

May 2007

CLEAN WATER

Further Implementation and Better Cost Data Needed to Determine Impact of EPA's Storm Water Program on Communities

In this Web version, appendix I, "Briefing Provided to Congressional Requesters," is available as a separate electronic file by clicking the link on page 40.





Highlights of [GAO-07-479](#), a report to congressional requesters

Why GAO Did This Study

Urban storm water runoff is a major contributor to the nation's degraded waters. Under the Clean Water Act, the Environmental Protection Agency (EPA) established a program requiring communities to obtain permits and implement activities to control storm water pollution. EPA's Phase I regulations (1990) applied to communities with populations of 100,000 or more, and its Phase II regulations (1999) covered smaller urban communities. Communities must report progress in meeting permit requirements. Some have raised concerns that storm water requirements impose an undue burden. To evaluate storm water program costs, EPA developed estimates for both phases.

GAO was asked to (1) determine the progress in implementing the storm water program, (2) evaluate the extent to which the program burdens communities, (3) examine the accuracy of EPA's cost estimates, and (4) examine the data available for assessing program burden. GAO collected data for all states and a sample of 130 communities, among other steps.

What GAO Recommends

GAO recommends that EPA issue guidance and consider regulatory changes so that communities report consistently on their efforts. EPA stated it has already taken some action, but agreed to take additional steps to collect better cost data.

www.gao.gov/cgi-bin/getrpt?GAO-07-479.

To view the full product, including the scope and methodology, click on the link above. For more information, contact John B. Stephenson at (202) 512-3841 or stephensonj@gao.gov.

CLEAN WATER

Further Implementation and Better Cost Data Needed to Determine Impact of EPA's Storm Water Program on Communities

What GAO Found

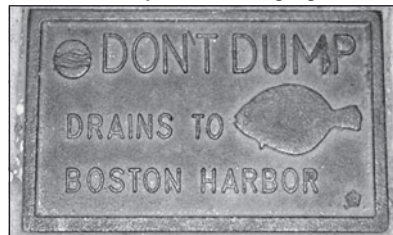
Storm water program implementation has been slow for both Phase I and II communities. The federal deadlines for permit applications were years ago—14 years for Phase I and 4 years for Phase II—but almost 11 percent of all communities were not yet permitted as of fall 2006. In addition, litigation, among other reasons, delayed the issuance of some permits for years after the application deadlines. As a result, almost all Phase II and some Phase I communities are still in the early stages of program implementation.

It is too early to determine the storm water program's overall burden, but several factors influence the extent to which the program burdens a community. In particular, burden varies depending on whether communities (1) can use the flexibility built into EPA's regulations to implement less expensive measures, or (2) are able to benefit from prior storm water management experience. Some communities may face a greater burden because of more stringent requirements set by EPA or the states, additional efforts required to address litigation over water quality, or because of barriers to obtaining funding for storm water activities. Storm water program burdens could increase in the future because, among other reasons, EPA or the states may reissue permits with more stringent requirements.

Without an estimate of actual storm water program costs—or burden—GAO could not determine the accuracy of EPA's cost estimates. However, GAO did identify methodological concerns that raise questions about the usefulness of these estimates for measuring the burden communities face. That is, the Phase I analysis was not designed to estimate national program costs, the Phase II analysis was based on survey data of questionable validity and reliability, and neither analysis excluded costs for activities that communities were implementing before the program.

Any assessment of program burden will be hampered because EPA is not collecting complete and consistent data on communities' activities and their costs. For example, only Phase I communities are required to include data on program costs and these data are often limited. Also, communities' inconsistent reporting of activities makes it difficult to evaluate program implementation nationwide. Consequently, EPA will find it challenging to meet its goal to examine Phase II implementation starting in 2012.

Sidewalk Plaque Discouraging Storm Drain Pollution



Source: GAO.

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Abbreviations

BMP	best management practice
CWSRF	Clean Water State Revolving Fund
EPA	Environmental Protection Agency
MS4	municipal separate storm sewer system
NAFSMA	National Association of Flood and Stormwater Management Agencies
NPDES	National Pollutant Discharge Elimination System
TMDL	Total Maximum Daily Load

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United States Government Accountability Office
Washington, DC 20548

May 31, 2007

The Honorable James M. Inhofe
Ranking Member
Committee on Environment and Public Works
United States Senate

The Honorable Mike Crapo
United States Senate

Storm water from urban areas is a major contributor to the degradation of the nation's lakes, rivers, and streams. It runs off paved or other impervious areas into surface waters and may contain dangerous chemicals, harmful bacteria, debris, and other pollutants that can pose serious public health risks. As urban and suburban areas have expanded, so too has the amount of impervious surface. As a result, storm water runoff has increased in volume and velocity, which can alter the natural flow of water, harm aquatic ecosystems, and cause considerable property damage.

In 1987, Congress amended the Clean Water Act, directing that the Administrator of the Environmental Protection Agency (EPA) establish a program to regulate storm water pollution. EPA developed the Storm Water Program as part of the National Pollutant Discharge Elimination System (NPDES) Program by issuing regulations in two phases: Phase I in 1990 and Phase II in 1999. These regulations required communities with separate sewer systems for storm water to obtain permits and implement activities to control storm water runoff.¹ The Phase I regulations generally applied to communities with populations of 100,000 or more and identified 220 communities potentially subject to the program. The Phase II regulations generally applied to smaller communities in urban areas and identified 5,036 communities that could be required to obtain permit

¹EPA's storm water regulations apply to communities with separate storm water and sanitary sewer systems. In some communities, particularly older communities, the sanitary and storm sewer systems are combined. Combined sewer systems are regulated under different NPDES permits.

coverage.² Communities had to apply for permits by specified dates early in the 1990s for Phase I and in 2003 for Phase II. In most cases, the states, authorized by EPA, issue 5-year permits that must then be renewed. The permits require communities to implement activities to control storm water runoff. These activities may include (1) educating the public about the impacts of runoff in order to discourage such practices as dumping used automobile oil into a storm drain; (2) street-sweeping; (3) structural practices, such as building retention ponds to slow or prevent the release of polluted storm water; or (4) disconnecting illicit plumbing connections to the storm sewer system. Communities are required to report periodically on their storm water activities. In some cases, communities may be able to obtain federal or state funds, such as Clean Water State Revolving Fund loans—low-interest loans that can be used for a variety of water quality projects—to help implement their storm water management programs.

In 1990 and 1999, respectively, EPA analyzed the costs of implementing Phases I and II of the storm water program. EPA's Phase I analysis modeled program costs for a limited number of large and medium cities. It did not provide a national estimate of program costs. EPA's Phase II analysis estimated national program implementation costs based on survey data received from 56 communities. In its Phase II regulations, EPA set a goal of beginning to evaluate implementation of Phase II of the program in 2012.

The Unfunded Mandates Reform Act of 1995 requires agencies to determine the cost of a significant regulatory action on state and local governments. However, the act does not require agencies to look at the cumulative costs of multiple regulations. Many communities responsible for implementing storm water program requirements are also responsible for implementing other regulations relating to water quality, such as drinking water regulations or specific pollution treatment programs. Consequently, states, local governments, water associations, and industry and academic experts have raised concerns that implementing EPA's storm water program imposes a burden on communities. For purposes of this report, we use burden to mean additional costs for implementing storm water control measures, increased administrative activities, reduced

²EPA's Phase II regulations also listed 590 communities outside urban areas that met certain population criteria and could potentially be required to obtain permit coverage. Furthermore, the regulations listed a number of communities in Puerto Rico as potential Phase II communities.

budget flexibility because of the need to divert resources from other governmental activities, actions related to litigation, and the influences of other regulatory programs on how storm water runoff is managed.

In this context, you asked us to (1) identify the progress made in implementing the storm water program, (2) determine the extent to which the storm water program burdens communities, (3) evaluate the accuracy of EPA's cost estimates, and (4) examine the data available for future assessment of program burdens. On December 18, 2006, we briefed your staff on the results of our review; this report provides more information on highlights presented at this briefing. A copy of our December briefing is included as [appendix I](#).

To identify progress made in program implementation, as well as to examine the extent of program burden, we interviewed officials responsible for implementing the storm water program, including EPA, state, and local officials. For all 50 states, we obtained and analyzed storm water program data, such as the number of communities required to obtain permits, and the number that had obtained permits as of fall 2006.³ For each state's data, we assessed the reliability of the data by (1) examining how the data were collected, processed, and maintained; (2) reviewing the data we received for discrepancies, such as duplicate entries; and (3) conducting detailed follow-up in cases where we found inconsistencies. Through these efforts, we determined that the data we collected were sufficiently reliable for the purposes of our review. In addition, we reviewed applicable statutes, regulations, guidance, and studies, and obtained the views of state and local government associations and academic and industry experts on program implementation. Furthermore, we analyzed EPA's cost estimates of the Phase I and II regulations and adjusted all dollars to 2006 dollars. Finally, to obtain information on future data availability issues, we reviewed storm water program documents from a sample of 130 communities to obtain information on their activities. Most of these communities (about 95 percent) were selected randomly, with the remainder chosen through a judgmental selection of communities that we believed had well-established storm water programs and good cost information based on interviews we conducted and studies we reviewed. Appendix II provides a more detailed description of our scope and methodology. We conducted

³We limited our data collection effort to communities in the 50 states. As a result, we did not include the District of Columbia or communities in the U.S. territories in our analysis.

our work between January 2006 and April 2007 in accordance with generally accepted government auditing standards.

Results in Brief

Implementation of the storm water program has been slow for both Phase I and II communities. While the Phase I and II federal application deadlines were years ago—14 years ago for Phase I and 4 years ago for Phase II—11 Phase I and 809 Phase II communities were not yet permitted as of fall 2006 (almost 11 percent of all communities). In addition, many permits were issued years after the application deadlines, in part because of litigation challenging the process for issuing these permits or the conditions that communities were to meet. As a result, almost all permitted Phase II and some permitted Phase I communities are still in the early stages of program implementation. That is, they are gathering information on the types of storm water pollution they face and determining which activities they plan to implement to address this pollution. Furthermore, some permitted communities may not be complying with their permit requirements. For example, recent audits sponsored by EPA Region 9 and California revealed that some communities were not adequately controlling storm water runoff at municipally owned and operated facilities. In one instance, a community's state-issued permit required it to reduce the discharge of pollutants into the storm sewer system to the maximum extent practicable. However, auditors found problems with compliance, such as street-sweeping debris that was dumped about 10 feet from a storm drain inlet at the community's municipal maintenance facility.

Because many communities are still in the early stages of implementing the storm water program, it is too early to determine the overall program burden. However, several factors influence the extent to which storm water program implementation is currently a burden for communities or could become a burden in the future. For example:

- Considerable flexibility is built into EPA's storm water regulations, which allow communities to choose the activities and levels of effort most appropriate to manage their storm water runoff. Therefore, one factor that may reduce the burden communities currently face is the extent to which they take advantage of this flexibility and choose less expensive measures for implementing their permits. For example, communities may choose to meet the program requirement to educate the public about the impacts of storm water runoff by having staff put together a brochure rather than by hiring a public relations firm to develop an elaborate media campaign. Other factors that may reduce

program burdens for some communities include whether they already had storm water management activities in place, such as street-sweeping, or whether they are able to obtain federal or state funds to help implement permit requirements.

- In contrast, other factors, such as whether permitting authorities include more stringent or specific conditions in storm water permits, may increase the burden communities currently face. For instance, one community reported that meeting a state requirement to increase the frequency with which it cleaned elements of its storm sewer system would increase West Nile Virus treatment costs, and draw staff away from other priorities, such as maintenance of its sanitary sewer system. Also, some communities face barriers to funding their activities. For example, communities in one state with hundreds of permittees have not been able to obtain Clean Water State Revolving Fund loans to help implement storm water activities because of a misperception regarding the eligibility of these activities for funding.
- Furthermore, several factors may cause program burdens to increase in the future. For example, although EPA's program regulations are flexible, the agency instructs communities to expand or alter their storm water management activities, as needed, over successive permit terms to improve water quality. Some Phase I communities that have been implementing the storm water program for a longer period of time have already been reissued permits with more stringent or specific conditions. As EPA and state permitting authorities reissue permits for other communities, they may include additional requirements to help meet water quality standards—which could increase program burdens. Finally, although some communities have obtained federal funds to help manage storm water, continued reductions in the amount of federal funds potentially available for storm water projects—such as the nearly 20 percent reduction in federal loan funds between 2004 and 2005—could cause communities to carry a greater share of program costs.

Because we could not independently develop an estimate of actual storm water program costs, we could not conclusively determine whether EPA's 1990 Phase I and 1999 Phase II analyses over- or underestimated these costs. However, we identified a number of methodological concerns that raise questions about the usefulness of EPA's estimates as measures of the burden communities face from implementing the program. For example, EPA's Phase I analysis, which estimated program costs for a small set of hypothetical cities under various scenarios, was not designed to estimate actual program costs for any specific community or provide a national

estimate of program costs. Additionally, the Phase II cost analysis was largely based on data from only about 3.5 percent of the 1,600 communities surveyed to identify the types of storm water activities they were conducting and the costs of these activities. In fact, only 56 officials returned information on activity costs. Moreover, many of the key survey questions were extremely complicated and subject to multiple interpretations, making it unlikely that communities could have responded with accurate information. Because of the small sample of data and concerns over their reliability, we do not believe that the Phase II survey data provide a valid and reliable estimate of program costs nationwide. Furthermore, EPA's Phase I and II analyses did not exclude costs of storm water activities that communities may have been conducting before the program, which could cause its analyses to overestimate incremental program costs.

Any assessment of program burden will be hampered by limited and inconsistent data. EPA is not collecting complete and consistent data on communities' activities and their costs. While both Phase I and Phase II communities must submit reports on their storm water activities, only Phase I communities are required to include any information on storm water activity costs. Furthermore, the data in communities' reports are often limited. For example, one Phase II community's annual report was a one-page letter which stated that the community's estimated implementation status was "20-percent," but provided few additional details. Finally, because a number of factors influence the costs of implementing each of the many activities that may be part of a community's storm water management program, inconsistencies in reporting among different communities hamper a national evaluation of these costs. Consequently, EPA will find it difficult to assess implementation of either phase of the program, particularly to meet its goal to examine Phase II implementation starting in 2012.

So that EPA can evaluate the implementation of the storm water program nationwide, we are recommending that the Administrator, EPA, issue program guidance and consider regulatory changes to ensure that communities provide consistent data on the scope, costs, and results of their efforts.

In responding to a draft copy of this report, EPA recognized the importance of being able to assess the performance of the storm water program. On the basis of our recommendation, EPA said that it would investigate ways to gather better cost information through communities'

annual reports. See appendix IV for EPA's written comments. EPA also offered technical comments, which we have incorporated as appropriate.

Background

Pollutants and sediment carried by storm water, as well as the volume and temperature of runoff, can alter aquatic habitats and make it hard for fish and other organisms to survive. Some pollutants can also make fish and shellfish unsafe to eat. Reducing storm water pollution may help increase the number, size, and quality of fish and other organisms; which could provide benefits to those who value these resources for consumption, as well as for commercial, recreational, subsistence, and aesthetic purposes. Moreover, polluted storm water runoff can negatively impact those who use fresh and salt water areas for swimming and boating. Swimmers in water with high levels of bacteria have a greater risk of contracting gastrointestinal or respiratory illnesses. Reducing storm water pollution could also lead to fewer beach closings, and enhanced enjoyment of fresh and salt water areas. Finally, reducing the quantity and improving the quality of storm water runoff could help avoid costs to

- treat illnesses caused by contact with polluted runoff,
- stabilize stream banks to limit erosion and prevent property damage,
- repair water and sediment damage caused by flood events,
- dredge waterways to maintain navigation channels, and
- treat or obtain alternate sources of drinking water.

EPA's Office of Wastewater Management, within the Office of Water, leads and manages water quality improvement efforts under the NPDES program in partnership with EPA regional offices, states, and tribes. The NPDES program, created in 1972 under the Clean Water Act, authorized the Administrator to issue permits, according to conditions prescribed in regulation, for the discharge of pollutants from point sources.⁴ These point sources included factories or wastewater treatment plants that contributed pollutants directly into a body of water from a pipe or other conveyance. Neither the NPDES legislation nor the rules promulgated in 1973 specifically addressed storm water discharges. Under the 1987

⁴Section 402(a) of the Clean Water Act. 33 U.S.C. §1342(a).

amendments to the Clean Water Act,⁵ Congress required EPA to regulate storm water runoff that reaches municipal separate storm sewer systems (MS4s) as a point source of pollution.⁶

EPA met this requirement by establishing the NPDES Storm Water Program, which regulated storm water discharges from MS4s in two phases.⁷ In November 1990, EPA issued regulations for Phase I of the program, requiring that large and medium MS4s obtain permits for their storm water discharges. Large MS4s were those serving populations of 250,000 or more, while medium MS4s were those serving 100,000 or more but less than 250,000. In a February 2000 report to Congress on the implementation of Phase I, EPA reported that storm water pollution from these systems was considered to be the greatest threat to water quality.⁸ EPA's Phase I regulations required that applications for storm water permits be submitted in two parts. Among other things, the first part was to describe the characteristics of local storm water pollution and identify existing controls. The second part was to include a proposed storm water management program, and was due in November 1992 and May 1993 for large and medium MS4s, respectively. In December 1999, EPA issued regulations for Phase II of the program, which required other systems—generally smaller MS4s in urban areas—to obtain permits for their storm water discharges. Applications for these smaller systems were more streamlined and were generally due in March 2003. EPA has authorized most states to issue and enforce storm water permits.⁹ EPA and state permitting authorities are authorized to include additional MS4s in the storm water program, beyond those designated automatically by EPA

⁵Section 402(p) of the Clean Water Act. 33 U.S.C. §1342(p).

⁶While we generally use “MS4” to refer to the local government implementing the program, an MS4 is technically a system of storm water conveyances (including roads with drainage systems and municipal streets) that is owned or operated by a state, city, town, borough, county, parish, district, association, or other public body and that is not a combined sewer or part of a publicly owned treatment works.

⁷Phases I and II of the storm water program also included requirements relating to storm water runoff from industrial facilities and construction sites; however, we did not examine the implementation of these requirements as part of our work.

⁸EPA, *Report to Congress on the Phase I Storm Water Regulations*, EPA 833-R-00-001 (Washington, D.C.: February 2000).

⁹Five states (Alaska, Idaho, Massachusetts, New Hampshire, and New Mexico) do not have authority to issue storm water permits, and in these states EPA administers the storm water program. Arizona may lose NPDES permitting authority as a result of pending litigation.

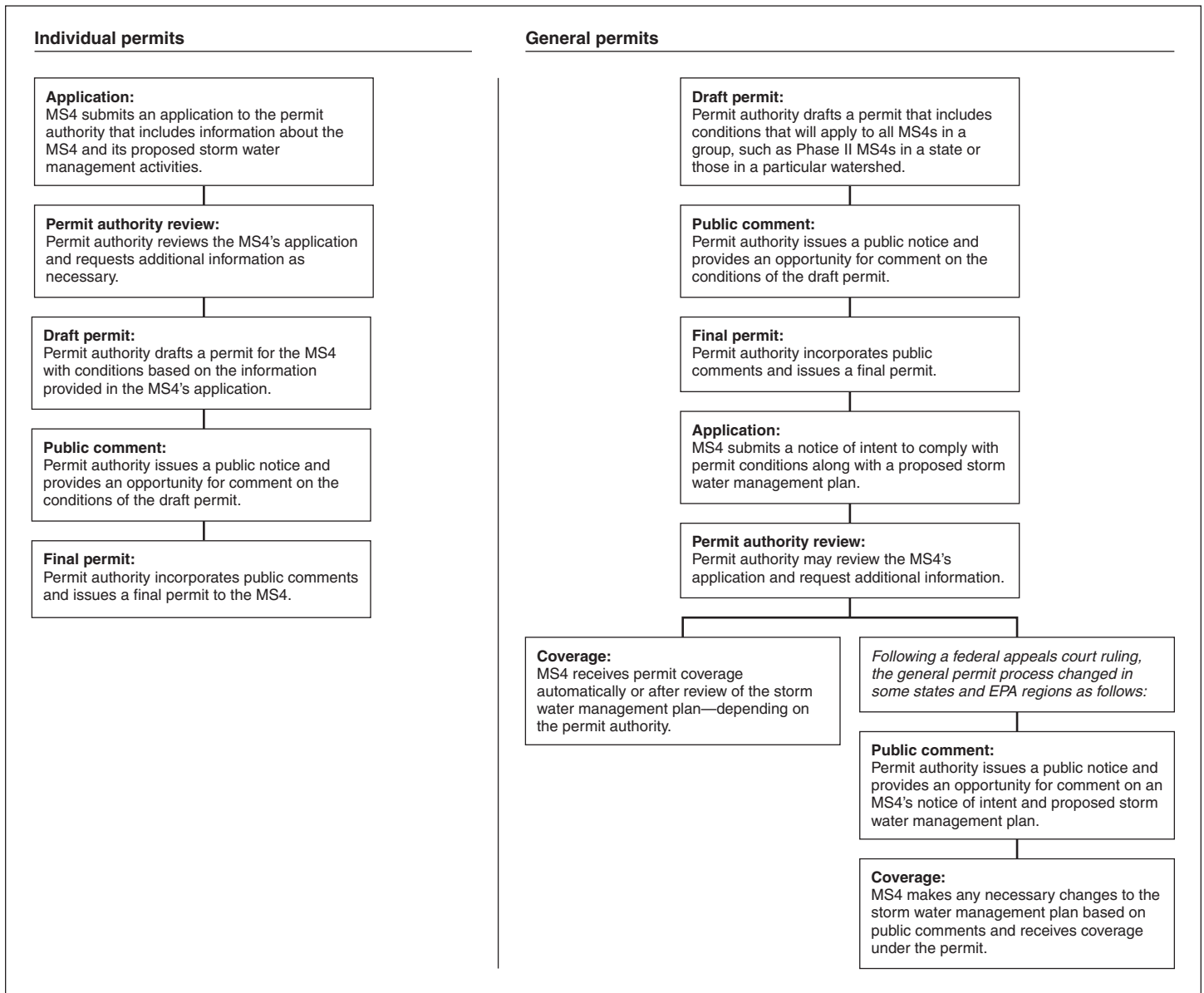
regulations.¹⁰ Most Phase I MS4s have been issued individual permits, while most Phase II MS4s have received coverage under general permits that EPA and state permit authorities issued for entire groups, such as all Phase II MS4s in a state.¹¹ Figure 1 shows the processes for issuing individual and general storm water permits.¹²

¹⁰EPA and state permitting authorities are also authorized to waive MS4s from permit requirements if they meet certain conditions.

¹¹Permit authorities can deny coverage under a general permit and require an MS4 to obtain an individual permit for its storm water discharges.

¹²In addition to the individual and general permitting processes outlined in figure 1, EPA must have an opportunity to review each permit issued and the agency may object to elements that conflict with federal requirements. If the permit authority does not address these concerns, EPA may issue the permit itself.

Figure 1: The Storm Water Permitting Process



Source: GAO analysis of EPA guidance.

Under the Clean Water Act, permits issued to MS4s must require controls that reduce storm water pollution to the maximum extent practicable. EPA intentionally did not include a precise definition of what it means to reduce storm water pollution to the maximum extent practicable in order

to provide EPA and state permitting authorities with flexibility in developing MS4s' permits. As a result, EPA's storm water regulations largely do not identify specific controls that MS4s must implement. Instead, the regulations direct MS4s to meet their permit requirements by implementing storm water management programs that may include best management practices (BMPs) in the following categories: public education, public involvement, illicit discharge detection and elimination, construction site runoff, post-construction runoff, and pollution prevention from commercial, industrial, and residential areas, as well as from municipal operations. Storm water BMPs include, among other things, prohibiting certain practices or establishing maintenance or other management procedures to reduce or prevent storm water runoff and/or pollutants from reaching receiving waters. Table 1 shows examples of BMPs that MS4s may implement in each of these categories.¹³

¹³EPA's regulations for Phases I and II of the storm water program were set up differently. Specifically, the Phase II regulations directed MS4s to develop storm water management programs that included actions in six BMP areas, while the Phase I regulations did not specifically mention all six areas. However, in practice, many of the BMPs that MS4s are implementing under Phase I or II are similar.

Table 1: Examples of Storm Water BMPs

BMP category	Examples of BMPs
Public education —implement a program to educate the public about the impacts of storm water pollution and how to mitigate them	<ul style="list-style-type: none"> • Distribute inserts in utility bills to help educate the public about the storm water impacts of certain activities, such as not cleaning up pet waste • Stencil storm drains to increase public awareness of where storm water goes to help prevent dumping of waste into storm drains
Public involvement —implement a program to include the public in developing, implementing, and reviewing an MS4’s storm water management program	<ul style="list-style-type: none"> • Enlist community groups in helping to clean up local streams • Use volunteers to stencil storm drains
Illicit discharge detection and elimination —develop and implement a program to prevent or eliminate discharges from entering an MS4 that are not composed entirely of storm water ^a	<ul style="list-style-type: none"> • Map storm sewer systems to identify the locations of outfalls • Use dye or other types of testing to trace the source of illicit connections to the storm sewer system
Construction site runoff —develop and implement a program to reduce pollutants in storm water runoff from construction activities	<ul style="list-style-type: none"> • Train and certify construction site contractors • Conduct inspections of construction sites to ensure BMPs are properly installed and maintained
Post-construction runoff —develop, implement, and enforce a program to prevent or minimize storm water runoff impacts from new development and redevelopment projects	<ul style="list-style-type: none"> • Review the design plans of new development sites to minimize additional storm water runoff • Ensure that structural controls to capture and help treat runoff at new or redeveloped sites (e.g., swales, ponds, or wetlands) are maintained
Pollution prevention/municipal good housekeeping —develop and implement programs to reduce or prevent pollution from commercial, industrial, and residential areas, and municipal operations	<ul style="list-style-type: none"> • Periodically clean catch basins or sweep streets and parking lots to help eliminate trash and other pollutants from entering the storm sewer system • Establish municipal vehicle maintenance procedures to prevent surface water pollution

Source: GAO analysis of EPA regulations and guidance.

^aIllicit discharges can enter an MS4 through (1) piping mistakenly or deliberately connected to storm drains, or (2) infiltration from cracked sanitary systems, spills, or dumping.

As part of their storm water management programs, some MS4s may also have to implement certain activities as a result of other environmental requirements, such as those stemming from the Total Maximum Daily Load (TMDL) Program, EPA’s Combined Sewer Overflow Control Policy, and the Endangered Species Act. Specifically:

- The TMDL Program is a Clean Water Act program requiring states to (1) set the maximum amount of a pollutant that a waterbody can receive while still meeting water quality standards, and (2) allocate specific amounts of the pollutant to individual entities that contribute it

to the waterbody.¹⁴ As a result of a TMDL for a pollutant contained in storm water runoff, an MS4 may have to implement certain activities, such as treating storm water runoff to ensure that the amount of pollution it discharges does not exceed the TMDL.

- EPA's 1994 Combined Sewer Overflow Control Policy provides guidance to permitting authorities and municipalities on how to meet the Clean Water Act's pollution control goals through NPDES permits issued to combined sewer systems. The policy requires communities with combined sewer systems to take action to address overflows caused when the amount of storm water entering pipes already carrying sewage exceeds the capacity of the system. Actions that communities take to adhere to this policy, such as separating their sanitary and storm sewer systems, can affect their storm water programs by increasing the size of the MS4 and requiring controls for storm water runoff previously discharged through the combined sewer system.
- The Endangered Species Act of 1973 prohibits, among other things, actions that harm endangered species within the United States.¹⁵ Actions that harm endangered species might include discharging pollution that kills these species or destroys their habitats. As a result, an MS4 may have to take steps through its storm water program to protect endangered species, such as improving the quality of storm water discharges to certain streams to prevent damage to these species' breeding, feeding, or sheltering areas.

MS4s outline their storm water management programs in plans that they submit to their permitting authority. According to EPA regulations, MS4s have up to 5 years to fully implement their programs. In addition, MS4s may work with other entities including the state, neighboring MS4s, or community groups to implement their storm water management programs. These relationships may be established by MS4s applying for permit coverage together as co-permittees, or through agreements allowing individual permittees to share responsibility for storm water activities. For those MS4s that establish co-permittee relationships, one MS4 may assume

¹⁴33 U.S.C. §1313(d). Territories and authorized tribes are also required to establish TMDLs where necessary. TMDL requirements specifically apply to waterbodies that have been designated as impaired, or not meeting water quality standards.

¹⁵Endangered Species Act of 1973, Pub. L. No. 93-205, §9(a), 87 Stat. 884, 893 (codified at 16 U.S.C. §1538(a)).

the position of a lead permittee and implement activities, such as monitoring, public education, and reporting on behalf of the co-permittees.

MS4s must submit annual reports on their storm water management efforts that include information on (1) the status of compliance with permit conditions, (2) proposed changes or revisions to the storm water management program, and (3) results of information collected and analyzed, including monitoring data, if any, during the reporting period.¹⁶ In addition, Phase I MS4s must submit information on annual program expenditures and a budget for the following year. Phase II MS4s also must submit (1) an assessment of the appropriateness of their BMPs and progress towards achieving identified measurable goals in each of the six BMP categories, (2) a summary of the storm water activities planned for the next reporting cycle, and (3) notice if the MS4 is relying on another entity to satisfy any of the permit obligations.

In some cases, MS4s may obtain federal funding to help implement storm water management efforts. The primary source of federal funds for storm water activities is the Clean Water State Revolving Fund (CWSRF), which was created by the 1987 amendments to the Clean Water Act as a source of independent, permanent, low-cost financing for a wide range of efforts to protect or improve water quality.¹⁷ However, from July 1987 to June 2006, only \$346 million, or less than 1 percent of all CWSRF funding for wastewater projects, was loaned for storm water projects.¹⁸ Other types of

¹⁶EPA's regulations for Phase II required that MS4s submit reports annually during the first permit cycle, and then in years 2 and 4 of subsequent permit cycles, unless otherwise specified by the permitting authority.

¹⁷Through the CWSRF, EPA provides annual grants to the states to capitalize state-level CWSRFs. States must match these EPA grants with a minimum of 20 percent of their own contributions. States loan their CWSRF dollars to local governments and other entities for various water quality projects, and loan repayments are cycled back into the state-level programs to fund additional projects. Since 1987, states have used 96 percent of their CWSRF dollars to build, upgrade, or enlarge conventional wastewater treatment facilities and conveyances.

¹⁸Prior to the implementation of Phases I and II of the storm water program, storm water control projects in Phase I and II MS4s could have been funded using CWSRF loans; however, according to EPA, these loans would have been tracked as nonpoint source (not wastewater) expenditures. Through June 2006, EPA data indicated that \$2.4 billion in CWSRF funds had been spent on nonpoint source projects, such as pollution control from sanitary landfills. Because, prior to the storm water program, nonpoint source loans were provided for a variety of purposes in addition to storm water projects, EPA could not determine the extent to which these loans were provided for projects that would now be part of the storm water program.

federal assistance that may be available to MS4s include grant and technical assistance programs. Finally, assistance provided through other federal agencies' programs may have a storm water component. For example, federal community development block grants may be provided for activities that include some aspect of storm water runoff management.

Storm Water Permit Issuance Has Been Slow and Many Communities Have Not Fully Implemented Activities

Storm water program implementation has been slow for both Phase I and II MS4s. Although the Phase I and II federal application deadlines for storm water permits passed years ago—around 14 years ago for Phase I and 4 years ago for Phase II—nearly 11 percent of MS4s have not yet received permits, and thus are not required to implement storm water management activities. Moreover, for many MS4s, litigation over the process of issuing storm water permits or their conditions, among other reasons, delayed program implementation for years after the initial permit application deadlines. As a result, almost all Phase II and some Phase I MS4s are still in the early stages of implementing their first 5-year permits. Furthermore, some permitted MS4s may not be complying with their permit requirements.

A Large Number of Communities Are Still Not Permitted and Many Permits Were Issued Years after Application Deadlines

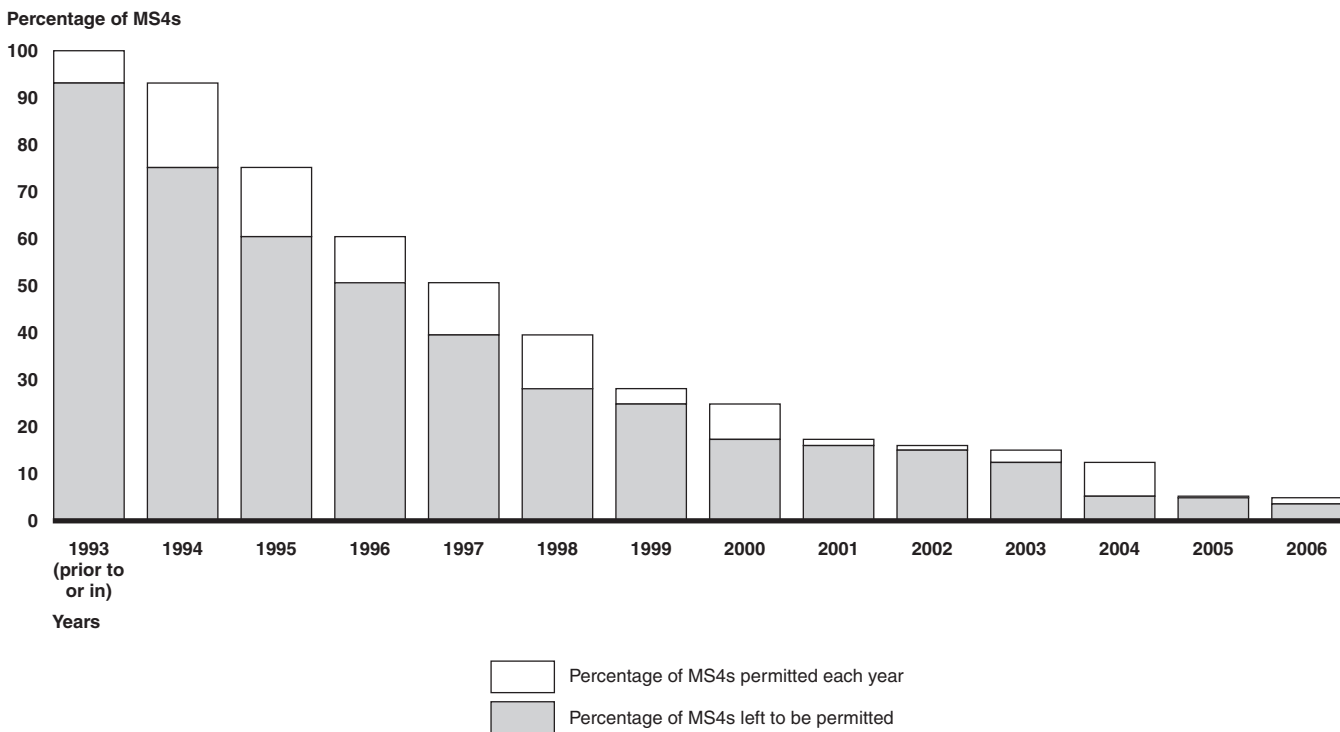
As of fall 2006, a substantial number of MS4s—11 Phase I and an estimated 809 Phase II MS4s (nearly 11 percent)—had not yet been issued permits. Furthermore, this problem is widespread. More than half of all permitting authorities nationwide still had not issued all of their permits. Some permitting authorities, including Texas, Washington, and EPA Region 6, had not issued any Phase II permits because they had not yet developed final permits,¹⁹ or (in the case of Region 6) the permit had not yet gone into effect.²⁰ For instance, while one Texas official indicated that most issues with the state's Phase II permit had been resolved as of October 2006, another official anticipated that the permit would not be final until mid-2007. Appendix III provides more detailed data on the status of storm water program implementation, by state.

¹⁹As of fall 2006, Washington had not yet issued its Phase II general permit. However, on January 17, 2007, the Washington Department of Ecology issued two Phase II permits, one for eastern Washington (covering 20 cities and 8 counties), and one for western Washington (covering at least 80 cities and 5 counties). These permits became effective on February 16, 2007.

²⁰EPA Region 6 issued a general permit for Phase II MS4s in New Mexico on September 29, 2006; however, this permit did not become effective until January 1, 2007. Phase II MS4s in New Mexico had until April 1, 2007, to submit their notices of intent for coverage under this permit.

While EPA and state permitting authorities issued storm water permits to most MS4s by the fall of 2006, in many cases these permits were issued years after the initial application deadlines. For example, as shown in figure 2, although some Phase I MS4s' initial permits were issued by 1993, many other Phase I MS4s did not receive their initial permits until years later. Ultimately, almost 93 percent of permitted Phase I MS4s were not permitted until after 1993.

Figure 2: Issuance of Larger MS4s' Permits Has Taken up to 14 Years, and Some Are Still Not Issued

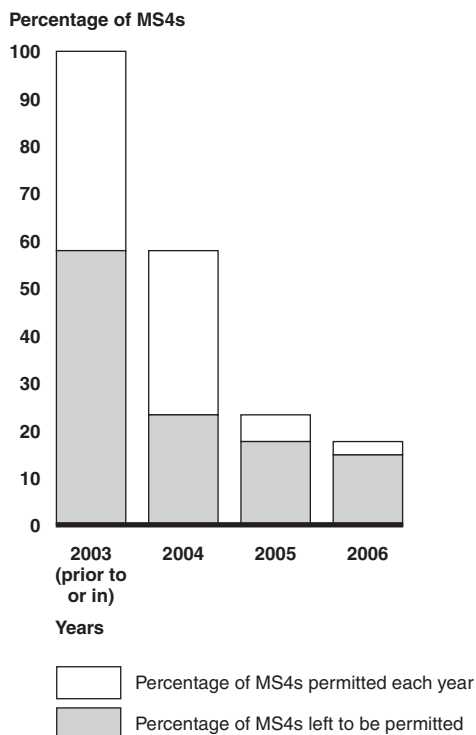


Source: GAO analysis of EPA and state data.

Note: These data are for lead Phase I MS4s as of fall 2006. Phase I permit applications were due by November 1992 for large MS4s, and May 1993 for medium MS4s. The percentage for 1993 represents 21 MS4s that first received permit coverage prior to or in 1993. The other percentages represent MS4s that received permit coverage in each year as follows: 55 MS4s in 1994, 45 MS4s in 1995, 30 MS4s in 1996, 34 MS4s in 1997, 35 MS4s in 1998, 10 MS4s in 1999, 23 MS4s in 2000, 4 MS4s in 2001, 3 MS4s in 2002, 8 MS4s in 2003, 22 MS4s in 2004, 1 MS4 in 2005, and 4 MS4s in 2006. 644 MS4s received coverage as Phase I co-permittees, 25 MS4s received waivers, and 11 MS4s had not received either a permit or a waiver.

Furthermore, as figure 3 shows, some Phase II MS4s did not receive permit coverage until years after the 2003 permit application deadline, and a substantial number are still not permitted.²¹

Figure 3: Many Phase II Permits Were Delayed or Are Not Yet Issued



Source: GAO analysis of EPA and state data.

Note: These data are for lead Phase II MS4s as of fall 2006. Phase II permit applications were due by March 2003. The percentage for 2003 represents 2,283 MS4s that first received permit coverage prior to or in 2003. The other percentages represent MS4s that received permit coverage in each year as follows: 1,881 MS4s in 2004, 306 MS4s in 2005, and 153 MS4s in 2006. 437 MS4s received coverage as Phase II co-permittees, 758 MS4s received waivers, and 809 MS4s had not received either a permit or a waiver.

These delays in issuing MS4s their Phase I and II permits were caused, in part, by legal challenges to both the process of issuing storm water

²¹EPA's Phase II regulations allowed permit authorities to phase in permit coverage for MS4s with a population under 10,000. Under this option, these MS4s were required to have permit coverage no later than March 8, 2007. Permit authorities were required to obtain EPA approval to exercise this option; however, we did not obtain information on how many permit authorities used this approach.

permits and the conditions of these permits. Several EPA, state, and other storm water experts we spoke with said that legal challenges had complicated implementation, and many of these individuals noted that the legal challenges limited permitting authorities' ability to issue permits on time. One challenge in particular—*Environmental Defense Center v. EPA*, decided in 2003 by the U.S. Court of Appeals for the 9th Circuit—significantly affected the Phase II permitting process for MS4s in some states.²² At issue was whether permit authorities had to submit MS4s' permit coverage documents for public review and comment. To streamline the permit application process, EPA's Phase II regulations authorized the use of general permits for MS4s. However, the regulations did not require the notices of intent that MS4s submitted for coverage under these permits to be subject to public notice and comment. The court held that EPA's failure to require the review of these documents violated the Clean Water Act. To implement the court's decision, EPA issued guidance in April 2004 that instructed permitting authorities to make MS4s' notices of intent available to the public, provide the public with an opportunity to request a hearing, and review the notices of intent to ensure their consistency with the permit.

Permitting authorities' responses to this decision delayed permit issuance for some MS4s. In particular, permitting authorities for a few states decided to change their Phase II permitting processes and issue individual permits—rather than general permits. An EPA Region 10 official expressed concern over the number of legal challenges that had been filed against permitting authorities' use of general permits to address local environmental issues, and cited it as a key reason for these decisions. For example, EPA Region 10 was about to issue a general permit for Phase II MS4s in Alaska and Idaho when the 2003 decision was issued. The EPA Region 10 official reported that, as a result of the decision, the region withdrew its draft permit and decided to issue watershed-based individual permits to MS4s to address specific water quality concerns. As a result of the extensive planning, consultation, and negotiation involved in issuing these permits individually, as of fall 2006 Region 10 had not issued permits to any Phase II MS4s in Idaho, although it had issued such permits to Phase II MS4s in Alaska.²³ Similarly, an Oregon official noted that the state initially planned on issuing a Phase II general permit. Because of concern

²²344 F.3d 832 (9th Cir. 2003).

²³Since fall 2006, EPA Region 10 issued permits to 3 Idaho Phase II MS4s, leaving 25 MS4s without permits.

over the impact of the 2003 decision, the state decided to withdraw its draft general permit and issue individual permits to Phase II MS4s.

Several EPA and state officials also noted that legal challenges to the specific conditions of storm water permits delayed permit issuance. For instance, an EPA Region 10 official reported that the issuance of Washington's Phase II general permits was delayed because environmental groups filed legal challenges against general permits the state had previously drafted for construction sites and industrial facilities. The environmental groups claimed that these general permits did not adequately address impaired waters. The Region 10 official said that these challenges caused Washington to postpone issuance of general permits for Phase II MS4s until it was able to resolve the groups' concerns about how to deal with impaired waters in the context of a general permit. Conversely, a South Carolina official said that cities in that state challenged the state's Phase II general permit because they considered the permit requirements to be too strict.

Other factors also contributed to delays in issuing storm water permits to MS4s. For example, officials for two permitting authorities we spoke with linked the lack of staff resources available for implementing the storm water program to competing priorities, such as implementing the TMDL Program and other Clean Water Act efforts. Finally, some MS4s may not yet have received permit coverage because of questions about whether they should be included in the program. For example, Missouri has a few MS4s where the portion of the population served by the MS4 inside the urban area is actually less than the population threshold set by the federal regulations. However, these MS4s may also serve people outside the urban area, bringing their total population served above the federal threshold. Missouri officials said that they are still trying to determine whether the state should require these MS4s to obtain permit coverage.

Many Communities Have Not Fully Developed Storm Water Programs

Because many MS4s are still in the early stages of implementing their storm water permit requirements, the results of their efforts cannot generally be assessed. Nearly all Phase II MS4s (4,589, or over 99 percent of those permitted) and some Phase I MS4s (38, or almost 13 percent of those permitted) received their initial permits in 2002 or after, and therefore are still in their first permit terms. According to EPA regulations, MS4s are typically not responsible for full program implementation until the end of their first 5-year permit term. Therefore, state officials and storm water experts reported that they expect MS4s to take some time to gather information and develop their programs. For example, Virginia

officials said that Phase II MS4s in that state would not have their programs fully developed and implemented until the end of the first permit cycle in 2007. Furthermore, because MS4s are still developing their storm water management programs, some EPA enforcement officials and state officials reported that they could not yet assess the degree to which MS4s are in compliance with the Phase II regulations. For example, a Connecticut official noted that some Connecticut MS4s had only submitted monitoring results on the types of pollution they face and did not yet have complete annual reports.

Some permitting authorities who have attempted to assess the status of their MS4s' programs found instances in which MS4s may not be complying with the conditions of their permits. State and other storm water experts we spoke with noted that there is a wide variation in the level of noncompliance among permittees—ranging from MS4s that are inadequately implementing storm water BMPs to MS4s that are potentially violating their permits. For example, auditors for EPA Region 9 and the state of California recently discovered, among other things, that some MS4s (1) had not developed storm water management plans, (2) were not properly performing an adequate number of inspections to enforce their storm water ordinances, and (3) were lax in implementing BMPs at publicly owned construction sites. They also found that some MS4s were not adequately controlling storm water runoff at municipally owned and operated facilities, such as maintenance yards. In one case, an MS4's state-issued permit required it to reduce the discharge of pollutants into the storm sewer system to the maximum extent practicable. However, auditors found that street-sweeping debris was dumped about 10 feet from a storm drain inlet at one of this MS4's facilities.

Several Factors Influence the Extent to Which Storm Water Program Implementation Is or Could Be a Burden

Because many MS4s are still in their first permit cycle, it is too early to determine the overall program burden. However, several factors influence the extent to which implementing the storm water program burdens an MS4. Some of these factors may lessen the burden MS4s face from implementing the storm water program, while other factors may increase the extent to which the program is a burden on MS4s. In the future, several factors could increase the program's burden on MS4s.

Regulatory Flexibility, Preexisting Activities, and Communities' Decisions Can Help Reduce Burden

According to EPA, the maximum extent practicable standard gives MS4s the flexibility to design their storm water programs using BMPs that require varying levels of effort and cost. MS4s may choose to implement lower cost, nonstructural BMPs over higher cost structural activities. In addition, MS4s can choose less costly routes to implement specific BMPs. For example, MS4s could be in compliance with permit requirements if they:

- educate the public by having a few staff members put together a storm water brochure rather than hiring a public relations firm to develop an elaborate media campaign, or
- map their storm sewer systems by purchasing a map from a gas station and asking volunteers to place dots where the storm water outfalls are located rather than creating a sophisticated geographic information system map.

MS4s can also count storm water management efforts they were undertaking before implementing the program towards meeting their permit requirements. In some cases we found the following:

- **States already had regulations to control runoff.** Several state officials reported that they had state storm water regulations in place prior to the storm water program. Some of these state programs began as early as the 1970s.
- **MS4s were already implementing comprehensive storm water management programs.** For example, officials in Austin, Texas, said that by 1991, virtually the entire city was required to have structural storm water controls, and that almost all of the controls that it now uses to meet the conditions of its storm water permit were in place prior to the permit. In addition, a local official in Florida said that some MS4s in his region were implementing storm water management programs long before they were covered under an NPDES permit.
- **MS4s conducted individual storm water management activities.** For example, several officials reported that MS4s were conducting street-sweeping, reviewing construction site plans, or collecting household hazardous waste prior to the storm water program.

Federal and state program funds and/or dedicated funding sources can also be used to reduce the burden of implementing the storm water program. As of June 30, 2006, 19 states had provided nearly \$346 million in

low-interest loans from their CWSRF programs for storm water projects. Several state officials also reported that their states established programs to provide financial support to MS4s to implement storm water activities. For example, a New Jersey official said the state allotted \$12 million in grants to help MS4s establish their programs, and a Rhode Island official noted that most MS4s in the state took advantage of a state grant to implement their storm water programs. In addition to obtaining federal or state funds, officials and other experts reported that MS4s can reduce program burdens by creating a dedicated funding source, such as a storm water utility—a fee-based funding mechanism. With a dedicated funding source, MS4s may reduce the annual budgetary competition with other local funding priorities. At the same time, fee-based utilities help to ensure equity by linking fees to the demands placed on the storm drain system caused by the runoff from a particular property.

MS4s may also reduce the burden they face by sharing program responsibilities with the state, co-permittees, or other entities. For example, Maine officials said MS4s in that state shared costs by implementing a statewide mass media campaign on storm water management. The Phase II regulation encouraged MS4s to work cooperatively with other Phase II MS4s or with a Phase I MS4 to avoid duplicative efforts and take advantage of economies of scale. For example, a Maryland official said that some Phase I Maryland counties have taken on responsibility for helping nearby Phase II MS4s implement the program. In one instance, a county is implementing the storm water requirements for Phase II MS4s within the county in exchange for funding contributions from the MS4s. The county is also submitting annual reports for these MS4s.

In addition, MS4s may plan public projects in ways that minimize additional expenditures and reduce program burden. One storm water expert we spoke with reported that MS4s can avoid large-scale structural control costs associated with new development sites by planning to capture and filter storm water runoff at its source through environmentally friendly techniques, such as conservation design. MS4s can also help reduce storm water costs by scheduling construction activity for a time of year when the erosion potential of a site is relatively low. Additionally, some cities have begun to take steps to manage storm water runoff before it gets into the storm sewer system—thereby avoiding costly infrastructure investments. For instance, Portland, Oregon, recently implemented a program to redirect residential downspouts to decrease the amount of storm water that drains into city sewers. City officials noted that, to date, 44,000 residential downspouts have been redirected, preventing 1 billion

gallons, or approximately one-tenth of the city's storm water, from draining into sewers. By redirecting storm water onto lawns and gardens, the city was able to avoid spending billions of dollars on structural storm water systems and treatment plants.

Finally, MS4s may not experience significant program burden if, as is often the case, developers and contractors have primary responsibility for implementing BMPs at new and redeveloped sites. According to some storm water experts we spoke with, developers and contractors—and not MS4s—are implementing the more expensive structural BMPs. Such controls may be needed to meet certain water quality standards. Moreover, experts reported that some MS4s are reducing burden by negotiating with homeowners' associations or other groups to maintain these BMPs.

Additional State Permit Requirements and Litigation, Among Other Factors, May Increase Program Burden

Other factors may increase burdens. First, some states may require that MS4s implement more stringent or specific storm water permit requirements than envisioned by federal regulations to address local water quality concerns. Several state officials noted that such requirements can (1) widen the scope of the program, (2) establish additional program goals, (3) institute implementation deadlines, or (4) delineate minimum acceptable activity levels and measurable goals, which can increase the burden for MS4s. For example, Washington's storm water program includes all of the portions of MS4s—not just the portion in the census-defined urban areas as required by the federal regulations—as well as the growth areas of unincorporated counties. In addition, one of Washington's Phase II general permits includes a requirement that MS4s adopt an ordinance or other enforceable mechanism to regulate runoff from new and redeveloped sites that conforms to the state's standards within 2-1/2 years of receiving permit coverage. The permit also requires that MS4s institute a process to review development plans, inspect sites, and enforce ordinance compliance within the same time frame. Specific requirements, such as those to increase the frequency of activities, can burden MS4s. For instance, one Wisconsin MS4 reported that a state requirement to increase the frequency of cleaning catch basins (which are part of its storm sewer system) will impose a burden. Additional manpower is needed during warmer months because the city can only clean catch basins during portions of the year when the temperature is above freezing. Also, shifting these resources away from current sanitary sewer maintenance may expose the city to more sanitary sewer overflows than in the past. In addition, while previously an annual larvicide treatment effectively treated West Nile Virus, multiple applications will now be necessary because of the increased catch basin cleaning.

Second, permitting authorities have made adjustments to their permitting procedures in response to legal challenges that have affected program requirements for some MS4s. For instance, an EPA Region 10 official said that the decision to issue watershed-based individual permits in lieu of a Phase II general permit in response to the 2003 court decision has resulted in more prescriptive permits than were required by the Phase II rule. Similarly, legal challenges to the conditions of permits have required permitting authorities to adjust these conditions. For example, a Minnesota official said that an environmental group challenged the state's initial Phase II general permit, arguing that the permit would not prevent water quality from being degraded in certain waters designated by the state as highly valued. As a result of this challenge, Minnesota revised its permit to include additional requirements for communities discharging to these waters, such as evaluating their BMPs to determine whether any adjustments are needed to prevent storm water pollution that could degrade water quality. Such provisions could require these communities to take actions that nondesignated communities do not have to take. Legal challenges have also resulted in consent decrees that require MS4s to increase efforts to control storm water runoff. One storm water expert we spoke with stated that some MS4s do not take the program seriously until they are forced to do so under a court order.

Third, state and other storm water officials said that requirements incorporated into storm water permits as a result of other regulatory programs—such as the TMDL Program, Combined Sewer Overflow Policy, or Endangered Species Act—have increased program burdens. For example, a Washington official reported that TMDL requirements for one local drainage area include, among other things, monitoring for fecal coliform concentrations at certain places and times, and doing additional source tracing. Also, one expert noted that incorporating TMDL requirements into storm water permits can be costly if they lead to expensive controls such as piping storm water to a wastewater treatment plant. Officials in Portland, Oregon, said that their storm water costs are higher because activities the city is implementing as a result of the Combined Sewer Overflow Policy are being implemented citywide—even in areas where the storm and sanitary sewers are separate. Further, Austin, Texas, officials reported that the city is taking additional steps through its storm water activities, such as purchasing land, to address endangered species concerns.

Fourth, resource limitations can make program implementation more burdensome. Specifically, federal funding for storm water activities has either decreased or been eliminated in recent years. For example,

according to EPA, federal allocations to state CWSRF grants decreased by about \$259 million (nearly 20 percent) between 2004 and 2005.²⁴ Also, EPA officials noted that the water quality cooperative agreements grants program—otherwise known as the 104(b)(3) grants program—is ending. The officials said that at the peak of the program, the agency was providing around \$19 million in grants. Program funds were used, in part, to support innovative storm water projects. Additionally, officials for two permitting authorities said they lack sufficient staff to provide technical assistance to MS4s as they develop their storm water management programs. For instance, an Oregon official noted that the state did not have any full-time storm water staff until 4 years ago, which limited the state’s ability to review MS4s’ storm water management documents in any meaningful way. Storm water officials we spoke with also cited limited technical expertise and staff availability in Phase II MS4s as an implementation burden.

Fifth, some MS4s may face barriers to obtaining additional resources, such as CWSRF loans, to help implement storm water activities. EPA storm water and CWSRF program officials stated that smaller MS4s may not be aware of the availability of CWSRF loans. The officials attributed this lack of awareness to a variety of factors, including the limited outreach on the eligibility of storm water projects for CWSRF loans that has been conducted to date, as well as the inexperience of local officials who are just beginning to develop storm water programs.²⁵ In addition, confusion caused by unclear language in EPA guidance could affect some MS4s’ ability to obtain CWSRF loans. For example, one EPA guidance document lists a number of storm water activities that may be eligible for CWSRF loans, such as rehabilitating a storm sewer system, constructing a wetland, or purchasing a street sweeper, as long as such efforts are undertaken by a publicly owned system. However, another section of the same guidance indicates that an MS4 may be eligible for CWSRF funding “so long as it is a

²⁴As of the end of fiscal year 2006, federal allocations to state CWSRF grants declined by about another \$181 million. In 2007, congressional appropriations for CWSRF grants increased by about \$183 million to over \$1.08 billion. However, this increase was largely due to the inclusion of formerly earmarked funds. Comparable data on fiscal year 2007 federal allocations to state CWSRF grants were not available at the time of our report.

²⁵EPA said that limited resources impacted the amount of outreach it could conduct on the eligibility of storm water projects for CWSRF loans. However, the agency also noted that, due to the early stage of implementation of Phase II of the storm water program, it is not yet clear whether there will be a significant demand from Phase II MS4s for CWSRF loans to help fund storm water projects.

publicly owned treatment works.” While this guidance is consistent with federal requirements that entities receiving certain CWSRF loans be publicly owned, a Publicly Owned Treatment Works is a specific type of facility regulated under the Clean Water Act and is not part of an MS4. According to one state official, the state had not issued any loans for storm water activities under this category of CWSRF loans because the official believed that loans were only authorized for a publicly owned treatment work. Furthermore, many smaller Phase II MS4s may lack dedicated funding sources. However, these MS4s need to show that they have sufficient revenue streams to pay back a CWSRF loan in order to be eligible to receive such a loan. In some cases, the ability of these MS4s to establish utilities and other dedicated funding sources is limited by a lack of authority or local opposition. For example, according to a California official, a 67 percent vote of public approval is required in that state for certain new taxes and fees.

Finally, MS4s’ characteristics—environmental or geographic conditions and age of infrastructure—can increase the burden of implementing the storm water program. State and other storm water experts we spoke with noted that the quality of local receiving waters, whether degraded or highly valued, is an important factor in determining if an MS4 has to implement additional BMPs. Geographic conditions, such as the characteristics of local soils or topography, may affect which BMPs an MS4 selects. For example, if the composition of an MS4’s soil does not allow storm water to infiltrate, the MS4 may need to construct a more costly BMP. In addition, older MS4s will have higher illicit discharge detection and elimination program costs than newer MS4s because older infrastructure can mean more incidences of illicit connections and more pipes needing repair.

Storm Water Program May Impose Additional Burdens in the Future

Four factors could increase MS4s’ storm water program burden in the future. First, burdens could increase as EPA and state permitting authorities reissue permits with more stringent or specific requirements than they have done to date. Future permits may be more rigorous because, as EPA described in publication of its regulations, compliance with the Clean Water Act’s standard of preventing storm water pollution to the maximum extent practicable should be an iterative process in which MS4s refine their efforts over time as they consider current conditions and the effectiveness of their BMPs. For example, a California official said that with each generation of Phase I permits the state has included more specific requirements, such as (1) identifying the BMPs MS4s have to implement, (2) establishing which pollutants MS4s should focus on

reducing, and (3) detailing the number of times MS4s must inspect a BMP. Similarly, EPA Region 5 officials noted that states in the region that issued their permits at the beginning of Phase II did not include specific conditions, while those states that issued their permits more recently included specific conditions, such as dates by which MS4s had to complete certain activities. The officials said that as permits expire and are reissued, they expect that more states will make their permit conditions and compliance dates more specific. EPA and state officials and other storm water experts also said that permits could become more burdensome as requirements get added from future TMDLs. While TMDLs have been required by the Clean Water Act since 1972, until recently many had not been developed. As a result, according to EPA, the agency is under court order or consent decrees in many states to ensure that TMDLs are established, either by the state or EPA. Several of the officials we spoke with noted that they expect additional storm water permit requirements as more TMDLs are developed. Future legal challenges to storm water permits could also increase permit requirements, as they have done in the past, according to EPA and state permitting officials.

Second, more aggressive permit enforcement could cause some MS4s to increase their efforts to implement the program—potentially increasing the burdens that they face. With some exceptions, enforcement of MS4s' storm water permits has been limited to date. EPA Region 5 officials said that early on, the agency's role in implementing the storm water program was to make sure that state permitting authorities adopted the necessary rules, issued permits to MS4s, and kept the permits current. According to one storm water expert, the lack of permit enforcement has, in part, contributed to some MS4s' noncompliance with their permit conditions. However, officials with EPA's Office of Enforcement and Compliance Assurance (the Office), told us they expect to emphasize the enforcement of storm water permits in the future. For example, while officials stated that the Office had conducted only 30 Phase I MS4 audits as of November 2006, one official said that EPA is taking steps to increase compliance monitoring of Phase I and II MS4s by, for example, modifying audit guidance and procedures to increase the efficiency of audits and conducting additional training for EPA regional staff. The official said that these steps are designed to help the agency increase the number of MS4 audits and inspections it conducts. In addition, while EPA regions and states have conducted limited MS4 audits to date, some states may be planning to increase their efforts. For example, EPA Region 5 officials said that the region is training state officials to conduct MS4 audits because several states in the region have expressed interest in auditing MS4s' permit compliance in the future.

Third, the need to maintain and replace BMPs could raise storm water program costs in the future, and some experts indicated that BMP maintenance and replacement costs are among the more significant determinants of MS4s' overall program costs. In particular, some BMPs with relatively low installation costs have relatively high maintenance costs. For example, a local storm water official noted that one BMP—an underground storm water storage unit—is relatively less expensive to install (since it does not require land space), but could be difficult and costly to maintain. As a result, the official advocated that MS4s consider the life-cycle costs of a BMP; that is, the administrative, inspection, and maintenance costs—in addition to the installation costs—as they determine which BMPs to use. Furthermore, while private developers often bear the costs of initially installing storm water BMPs at new or redeveloped sites, MS4s may be responsible for maintaining these BMPs over the long term. However, some storm water officials we spoke with said that MS4s are not adequately planning to maintain storm water BMPs over the long term. Some BMPs, if not properly maintained, may need to be replaced, which could lead to even greater costs for MS4s. In addition, some BMPs may simply prove ineffective at meeting the storm water management goals for which they were initially installed. Several storm water experts said that because data are not available on the effectiveness of some BMPs, controls are being installed that may not achieve their intended purposes over time. Should MS4s need to redesign or replace ineffective BMPs, they could face additional costs.

Fourth, the program burdens MS4s face may also increase over time because federal funds may not be available for storm water projects—particularly CWSRF loans. Officials in a few states we contacted said continued reductions in federal CWSRF allocations could hurt their ability to fund storm water projects in the future.²⁶ For example, in Massachusetts—which has used more CWSRF funds for storm water projects than any other state except Florida—officials told us that while current CWSRF funding levels have been sufficient, future reductions in the federal allocation to the state's CWSRF fund could prevent the state from being able to fund lower priority projects, such as storm water projects. Similarly, New Jersey officials said that recent decreases in federal funding will require the state to set priorities for distributing

²⁶However, officials in a few other states we contacted said that the federal allocations to their funds make up such a small percentage of their overall funds that recent reductions in the federal allocations have had limited impact.

CWSRF funds for projects, and municipal storm water needs would be the first category of projects left off the state's priority list if sufficient funding is not available for all projects. They also told us that recent reductions in the federal allocation to the state's CWSRF fund have reduced New Jersey's ability to pay the administrative costs of the CWSRF program. Consequently, New Jersey has initiated a fee—2 percent of a project's cost—to help with administrative costs. However, such a fee reduces the funds available to MS4s to implement their storm water projects.

Methodological Concerns Raise Questions about the Usefulness of EPA's Cost Estimates

Because we could not identify the overall burden MS4s face from the storm water program, in part due to its early implementation, we could not determine whether EPA's Phase I and II analyses over- or underestimated actual costs for implementing the storm water program. However, the methodologies and data used in these studies raise questions about whether the estimates of potential storm water costs identified in EPA's analyses are useful as indicators of actual program costs. Specifically, (1) the methodology used for the Phase I analysis was not designed to estimate national program costs or present ranges that reflect actual program costs, (2) concerns about the validity and reliability of Phase II data call into question the usefulness of the Phase II cost estimates, and (3) EPA's Phase I and II analyses did not exclude the costs of storm water activities that MS4s may have been conducting prior to the program.

Phase I Methodology Did Not Realistically Estimate Ranges of National Program Costs

EPA's 1990 Phase I cost estimate did not provide realistic estimates of the range of national program costs. EPA estimated Phase I program costs by modeling storm water management programs for eight hypothetical cities representing a range of storm sewer system sizes, climatic conditions, topographies, and other characteristics relevant to storm water pollution.²⁷ EPA modeled the per capita capital and operations and maintenance costs of storm water management programs for these cities under the following three scenarios:

²⁷Data for the characteristics of these 8 hypothetical cities were taken from 18 actual Phase I cities, including Birmingham, Alabama; Cleveland, Ohio; Des Moines, Iowa; Detroit, Michigan; Durham, North Carolina; Hialeah, Florida; Honolulu, Hawaii; Lexington, Kentucky; Los Angeles, California; Nashville, Tennessee; New Orleans, Louisiana; Oklahoma City, Oklahoma; Pittsburgh, Pennsylvania; Providence, Rhode Island; St. Petersburg, Florida; Salt Lake City, Utah; South Bend, Indiana; and Tempe, Arizona.

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- **Scenario 1** assumed the cities would implement the program using nonstructural BMPs, such as educating the public and cleaning storm water catch basins;
 - **Scenario 2** assumed the cities would implement both nonstructural BMPs and structural controls, such as excavated ditches that hold runoff and allow it to settle (known as infiltration trenches) or vegetative buffer zones; and
 - **Scenario 3** assumed the cities would install more complex controls, such as storm water treatment facilities, in addition to nonstructural BMPs.

Because of multiple limitations in this analysis, however, EPA's Phase I costs cannot be statistically projected to identify national program costs. First, while the characteristics of the hypothetical cities EPA developed were based on actual cities, these cities were not designed to be representative of Phase I MS4s nationwide. Second, EPA did not model program costs for a Phase I county, even though 47 (or over 21 percent) of the communities designated by the Phase I rule for potential coverage under the program were counties. Third, owing to the many assumptions it made about storm water volumes and other local characteristics, EPA acknowledged that the costs identified for its hypothetical cities should only be viewed as gross indicators of compliance costs, not actual compliance costs. Finally, EPA's cost estimate did not consider Phase I permit application costs, which according to one state official we spoke with, have been one of the more expensive aspects of the program.²⁸ For example, we found that six Phase I MS4s reported spending (or expecting to spend) between \$237,000 and almost \$1.1 million on preparing their Phase I permit applications.²⁹

In addition, the three scenarios identified in EPA's Phase I analysis did not provide a realistic estimate of the potential range of Phase I costs. Specifically, estimated costs for the third scenario in EPA's Phase I

²⁸EPA decided not to include permit application costs in its analysis—reasoning that these costs would be incurred before storm water permits are issued, and should therefore not be considered as costs of complying with permit requirements.

²⁹These 6 were the only MS4s, out of the 57 Phase I MS4s we contacted, for which we could identify data on the costs of their Part I and II permit applications from the documents they provided. These estimates represent costs reported between 1991 and 1994. Dollar values have not been adjusted for inflation.

analysis—implementing complex controls to treat storm water—were so high that the agency considered it unlikely that permit authorities would require this level of effort. While presenting cost estimates in terms of ranges is generally desirable for capturing uncertainty in the data used and assumptions made, EPA’s inclusion of an unrealistic scenario in this analysis limits the usefulness of its estimated cost ranges. Table 2 shows the ranges of per capita capital and operations and maintenance costs in each of EPA’s three Phase I scenarios.

Table 2: EPA’s Estimated Ranges of Phase I Per Capita Costs

Scenario	Low		High		Weighted average ^a	
	Capital	Operations and maintenance	Capital	Operations and maintenance	Capital	Operations and maintenance
(1)	\$18	\$25	\$318	\$263	\$73	\$61
(2)	29	30	378	372	91	76
(3)	54	32	61,279	13,456	7,924	1,762

Source: GAO analysis of EPA data.

Note: Dollars are adjusted to 2006.

^aAverage Phase I per capita costs weighted by the population of the hypothetical cities used in EPA’s analysis.

Limitations in the Validity and Reliability of the Phase II Data Raise Questions about the Cost Estimates

EPA’s 1999 Phase II cost estimate may not accurately represent program costs because of limitations in the validity and reliability of the data the agency used. EPA estimated costs using data from a 1998 survey distributed to more than 1,600 potential Phase II MS4s by the National Association of Flood and Stormwater Management Agencies (NAFSMA).³⁰ NAFSMA sought to (1) solicit information about the proposed Phase II storm water program, (2) identify current storm water spending levels in Phase II MS4s, and (3) identify future needs for these communities. It asked the MS4s to provide annual cost data for activities they were conducting related to the BMP categories identified by EPA’s Phase II regulations.

EPA calculated Phase II costs by dividing reported costs per BMP category by the population of that MS4, and then multiplying the result by an estimated 2.62 persons per household. In addition to costs for implementing storm water BMPs, EPA estimated costs for complying with

³⁰The Phase II analysis did not indicate whether NAFSMA selected the 1,600 MS4s it surveyed randomly or by some other method.

Phase II administrative requirements, such as submitting applications and annual reports. These costs were averaged over a 5-year permit term to obtain an annual administrative cost per household. EPA calculated total Phase II costs by multiplying its per household estimate by the number of households (based on total population)³¹ in the 5,040 MS4s it anticipated would be regulated by the Phase II rule.³²

While EPA's analysis attempts to provide a national estimate of costs, the NAFSMA survey data EPA used are not sufficiently valid or reliable for the purpose of making national projections about MS4s' costs for implementing Phase II. Of the over 1,600 MS4s surveyed, only 56 (about 3.5 percent) responded with cost data EPA could use for its analysis. Furthermore, the overwhelming majority of the 56 MS4s did not provide responses to all of the questions that EPA relied upon to develop its estimates. In fact, only 5 MS4s provided data for all of the questions that EPA used, while 17 MS4s provided cost data in response to only one of the questions EPA used for its cost analysis. Because of the low response rate to the NAFSMA survey—either in aggregate or for each of the cost data questions—the MS4s that responded to the survey are unlikely to be a representative sample of Phase II MS4s nationwide.³³

The NAFSMA survey data are also of limited usefulness because many of the key survey questions were extremely complicated and subject to multiple interpretations, making it unlikely that MS4s could have responded with valid and reliable information. For example, one survey question asked whether an MS4 had a map of its storm sewer system. If the MS4 answered no, then the survey asked the MS4 to provide an estimate of the costs of preparing such a map. However, the survey design

³¹EPA estimated the total population affected by Phase II would be 85 million on the basis of the 5,040 MS4s it identified as potentially regulated under the Phase II rule.

³²To check these results, EPA analyzed cost data from the annual reports of 26 Phase I MS4s to obtain information on incremental Phase II costs. EPA selected these MS4s because they had been implementing the Phase I program for one permit term, were smaller cities that closely reflected the population of Phase II MS4s, and had detailed data reflecting actual implementation costs for program elements similar to Phase II. While this analysis yielded results similar to EPA's analysis of the NAFSMA survey data, we have concerns about the sufficiency and comparability of data reported by MS4s in their annual reports on the basis of our attempts to conduct a similar type of analysis.

³³Survey response rate is generally considered to be one indication of the quality of survey data because a survey with a low response rate may report only extreme views—potentially biasing the results. For this reason, current Office of Management and Budget guidance suggests that agencies aim for a response rate of 80 percent or higher.

did not lead the MS4 to provide cost information if it answered yes to this question. As a result, an MS4 that had already developed a storm sewer map (and should therefore have more reliable data on the cost of this effort than an MS4 that had not yet done so) was not prompted to provide data on the costs of developing a map in its survey response. Moreover, the NAFSMA survey questions did not clarify the types of costs that MS4s should report in their responses, leaving substantial room for MS4s to interpret questions themselves. For example, one question asked MS4s to report the annual costs of their program to detect and address illicit discharges, including illegal dumping, to the storm sewer system. However, the question provided no guidance on what types of activities or costs MS4s should include in their responses.

As we have found in conducting surveys, such survey questions are unlikely to yield reliable responses. For example, EPA guidance on developing programs to detect and eliminate illicit discharges indicates that these programs can have a number of different components, including mapping systems, testing for illicit discharges, and taking steps to eliminate discharges. However, without providing more specific directions on the illicit discharge activities for which MS4s were to report cost data, the NAFSMA survey cannot ensure that the data MS4s reported were comparable. Furthermore, the NAFSMA survey did not instruct MS4s on the types of costs, such as capital, administrative, and labor, they were to report. The difficulty in obtaining reliable data on MS4s' storm water activities is illustrated by the experience of one California expert we contacted. This researcher attempted to survey six MS4s in California to obtain data on the costs of implementing the storm water program. However, owing in part to inconsistencies in reporting between the MS4s, he had to conduct document reviews as well as in-depth interviews with local officials in order to obtain reliable data.

The problems with the data collected through the NAFSMA survey limit the usefulness of EPA's Phase II cost estimate. Based on the responses from 56 MS4s, EPA estimated that annual program costs would be \$4.30 per capita, and reported that these costs could range from \$0.20 to \$25.75 per capita.³⁴ However, the size of the sample of MS4s that responded with cost data for all of the questions on program implementation costs was so small that the survey data cannot be used to make precise estimates. As a

³⁴EPA reported that the per household costs for these 56 MS4s ranged from \$0.42 to \$54.91. We adjusted these costs to arrive at per capita costs in 2006 dollars.

result, EPA's Phase II cost estimate is much less meaningful than EPA suggests. Finally, even if the MS4s that provided the data used in this estimate constituted a representative sample of Phase II MS4s nationwide, the NAFSMA survey questions were not designed to ensure that these data were reliable—raising questions about the extent to which the data represent actual program costs.

EPA's Phase I and II Analyses Did Not Exclude Previous Costs of Storm Water Activities

The methodologies EPA used in its Phase I and II analyses also raise concerns because neither of these analyses excluded costs for storm water activities that MS4s were undertaking before implementing the storm water program. As a result, EPA cannot determine the costs specifically attributable to the program's requirements and could overestimate costs, which limits the estimates' usefulness as indicators of actual program costs. In its Phase I analysis, EPA assumed that none of its hypothetical cities had any storm water controls already in place. For Phase II, since the NAFSMA survey was distributed in 1998 (prior to the Phase II final regulation in 1999 and permit application deadline in 2003), the cost data reported by MS4s largely represent costs for activities that they were undertaking prior to the program. However, EPA did not exclude costs for such preexisting activities from its final cost estimate.

Several state officials and storm water experts we contacted said that, before the program, some states had regulations in place to control storm water runoff, and that some MS4s were (1) implementing comprehensive storm water management programs or (2) conducting some storm water management activities, such as street-sweeping. In addition, in publication of both the Phase I and II regulations, EPA encouraged MS4s to consider these preexisting activities as they developed their storm water management programs. Therefore, to the extent that MS4s were already taking steps to control storm water, the costs of these activities should not be considered program implementation costs.

Assessment of Program Burden Is Hampered by Limited and Inconsistent Data

Any assessment of program burden will be hampered by limited and inconsistent data on MS4s' storm water activities and their costs. Specifically, while MS4s must submit reports of their storm water activities to their permitting authority, according to EPA storm water officials, there are no national guidelines on what should be included in an MS4's annual report, and federal regulatory requirements are weak and unambiguous. For example, the officials noted that the Phase I rule directs MS4s to provide information on expenditures and budgeted amounts in their annual reports, but does not include any specific direction on what

costs should be tracked and how they should be reported. Moreover, the Phase II rule did not require MS4s to report any cost data.

Without standard reporting guidelines, we found it difficult to use the data in MS4s' reports to assess the costs of the storm water program. Specifically, we examined the cost data (either total expenditures or unit costs) and output information (such as the number of miles swept or the number of catch basins cleaned)³⁵ in the most recent annual report provided by the 130 MS4s we sampled.³⁶ We also collected data from other studies of BMP costs. Using all these data, we tried to identify cost ranges for selected BMPs that we thought would be among the more commonly implemented BMPs: public education efforts, catch basin/storm drain cleaning, street-sweeping, and illicit discharge detection and elimination activities.

However, our efforts to develop reliable data for all the selected BMPs were hampered by the limited and inconsistent data available in MS4s' annual reports. Some MS4s' annual reports were hundreds of pages long, with detailed data on their activities, while other MS4s' annual reports provided little evidence of their storm water activities or costs. In one case, a Phase II MS4's annual report was a one-page letter which stated that the MS4's estimated implementation status was "20-percent," but provided few additional details. As a result, we were only able to estimate the per capita costs of street-sweeping activities, which we found ranged between \$0 and \$17.51 for Phase I MS4s, and between \$0 and \$9.61 for Phase II MS4s.³⁷

Overall, we found that about 18 percent of the MS4 annual reports we reviewed reported some cost data in such a way that these data could be used to develop ranges of BMP costs. Some MS4s' annual reports provided

³⁵We intended to use this output information, in conjunction with cost data obtained from other MS4s and studies, to estimate costs for MS4s that did not report detailed cost data for the selected BMPs.

³⁶After collecting data on which MS4s nationwide have received storm water permits, we took a sample of 150 MS4s and requested copies of annual reports, among other program documents. Sampled MS4s were selected largely at random; however, we added 7 MS4s that could serve as potential case study locations because, on the basis of our discussions with storm water experts, we believed they had well-established storm water programs and could provide good cost data. Of the 150 MS4s for which we requested program documents, we received at least one annual report from 130.

³⁷These estimates are presented in 2006 dollars.

cost data that were not usable for certain BMPs. In these cases, MS4s' data for some BMPs were not useful because MS4s tracked and reported costs differently. For example, where they reported cost data, Phase I MS4s frequently reported total cost data for their activities. One Phase I MS4 estimated spending \$770,000 on public education activities, including workshops, seminars, and education programs and materials related to water quality. However, in order to compare this total cost figure with the total cost for other MS4s, we needed sufficiently detailed activity data to allow for comparisons among programs with similar activities. Because MS4s usually did not report their activities and costs consistently, it was not possible to make such comparisons.

In addition, we found that 60 percent of the MS4 annual reports we reviewed reported output data in such a way that these data could be used to estimate BMP costs. Some reports included output data that could not be used to estimate BMP costs. In these instances, MS4s' output data for certain BMPs were not usable because MS4s either did not report BMP output measures consistently, or did not provide sufficiently detailed information to estimate BMP costs. Even for street-sweeping, such inconsistencies could cause errors in the estimated cost ranges we developed. For instance, some reports provided estimates of the number of lane miles swept; others provided estimates of the number of curb miles swept; and still others simply provided estimates of the miles swept.³⁸

The difficulties in assessing program costs due to a lack of detailed and consistently reported data are even greater for more complex BMPs, which may have different types of costs. For example, the development of local ordinances to control storm water pollution entails legal and administrative costs, while the installation of a structural storm water control (such as a retention pond) entails costs for planning, mobilization and demobilization of construction equipment, materials, labor, and land. Moreover, the costs of implementing any particular BMP are influenced by a number of factors. For example, the costs of street-sweeping are influenced by fuel and dumping costs, equipment choices, and the type of material being swept. Therefore, the more potential variation in the scope and nature of a BMP, the greater the need for MS4s to report detailed and

³⁸While it might be reasonable to assume that curb and lane miles are approximately equal measures of distance, additional follow-up would be needed to confirm the data for MS4s that simply reported the number of miles swept.

consistent data on the costs of that BMP in order to ensure that the data reported will be comparable to those of other MS4s.³⁹

Several state officials and storm water experts we contacted cited problems with these data as a barrier to assessing program implementation, costs, or effectiveness. For example, according to one expert who has audited MS4s as an EPA contractor, the quality of annual reports varies so greatly that site visits are often necessary to obtain accurate and detailed information about program activities. One MS4's annual report contained documentation showing that MS4 officials conducted two storm water site inspections per week. However, when the expert visited the MS4, he found that there were 5,000 sites that needed to be inspected, and at the rate of 2 sites per week, it would take the MS4 nearly 50 years to visit each of its sites once. In addition, EPA storm water officials said that without clear and specific reporting guidance, it is difficult to identify the incremental activities and costs attributable to the storm water program. The officials said that some MS4s may be reporting costs for all storm water program activities—including costs for those activities that were taking place prior to permit implementation.

Without specific guidance directing MS4s to provide detailed information in their annual reports on storm water activities, costs, and results, EPA will encounter difficulties similar to those we and others have encountered in using the data in the annual reports to assess program implementation, burdens, and effectiveness. For example, in January 2007, EPA published guidance that identified a number of data elements that permitting authorities may use for evaluating an MS4's compliance with program requirements by reviewing its annual reports. While the guidance, for example, instructs evaluators to identify the total number of sites an MS4 must inspect to determine if an inspection schedule is adequate, there are no requirements for reporting detailed data on costs and activities in a consistent manner. Therefore, the data collected through these evaluations will likely vary by MS4, and be of limited use in assessing program implementation nationwide.

³⁹In a June 2001 report on storm water runoff, we also found that any cost information reported by MS4s would be difficult to analyze unless EPA and the states set guidelines to elicit better and more standardized data. As a result, we recommended that EPA, among other things, establish guidelines for obtaining consistent and reliable data from local governments with Phase I permits, including data on the effects of the program and the costs to these governments. GAO, *Water Quality: Better Data and Evaluation of Urban Runoff Programs Needed to Assess Effectiveness*, GAO-01-679 (Washington, D.C.: June 29, 2001).

Conclusions

Because many communities are still implementing their first permits for controlling storm water runoff, it is too early to determine the extent to which implementation of the program has been a burden. Furthermore, the number of factors that can influence a community's storm water management activities—such as whether it can take advantage of the flexibility provided by EPA's storm water regulations to implement the program in a less expensive manner, its current level of water pollution, or whether it shares program responsibility with other entities—make it difficult to develop a uniform assessment of the burden the storm water program may impose nationwide. For some communities, challenges to establishing reliable sources of local funding for their efforts can also influence the extent to which the program is a burden.

Furthermore, it will be difficult to assess the burden of implementing the storm water program, and for EPA to meet its goal of evaluating Phase II starting in 2012, without more complete and consistent reporting on the scope, costs, and results of communities' storm water best management practices.

Recommendation for Executive Action

In order to enable EPA to evaluate the implementation of the storm water program, we are recommending that the Administrator, EPA, issue additional program guidance and consider regulatory changes to ensure that (1) communities report on activities in sufficient detail to determine their scope, costs, and results; and (2) communities report this information consistently so that it can be analyzed on a national basis.

Agency Comments and Our Evaluation

We provided a draft copy of this report to EPA for review and comment. EPA's letter is presented as appendix IV.

In its written comments, EPA stated that it had already taken some steps to implement our recommendation, but agreed to investigate ways to collect better cost data through communities' annual reports. While EPA indicated that it does not believe it appropriate to modify the annual reporting regulations at this time, it said it had initiated an effort to identify the information communities should submit in their annual reports and to develop corresponding guidance for EPA regions, states, and local communities. Furthermore, EPA supported the development of an annual report template or other information collection tool. We believe that this tool, along with EPA guidance, could help the agency obtain better data for evaluating program implementation. However, some states have already established their own annual report formats, and may choose

not to follow EPA's guidance or use its annual report template. As a result, without strengthening federal regulatory reporting requirements—such as requiring Phase II MS4s to report cost data—we believe it could be difficult for EPA to obtain consistent and reliable data on program implementation nationwide. EPA also provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the congressional committees with jurisdiction over EPA and its activities; the Honorable Stephen L. Johnson, Administrator, EPA; and the Honorable Rob Portman, Director, Office of Management and Budget. In addition, this report will be available at no charge on the GAO 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 stephensonj@gao.gov. Contact points for our Offices of Congressional Relations and of Public Affairs may be found on the last page of this report. Key contributors to this report are listed in appendix V.

A handwritten signature in black ink, reading "John B. Stephenson". The signature is written in a cursive style with a long horizontal flourish at the end.

John B. Stephenson
Director, Natural Resources
and Environment

Appendix I: Briefing Provided to Congressional Requesters

To view appendix I, “Briefing Provided to Congressional Requesters,” click here: <http://www.gao.gov/d07479appendix1.pdf>. We are providing the 51-page briefing as a separate file because the file size is 32 megabytes. Therefore, appendix II begins on the following page, page 91.

Appendix II: Objectives, Scope, and Methodology

In September 2004, Senator Inhofe and Senator Crapo requested that GAO provide information on the cumulative costs that communities face from implementing drinking water and clean water regulations. In particular, Senator Inhofe and Senator Crapo noted that communities faced the costs of implementing Phase II of the storm water program at the same time they were expected to address a number of other water pollution prevention regulations. However, the Environmental Protection Agency's (EPA) estimates of the costs of implementing these regulations did not consider the burdens communities faced from regulations already in place.

To address these concerns, GAO issued *Federal Water Requirements: Challenges to Estimating the Cost Impact on Local Communities* ([GAO-06-151R](#)) in November 2005. In this report, we noted that while EPA and others developed cost estimates for different regulatory programs, these estimates did not provide information on the cumulative costs of complying with federal water requirements—primarily because they were not intended to do so. Moreover, we found that several methodological challenges hinder 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.

In consideration of Senator Inhofe's and Senator Crapo's continued interest in the costs of EPA's storm water program, GAO agreed, in December 2005, to examine the implementation of Phases I and II of the program. In this context, GAO was asked to (1) identify the progress made in implementing the storm water program, (2) determine the extent to which the storm water program burdens communities, (3) evaluate the accuracy of EPA's cost estimates, and (4) examine the data available for future assessment of program burdens.

To identify the progress made in implementing the storm water program, we collected and analyzed storm water permittee data for all 50 states between early March and early June 2006. Specifically, from the 3 EPA regions and 45 states with permitting authority, we obtained data on the number of Phase I and II municipal separate storm sewer systems (MS4s) that (1) were required to have a storm water permit, (2) obtained a permit, (3) received a waiver from permit coverage, or (4) had not obtained either

a permit or a waiver.¹ Moreover, we developed a detailed database of Phase I and II MS4s that included information on each MS4's:

- name,
- permit number,
- date of initial permit coverage (by year),
- type of entity (traditional local government or nontraditional entity),²
- type of permit (individual or general),
- source of designation (the federal rule or as a result of additional designation criteria set by the EPA region or state), and
- co-permittee status (whether the MS4 established a co-permittee relationship with another MS4 or other entity to share responsibility for implementing permit requirements).

To ensure a consistent, reliable, and verifiable approach to collecting these data, we developed and distributed a standardized data request. We sent the data request to the EPA regional and state officials that EPA identified as being in charge of storm water permitting for each state. Furthermore, to gain a better understanding of the reliability of the data we obtained, we conducted structured interviews with each of the permitting officials during which we asked about how they collected, processed, and maintained their storm water data. Specifically, we asked these officials to provide information on:

- how their data are stored,
- whether they assign MS4s a unique identifier for tracking purposes,

¹We limited our data collection effort to MS4s in the 50 states. For the states of Massachusetts and New Hampshire, data were provided by an EPA Region 1 official; New Mexico data were provided by EPA Region 6 officials; and Alaska and Idaho data were provided by an EPA Region 10 official. We did not include the District of Columbia or MS4s in the U.S. territories in our analysis.

²Nontraditional MS4s include prisons, universities, military bases, or other entities that are not considered traditional local governments. These entities, and Indian Nations, were excluded from our review.

- what sources they use to compile their data,
- how often their data are updated and when this was last done,
- reasons why their data might not be complete,
- whether checks are performed on the accuracy of their data or to identify duplicate entries, and
- their confidence in the accuracy and completeness of their data.

We also performed additional checks to ensure the reliability of the data we collected. First, to ensure the data provided by permitting authorities were complete, we compared summary statistics for each state with the individual permittee data we received. Second, we identified any errors or inconsistencies in the data by, for example, sorting the data to distinguish duplicate entries. In cases where we identified errors or inconsistencies, we resolved these issues during follow-up interviews conducted with the permitting officials. Third, we clarified which MS4s should be considered traditional or nontraditional MS4s. Fourth, we confirmed the dates of MS4s' initial permit coverage. Fifth, in cases where EPA or state officials reported that MS4s established co-permittee relationships, we verified, if possible, which MS4 was the lead permittee and how many co-permittees were associated with the permit. Based on these assessments, we determined that the data we collected were sufficiently reliable for the purposes of our audit work.

As many EPA and state permitting authorities indicated that they were still developing and finalizing MS4s' initial permits around the time of our data collection effort, we conducted a second data collection effort between October and December 2006 to obtain updated data. During this second data collection effort, we obtained data on the number of Phase I and II MS4s that had received permit coverage or a waiver since the initial data collection effort. We also obtained data on the number of co-permittees associated with these newly issued permits. We did not obtain certain data, such as the permit number, type of permit, or source of designation for these MS4s. However, we checked all of the updated data we received for errors and inconsistencies, and conducted follow-up interviews to resolve any issues we identified. In technical comments provided on a draft copy of this report, EPA indicated that there are some differences between its storm water permittee data and the data we present in this report. For example, EPA said that some MS4s were required to obtain

Phase I permits as a result of additional designations made by their permitting authority, but may not have been notified that they were required to obtain this coverage until years after the program began. We did not obtain information on the dates when MS4s were notified that they were required to obtain permit coverage; the data we present on the status of storm water program implementation include MS4s that received permit coverage in a given year, and MS4s that have not yet obtained permit coverage, according to EPA regional and state officials. In addition, EPA said that some additional MS4s received waivers from Phase I of the program. However, the data we obtained from EPA regional and state officials indicated that these MS4s were generally either permitted under Phase I, permitted under Phase II with no indication that they had been waived, or were not yet permitted or waived.

In addition, to assess the status of program implementation we collected information on storm water program requirements and reasons why MS4s may not yet have permit coverage. Specifically, we examined the Clean Water Act and EPA's Phase I and II storm water regulations to gain an understanding of permitting processes and program requirements. Then, to identify the types of best management practices (BMPs) that MS4s can implement to meet program requirements, we reviewed EPA's guidance for states and MS4s, and assessed the likelihood that MS4s would implement certain BMPs through our interviews with EPA and state permitting authorities and other storm water experts. Finally, we examined relevant legal decisions concerning storm water permit processes and conditions. We also discussed the impact of these decisions, including whether they delayed permit issuance, during our interviews with storm water officials and experts.

To determine the extent to which the storm water program has imposed a burden on communities, we initially considered estimating the ranges of costs for Phase I and II MS4s implementing the program. Using the database of permittees we developed through our 50-state data collection effort, we selected a random sample of 143 permitted Phase I and II MS4s that had been implementing their storm water permits for at least 1 year as of June 2006. The sample was designed to allow us to generalize any cost data we obtained to the universe of Phase I and II MS4s. To this sample, we added a judgmental selection of 7 MS4s that we believed had well-established storm water programs and good cost information based on our interviews with storm water experts and storm water management studies we reviewed. We contacted each of these 150 MS4s and requested copies of their annual reports, storm water management plans, permit applications, and related documents. We developed a data collection

instrument which we planned to use to analyze the information on storm water activities and costs that MS4s included in the documents we collected. We intended to supplement the cost data obtained through this effort with data on activity costs we obtained from our review of national, state, and local studies and publications on the costs of storm water BMPs.

However, during the process of testing our data collection instrument we encountered a number of challenges. First, we found that MS4s' annual reports provided widely varying detail on their activities, which made it hard to compare the data we gathered from different MS4s' documents. Second, we found it difficult to determine which activities MS4s were conducting before the program. For example, we found evidence in MS4s' permit application documents that they were taking some steps to manage storm water runoff before the program began. However, in reviewing subsequent annual reports we had difficulty determining whether these activities had continued at the same level of effort, or, if the level of effort had increased, the data for estimating the cost impacts of this increase were not provided. Third, we found it challenging to identify MS4s' actual program costs due to a lack of specific information on (1) how costs were shared in instances where MS4s cooperated with other entities to implement program requirements, and (2) what efforts were taken because of storm water program requirements versus those that were taken because of MS4s' own initiative or the requirements of other environmental programs.

As a result of these and other challenges associated with our initial methodology, we revised our approach to evaluating the extent to which implementing the storm water program has burdened MS4s by examining the factors that influence the extent of program burden instead of estimating ranges of program costs.³ To identify the factors that influence storm water program burdens and characterize which factors may increase or reduce these burdens, we interviewed EPA, state, and local officials, and almost 20 storm water experts from industry, academia, and relevant state and local government associations. Specifically, we interviewed EPA officials with the Office of Wastewater Management's Storm Water Program, the Office of Science and Technology's Effluents

³For purposes of this report, we use burden to mean additional costs for implementing storm water control measures, increased administrative activities, reduced budget flexibility because of the need to divert resources from other governmental activities, actions related to litigation, and the influences of other regulatory programs on how storm water runoff is managed.

Guidelines Program, the Office of Research and Development's Wet-Weather Flow Research Program, and six regional offices.⁴ We asked state permitting officials about the factors that could influence program burdens during the follow-up interviews we conducted as part of our 50-state data collection effort. Further, we interviewed officials from Altamonte Springs, Florida; Austin, Texas; Denver, Colorado; and Portland, Oregon. Finally, the state and local government associations we contacted included the National Association of Flood and Stormwater Management Agencies, the Association of State and Interstate Water Pollution Control Administrators, and the Environmental Council of the States.

In addition to interviewing regulatory officials and other experts, we obtained information on the factors that influence program burdens through an extensive literature review of national, state, and local storm water BMP studies. We identified roughly 55 studies related to storm water management practices based on our expert interviews, and internet and database searches. Due to concerns about their methodology, data sources, or limits in geographic area or BMP type, we excluded 33 of the studies. We then synthesized information from the remaining 22 studies based on factors that can influence storm water program burdens, such as the costs of implementing particular BMPs. We then incorporated this information into our analysis of statements from the experts we interviewed.

As part of our effort to gather information on the extent to which program implementation has been a burden on MS4s, we also obtained data on federal funding for storm water projects. Specifically, we contacted EPA staff, including officials in the Office of Wastewater Management and the Office of the Chief Financial Officer, to collect information on the availability of federal funds for storm water activities, as well as data on the amount of funds provided. After confirming that wastewater treatment loans from the Clean Water State Revolving Fund (CWSRF) are the primary source of federal storm water funding, we conducted targeted follow-up interviews with nine states that we selected based on factors including the amount of CWSRF funding they used for storm water-related

⁴Both the Office of Wastewater Management and the Office of Science and Technology are located in EPA's Office of Water.

projects and their populations.⁵ We asked these officials to provide information on their experiences using these loans to fund storm water projects and how they set funding priorities. We also obtained information from both EPA and state officials we interviewed on the potential barriers that may prevent MS4s from applying for or receiving these loans. To assess the reliability of the CWSRF funding data we analyzed, we contacted an EPA official responsible for managing the data. We obtained information describing the CWSRF program, its data management procedures, and the reliability of these data. Based on the official's responses, these data are sufficiently reliable for the purposes of our report.

To assess the potential for future changes in program burdens, we asked about the factors that could influence future burdens during our interviews with regulatory officials and other storm water experts. From these interviews, we obtained information on the extent to which the burdens MS4s face may increase from more stringent or specific permit requirements, as well as increasing BMP maintenance and replacement costs. For information on the potential impact of increased storm water permit enforcement, we contacted officials from EPA's Office of Enforcement and Compliance Assurance. We also discussed this issue during our interviews with EPA regional officials and other storm water experts.

To examine the accuracy of EPA's cost estimates, we analyzed the methodology and data used by the agency to estimate the costs for implementing Phases I and II of the storm water program. Specifically, we assessed EPA's use of hypothetical cities as the basis for its estimate of Phase I program costs. In addition, we obtained data on Phase I permit application costs by reviewing permit application documents we collected from the MS4s in our sample. Of the 57 Phase I MS4s in our sample of 150, we were able to identify Phase I permit application cost data in 10 of these MS4s' permit application documents. However, we were not able to identify cost data for both Parts I and II of the Phase I permit application for all of these MS4s. Consequently, we only reported data for the 6 MS4s for which we were able to identify total Phase I permit application costs,

⁵We based this analysis on loans made under authority provided by the Clean Water Act for funding of wastewater treatment projects. According to an official with EPA's State Revolving Fund Branch, the majority of CWSRF loans made for storm water projects would be made under this authority.

or costs for both Parts I and II of the application.⁶ We did not assess the reliability of these data. For Phase II, we examined the methodology and data EPA used for its analysis of Phase II program costs. We also obtained and analyzed the raw survey data collected by the National Association of Flood and Stormwater Management Agencies and used by EPA to develop the Phase II cost estimate. Finally, we interviewed knowledgeable EPA and state officials and other storm water experts to obtain their views on the accuracy of EPA's cost estimates, and the extent to which MS4s were implementing storm water management activities before the program.

To summarize future challenges associated with evaluating the storm water program's burden, we conducted a limited review of the documents we received from our nationwide sample of MS4s. Of the 150 MS4s in our sample, we received at least one annual report from 130. We reviewed the most recent annual report for each of these 130 MS4s to obtain data on activities that we expected to be among the more commonly implemented, including public education BMPs, catch basin/storm drain cleaning, street-sweeping, and illicit discharge detection and elimination activities. Through this effort, we collected any cost data included in the document for the selected BMPs, either as total expenditures or unit costs. We also collected output information to the extent it was available, such as the number of miles swept or the number of catch basins cleaned. We planned to identify ranges of costs for these activities based on the data we found, supplemented with data from the storm water BMP studies we reviewed.

However, we found limited and inconsistent data in MS4s' annual reports. As a result, with the exception of street-sweeping, we were unable to identify ranges of costs for these activities. The estimated range of Phase I street-sweeping costs we present in the report is based on data we identified in 10 MS4s' annual reports, as well as data for 10 Phase I MS4s that we obtained from other documentation we reviewed. The estimated range of Phase II street-sweeping costs is based on data from 14 MS4s' annual reports.⁷ We developed a per capita street-sweeping cost for each MS4 by dividing that MS4's total street-sweeping cost by its estimated population as reported by the U.S. Census Bureau for July 1, 2005. Some MS4s reported only output information (e.g., number of miles swept). For

⁶We did not adjust these data to 2006 dollars.

⁷For one Phase II MS4, we excluded street-sweeping data included in its annual report, because upon calculation of per capita cost, the data appeared to be a significant outlier. We tried to contact the MS4 to confirm its data, but we were unsuccessful.

those MS4s, we obtained total street-sweeping costs using an estimated street-sweeping cost per mile that we calculated based on MS4s that reported both total cost and output information. We adjusted all cost data to 2006 dollars.

This analysis has a number of limitations. First, the sample size is extremely small, which could impact the reliability of our estimated cost ranges. Second, the MS4s for which we were able to obtain street-sweeping data did not always report these data in consistent units. For instance, some reports included estimates of the number of lane miles swept, while others reported estimates of the number of curb miles swept, and still others simply reported estimates of the miles swept. While it might be reasonable to assume that curb and lane miles are approximately equal measures of distance, additional follow-up would be needed to confirm the data for MS4s that simply reported the number of miles swept. Third, we did not assess the reliability of the data included in these annual reports.

We conducted our work between January 2006 and April 2007 in accordance with generally accepted government auditing standards.

Appendix III: Detailed Analysis of Storm Water Program Implementation Data

Table 3: Phase I Storm Water Program Implementation Data, by State as of Fall 2006

	Number of lead permittees ^a	Number of co-permittees ^b	Number of MS4s that received waivers ^c	Number of MS4s that have not received a permit or a waiver ^d
AK	1	0	0	0
AL	5	41	0	0
AR	1	0	0	0
AZ	7	0	0	0
CA	22 ^f	260 ^f	0	0
CO	4	0	0	0
CT	1	0	0	0
DE	1	13 ^g	0	0
FL	27	161	0	0
GA	58	0	0	0
HI	1	0	0	0
IA	2	0	1	0
ID	1	3	0	0
IL	1	0	2	0
IN	1	0	1	0
KS	3	0	0	0
KY	2	100	0	0
LA	4	8	0	0
MA	2	0	0	0
MD	10	6	0	0
ME ^e	0	0	0	0
MI	5	0	3	0
MN	2	0	0	0
MO	3	0	1	0
MS	1	0	0	0
MT ^e	0	0	0	0
NC	6	0	0	0
ND ^e	0	0	0	0
NE	2	0	0	0
NH ^e	0	0	0	0
NJ	0	0	4	0
NM	1	0	0	0
NV	2	6	0	0
NY	14	0	5	0
OH	4	0	2	1

**Appendix III: Detailed Analysis of Storm
Water Program Implementation Data**

	Number of lead permittees^a	Number of co-permittees^b	Number of MS4s that received waivers^c	Number of MS4s that have not received a permit or a waiver^d
OK	2	0	0	0
OR	6	12 ^f	0	0
PA	2	0	2	0
RI ^e	0	0	0	0
SC	2	2	1	1
SD	1	0	0	0
TN	4	0	0	0
TX	19	1	0	0
UT	2	14	0	0
VA	11	0	1	0
VT ^e	0	0	0	0
WA	6 ^f	0 ^f	2	0
WI	46 ^h	17 ^h	0	9
WV ^e	0	0	0	0
WY ^e	0	0	0	0
Total	295	644	25	11

Source: GAO analysis of EPA and state data.

Note: The Phase I statistics include only traditional local government entities, such as counties, cities, towns, and boroughs. Nontraditional Phase I MS4s, such as universities, military bases, state departments of transportation, and Indian Nations were excluded. Also, we did not assess whether all of the potentially regulated communities listed in EPA's Phase I regulations received permit coverage.

^aLead permittees include MS4s reported by EPA and state permitting authorities as being a co-permittee with one or more MS4s and having lead responsibility for coordinating or implementing activities for those co-permittees. Some MS4s cooperate with other MS4s without becoming co-permittees; however, the number of MS4s with these cooperative relationships are not represented in the table.

^bCo-permittees do not include MS4s counted as lead permittees. These data do include some Phase II MS4s that became co-permittees with Phase I MS4s prior to, or after the Phase II regulations became effective. For example, the number of Phase I co-permittees in Kentucky includes 94 MS4s that are co-permittees with one lead Phase I MS4. A state official said these MS4s would have been required to obtain Phase II permit coverage had they not obtained coverage under Phase I. We counted such MS4s as Phase I co-permittees because they are implementing the program under the conditions of a Phase I permit.

^cWaived MS4s include those issued official waivers from Phase I permit requirements by permitting authorities because they met certain conditions, such as having a combined sewer system that served enough of their population to bring them below the Phase I population threshold. Many of these MS4s were subsequently permitted under Phase II of the storm water program, and we included them in the data provided in table 4. In some cases, Phase I MS4s were exempted, but not officially waived, from Phase I requirements. For consistency, we counted these MS4s as being waived.

^dSouth Carolina and Wisconsin Phase I MS4s that had not obtained either a permit or a waiver include MS4s for whom these states were in the process of developing final permits. In the case of the one Ohio Phase I MS4 that had not obtained either a permit or a waiver, the MS4 has a combined sewer system, and according to an Ohio official, the state and the MS4 had not reached agreement on which type of permit the MS4 should be required to obtain.

Appendix III: Detailed Analysis of Storm Water Program Implementation Data

^eThese states did not have any MS4s that were required to obtain Phase I permits.

^fIn these states, some MS4s are covered under multiple permits:

- In California, three MS4s are the lead permittees for multiple permits; however, we counted each of these permittees only once in table 3. Also, one MS4 received a Phase I permit and later obtained coverage under a Phase II permit, while another MS4 is the lead permittee under both a Phase I and a Phase II permit. We included these MS4s in table 3 rather than table 4 because they first received coverage under a Phase I permit. In addition, four MS4s received coverage as both Phase I co-permittees and Phase II lead permittees. We included the data for these four MS4s in table 4 since that is the phase of the program under which they are lead permittees.
- One Oregon MS4 has received coverage as a co-permittee under two different permits; however, we counted this MS4 only once in table 3.
- Two of Washington's Phase I MS4s are lead permittees that received coverage under multiple permits; however, these permittees are counted only once. Also, one Washington MS4 received coverage as both a lead permittee, and a co-permittee with a different MS4. We counted this MS4 only once in table 3.

^gDelaware's Phase I co-permittees include four MS4s that volunteered to implement the program, but which were never officially required to obtain permit coverage under Phase I or II.

^hA state official indicated some Wisconsin MS4s have established co-permittee relationships, but there is no lead permittee. In these instances, we counted all of the co-permittees as lead permittees.

Table 4: Phase II Storm Water Program Implementation Data, by State as of Fall 2006

	Number of lead permittees ^a	Number of co-permittees ^b	Number of MS4s that received waivers ^c	Number of MS4s that have not received a permit or a waiver ^d
AK	2	1	0	0
AL	27	4	0	1
AR	39	0	N/A ^f	8 ^e
AZ	32	0	1	1
CA	77 ^{h,i}	21 ^h	8	61
CO	53	1	7	0
CT	113 ⁱ	0	19	0
DE	2	1	2	1
FL	94	0	0	0
GA	84	0	0	0
HI	0	0	0	2
IA	41	0	13	9
ID	0	0	0	28 ^e
IL	426	0	195	18
IN	125	18	20	0
KS	52	0	27	1

**Appendix III: Detailed Analysis of Storm
Water Program Implementation Data**

	Number of lead permittees^a	Number of co-permittees^b	Number of MS4s that received waivers^c	Number of MS4s that have not received a permit or a waiver^d
KY	43	54 ^j	1	1
LA	39	10	0	0
MA	237	0	13	0
MD	52	0	15	0
ME	28	0	4	0
MI	355 ^{g,i}	0	0	1
MN	168	0	1	44
MO	64	67	N/A ^f	24 ^e
MS	32	0	0	0
MT	8	2	0	0
NC	81	12	40	20
ND	14	0	4	0
NE	19	2	N/A ^f	1
NH	38	0	7	0
NJ	462 ^k	0	31 ^k	0
NM	0	0	0	28 ^e
NV	5	0	0	0
NY	448	2	17	0
OH	252	231	42	14
OK	38	1	14	1
OR	0	0	8	18
PA	722	0	216	4
RI	32	0	0	1
SC	0	0	4	64
SD	13 ^g	0	0	0
TN	72	10	2	2
TX	0	0	0	300 ^e
UT	56	0	3	0
VA	39	0	5	3
VT	9	0	2	0
WA	0	0	0	111 ^e
WI	102	0	28	36
WV	28	0	9	0
WY	0	0	0	6
Total	4623	437	758	809

Source: GAO analysis of EPA and state data.

**Appendix III: Detailed Analysis of Storm
Water Program Implementation Data**

Note: The Phase II statistics include only traditional local government entities, such as cities, towns, and villages. Nontraditional Phase II MS4s, such as universities, military bases, state departments of transportation, and Indian Nations were excluded. Also, we did not assess whether all of the potentially regulated communities listed in EPA's Phase II regulations received permit coverage.

^aLead permittees include MS4s reported by EPA and state permitting authorities as being a co-permittee with one or more MS4s and having lead responsibility for coordinating or implementing activities for those co-permittees. Some MS4s cooperate with other MS4s without becoming co-permittees; however, with some exceptions, the number of MS4s with these cooperative relationships are not represented in the table.

^bCo-permittees do not include MS4s counted as lead permittees.

^cWaived MS4s include those issued official waivers from Phase II permit requirements by EPA and state permitting authorities because they met certain conditions, such as they did not own or operate any roads or drains that discharged into local waterways. In some cases, Phase II MS4s were exempted, but not officially waived, from Phase II requirements. For consistency, we counted these MS4s as being waived.

^dPhase II MS4s that have not obtained either a permit or a waiver include MS4s whose permit authorities have not yet (1) determined whether the MS4s need to obtain permit coverage, or (2) issued a final permit.

^eFor these states, EPA and state permitting authorities could not provide the exact number of Phase II MS4s that may ultimately be required to obtain permit coverage. The totals shown are estimates provided by these officials.

^fOfficials in these states reported that they had waived or exempted some Phase II MS4s, but could not provide an estimate of how many.

^gMichigan and South Dakota officials reported four MS4s and two MS4s, respectively, that volunteered to obtain permit coverage.

^hA state official indicated some California MS4s have established co-permittee relationships, but there is no lead permittee. In these instances, we counted all of the co-permittees as lead permittees.

ⁱIn these states, some MS4s are covered under multiple permits:

- One California MS4 received coverage under the state's Phase II general permit twice; however, we counted this MS4 only once in table 4. Also, one MS4 received a Phase I permit and later obtained coverage under a Phase II permit, while another MS4 is the lead permittee under both a Phase I and a Phase II permit. We included these MS4s in table 3 rather than table 4 because they first received coverage under a Phase I permit. In addition, four MS4s received coverage as both Phase I co-permittees and Phase II lead permittees. We included the data for these four MS4s in table 4 since that is the phase of the program under which they are lead permittees.
- One Connecticut MS4 received two Phase II permits; however, we counted this MS4 only once in table 4.
- Thirteen Michigan MS4s received multiple Phase II permits; however, we counted these MS4s only once in table 4.

^jThe number of co-permittees in Kentucky includes five unincorporated communities, which according to a state official, have not received either a permit or a waiver. These MS4s' storm water management responsibilities are being covered by their respective counties. Consequently, although these MS4s have not entered into co-permittee relationships, Kentucky considers them to be in compliance with program requirements. Therefore, we included these MS4s among those that have received coverage as co-permittees.

**Appendix III: Detailed Analysis of Storm
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⁴New Jersey issued two different types of storm water permits for traditional MS4s. One type of permit meets federal storm water requirements, while the other meets the requirements of the state's pollution prevention permitting system. The data we present for New Jersey include only MS4s covered under the permits meeting federal requirements. Regarding the number of waivers issued by New Jersey, some of the MS4s were waived from meeting federal storm water requirements, but were covered under permits issued under the state program. We did not obtain data on the number of MS4s for which this occurred.

Appendix IV: Comments from EPA



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 22 2007

OFFICE OF
WATER

Mr. John B. Stephenson, Director
Natural Resources and Environment
United States Government Accountability Office
Washington, DC 20548

Dear Mr. Stephenson:

Thank you for the opportunity to review your draft report entitled "Further Implementation and Better Cost Data Needed to Determine Impact of EPA's Storm Water Program on Communities." The U.S. Environmental Protection Agency (EPA) believes that stormwater runoff is a significant threat to water quality and is actively working with our State and municipal partners to control stormwater discharges to protect and improve water quality. Although the stormwater program has been in place since the early 1990s, the complexity of the water quality problem and the myriad of stakeholders who must contribute to its successful implementation make it imperative that an iterative approach be employed. Your report concludes that:

- It too early to determine if program implementation has been a burden
- It is difficult to develop a uniform assessment of the burden of the program nationally
- A community's ability to establish reliable sources of funding influences whether the program is a burden
- More complete and consistent reporting on the scope, costs, and results of communities' stormwater best management practices is needed to accurately assess burden.

Your report recommends that EPA:

"issue additional program guidance and consider regulatory changes to ensure that (1) communities report on activities in sufficient detail to determine their scope, costs, and results, and (2) communities report this information consistently so that it can be analyzed on a national basis."

EPA has already taken steps to address your recommendation. Existing stormwater regulations establish annual reporting requirements for communities, at 40 CFR §122.42(c) for medium and large communities (i.e., Phase I) and §122.34(g)(3) for smaller communities (i.e., Phase II). Also, §122.37 specifies that EPA will evaluate the stormwater regulations for Phase II communities after December 10, 2012, and make any necessary revisions. EPA acknowledges the importance of obtaining robust data on which to base decisions. The framework of EPA's stormwater permitting program for local communities, however, does not lend itself to reporting data in a form that can be easily compiled and compared with other communities.

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The stormwater program provides local flexibility to implement programs tailored to best address the varying array of complex environmental issues associated with stormwater runoff in different locations. EPA expects local stormwater program activities to reflect local problems and locally derived solutions. In addition, many communities have been implementing stormwater control practices for many years, well before the advent of EPA's stormwater program. Separating burden associated with EPA's stormwater program from that incurred irrespective of the program has proven challenging. Accounting for stormwater control activities in all the different departments and divisions within these local governments is quite complex. As a result, gauging the true burden associated with EPA's stormwater program has been and will continue to be a challenge.

EPA does recognize the importance of being able to assess stormwater program performance and sees the annual report as one of the best ways to gather information necessary to perform this evaluation. While EPA does not believe it is appropriate to modify the annual reporting regulations at this time, EPA initiated an effort to identify necessary information to be able to track and assess local stormwater program performance for both environmental effectiveness and compliance. The purpose is to identify the information that communities should submit in their annual reports and then to develop corresponding guidance for EPA Regions, states, and local communities.

While the actual reporting format has not been determined, EPA supports developing an annual report template or form for use by communities to provide a consistent level of program information. Based on GAO's recommendation, EPA will investigate ways to incorporate better cost information into the annual report.

Enclosed are additional comments that we provided on the draft report that addressed the most substantive issues. Again, we appreciate the opportunity to review and comment on the draft report. If you have any questions about these comments or would like to discuss our national stormwater program, please contact me or call Linda Boornazian, Director of the Water Permits Division, at (202) 564-9545.

Sincerely,



Benjamin H. Grumbles
Assistant Administrator

Enclosure

Appendix V: Key Contributors to This Report

Contact

John B. Stephenson, (202) 512-3841

Acknowledgments

In addition to the individual named above, Diane B. Raynes, Assistant Director; Tim Bazzle; Kevin Bray; Mark Braza; Ellen M. Crocker; Kathleen M. Drennan; Brian Hanley; Benjamin Howe; Krista Loose; Christopher Murray; Mehrzad Nadji; Ellen Phelps Ranen; Carol Herrstadt Shulman; and Winnie Tsen made key contributions to this report.

Related GAO Products

Clean Water: How States Allocate Revolving Loan Funds and Measure Their Benefits. [GAO-06-579](#). Washington, D.C.: June 5, 2006.

Federal Water Requirements: Challenges to Estimating the Cost Impact on Local Communities. [GAO-06-151R](#). Washington, D.C.: November 30, 2005.

Storm Water Pollution: Information Needed on the Implications of Permitting Oil and Gas Construction Activities. [GAO-05-240](#). Washington, D.C.: February 9, 2005.

Water Quality: Better Data and Evaluation of Urban Runoff Programs Needed to Assess Effectiveness. [GAO-01-679](#). Washington, D.C.: June 29, 2001.

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