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United States Government Accountability Office  
Washington, DC 20548

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November 30, 2005

The Honorable James M. Inhofe  
Chairman, Committee on  
Environment and Public Works  
United States Senate

The Honorable Mike Crapo  
United States Senate

Subject: *Federal Water Requirements: Challenges to Estimating the Cost Impact on  
Local Communities*

Under the Safe Drinking Water Act and the Federal Water Pollution Control Act, commonly referred to as the Clean Water Act, the Environmental Protection Agency (EPA) has responsibility for protecting public health and welfare, as well as the integrity of our nation's waters. Federal water requirements under these acts affect facilities providing the most basic services at the local level, including drinking water treatment plants and distribution systems; wastewater treatment plants and collection systems; and storm sewer systems, which collect storm water, or the runoff created by rainfall and other types of wet weather. For example, depending on the circumstances, local communities may have to pay for installing new treatment technologies or taking other measures so that community-based or regional facilities can meet applicable water quality standards. Nationwide, there are roughly 53,000 community drinking water systems,<sup>1</sup> 17,000 municipal wastewater treatment plants, and 7,000 communities served by municipal storm sewer collection systems<sup>2</sup> that may be affected by federal water requirements.

While recognizing the public health and environmental benefits of federal water requirements, communities are increasingly voicing concerns about the financial burden imposed by these requirements—in particular, the projected costs of more recent regulations and their cumulative costs over time. Over the years, EPA, water and community associations, and other parties have developed various estimates of some of the different costs related to ensuring clean water and safe drinking water. Additionally, the Unfunded Mandates Reform Act of 1995 requires EPA to prepare a written statement identifying the costs and benefits of federal mandates contained in

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<sup>1</sup>There are also roughly 107,000 noncommunity water systems that may be affected by federal drinking water requirements. About 19,000 of these systems are located at facilities such as schools, factories, and hospitals, which regularly serve at least 25 of the same people at least 6 months per year. The remaining noncommunity water systems are located at facilities, such as gas stations and campgrounds, which serve transient populations.

<sup>2</sup>Some municipalities have separate collection systems for wastewater and storm water, and some have combined collection systems. Both types may be affected by federal requirements and are included in this figure.

certain regulations. However, the act does not require EPA to identify the cumulative costs and benefits of multiple regulations. As the Congress considers legislation to provide more resources to communities to address regulatory costs and aging water infrastructure, it is seeking a more complete understanding of the federal water requirements affecting local communities and the cumulative costs associated with implementing them.

In this context, you asked us to determine the cumulative cost of federal water requirements. In conducting this work, we identified some major methodological challenges to developing complete and reliable cost information. We subsequently briefed your staffs on these challenges. This report summarizes the information provided to your staffs during our November 17, 2005, briefing and formally transmits the charts presented during that briefing (see enc. I). As requested, this report provides information on (1) key federal water requirements that local communities are subject to under the Safe Drinking Water Act and the Clean Water Act, (2) the extent to which existing studies provide information on the cumulative cost of such requirements to communities, and (3) the methodological challenges to developing reliable cumulative cost estimates attributable to federal water requirements.

To respond to the first objective, we identified key federal water requirements and verified the accuracy and completeness of the list with EPA. Under the Safe Drinking Water Act, we included key regulations directed at local drinking water systems and excluded regulations that focused on analytical methods or provided clarification to existing requirements. For the Clean Water Act, we included key regulations that typically affect local wastewater treatment plants and municipalities with combined or separate storm sewer systems and excluded regulations that are specific to particular locations or involve technical clarifications. In addition, we met with representatives from more than 10 associations representing water and community interests to obtain their views on which requirements have had, or will have, the most significant cost impacts on local communities. In responding to the second objective, we conducted Internet searches and held discussions with EPA, the Congressional Budget Office, the Congressional Research Service, associations, and others to identify studies that estimated some aspect of costs associated with federal water requirements. Overall, we reviewed over 25 studies published between 1988 and 2005 and summarized their scope, methodology, and findings. For the third objective, we conducted site visits to four communities, which we selected on the basis of three criteria: diversity in community size and level of complexity, community willingness to participate, and diversity of geographic location. During these site visits, we met with community and system managers to determine what information was available to support cumulative cost estimates, identify challenges to developing such estimates, and obtain perspectives on the federal water requirements that have had the most significant impact on their communities. We supplemented this information with examples of methodological challenges identified in existing cost studies and perspectives gathered in interviews with EPA, associations, and others. We conducted our review from February 2005 to October 2005 in accordance with generally accepted government auditing standards.

## Summary

The key requirements of the Safe Drinking Water Act and the Clean Water Act that communities must meet focus on limiting the exposure of customers to contaminants in water supplied by community drinking water systems and ensuring that communities prevent pollutants from sewage and diffuse sources, such as streets and construction sites, from reaching surrounding water bodies. (See enc. II for a list and brief description of these federal water requirements.) Under the Safe Drinking Water Act, EPA currently regulates over 90 contaminants, such as arsenic and lead, and is developing regulations on several more. Generally, as required by the Safe Drinking Water Act, EPA's regulations establish a limit, or "maximum contaminant level," for specific contaminants and require water systems to test the water periodically to determine if the quality is acceptable. If contaminant levels are too high, water systems must install new treatment technologies or take other measures to address the problem, such as finding a new water source. However, if it is not economically or technically feasible to ascertain the level of a contaminant, EPA may instead establish a treatment technique to prevent known or anticipated health effects. Other regulations require water systems to notify the public when contaminant levels exceed established limits and provide annual reports summarizing the results of all water quality testing. The Clean Water Act requires wastewater treatment plants to meet minimum technology-based effluent limitations. Plants also may need to implement additional, more stringent limitations, including those necessary to meet water quality standards. In addition, EPA requires municipalities to develop and implement management programs that help prevent pollutants in runoff from reaching surrounding bodies of water. In developing these plans, communities must adopt certain minimum practices, such as controls to reduce or eliminate pollution that collects on streets.

While many parties, including EPA, various water and community associations, and private consulting firms, have developed cost estimates for different aspects of maintaining safe, clean water, these estimates have not provided information on the cumulative costs of complying with federal water requirements, primarily because they were not intended to do so. Some studies focus on developing a broad estimate of the costs of providing safe drinking water or clean water, but do not attempt to separate the costs associated with meeting regulatory requirements from other costs. For example, EPA's 2000 Clean Watersheds Needs Survey presents the cost of projects needed, nationwide, to address water quality and public health problems, which EPA estimated to be \$181.2 billion.<sup>3</sup> The study includes the costs of adding capacity to accommodate population growth, replacing aging infrastructure, and complying with requirements in its estimates, among other costs, but it does not distinguish the portion of the total costs that are associated with meeting federal water requirements. In addition, many studies have a narrower scope, focusing on estimating costs for a subset of regulatory requirements and particular time periods, or estimate costs to different entities (e.g., states, private sector). For example,

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<sup>3</sup>The estimate includes current and projected abatement costs, in 2000 year dollars, for projects needed to address water quality or public health problems eligible for funding under the Clean Water State Revolving Fund. According to EPA, the quality of data informing the estimate was affected by the variation in the level of effort states put forth in reporting the cost data. We did not independently evaluate the estimation methodology for any of the EPA estimates discussed in this report, nor did we evaluate the validity or the reliability of the survey and other data used to develop these estimates.

EPA's 2003 Drinking Water Infrastructure Needs Survey and Assessment presents an estimate of current and projected costs, for the time period of 2003 to 2022, for drinking water infrastructure investment needs, which totals \$276.8 billion.<sup>4</sup> While EPA did distinguish the portion of the total cost attributable to compliance with regulatory requirements (\$45.1 billion),<sup>5</sup> the estimates do not include expenditures prior to 2003, and only cover regulations under the Safe Drinking Water Act. (See enc. III for an abbreviated description of the studies we reviewed.) Similarly, although EPA is required to develop cost estimates for some individual regulations, by definition, these estimates are narrow in scope. While the estimates provide a measure of potential costs to comply with individual regulations, which EPA has estimated may reach into the hundreds of millions of dollars for some regulations,<sup>6</sup> the estimates have been subject to criticism for both overestimating and underestimating actual implementation costs. Moreover, adding the projected costs of individual regulations together to obtain an estimate of actual cumulative cost impacts to communities would not provide a meaningful result because, among other reasons, the regulatory estimates are prospective, the range of uncertainty surrounding them is compounded as they are added together, and, in any event, estimates do not exist for all relevant federal water requirements.

Several methodological challenges hinder new efforts to develop reliable cumulative cost estimates, including obtaining accurate and complete cost data, particularly for older requirements; accurately allocating costs (e.g., among jurisdictions that share costs); and establishing a causal link between community investments and federal water requirements. Therefore, any estimate of the cumulative costs of federal water regulations should be viewed in light of the following challenges and consequent data limitations.<sup>7</sup>

- Local communities often lack the institutional knowledge or historical records on the costs of treatment technologies or other operational changes. As a result, local officials may not be able to provide information on the costs associated with installing new treatment technologies or making other operational changes, when such changes occurred, or why they were made.
- Even when data on the costs of treatment technologies or other operational changes are available, local officials often have trouble allocating costs attributable to federal water requirements partly because accounting systems generally track costs by project rather than by federal requirement. Cost

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<sup>4</sup>The estimate includes costs, in 2003 year dollars, for projects to protect public health, preserve the physical integrity of water systems, convey treated water to homes and commercial and industrial establishments, and ensure continued compliance with specific Safe Drinking Water Act regulations. According to EPA, there is some uncertainty in the estimates due to sampling error and the use of statistical cost models and regulatory economic analyses.

<sup>5</sup>The estimate includes costs, in 2003 year dollars, for projects directly attributable to specific Safe Drinking Water Act regulations. According to EPA, there is some uncertainty in the estimates due to sampling error and the use of statistical cost models and regulatory economic analyses.

<sup>6</sup>Estimated costs for individual rules can vary widely, and in some instances, reach into the hundreds of millions of dollars. For example, EPA estimated that the Arsenic Rule would cost public water systems between \$190 million and \$227 million annually (in 1999 year dollars, annualized over 20 years using a commercial discount rate, which approximates 5 percent).

<sup>7</sup>Two previous GAO reports, *Regulatory Burden: Measurement Challenges and Concerns Raised by Selected Companies*, [GAO/GGD-97-2](#) (Washington, D.C.: November 18, 1996), and *Unfunded Mandates: Views Vary About Reform Act's Strengths, Weaknesses, and Options for Improvement*, [GAO-05-454](#) (Washington, D.C.: March 31, 2005) presented similar limitations and concerns regarding the accuracy and completeness of regulatory cost estimates.

allocation is especially difficult when costs are shared by multiple, overlapping jurisdictions or when communities make system or program changes for multiple reasons, such as installing a new treatment technology that both meets federal requirements for safe drinking water and improves the water's aesthetic quality.

- Establishing a causal link between community investments and federal water requirements is also problematic in developing cost estimates. First, in some instances, there is no good measure of what communities would have done in the absence of federal water requirements that can be used as a baseline in developing cost estimates. Second, some investments are made in anticipation of potential federal requirements rather than in response to finalized ones. Consequently, because of the subjective judgments that would have to be made, it is difficult to reliably determine how far in advance of a requirement an investment can be made and still be attributed to that requirement. Third, because some states or regional entities may exercise their authority to establish requirements that are more stringent than the federal standards, some community investments may include costs beyond those fairly attributable to federal requirements. Identifying the federal portion of the costs is often not feasible because the authority and requirements of the multiple levels of government overlap.

Information on the cumulative cost of federal water requirements is critical in determining the nature and extent of the financial burden on local communities. However, given the methodological challenges of obtaining accurate and complete cost data, accurately allocating costs, and establishing a causal link between community investments and federal water requirements, researchers face formidable obstacles in developing a reliable cumulative cost estimate.

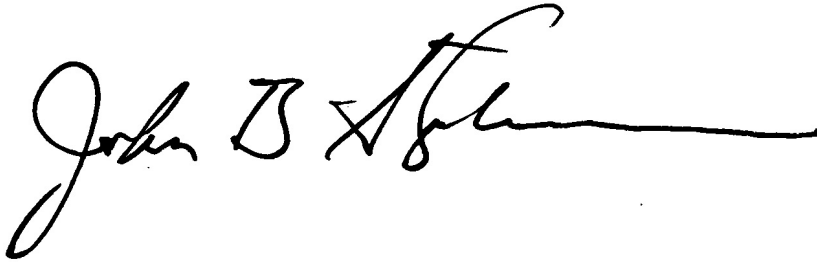
### **Agency Comments and Our Evaluation**

We requested comments on a draft of this report from the Administrator of the EPA or his designee. On November 9, 2005, we obtained oral comments from officials with EPA's Office of Water, including the Director of the Office of Ground Water and Drinking Water, the Deputy Director of the Municipal Support Division of the Office of Wastewater Management, and the Associate Director of the Water Permits Division of the Office of Wastewater Management. They generally agreed with our findings and provided some technical comments, which we have incorporated into this report where appropriate.

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We are sending a copy of this report to EPA. Copies will be made available to others upon request. This report will also be available at no charge on GAO's Web site at <http://www.gao.gov>.

If you have any questions about this report or need additional information, please contact me at (202) 512-3841 or by e-mail at [stephensonj@gao.gov](mailto:stephensonj@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report include Ellen Crocker, Mark Braza, Nancy Crothers, Laura Gatz, Alyssa Hundrup, Richard Johnson, and Mehrzad Nadji.

A handwritten signature in black ink, reading "John B. Stephenson". The signature is written in a cursive style with a long horizontal line extending to the right.

John B. Stephenson  
Director, Natural Resources  
and Environment

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