training workshops, one-on-one direct technical assistance, conferences, distance learning, and other means. EPA and RUS will coordinate "in-service" training for the field staff of NRWA and RCAP. Both EPA and RUS will coordinate their efforts with NRWA and RCAP to ensure that systems identified as needing capital improvements for arsenic compliance will have access to information and assistance relative to compliance options.

Both EPA and RUS provide funding to non-profit technical assistance organizations that offer direct training and one-on-one assistance to small rural water systems. The NRWA receives funding from both agencies to provide training and technical assistance to systems serving fewer than 10,000 persons. The RCAP receives funding from both agencies to provide training and technical assistance to small, primarily disadvantaged communities. RUS provides funding to support the operation of the National Drinking Water Clearinghouse at West Virginia University. The clearinghouse offers technical assistance via a toll-free hotline and produces a number of technical resources including a quarterly newsletter. Finally, EPA provides funding for a network of university based technology assistance centers. These centers conduct research, and offer training and technical assistance to small systems.

Improve System Capacity and Effectiveness

Under the capacity development provisions of the SDWA, EPA is working with the States to help systems understand and realize the benefits of restructuring to achieve more

appropriate and efficient institutional structure and size. Such restructuring allows systems to achieve sustainability. Systems are empowered through appropriate rate structures, and can achieve a comprehensive and coordinated multi-barrier approach to public health protection utilizing the full range of available programs and tools including source water protection programs, treatment enhancements, monitoring and risk assessment, and increased citizen understanding and involvement.

Facilitate Program Implementation through Exemptions

EPA is supporting the use of exemptions by States by providing guidance and training for state regulators on issuing exemptions. EPA is developing guidance for the States that will include making statutorily required determinations regarding "unreasonable risk to health."

C. Treatment Technology Research, Development, and Technical Assistance Efforts

In an October 31, 2001, letter to the conferees on the Veterans Affairs, Housing and Urban Development and Independent Agencies appropriations measure, EPA Administrator Christine Todd Whitman announced an initiative that would provide a total of $20 million over fiscal years 2002 and 2003 for research and development of more cost-effective technologies to help small systems meet the new arsenic standard and to provide technical assistance to operators of small systems to reduce compliance costs.

The following is a description of the Agency's conceptual framework to complete this effort. The framework consists of a series of activities to identify, research, develop, and verify arsenic treatment technologies with an emphasis on small system needs, and to transfer this technology to small systems through technical assistance and operator training. Using this framework, EPA expects to identify more reliable, cost effective technologies that are both easier to maintain and operate and could be applicable to other water pollutants.

EPA expects to integrate and coordinate these activities with activities that may be underway or planned by the American Water Works Association (AWWA), the National Rural Water Association (NRWA), the Association of State Drinking Water Administrators (ASDWA), and the American Water Works Association Research Foundation (AWWARF).

The research program consists of five major areas:

- Support for small business development of innovative treatment processes for cost-effective removal of arsenic in drinking water;
- Treatment technology research demonstrations to evaluate performance and cost of various arsenic removal technologies;
- Short-term performance verification studies of commercially-ready arsenic adsorption technologies;

- Enhanced internal research program focused on managing residuals from arsenic treatment, improved exposure studies and analytical methods, treatment process optimization and development of design manuals for arsenic removal technologies; and
- Technical assistance and training for States, systems, and assistance providers to help systems achieve compliance at the lowest possible cost.

Support for Small Business Development of Innovative Treatment Processes

Through the Small Business Innovation Research (SBIR) program, $1.3 million dollars in fiscal year 2002 will be targeted to study new and emerging arsenic removal technologies applicable to public water systems (PWSs). The application period for contracts under the SBIR program opened January 2002 and closes March 2002. These studies will be conducted by small businesses and will be conducted in two phases.

The objective of the first phase is to determine, with a relatively small Agency investment, the technical feasibility and preliminary commercialization potential of the proposed effort and the quality of performance. Studies in this preliminary phase will be at the "bench" (i.e., laboratory) scale. Those technologies showing promise in Phase I, will be moved into Phase II.

Phase II is the principal research and development effort. The objective is to continue the research and development initiated under Phase I and work toward commercialization of the technology. Phase II awards are expected to include full-scale testing of the technology, but may not necessarily complete the total research and development that may be required to satisfy commercial or federal needs beyond the SBIR program. It is expected that 50% to 60% of the Phase I technologies will move into Phase II. Additional funds will be allocated to Phase II awards in fiscal year 2003 for successful Phase I participants.

Treatment Technology Research Demonstrations

In 2002 and 2003, EPA expects that long-term, on-site treatment technology demonstration research projects will be initiated at 10 to 20 geographically diverse PWSs. These projects will demonstrate new or improved treatment processes or engineering controls. Systems will be chosen that exceed the 10 ppb MCL and a focus will be placed on small systems. These projects are expected to be funded at $4 million in each fiscal year. This research will 1) evaluate the effectiveness of arsenic treatment technologies under varying water quality conditions, 2) compare reliability, 3) gauge simplicity and cost-effectiveness relative to existing technologies, 4) document operation and maintenance needs, and 5) characterize arsenic wastes (residuals).

Each demonstration project is expected to last approximately one year and will include data on effectiveness that takes into account seasonal differences. To evaluate reliability and simplicity, the operation and maintenance of the installed technology will be conducted by PWS personnel at the small system. Each demonstration project is expected to cost $400,000-$500,000 for a total of $4 million each fiscal year (2002 and 2003).

Short-term Performance Verification Studies

Research will include short-term performance verification of commercially ready arsenic treatment and monitoring technologies under EPA's Environmental Technology Verification (ETV) Program. In fiscal year 2002, verification of adsorption media technologies will be conducted. A second solicitation for arsenic treatment technologies is anticipated in fiscal year 2003.

Enhanced Internal Research Program

This research will focus on 1) optimizing current arsenic treatment processes, 2) studying the effect of co-occurring interfering contaminants such as sulfate, phosphate and silicon and studying the effect of co-occurring contaminants that may actually enhance removal, such as iron, 3) improving the management of arsenic treatment wastes (residuals management) under federal, state or local requirements, and 4) analyzing and mitigating adverse changes in distribution system infrastructure resulting from treatment of drinking water.

Existing arsenic treatment technologies will be studied as part of these research activities. These include media adsorption, iron removal, ion exchange, membranes, and Point of Entry (POE)/Point of Use (POU) devices. Arsenic removal and control processes include both treatment prior to distribution of drinking water, and POU devices. POU devices are of particular significance because, in their review of the January 2001 arsenic final rule, the National Drinking Water Advisory Council suggested that the Agency "consider expanding the use of the POU option to larger size categories if new cost evaluations show a significant advantage…"

Technical Assistance and Training

In fiscal years 2002 and 2003, $2 million will be allocated to developing technical assistance manuals, guides and brochures, and to delivering training to small system operators. The Agency will work or coordinate with partners, such as AWWA and regional NRWA Technical Assistance Centers, to develop and deliver these products and services. Technical assistance materials will provide detailed information for small systems on the design, selection, installation and start-up of arsenic treatment technologies that have been identified through research, and verified in demonstration projects at several small PWSs. Training is expected to focus on compliance and monitoring under the new arsenic standard, and treatment operation and maintenance problems and solutions. Where possible, EPA will rely on multi-media training with interactive personal computer (PC)-based technology. PC-based training eliminates the need for participants to travel to or from remote locations. The Agency also will provide technical assistance by updating and expanding current web pages to advertise arsenic research opportunities, report research and site demonstration results, and respond to frequently asked questions.

VII. Conclusion

EPA fully shares the concerns expressed by Congress in its Conference report concerning small system affordability issues and is committed to undertaking the suite of activities described above over the next year to complement and build upon its efforts to date. As discussed, we plan to conduct, in concert with partners and stakeholders, a thorough and comprehensive examination of our approach to implementing the affordability provisions of the Safe Drinking Water Act and to making any revisions or adjustments to this approach that are needed. We also plan to use all tools available under SDWA to 1) provide financial assistance to small systems, 2) allow additional time to comply with the regulatory deadlines associated with the arsenic in drinking water rule where appropriate, and 3) provide technical assistance to improve the capacity of small systems to implement this and future rules. Finally, we plan to recommend legislative changes, if necessary, that would help facilitate small system compliance with drinking water regulations.

As a result of these various activities and projects, EPA expects that new, more cost effective approaches to comply with drinking water requirements will be developed, and that small systems will be better able to meet the challenges posed by the new arsenic in drinking water standard as well as other, future drinking water standards.

Attachments

Conference Report 107-272, pg 174-175.
Oct 31, 2001 Letter to Honorable Barbara Mikulski from Administrator Christine Todd Whitman
Variance Technology Findings for Contaminants Regulated before 1996

Appendix 1

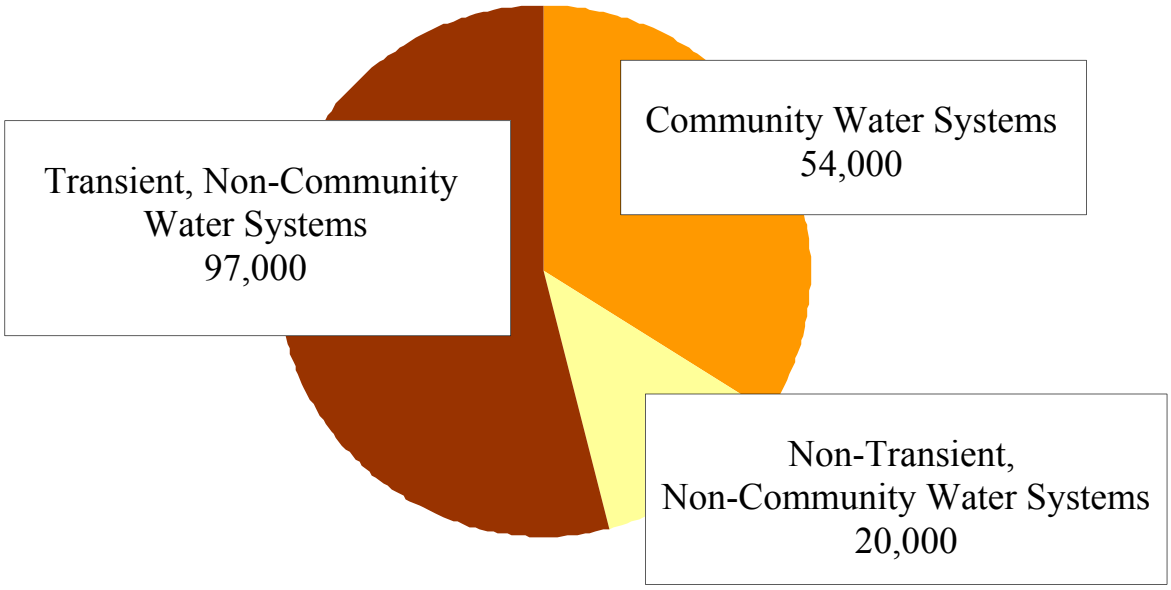
Small System Demographics

Public water systems serve 85% of US households. The remaining 15% of US households are served by private wells. Virtually all of the Non-Transient, Non-Community (NTNCWS) and Transient Non-Community Systems (TNCWS) are small. A Community Water System (CWS) is defined as a public water system serving at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. A Non-Transient Non-Community Water System (NTNCWS) is a public water system that is not a community water system and that regularly serves at least 25 of the same persons over 6 months per year. A Transient Non-Community System (TNCWS) is a non-community water system that does not regularly serve at least 25 of the same persons over 6 months per year.

Small systems are characterized by a great diversity of ownership types. Systems are classified as public, private, or ancillary. Public systems are those owned by towns, villages, special districts, or similar entities. Private systems are those owned by individuals, investors, or homeowners' associations. Ancillary systems are those owned by mobile home parks, other businesses, or institutions, and can be publicly or privately owned. Ancillary systems and private systems are the overwhelming majority of systems serving fewer than 500 persons each.

While most people obtain their water from large public water systems serving 10,000 or more people, many people rely on small public drinking water systems. Sixty-eight million people receive their water from public water systems serving less than 10,000 people, while 216 million people receive their water from public water systems serving more than 10,000 people. However, small public drinking water systems serving fewer than 10,000 people represent 94% of all public water systems. Ninety-four percent of Community Water Systems serve fewer than 10,000 persons each. Eighty-six percent of Community Water Systems serve fewer than 3,300 persons each. Approximately 60% of ground water systems under 10,000 persons are private systems.

Public Water Systems



Public Water Systems (PWS's) serve:

- *15 connections or*
- *25 people per day at least 60 days per year*

There are 170,000 PWS's; this universe is comprised of:

- *Community Water Systems (CWS's)*
- *Non-Community Water Systems; this category further delineated:*
  - *Non-Transient, Non-Community Water Systems (NTNCWS's)*
  - *Transient, Non-Community Water Systems (TNCWS)*

Percentages of households served by types of systems:

- *85% of US households are served by PWS's*
- *15% of US households are served by private wells*