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Safe Drinking Water Act: Implementation and Issues

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SUMMARY

In the 108th Congress, key drinking water issues involved water infrastructure funding and problems caused by specific contaminants, such as the gasoline additive methyl tertiary butyl ether (MTBE), perchlorate, and lead in drinking water. Congress last reauthorized the Safe Drinking Water Act (SDWA) in 1996, and although funding authority for most SDWA programs expired in FY2003, broad reauthorization efforts were not pursued as EPA, states, and water utilities continued implementing the 1996 amendments.

Both chambers passed bills to address MTBE contamination. The Senate passed S. 195, an underground storage tank leak prevention and cleanup bill. The House passed the conference report for H.R. 6, and passed H.R. 4503; the two broad energy bills included provisions similar to S. 195. Several bills would have strengthened the regulation of lead in drinking water (H.R. 4268/S. 2377, and S. 2550).

In response to concerns about perchlorate contamination of water, Congress required health studies of perchlorate in P.L. 108-136, the Department of Defense (DOD) Authorization Act of FY2004, and directed DOD with EPA to study perchlorate groundwater pollution in the Southwest in the DOD FY2004 Appropriations Act (P.L. 108-87). The National Defense Authorization Act for FY2005 (P.L. 108-375) included a "Sense of Congress" that DOD should develop a plan for remediating perchlorate contamination.

Concerns over the security of the nation's drinking water supplies were addressed by the 107th Congress through the Bioterrorism Preparedness Act (P.L. 107-188), which amended SDWA to require community water systems to conduct vulnerability assessments and prepare emergency response plans. The 108th Congress remained interested in this issue, particularly through the oversight and funding of water security efforts.

An ongoing SDWA issue involves the growing cost of drinking water standards and the availability of funding for infrastructure projects needed by public water systems, and especially small systems, to comply with SDWA standards. Congress authorized a drinking water state revolving fund (DWSRF) program in 1996 to help communities finance projects needed to meet standards. For FY2005, Congress approved roughly $850 million for the DWSRF program. However, studies show that a large funding gap exists and will grow as SDWA requirements increase and infrastructure ages.

Concern over the costs of drinking water standards has merged with the larger debate over the federal role in assisting communities with financing drinking water infrastructure — an issue that has become more challenging in a time of tightened budgets. In the 108th Congress, several bills were introduced to increase funding for water infrastructure projects, with special emphasis on helping small systems. The Senate Environment and Public Works Committee reported S. 2550, a water infrastructure financing bill to increase funding for the DWSRF, provide more technical assistance to small systems, and create a grant program for qualified systems. Other bills, including H.R. 3328, S. 1432, and S. 1732, would have authorized grant programs to help small communities comply with standards. H.R. 4717 and S. 2717 would have provided new regulatory flexibility for small water systems in certain instances.

MOST RECENT DEVELOPMENTS

In the Consolidated Appropriations Act for FY2004 (H.R. 4818, H.Rept. 108-792), Congress provided $850 million for the drinking water state revolving fund (DWSRF) program ($843 million, after applying a mandatory 0.8% across-the-board reduction). Congress also provided $100.5 million for state public water system supervision grants, $10.8 million for underground injection control grants, and $5 million for Drinking Water Program State Homeland Security Coordination grants, all subject to the mandatory 0.8% reduction. In addition, the conferees directed EPA to report, by August 2005, on the extent to which communities will be impacted by the arsenic rule, and to propose compliance alternatives and make recommendations to minimize compliance costs.

BACKGROUND AND ANALYSIS

Introduction

The Safe Drinking Water Act (SDWA), title XIV of the Public Health Service Act (42 U.S.C. 300f-300j-26), is the key federal law for protecting public water supplies from harmful contaminants. First enacted in 1974 and widely amended in 1986 and 1996, the Act is administered through programs that regulate contaminants in public water supplies, provide funding for infrastructure projects, protect sources of drinking water, and promote the capacity of water systems to comply with SDWA regulations. The 1974 law established the current federal-state arrangement in which states and tribes may be delegated primary enforcement and implementation authority (primacy) for the drinking water program by the Environmental Protection Agency (EPA), which is the federal agency responsible for administering the law. The state-administered Public Water Supply Supervision (PWSS) Program remains the basic program for regulating public water systems, and EPA has delegated primacy for this program to all states, except Wyoming and the District of Columbia (which is defined as a state under SDWA); EPA has responsibility for implementing the PWSS program in these two jurisdictions. (See also CRS Report RL31243, *Safe Drinking Water Act: A Summary of the Act and Its Major Requirements*.)

More than 90% of people in the United States get their drinking water from one of the nearly 53,400 community water systems nationwide. Congress passed the SDWA in 1974, after a nationwide study of community water systems revealed widespread water quality problems and health risks resulting from poor operating procedures, inadequate facilities, and poor management of water supplies in communities of all sizes. Since then, government and private efforts to implement the Act have led to better public water system management and more information about, and greater confidence in, the quality of water provided at the tap.

Significant progress has been made during the 28 years of the federal drinking water program. Some 91 drinking water contaminants are now regulated, and EPA reports that the population served by community water systems that met all health-based standards increased from 83% in 1994 to 91% in 2002. Nonetheless, drinking water safety concerns and challenges remain. EPA and state enforcement data indicate that public water systems still incur tens of thousands of violations of SDWA requirements each year. These violations primarily involve monitoring and reporting requirements, but also include thousands of

violations of standards and treatment techniques. Moreover, monitoring and reporting violations create uncertainty as to whether systems actually met the applicable health-based standards. Concern also exists over the potential health effects of contaminants for which drinking water standards have not been set, such as perchlorate and MTBE.

The 1996 SDWA Amendments

The 104th Congress made numerous changes to the Act with the SDWA Amendments of 1996 (P.L. 104-182), culminating a multi-year effort to amend a law that was widely criticized as having too little flexibility, too many unfunded mandates, and an arduous but unfocused regulatory schedule. Among the key provisions, the 1996 amendments authorized a drinking water state revolving loan fund (DWSRF) program to help public water systems finance projects needed to comply with SDWA rules. The amendments also established a process for selecting contaminants for regulation based on health risk and occurrence, gave EPA some added flexibility to consider costs and benefits in setting most new standards, and established schedules for regulating certain contaminants (such as *Cryptosporidium*, arsenic, and radon). The law added several provisions aimed at building the capacity of water systems (especially small systems) to comply with SDWA regulations, and it imposed many new requirements on the states including programs for source water assessment, operator certification and training, and compliance capacity development. The amendments also required that community water suppliers provide customers with annual "consumer confidence reports" that provide information on contaminants found in the local drinking water. The law authorized appropriations for SDWA programs through FY2003.

Regulated Public Water Systems

Federal drinking water regulations apply to some161,000 privately and publicly owned water systems that provide piped water for human consumption to at least 15 service connections or that regularly serve at least 25 people. (The law does not apply to private, residential wells.) Of these systems, roughly 53,400 are *community water systems* (CWSs) that serve a residential population of nearly 270 million year-round. All federal regulations apply to these systems. (Roughly 15% of community systems are investor-owned.) Nearly 18,700 public water systems are *non-transient, non-community water systems* (NTNCWSs), such as schools or factories, that have their own water supply and serve the same people for more than six months but not year-round. Most drinking water requirements apply to these systems. Another 89,000 systems are *transient non-community water systems* (TNCWSs) (e.g., campgrounds and gas stations) that provide their own water to transitory customers. TNCWSs generally are required to comply only with regulations for contaminants that pose immediate health risks (such as microbial contaminants), with the proviso that systems that use surface water sources must also comply with filtration and disinfection regulations.

Of the 53,363 community water systems, roughly 84% serve 3,300 or fewer people. While large in number, these systems provide water to just 10% of the population served by all community systems. In contrast, 7% of community water systems serve more than 10,000 people, and they provide water to 81% of the population served. Fully 85% (15,900) of non-transient, non-community water systems and 97% (86,400) of transient noncommunity water systems serve 500 or fewer people. These statistics give some insight into the scope of financial, technological, and managerial challenges many public water systems face in

meeting a growing number of complex federal drinking water regulations. **Table 1** provides statistics for community water systems.

Table 1. Size Categories of Community Water Systems

System size (population served)	Number of Community Water Systems	Population Served (millions)	Percent of Community Water Systems	Percent of Population Served
Very small (25-500)	30,417	5.01	57%	2%
Small (501-3,300)	14,394	20.26	27%	7%
Medium (3,301-10,000)	4,686	27.20	9%	10%
Large (10,001-100,000)	3,505	98.71	7%	36%
Very large (>100,000)	361	122.15	1%	45%
Total	53,363	273.33	100%	100%

Adapted from: US Environmental Protection Agency. Factoids: Drinking Water and Ground Water Statistics for 2003. Available at Internet website: [http://www.epa.gov/safewater/data/pdfs/factoids_2003.pdf].

Current Drinking Water Issues

Major drinking water issues involve infrastructure funding needs; the security of water supplies; small system capacity to comply with SDWA; and contamination of drinking water by specific contaminants, including lead and the unregulated contaminants, MTBE and perchlorate. Other issues include how the states are faring in their efforts to implement the Act, particularly the provisions added by the 1996 amendments. Although appropriations for most SDWA programs were authorized through FY2003, SDWA reauthorization was not on the agenda in the 108th Congress. Rather, various bills were offered to address specific issues, such as infrastructure funding and contamination by lead, MTBE, and perchlorate. As with other EPA-administered statutes having expired funding authority, the programs do not expire as long as Congress continues to appropriate funds for these programs.

Regulating Drinking Water Contaminants

Standard-Setting. The Safe Drinking Water Act directs EPA to promulgate National Primary Drinking Water Regulations for contaminants that may pose public health risks and that are likely to be present in public water supplies. These regulations generally include numerical standards to limit the amount of a contaminant that may be present in drinking water. Where it is not economically and technically feasible to measure a contaminant at very low concentrations, EPA establishes a treatment technique in lieu of a standard.

To develop a drinking water regulation, EPA must address a variety of technical issues. The agency must (1) determine the occurrence of a contaminant in the environment, and especially in public water systems; (2) evaluate human exposure and risks of adverse health effects to the general population and to sensitive subpopulations; (3) ensure that analytical methods are available for water systems to use in monitoring for a contaminant; (4) evaluate the availability and costs of treatment techniques that can be used to remove a contaminant; and (5) assess the impacts of a regulation on public water systems, the economy, and public

health. Consequently, regulation development typically is a multi-year process. EPA may expedite procedures and issue interim standards to respond to urgent threats to public health.

After reviewing health effects studies, EPA sets a nonenforceable maximum contaminant level goal (MCLG) at a level at which no known or anticipated adverse health effects occur and that allows an adequate margin of safety. EPA also considers the risk to sensitive subpopulations (e.g., children). For carcinogens and microbes, EPA sets the MCLG at zero. Because MCLGs consider only health effects and not analytical detection limits or treatment technologies, they may be set at levels that water systems cannot meet. Once the MCLG is established, EPA sets an enforceable standard, the maximum contaminant level (MCL). The MCL generally must be set as close to the MCLG as is "feasible" using the best technology or other means available, taking costs into consideration.

EPA has relied on legislative history to determine the meaning of "feasible." Most recently, the Senate report accompanying the 1996 amendments stated that feasible means the level that can be reached by large, regional drinking water systems applying best available treatment technology. The report explained that this approach is used because 80% of the population receives its drinking water from large community water systems, and thus, safe water can be provided to most of the population at very affordable costs. (About 80% of the population is served by systems that serve a population of 10,000 or more.) However, because standards are based on cost considerations for large systems, Congress expected that standards could be less affordable for smaller systems. An issue in the 1996 reauthorization debate concerned whether the costs of some standards were justified, given their estimated risk-reduction benefits. As amended, the Act now requires EPA, when proposing a standard, to publish a determination as to whether or not the benefits of a proposed standard justify the costs. If EPA determines that the benefits do not justify the costs, EPA, in certain cases, may promulgate a standard less stringent than the feasible level that "maximizes health risk reduction benefits at a cost that is justified by the benefits."

Recent and Pending Rules. EPA's recent rulemaking activities include a 1998 rule package that expanded requirements to control pathogens, especially *Cryptosporidium* (Interim Enhanced Surface Water Treatment Rule (SWTR)) and disinfectants (e.g., chlorine) and their byproducts (e.g., chloroform) (Stage 1 Disinfectant and Disinfection Byproduct Rule). In 2002, EPA issued the Long Term 1 Enhanced SWTR to improve control of microbial pathogens among small systems. EPA also has issued new rules for several radionuclides, including radium (now in effect), and a revised standard for arsenic that water systems must comply with by January 2006.

EPA has nearly completed several related rulemakings, including a groundwater rule to establish disinfection requirements for systems relying on ground water (this rule is intended to protect against fecal bacteria contamination in these systems); and a rule package (expected in July 2005) that includes the Stage 2 Disinfectants and Disinfection Byproduct Rule and the Long Term 2 Enhanced Surface Water Treatment Rule. These rules build on the rules issued in 1998 to strengthen public health protection from disinfectants, their byproducts, and pathogens. EPA also is working to issue a radon rule. EPA is evaluating many other contaminants, including perchlorate and MTBE, for possible regulation.

Perchlorate. EPA identified perchlorate as a candidate for regulation in 1998, but concluded that information was insufficient at that time to make a regulatory determination.

EPA listed perchlorate as a priority for further research on health effects and treatment technologies, and for collecting occurrence data. In 2002, EPA issued a controversial draft risk assessment for perchlorate. In March 2003, EPA, the Department of Defense, and other agencies requested the National Academies of Science (NAS) to advise EPA on questions related to the risk assessment. The NAS study is expected to be completed soon.

The 108th Congress passed several perchlorate measures. The Department of Defense Authorization Act of FY2004 (P.L. 108-136) required DOD to provide for health studies of perchlorate in drinking water. The DOD FY2004 Appropriations Act (P.L. 108-87) directed DOD, with EPA, to study perchlorate groundwater pollution that threatens drinking water and irrigation supplies in the Southwest. The National Defense Authorization Act for FY2005 (P.L. 108-375) included a "Sense of Congress" that DOD should: develop a plan for remediating perchlorate contamination resulting from DOD activities to ensure DOD can respond quickly once a federal drinking water standard is established; continue remediating sites where perchlorate contamination poses an imminent and substantial endangerment to human health and welfare; develop a plan to remediate contamination when the Secretary determines that the contamination poses a health hazard; and continue evaluating sites, even in the absence of an SDWA standard. Also, S. 2550 (S.Rept. 108-386), a water infrastructure bill, would have required the U.S. Geological Survey to conduct a national survey of sites contaminated with perchlorate. H.R. 2123, H.R. 5344, and S. 502 would have required EPA to promulgate a drinking water regulation for perchlorate. (See also CRS Report RS21961, *Perchlorate Contamination of Drinking Water: Regulatory Issues and Legislative Actions*.)

Lead in Drinking Water. Lead from various sources (including paint in older homes, soil, and water) poses one of the main environmental threats to children's health. In 2004, the issue of lead contamination reemerged in Washington, D.C., where water monitoring revealed marked increases in the levels of lead in tap water in recent years. The local water authority's limited response to the monitoring results severely damaged public trust in the local water supply. These events led policy makers and EPA to examine the effectiveness of the lead rule, particularly its monitoring and public notification requirements, as well as compliance with the regulation. Hearings were held by the House Energy and Commerce Committee (July 22, 2004), the House Government Reform Committee (March 5 and May 21, 2004), and the Senate Environment and Public Works Committee (April 7, 2004).

Lead Rule Overview. In 1991, EPA issued the Lead and Copper Rule (56 *FR* 26460) to replace an interim lead regulation that included a standard of 50 parts per billion (ppb) that was outdated and not protective of public health. Epidemiological research had shown that adverse health effects from exposures to lead occur at lower levels and are worse than previously thought, particularly for infants and children. (There is no known safe level of exposure to lead, and recent studies suggest that very low levels of lead may adversely affect children's neurological development.) In 1988, EPA had proposed a regulation that would have established an enforceable lead standard (maximum contaminant level (MCL)) of 5 ppb applicable to water leaving the treatment plant and also would have required a treatment technique (corrosion control) to further reduce lead in drinking water. Commenters on the proposal expressed concern that a standard applicable at the treatment plant would not indicate the amount of lead in tap water, and that compliance at the tap was essential. EPA and utilities were concerned that an MCL applied at the tap would not be feasible because lead in household plumbing could be a major cause of violations of a lead standard applied at the tap — a situation beyond the control of the water system. This issue reflected the

problem with regulating lead. Unlike most contaminants, lead is not normally present in water as it leaves the treatment plant; rather, lead occurs in drinking water primarily as a corrosion by-product, entering water as it travels through pipes in the distribution system and in household plumbing. The primary sources of lead in drinking water are lead pipes, lead solder that has been used in plumbing systems, and brass plumbing fixtures that contain lead.

The final Lead and Copper Rule (LCR) did not include an enforceable standard. Instead, the LCR established a treatment technique (corrosion control) to prevent lead from leaching into drinking water. The rule generally required all large water systems (serving more than 50,000 people) to conduct corrosion control studies and recommend an optimal corrosion control treatment to the state (or to EPA in the case of Washington, D.C.). Smaller systems were required to optimize corrosion control when monitoring showed that it was needed. The state or EPA then approved or designated a treatment as optimal, and systems were given two years to install corrosion control and one year to conduct followup monitoring. Optimizing corrosion control is complex, and the "optimal" treatment can change as water characteristics change and as utilities add new treatment processes to meet other drinking water regulations.

The LCR also established a lead "action level" of 15 ppb at the tap, based on the 90th percentile level of water samples. Water systems are required to sample tap water in homes and buildings that are at high risk of lead contamination. If lead concentrations exceed 15 ppb in more than 10% of taps sampled, the system is required, within 60 days, to inform customers about lead's health effects and sources, and what can be done to reduce exposure. The system must continue to deliver educational materials as long as it exceeds the action level. If the system continues to exceed the action level after installing optimal corrosion control, it must replace 7% of the lead service lines under its ownership each year, and must offer to replace the privately owned portion of a service line (at the owner's expense).

Federal and Local Efforts. EPA, the D.C. Water and Sewer Authority (WASA), and other local officials worked with the U.S. Army Corps of Engineers to determine the cause of the elevated lead levels in the District of Columbia. (The Corps treats and supplies water from the Washington Aqueduct to the District and several communities.) It appears that changes in treatment processes, made by the Corps to comply with another EPA regulation, made the water more corrosive, thus causing more lead to be leached from lead pipes in the distribution system and from lead plumbing inside homes and other buildings. In November 2000, the Corps changed the chemicals in its secondary disinfection treatment from free chlorine to chloramines to comply with an EPA regulation that placed strict limits on disinfection byproducts. Starting with the monitoring period, July 2001 through June 2002, more than 10% of tap water samples taken by WASA exceeded the lead action level. The Corps of Engineers worked with a multi-agency work group to develop a new corrosion control treatment process, and began testing a new process in June. In August, EPA approved use of the process for the entire Aqueduct service area and also imposed supplemental monitoring and reporting requirements on the affected public water systems. In June 2004, EPA determined that WASA had failed to comply with numerous lead sampling, public notification, and reporting requirements. EPA and WASA reached a consent agreement that requires WASA to replace more than 1,600 lead service lines, improve its public education program, and upgrade its database management systems.

National Review. EPA has undertaken a national review of lead monitoring by water systems since 2000 to determine whether this problem is widespread. By June 2004, EPA

had received monitoring data for 744 (89%) of the 834 systems that serve more than 50,000 people. EPA reported that 27 of these systems (3.6%) exceeded the action level at least once since 2000, and 12 of the systems exceeded the action level during 2003. Most (66%) of the systems serving more than 50,000 people reported that the highest level observed during any monitoring period since 2000 was less than 5 ppb. For systems serving between 3,300 and 50,000 people, 237 (3.4%) of 7,833 systems reporting had exceeded the action level since 2000; 76 systems exceeded the action level for monitoring period ending after January 2003. Most systems (71%) in this size category reported that the highest level of lead observed since 2000 was less than 5 ppb. In October 2004, EPA announced that the national data from 73,000 water utilities demonstrate that lead in drinking water is not a widespread problem.

EPA also has been assessing national compliance with the lead rule and reviewing the rule to determine whether major changes are needed. Parts of the regulation that are receiving most scrutiny include the public notification, monitoring, and lead service line replacement requirements. In November, EPA issued a guidance memo to clarify sampling requirements.

In the 108th Congress, H.R. 4268 and S. 2377 were introduced to strengthen the regulation of lead in drinking water and to remediate lead in school drinking water. In October 2004, the Senate Environment and Public Works Committee reported S. 2550, a water infrastructure financing bill that included lead provisions. (See CRS Report RS21831, *Lead in Drinking Water: Washington, D.C., Issue and Broader Regulatory Implications*.)

Methyl Tertiary Butyl Ether (MTBE). The 108th Congress also passed bills to address drinking water contamination caused by MTBE, although none were enacted. For technological and cost reasons, this gasoline additive has been widely used to meet the Clean Air Act requirement that reformulated gasoline (RFG) contain at least 2% oxygen to improve combustion. RFG is required for use in areas that fail to meet the federal ozone standard. However, numerous incidents of water contamination by MTBE have led to calls for restrictions on its use. Seventeen states, including California and New York, have enacted limits or phase-outs of the additive. There is no federal drinking water standard for MTBE; however, at least 7 states have set their own MTBE drinking water standard.

The primary source of MTBE in drinking water has been petroleum releases from leaking underground storage tank (UST) systems. Once released, MTBE moves through soil and into water more rapidly than other gasoline components, thus making it is more difficult and costly to clean up than conventional gasoline leaks. Although MTBE is considered to be less toxic than some other gasoline components (such as benzene), even small amounts of MTBE can render water undrinkable because of its strong taste and odor. These characteristics have made MTBE use an important issue for water suppliers and consumers.

In 1997, EPA issued a drinking water advisory for MTBE based on consumer acceptability (for taste and smell). Advisories provide information on contaminants that have not been regulated under SDWA. They are not enforceable, but provide guidance to water suppliers and others regarding potential health effects or consumer acceptability. While the MTBE advisory is not based on health effects, EPA states that keeping MTBE levels in the range of 20-40 micrograms per liter (μg/L) or lower for consumer acceptability reasons would also provide a large margin of safety from potential adverse health effects.

EPA has taken steps that could lead to the issuance of a drinking water standard for MTBE. In 1998, EPA included MTBE on a list of contaminants that are potential candidates for regulation. Compounds on the contaminant candidate list are categorized as regulatory determination priorities, research priorities, or occurrence priorities. Because of data gaps on health effects and occurrence, EPA placed MTBE in the category of contaminants for which further occurrence data collection and health effects research are priorities. Thus, although EPA did not select MTBE for regulation, the agency has pursued research to fill data gaps so that a regulatory determination may be made. The next round of determinations is scheduled for 2006, although EPA can make determinations outside of this cycle.

The 108th Congress passed several bills that addressed drinking water contamination by MTBE. The Senate passed an underground storage tank bill, S. 195 (S.Rept. 108-13), which would have authorized appropriations from the Leaking Underground Storage Tank (LUST) Trust Fund for cleaning up MTBE contamination and would have added new leak prevention, inspection, and enforcement requirements to the federal tank regulatory program. The comprehensive energy bill, H.R. 6 (H.Rept. 108-375) included similar UST regulatory provisions and authorized LUST Trust Fund appropriations to address leaks containing MTBE or other oxygenated fuel additives, such as ethanol.

H.R. 6 also included a contentious "safe harbor" provision to prohibit products liability lawsuits, alleging manufacturing or design defects, against producers of fuels containing MTBE and renewable fuels, such as ethanol and bio-diesel. The safe harbor provision would not affect liability for remediation costs, drinking water contamination, or negligence; however, with liability for manufacturing and design defects ruled out, plaintiffs would have to demonstrate negligence in the handling of such fuels, a more difficult legal standard to meet. Thus, public water suppliers have widely opposed a safe harbor provision and have expressed concern that it could leave communities paying much of the cost for cleaning up contamination by fuels containing MTBE or renewable fuels. Manufacturers have argued that a safe harbor provision is reasonable, given that the fuels are used to meet federal mandates, and that the key problem lies with leaking tanks, not with the fuels. The House passed the conference report for H.R. 6 on November 18, 2003; however, a cloture vote failed in the Senate. A modified version of H.R. 6, S. 2095, was introduced on February 12, 2004, and placed on the Senate Calendar. This bill contained the same UST provisions as H.R. 6, but did not include a defective-product safe harbor for MTBE or renewable fuels. In June, the House passed H.R. 4503, an energy bill nearly identical to H.R. 6, which included the MTBE safe harbor. No further action occurred on any of these bills. (See also CRS Report RS21201, *Leaking Underground Storage Tanks: Program Status and Issues*.)

Drinking Water Infrastructure Funding

Drinking Water State Revolving Fund. A persistent SDWA issue concerns the ability of public water systems to upgrade or replace infrastructure to comply with federal drinking water regulations and, more broadly, to ensure the provision of a safe and reliable water supply. In the 1996 SDWA Amendments, Congress responded to growing complaints about the Act's unfunded mandates and authorized a drinking water state revolving loan fund (DWSRF) program to help water systems finance infrastructure projects needed to meet drinking water standards and address the most serious health risks. The program authorizes EPA to award annual capitalization grants to states. States then use their grants (plus a 20% state match) to provide loans and other assistance to systems. Communities repay loans into

the fund, thus making resources available for projects in other communities. Eligible projects include installation and replacement of treatment facilities, distribution systems, and certain storage facilities. Projects to replace aging infrastructure are eligible if they are needed to maintain compliance or to further public health protection goals.

Congress authorized funding totaling $9.6 billion, including $1 billion for each of FY1995 through FY2003 for the DWSRF program. The President requested $850 million for FY2005; the House and Senate appropriations committees recommended $845 million and $850 million, respectively. Since FY1997, Congress has provided roughly $7.7 billion for this program, including $850 million provided in the FY2005 omnibus spending bill, H.R. 4818. (The amount provided is $843.2 million when adjusted for an across-the-board 0.8% reduction). Through June 2003, EPA had awarded more than $5 billion in capitalization grants that, when combined with the state match, bond proceeds, and other funds, amounted to $8.04 billion in DWSRF funds available for loans and other assistance. Through that same period, more than 3,100 loans had been made, and 5,333 discrete projects had received assistance. Total assistance provided by the program reached $6.37 billion. (See CRS Report 97-677, *Safe Drinking Water Act: State Revolving Fund Program*.)

Funding Issues. The DWSRF program is generally well regarded; however, many organizations and state and local officials argue that greater investment in drinking water infrastructure is needed. EPA's latest survey of capital improvement needs for water systems estimated that communities need to invest $150.9 billion on drinking water infrastructure improvements over 20 years (1999-2018) to comply with existing drinking water regulations and to ensure the provision of safe water. The survey excluded funds needed for compliance with several recent regulations (including the revised arsenic and radium rules) and pending rules for radon and other contaminants; nor did it consider funds needed for security upgrades. These requirements are expected to substantially increase needs estimates.

A related issue is the need for communities to address infrastructure needs that are outside the scope of the DWSRF program and, thus, generally are ineligible for assistance from this source. Ineligible categories include future growth, ongoing rehabilitation, and operation and maintenance of systems. According to EPA, outdated and deteriorated drinking water infrastructure poses a fundamental long-term threat to drinking water safety, and in many communities, basic infrastructure costs could far exceed SDWA compliance costs.

In September 2002, EPA issued *The Clean Water And Drinking Water Infrastructure Gap Analysis*, which identified potential funding gaps between projected needs and spending from 2000 through 2019. This analysis estimated the potential 20-year funding gap for drinking water and wastewater infrastructure capital and operations and maintenance (O&M), based on two scenarios: a "no revenue growth" scenario and a "revenue growth" scenario that assumed spending on infrastructure would increase 3% per year. Under the "no revenue growth" scenario, EPA projected a funding gap for drinking water capital investment of $102 billion (roughly $5 billion per year) and an O&M funding gap of $161 billion ($8 billion per year). Using revenue growth assumptions, EPA estimated a 20-year capital funding gap of $45 billion ($2 billion per year), and no gap for O&M.

Other needs assessments also reveal a funding gap. A Congressional Budget Office study, *Future Investment in Drinking Water and Wastewater Infrastructure*, concluded that current funding from all levels of government, combined with current revenues from

ratepayers, will not be sufficient to meet the nation's future demand for water infrastructure. In 2000, the Water Infrastructure Network (WIN) (a coalition of state and local officials, water service providers, environmental groups and others) reported that, over the next 20 years, water and wastewater systems need to invest $23 billion annually more than current investments to meet SDWA and Clean Water Act health and environmental priorities and to replace aging infrastructure. WIN and other groups have presented proposals to Congress for multi-billion dollar investment programs for water infrastructure. Others, however, have called for more financial self-reliance within the water sector.

The President's budget request for FY2004 addressed EPA's Gap Analysis. The request proposed that funding be continued at a level of $850 million annually through FY2018. EPA's budget justification explained that this level of support would allow DWSRFs to revolve at a cumulative level of $1.2 billion (more than double the previous goal of $500 million) and would help close the funding gap for drinking water infrastructure needs.

In the face of large needs, tight budgets, and debate over the federal role in funding water infrastructure, EPA, states, and utilities have been examining alternative management and financing strategies to address costs. Strategies include establishing public-private partnerships (privatization options range from contracting for services to selling system assets), improving asset management, and adopting full-cost pricing for water services.

In the 108th Congress, several bills were introduced to increase DWSRF funding levels. The Senate Environment and Public Works Committee reported S. 2550, a drinking water and wastewater infrastructure financing bill that would have authorized $15 billion over five years for the DWSRF, and directed states to reserve a portion of their DWSRF grant to make grants for up to 55% of project costs to qualified communities. The committee adopted various amendments, including one that applied Davis-Bacon prevailing wage requirements to projects receiving any DWSRF assistance, and another that directed the Water Resources Planning Council to conduct a special study on water resources, including water security issues. No further action occurred. (For details, see CRS Report RL32503, *Water Infrastructure Financing Legislation: Comparison of S. 2550 and H.R. 1560*.)

Drinking Water Security

Congress addressed drinking water security issues in the Bioterrorism Preparedness of 2002 (P.L. 107-188, H.Rept. 107-481), which amended SDWA to require community water systems to conduct vulnerability assessments and prepare emergency response plans. In the 108th Congress, attention has focused on several issues including the progress utilities have made in meeting the requirements of the Bioterrorism Act and in addressing identified vulnerabilities, and whether utilities need more resources to make security improvements. S. 2269 would have authorized EPA to make grants to utilities to improve security and authorized funds for the water information sharing and analysis center.

A key provision of the Bioterrorism Act required each community water system serving more than 3,300 individuals to assess their vulnerability to terrorist attacks or other intentional acts to disrupt the provision of a safe and reliable drinking water supply. Combined, these systems serve more than 90% of the population served by community water systems. The Act required these systems to certify to EPA that they conducted a vulnerability assessment and to give EPA a copy of the assessment. The Act also required these systems

to prepare or revise emergency response plans incorporating the results of the vulnerability assessments no later than six months after completing them. Table 2 outlines the schedule for utilities to submit their assessments to EPA and to complete emergency response plans.

Table 2. Community Water System Requirements under the Bioterrorism Act

System size by population (approx. no. of systems)	Vulnerability assessments must be completed (% completed as of 10/1/04)	Emergency response plans must be completed (% certified as of 10/1/04)
100,000 or more (425)	March 31, 2003 (100%)	September 30, 2003 (100%)
50,000 - 99,999 (460)	December 31, 2003 (98%)	June 30, 2004 (99%)
3,301 - 49,999 (7,500)	June 30, 2004 (88%)	December 31, 2004 (NA)

The Bioterrorism Act authorized $160 million for FY2002, and sums as may be needed for FY2003 through FY2005, to provide financial assistance to community water systems to assess vulnerabilities, prepare response plans, and address security enhancements and significant threats. The emergency supplemental appropriations for FY2002 (P.L. 107-117) provided $90 million for assessing the vulnerabilities of drinking water utilities and other security planning, and $5 million for state grants for assessing drinking water safety. In FY2002, EPA awarded roughly $53 million in water security grants to help the largest public water systems complete vulnerability assessments by the March 31, 2003 deadline.

Vulnerability assessments for systems serving between 50,000 and 100,000 were due December 31, 2003. Federal grants were not available for these and smaller systems covered by the Bioterrorism Act's requirements. Instead, EPA, states and water organizations have provided vulnerability assessment tools, guidance documents, training, and technical assistance to support security enhancement efforts among these systems. Similar assistance is also being provided for remaining 84% of community water systems that serve 3,300 or fewer and are not required to do vulnerability assessments and emergency planning.

For FY2003, EPA requested $16.9 million for vulnerability assessments for small and medium-sized systems and $5 million for state water security coordinators to work with EPA and utilities in assessing drinking water safety. The Consolidated Appropriations Resolution for FY2003 (P.L. 108-7) provided this amount plus $2 million for the National Rural Water Association to help small systems conduct vulnerability assessments, and $1 million to the American Water Works Association to provide drinking water security training.

For FY2004, EPA requested and received $32.4 million for critical water infrastructure protection, including $5 million for state water security coordination grants. This funding has supported states' efforts to work with water and wastewater systems to develop and enhance emergency operations plans; conduct training in the implementation of remedial plans in small systems; and develop detection, monitoring and treatment technology to enhance water security. EPA has used funds to assist the nearly 8,000 community water systems that serve water to populations between 3,300 and 100,000 and are subject to the Bioterrorism Act.

For FY2005, EPA requested $5 million for state water security grants and $6.1 million for other critical infrastructure protection efforts. EPA's budget justification explained that the $21.3 million reduction reflected a shift in priorities from assistance and training on vulnerability assessments. The Consolidated Appropriations Act for FY2005 provides this amount, including $2 million for the Water Information Sharing and Analysis Center, which shares sensitive security information with water systems. (See also CRS Report RL31294, *Safeguarding the Nation's Drinking Water: EPA and Congressional Actions*.)

Small Systems Issues

A key SDWA issue involves the financial, technical, and managerial capacity of small systems to comply with SDWA regulations. Roughly 84% of the nation's community water systems are small, serving 3,300 persons or fewer; 57% of the systems serve 500 persons or fewer. EPA and states have documented the problems many small systems face in meeting SDWA rules, and more fundamentally, in ensuring the quality of water supplies. Major problems include deteriorated infrastructure; lack of access to capital; limited customer and rate base; inadequate rates; diseconomies of scale; and limited technical and managerial capabilities. Although these systems serve just 9% of the population served by community water systems, the sheer number of small systems creates challenges for policymakers.

In the earliest SDWA debates, Congress recognized that setting standards based on technologies that are affordable for large cities could pose problems for small systems. During the reauthorization debate leading up to the 1996 amendments, policymakers gave considerable attention to the question of how to help small systems improve their capacity to ensure consistent compliance with the SDWA. The 1996 amendments added provisions aimed at achieving this goal, including a requirement that states establish strategies to assist systems in developing and maintaining the technical, financial and managerial capacity to meet SDWA regulations. Congress also revised provisions on standard-setting, variances, and exemptions to increase consideration of small system concerns.

Small System Variances. As amended in 1996, the SDWA requires EPA, when issuing a regulation, to identify technologies that meet the standard and that are affordable for systems that serve populations of 10,000 or fewer. If EPA does not identify "compliance" technologies that are affordable for these systems, then EPA must identify small system "variance" technologies. A variance technology need not meet the standard, but must protect public health. States may grant variances to systems serving 3,300 persons or fewer, if a system cannot afford to comply with a rule (through treatment, an alternative source of water, or other restructuring) and the system installs a variance technology. With EPA approval, states also may grant variances to systems serving between 3,300 and 10,000 people.

To date, EPA has determined that affordable compliance technologies are available for all drinking water regulations. Consequently, the agency has not identified any small system variance technologies, and no small system variances are available. If EPA had identified variance technologies, states still might not make much use of these variances for a number of reasons — a key issue being the existence of a double standard for tap water quality in communities that meet a standard, compared with those that would rely on variances.

Exemptions. The Act's exemption provisions also are intended to provide compliance flexibility in certain cases. States or EPA may grant temporary exemptions from a standard

if, due to certain compelling factors (including cost), a system cannot comply on time. For example, all systems are required to comply with the new arsenic standard five years after its promulgation date. An exemption would allow three more years for qualified systems. Small systems (serving 3,300 persons or fewer) may be eligible for up to three additional two-year extensions, for a total exemption duration of nine years (for a total of up to 14 years to achieve compliance). In the preamble to the arsenic rule published in January 2001, EPA noted that exemptions will be an important tool to help states address the number of systems needing financial assistance to comply with this rule and other SDWA rules (66 *FR* 6988).

Compliance and Affordability Issues. Prompted by intense debate over the revised arsenic standard, its potential cost to small communities, and its delay by EPA for further review, the conference report for EPA's FY2002 appropriations (H.Rept. 107-272) barred EPA from using funds to delay the arsenic rule, but also directed EPA to review its affordability criteria and how small system variance and exemption programs should be implemented for arsenic. EPA was required to report to Congress on a review of its affordability criteria, administrative actions, potential funding mechanisms for small system compliance, and possible legislative actions.

EPA's report to Congress, *Small Systems Arsenic Implementation Issues,* discusses the agency's efforts regarding its affordability criteria for water standards, and issues involving the arsenic rule. EPA activities included (1) reviewing the small system affordability criteria and variance process; (2) developing a small community assistance plan to improve access to financial and technical assistance, improve compliance capacity, and simplify the use of exemptions; and (3) implementing a $20 million research and technical assistance strategy.

Congress remains concerned about compliance costs, generally, and the arsenic rule, specifically. The conference report for H.R. 4818, the Consolidated Appropriations Act for FY2005, directs EPA to report, by August 2005, on the extent to which communities will be impacted by the arsenic rule, and to propose compliance alternatives and make recommendations to minimize compliance costs. Several other bills were introduced to address small system compliance and funding issues. H.R. 3328/S. 1432 and S. 2550 (S.Rept. 108-386) proposed to establish small system grant programs at EPA to help qualified communities comply with SDWA standards. Relatedly, S. 1732 would have directed the Secretary of Interior to establish a grant program for rural communities in the Reclamation states and authorized $70 million annually for projects to ensure a safe, reliable water supply.

LEGISLATION

P.L. 108-136, H.R. 1588 (Hunter)/S. 1050 (Warner)

The Department of Defense Authorization Act of FY2004 conference report (H.Rept. 108-354) requires an independent epidemiological study and endocrinological review of human exposure to perchlorate in drinking water. Signed into law Nov. 24, 2003.

P.L. 108-328, H.R. 2771 (Fossella)/S. 1425 (Clinton)

Amends SDWA to reauthorize the New York City Watershed Protection Program through 2010. Introduced July 17, 2003. H.R. 2771 was referred to the Committee on Energy and Commerce, Subcommittee on Environment and Hazardous Materials; hearings and

mark-up held April 2, 2004; reported from full committee April 28 (H.Rept. 108-476); passed by the House on May 5, 2004. S. 1425 was referred to the Committee on Environment and Public Works; reported, amended (S.Rept. 108-205), on Nov. 20, 2003. H.R. 2771 passed the Senate on Sept. 30, 2004; signed into law on Oct. 16, 2004.

H.R. 6 (Conference Report, H.Rept. 108-375)

Sec. 327 adopts the House provision to amend SDWA to specify that the definition of underground injection excludes the injection of fluids used in hydraulic fracturing operations for oil and gas production, thus removing EPA's authority to regulate the underground injection of fluids for hydraulic fracturing purposes. The Senate bill directed EPA to study the effects of hydraulic fracturing on underground sources of drinking water and to determine whether regulation was needed. The House approved the conference report Nov. 18, 2003.

H.R. 306 (Gary Miller)

Amends SDWA to provide procedures for claims relating to drinking water; protects drinking water suppliers against lawsuits where utilities are in compliance with drinking water regulations; establishes guidelines for suits involving contaminants that are not regulated under SDWA. Introduced January 8, 2003; referred to Committee on Energy and Commerce and to the Committee on the Judiciary.

H.R. 1471 (Engel)

Amends SDWA to allow systems to avoid filtration requirements in certain instances. Introduced March 27, 2003; referred to Committee on Energy and Commerce.

H.R. 2123 (Capps)

Preventing Perchlorate Pollution Act of 2003 amends SDWA to require EPA to set a drinking water standard for perchlorate by July 1, 2004. Amends the Clean Water Act to establish safety standards applicable to perchlorate storage facilities. Establishes the Perchlorate Pollution Prevention Fund and directs EPA to carry out a loan program to help water suppliers and well owners to attain water that meets federal and state perchlorate standards. Introduced May 15, 2003; referred to Committee on Energy and Commerce.

H.R. 2804 (Andrews)

Authorizes a supplemental appropriation of $85 million for the DWSRF program for FY2003, and requires that state source water assessment programs address nine specific pesticides. Introduced July 21, 2003; referred to the Committee on Appropriations.

H.R. 3328 (Wilson)/S. 1432 (Domenici)

Amends SDWA to establish an EPA-administered grant program to help eligible small and certain specified community water systems to comply with drinking water standards. H.R. 3328 was introduced October 16, 2003; referred to the Committee on Energy and Commerce. S. 1432 was introduced July 21, 2003; referred to the Committee on Environment and Public Works.

H.R. 4268 (Norton)/S. 2377 (Jeffords)

Lead-Free Drinking Water Act of 2004 amends SDWA to: strengthen the regulation of lead in drinking water; hasten the replacement of lead service lines; increase monitoring, public notification requirements; and remediate lead in school drinking water. Both were

introduced May 4, 2004. H.R. 4268 was referred to the Committee on Energy and Commerce. S. 2377 was referred to the Committee on Environment and Public Works.

H.R. 4717 (Otter)

Requires states to grant nonprofit, small public water systems exemptions from the requirements of federal drinking water regulations for naturally occurring contaminants, where compliance is not economically feasible. Introduced June 25, 2004; referred to the Committee on Energy and Commerce.

H.R. 5344 (Solis)

Requires EPA to promulgate a drinking water standard for perchlorate. Introduced on Oct. 8, 2004; referred to the Committee on Energy and Commerce.

S.Amdt. 2784 to S.Con.Res. 95 (Crapo)

Amendment to concurrent resolution, which set forth the FY2005 budget and budgetary levels for FY2006-FY2009, to increase funding for the Clean Water SRF and DWSRF by $5.2 billion over five years. Agreed to March 11, 2004; passed by Senate March 14, 2004.

S. 502 (Boxer)

Requires EPA to promulgate a drinking water standard for perchlorate by July 1, 2004. Introduced March 3, 2003; referred to Committee on Environment and Public Works.

S. 820 (Boxer)

Perchlorate Community Right-to-Know Act amends the Clean Water Act to establish safety standards for perchlorate storage facilities. Creates the Perchlorate Pollution Prevention Fund and directs EPA to carry out a loan program to help water suppliers and well owners attain water that meets perchlorate standards. Introduced April 8, 2003; referred to the Committee on Environment and Public Works.

S. 1163 (Hutchison)

Prohibits a U.S.-Mexico border state from receiving federal SRF grants unless the state requires local governments to set and enforce ordinances to prevent colonias development. Introduced June 2, 2003; referred to the Committee on Environment and Public Works.

S. 1413 (Boxer)

Authorizes feasibility studies for specific water quality and supply projects in California and authorizes appropriations for the DWSRF for FY2004 at a level of $2 billion. Introduced July 15, 2003; referred to the Committee on Environment and Public Works.

S. 1732 (Domenici)

Directs the Secretary of the Interior to establish a rural water supply program to serve the Reclamation states. Authorizes $70 million per year for water quality and supply projects. Introduced October 15, 2003; referred to the Committee on Energy and Natural Resources. Hearings held March 25, 2004 (S.Hrg. 108-639).

S. 2269 (Bond)

The Environmental Enforcement and Security Act directs EPA to increase the number of special agents assigned to criminal enforcement and homeland security; authorizes funds

for grants to water systems to improve security and funds to operate the Water ISAC. Introduced April 1, 2004; referred to the Committee on Environment and Public Works.

S. 2550 (Crapo)

The Water Infrastructure Financing Act amends the Clean Water Act and SDWA to improve drinking water and wastewater infrastructure. Authorizes $15 billion over five years for the DWSRF, directs states to reserve a portion of their DWSRF grant to make grants to qualified communities, establishes a small system grant program at EPA, applies prevailing wage provisions to water projects, authorizes funding to address lead contamination, requires a national assessment of perchlorate contamination and a study on water resources. Introduced June 21, 2004; referred to the Committee on Environment and Public Works; reported (S.Rept. 108-386), with amendments, on Oct. 7, 2004.

S. 2717 (Nelson, E. Benjamin)

Requires states to grant small, nonprofit systems exemptions from drinking water regulations for naturally occurring contaminants, in certain cases. Sets alternative arsenic standards for exempt systems. Directs EPA to establish arsenic research consortium. Introduced July 22, 2004; referred to the Committee on Environment and Public Works.

CONGRESSIONAL HEARINGS, REPORTS, AND DOCUMENTS

U.S. Congress. House. Committee on Energy and Commerce. Subcommittee on Environment and Hazardous Materials. *Tapped Out: Lead in the District of Columbia and the Providing of Safe Drinking Water*. Hearing, July 22, 2004, 108th Congress, 2nd session. 155 p. (108-97)

——*Drinking Water Needs and Infrastructure.* Hearing, April 11, 2002. 107th Congress, 2nd session. 108 p. (107-107)

U.S. Congress. House. Committee on Government Reform. Subcommittee on Energy Policy, Natural Resources and Regulatory Affairs. *EPA Water Enforcement: Are We on the Right Track?* Hearing, Oct. 14, 2003, 108th Congress, 1st session. 201p. (108-157)

U.S. Congress. House. Committee on Government Reform. *Public Confidence, Down the Drain: the Federal Role in Ensuring Safe Drinking Water in the District of Columbia*. Hearing, March 5, 2004, 108th Congress, 2nd session. 268 p. (108-161)

U.S. Senate. Committee on Environment and Public Works. *Water Infrastructure Financing Act.* Report to accompany S. 2550. Oct.7, 2004. S.Rept. 108-386. 116 p.

FOR ADDITIONAL READING

U.S. Environmental Protection Agency. *The Clean Water and Drinking Water Infrastructure Gap Analysis Report.* Report No. EPA 816-R-02-020. September 2002. 50 p.

U.S. General Accounting Office. *Water Infrastructure: Information on Financing, Capital Planning, and Privatization.* GAO-02-764. August 2002. 83 p.