



Clean Watersheds Needs Survey 2000

Report to Congress





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August 2003



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Acronyms

A/F	authority/facility number	MCP	Municipal Compliance Plan
BASINS	Better Assessment Science Integrating Point and Nonpoint Sources	mgd	million gallons per day
BMP	best management practice	MS4	municipal separate storm sewer system
BOD	biochemical oxygen demand	NOAA	National Oceanic and Atmospheric Administration
CAFO	concentrated animal feeding operation	NPDES	National Pollutant Discharge Elimination System
CCMP	Comprehensive Conservation and Management Plan	NPS	nonpoint source
CMOM	capacity assurance, management, operation and maintenance	O&M	operation and maintenance
CSO	combined sewer overflow	PCB	polychlorinated biphenyl
CWA	Clean Water Act	POR	Point of Record
CWNS	Clean Watersheds Needs Survey	POTW	publicly owned treatment works
CWSRF	Clean Water State Revolving Fund	SCADA	supervisory control and data acquisition
EPA	Environmental Protection Agency	SSE	Separate State Estimate
GIS	geographic information system	SSes	Sewer System Evaluation Survey
IHS	Indian Health Service	SSO	sanitary sewer overflow
I/I	infiltration and inflow	STORM	Storage, Treatment, Overflow, Runoff Model
LISS	Long Island Sound Study	TMDL	Total Maximum Daily Load
LTCP	[Combined Sewer Overflow] Long-Term Control Plan	USDA	U.S. Department of Agriculture
		WIN	Water Infrastructure Network

CWNS Terminology

CWNS: The Clean Watersheds Needs Survey. In this report, CWNS refers to the 2000 survey.

CWNS needs categories: The nine categories used in the CWNS 2000 to describe and report the need for water pollution control projects.

CWNS database: The database by which States enter and update their needs data. The newly modernized CWNS database allows States to enter detailed information about each facility, including geographic coordinates, population, flow discharge locations, watershed boundaries, and funding origins.

combined sewer overflow (CSO) correction: Any measure taken to prevent or control combined sewer overflows, which are overflows from sewer systems that convey both domestic sanitary wastewater and storm water. CSO corrections can be made to storage, treatment, and/or conveyance facilities.

documented needs: Needs that have met the CWNS 2000 documentation requirement and were accepted by U.S. Environmental Protection Agency. Only documented needs are used to report the total needs in this report.

facility: A project and location involved in water quality management, such as a wastewater treatment plant or sewer system, a municipal separate storm sewer system, or a nonpoint source (NPS) pollution control project. Although the term *facility* is typically thought of as a wastewater treatment facility or some other structure, for NPS pollution control it refers to a place or the location of the project. Data in the CWNS 2000

were collected and organized by facility for all types of water pollution control.

modeled need: Estimate or need developed using a model (e.g., Sanitary Sewer Overflow model) to compensate for needs categories where limited information was available.

need: A water quality or public health problem and an associated abatement cost that is eligible for funding under the Clean Water State Revolving Fund.

nonpoint source pollution control projects: Activities designed to prevent or reduce water pollution from sources that are not readily identifiable (i.e., pollution that is not from a pipe or sewer). In the CWNS 2000 these projects are mainly activities commonly referred to as best management practices (BMPs).

separate state estimate (SSE): Needs that have not met the CWNS 2000 documentation requirements described in Chapter 2.

storm water management programs: Programs required by the National Pollutant Discharge Elimination System (NPDES) permit program for discharges from municipal separate storm sewer systems. These programs generally include projects and/or source control measures (structural and nonstructural) that (1) reduce pollutants in runoff (from commercial and residential areas) discharged from storm sewers, (2) detect and remove illicit discharges and improper disposal into storm sewers, (3) prevent or reduce pollutants in runoff from municipally operated

industrial facilities that discharge to municipal separate storm sewers, and (4) reduce pollutants in construction site runoff discharged to municipal separate storm sewers. In addition, any activities that

control storm water pollution from diffuse sources that will ultimately be discharged via a municipal separate storm sewer can be considered part of a storm water management program.

Executive Summary

This report, the *Clean Watersheds Needs Survey 2000 Report to Congress*, presents the results of the U.S. Environmental Protection Agency's (EPA) survey of water quality programs and projects eligible for funding under the Clean Water State Revolving Fund (CWSRF). EPA prepared this report to meet the requirements set forth in section 516 of the Clean Water Act (CWA). Because of water quality problems associated with nonpoint source (NPS) pollution, EPA has elected to include NPS pollution control projects as well.

The Clean Watersheds Needs Survey (CWNS) 2000 is a collaborative effort between 48 States and the District of Columbia, and EPA. States entered data into the CWNS database over a 21-month period to be evaluated and analyzed by EPA. The results of the data entry are presented in this report.

The name of the survey was recently changed from the Clean Water Needs Survey to the Clean Watersheds Needs Survey to recognize the increasing number of water pollution control activities, such as developing Total Maximum Daily Loads (TMDLs) and setting certain Safe Drinking Water Act objectives, that are managed on a watershed basis. Among other benefits, identifying needs by watershed promotes water pollution control strategies that optimize water quality investments in a watershed.

This report presents the capital costs for publicly owned municipal wastewater collection and treatment, combined sewer overflow (CSO) correction, municipal storm water management, and NPS pollution control. This report presents the cost data in the CWNS database as "needs." A *need* is a water quality or public

health problem and an associated abatement cost that is eligible for funding under the CWSRF. The needs must have existed as of January 1, 2000, to be included in the CWNS 2000. In addition, technical data, such as population, flow, and effluent, are summarized and presented in this report.

The *CWNS 2000 Report to Congress* presents the total needs estimates in two ways. The first method is based entirely on documented needs. These documented needs are entered by a State and validated by appropriate documentation. This is the first time, since the beginning of the CWNS, that the report to Congress presents only the documented total need for the Nation. In past surveys, EPA used a second method of determining needs estimates. That method modeled needs data to supplement the survey results. For this report EPA believes that the data entered into the CWNS adequately represent the Nation's needs for wastewater treatment and collection.

For diffuse sources of pollution (such as nonpoint sources, sanitary sewer overflows [SSOs], and municipal storm water), however, data limitations preclude complete reliance at this time on a documented needs approach. Therefore, this report includes a modeled national needs estimate for these diffuse sources. (See Chapter 4 and Appendices D and E for details.) EPA expects that during the next decade, as improved information is derived in the course of developing TMDLs and other watershed plans, the States' and EPA's ability to document needs for all source categories will improve. EPA expects, therefore, that its estimates of documented needs will continue to be improved, ultimately enabling complete replacement of the modeled needs estimates by documented needs.

Objectives

Improved data quality and integrity was a primary objective that both EPA and the States strove to meet when documenting all needs in the CWNS 2000; however, collecting documentation and needs data for NPS pollution control, SSOs, CSOs, and storm water was a particular focus for this survey. Also, in keeping with the objective of improving data quality, States were required to redocument certain needs remaining from previous surveys. The CWNS National Workgroup initiated this effort with the 1996 Clean Water Needs Survey, and it proved to be successful in eliminating needs in the database that had already been met. Another important objective was the requirement that every facility in the CWNS 2000 include geographic information. This objective was important for helping States and EPA use data in the CWNS 2000 database for other initiatives beyond this report to Congress.

Results

The total CWSRF-eligible needs for the Nation as of January 1, 2000, are \$181.2 billion. These needs are summarized in Table ES-1 and Figure ES-1. As noted earlier, all of the needs shown in Table ES-1 are documented needs. This is a key difference between the CWNS 2000 and the previous surveys, which combined the documented needs with modeled estimates. The CWNS 2000 needs reflect an increase of \$26.6 billion (17.2 percent) from the previous survey. The total needs reported (\$181.2 billion) represent a simple summation of expenditures that may be made at different points in time over a multiyear planning horizon. No attempt has been made to predict the time pattern of these expenditures or to discount them to arrive at a present value sum. The total needs are presented for wastewater treatment, collection, and conveyance; CSO correction; storm water management programs; and NPS pollution control. A summary of the needs for each of these categories follows.

Wastewater Treatment, Collection, and Conveyance.

The needs for wastewater treatment (Categories I and II) are \$57.2 billion, or 31.6 percent of the total

Table ES-1. Total Documented Needs Reported in the CWNS 2000 (January 2000 dollars in billions)

Needs Category		Total Needs
I	Secondary wastewater treatment	36.8
II	Advanced wastewater treatment	20.4
III-A	Infiltration/inflow correction	8.2
III-B	Sewer replacement/rehabilitation	16.8
IV-A	New collector sewers and appurtenances	14.3
IV-B	New interceptor sewers and appurtenances	14.8
V	Combined sewer overflow correction	50.6
VI	Storm water management programs	5.5
VII	Nonpoint source pollution control	13.8
Grand Total (Categories I–VII)		181.2
Total treatment (Categories I and II only)		57.2
Total collection and conveyance (Categories III and IV only)		54.1
Total wastewater and collection systems (Categories I–V only)		161.9
Total Categories I–VI only		167.4

Notes:

1) NPS control *modeled* needs are \$21.5 billion in January 2000 dollars (Appendix D).

2) See Appendix A, Tables A-1 and A-2, for needs by category and State. Needs estimates presented in Table ES-1 might vary slightly from those in the appendices because of rounding.

needs. Eligible wastewater treatment needs include the capital costs of replacement, rehabilitation, expansion, upgrade, or process improvement of treatment plants; construction of new treatment plants; and construction, replacement, or rehabilitation of individual on-site systems and decentralized systems. Of the \$57.2 billion wastewater treatment needs in the CWNS 2000 data collection effort, only \$32.7 billion are new wastewater treatment needs identified for the first time during the CWNS 2000 data collection period. Figure ES-2 shows how the new and previously identified wastewater treatment needs are proposed to be expended in infrastructure improvements and in capital renewal.

Needs for wastewater collection and conveyance (Categories III and IV) account for \$54.1 billion, or 29.9 percent of the total needs. Wastewater collection and conveyance needs include capital

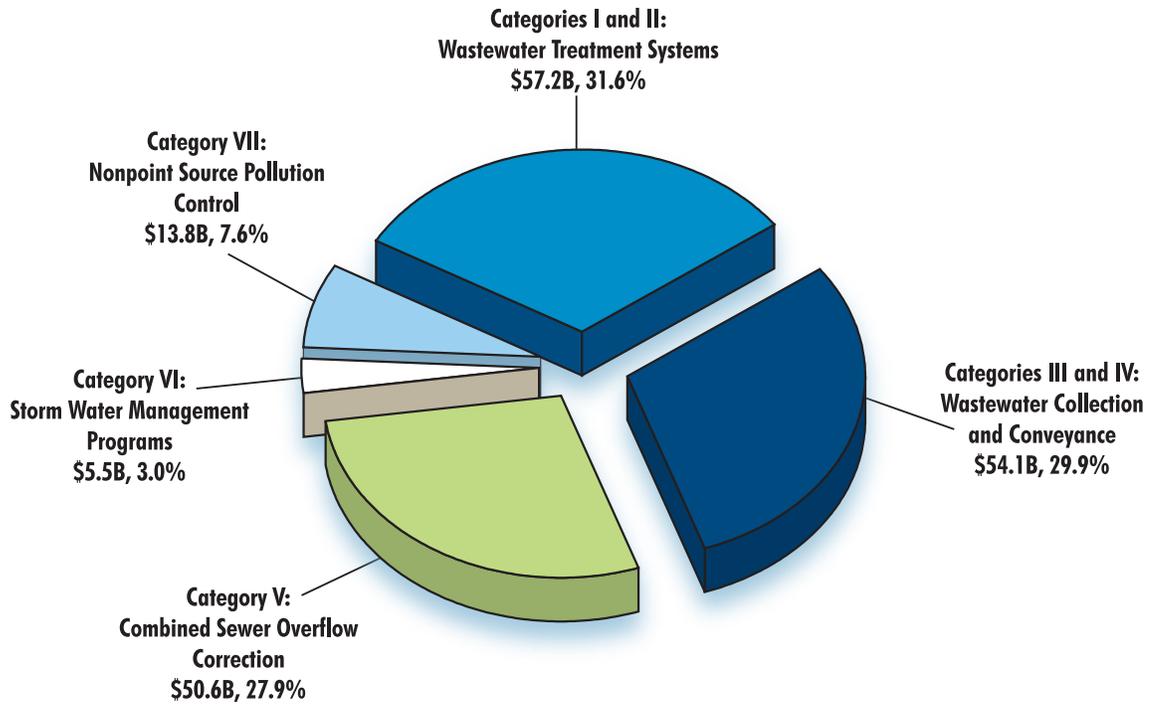


Figure ES-1. CWNS 2000 total documented needs (January 2000 dollars). This figure shows only *documented* needs. Note that NPS pollution control *modeled* needs are \$21.5 billion in January 2000 dollars (Appendix D).

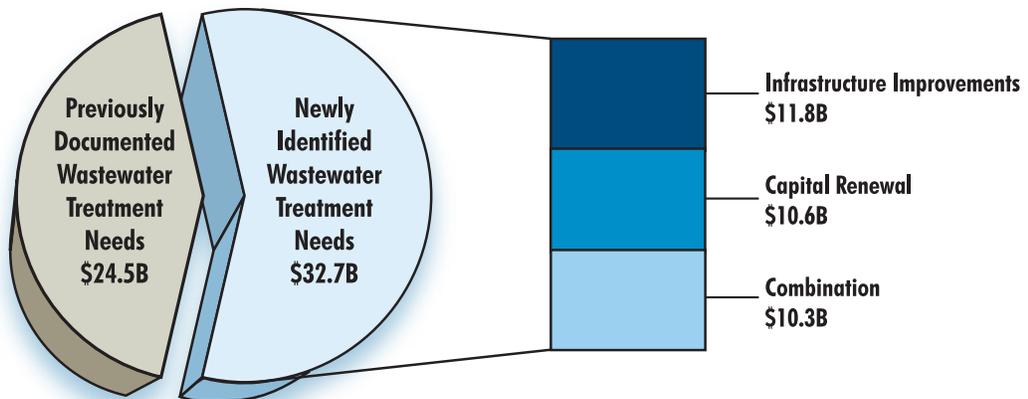


Figure ES-2. Comparison of previously documented wastewater treatment needs (from the 1996 and 2000 survey databases) and newly identified wastewater treatment needs (only in CWNS 2000 database) (January 2000 dollars).

costs for replacement, rehabilitation, or expansion of existing collection systems, as well as construction of new collection systems. These needs represent an \$18.8 billion (53.3 percent) increase from the previous survey. The \$4.5 billion increase for infiltration/inflow (I/I) correction (Category III-A) and \$9.1 billion increase for sewer replacement and rehabilitation (Category III-B) since the previous survey suggest that communities are beginning to plan for substantial capital renewal projects that indicate aging infrastructure.

CSO Correction. The estimated cost to control CSOs is \$50.6 billion, an increase of \$1.0 billion from the amount shown in the 1996 Clean Water Needs Survey. The \$50.6 billion estimate is primarily based on the level of control presented under the “Presumption Approach” in the 1994 CSO Control Policy. That level of control is based on capturing 85 percent of the flows that enter the combined sewer system during wet weather events and providing those flows with the equivalent of primary clarification, solids and floatables disposal, and disinfection of the effluent.

Storm Water Management Programs. Nineteen States and the District of Columbia reported \$5.5 billion (3 percent of total needs) in documented storm water management program needs (Category VI). Despite the increased availability of storm water management program information, not all States submitted storm water management program needs. As a result, the storm water control needs presented in this report underestimate the Nation’s storm water management program needs. These needs include the capital costs for developing and implementing municipal storm water management programs to meet the requirements of Phases I and II of the National Pollutant Discharge Elimination System (NPDES) storm water regulations. Because the storm water Phase II regulations were finalized on December 8, 1999, and did not take effect until March 2003, municipalities with Phase II needs identified as of January 1, 2000, were allowed to have their projected needs entered into the CWNS 2000 database.

Nonpoint Source Pollution Control. The needs eligible for inclusion in Category VII include those associated with implementing NPS management programs under section 319 of the CWA, as well as developing and implementing Comprehensive Conservation and Management Plans (CCMPs) for estuaries under section 320 of the CWA.

Thirty-two States and the District of Columbia documented needs totaling \$13.8 billion (7.6 percent of total needs) for NPS pollution control (Category VII). Urban and hydromodification NPS pollution control needs (Categories VII-D and VII-K) account for the largest portion of the total NPS pollution control needs (Figure ES-3).

Unable to identify all sources of NPS pollution, many States have not developed or identified documentation for CWNS 2000 that represents all of their NPS needs. For example, only 15 States documented needs for cropland or animal agriculture despite the fact that agriculture constitutes the most significant source of NPS pollution in the United States according to State 305(b) reports. Only 16 States estimated costs for hydromodification (the second most reported source of impairment to rivers and streams in State 305(b) reports). Only 2 States estimated costs for silviculture (forestry), and only 25 States estimated costs for urban sources.

EPA has provided a separate modeled estimate for some categories of NPS needs. Certain subcategories of NPS needs (Ground Water, Brownfields, Storage Tanks, and Sanitary Landfills) were not modeled because of a lack of data. For the categories modeled, the full array of best management practices and behavioral changes were not accounted for because of data and time restraints. The modeled NPS needs are shown in Figure ES-4 and are discussed more thoroughly in Appendix D.

Neither the documented estimate nor the modeled estimate gives a complete picture of NPS needs. It is inappropriate to add the modeled needs to the

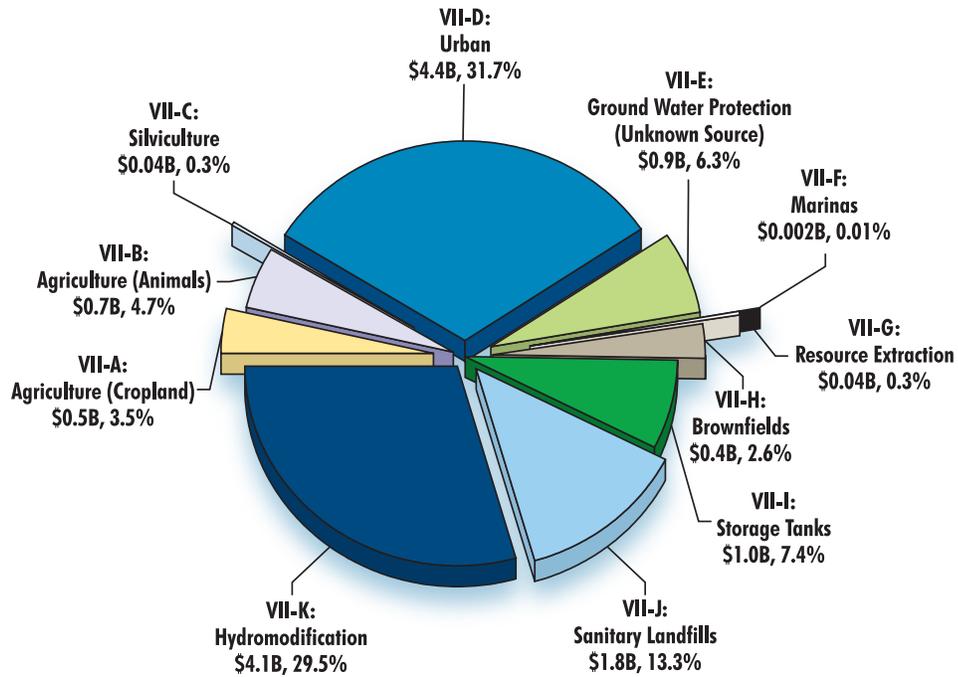


Figure ES-3. Total documented needs for NPS pollution control (Category VII) (January 2000 dollars). Note: This figure shows only *documented* needs. The NPS pollution control *modeled* needs (Figure ES-4) are \$21.5 billion in January 2000 dollars (Appendix D).

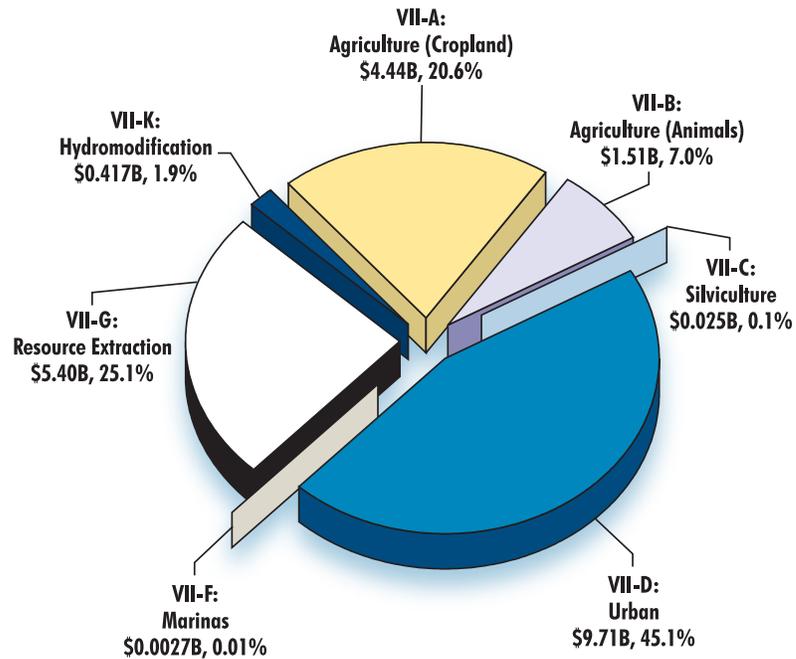


Figure ES-4. Total modeled needs for NPS pollution control (January 2000 dollars). Note: CWNS 2000 NPS Need Categories VII-E, H, I, and J were not modeled.

documented needs estimate because of the overlap between the two.

As State documentation improves, eventually the documented estimate approach will provide an assessment that allows EPA to thoroughly document all NPS needs in the United States and to do so on a watershed basis. EPA includes only the documented NPS needs in its official needs estimates provided to Congress in keeping with its long-standing policy of relying on documented needs wherever possible.

Small Community Needs. In addition to the needs documented in the CWNS 2000 for established need categories, the survey also had the ability to estimate the needs for small communities. Small communities, defined as communities with a population of fewer than 10,000 people and an average daily wastewater flow of less than 1 million gallons, have documented needs of approximately \$16 billion, representing about 10 percent of the \$161.9 billion in documented wastewater treatment and collection system needs for the country. For small communities, the needs for wastewater treatment (Categories I and II) are \$4.8 billion. Collection and conveyance needs (Categories III and IV) are \$9.4 billion, and CSO correction needs (Category V) are \$1.9 billion.

Improvements in Wastewater Infrastructure Since the 1996 Clean Water Needs Survey. Table ES-2 summarizes the increase in the number of facilities and the level of treatment provided since the 1996 Clean Water Needs Survey.

Other Needs Initiatives

WIN Report and Gap Analysis. Determining estimated costs for the necessary investment in the Nation's clean water infrastructure is an activity that has recently been undertaken elsewhere within EPA's Office of Water, as well as by associations of water and wastewater service providers, local governments and their ratepayers, and other interested parties. Two such assessments are the Water Infrastructure Network (WIN) Report and EPA's *Clean Water and Drinking*

Water Infrastructure Gap Analysis. The approaches used in the WIN Report and the Gap Analysis are similar in how they estimated the Nation's infrastructure. These reports, however, are not directly comparable to the CWNS 2000.

Both the WIN Report and Gap Analysis started with numbers from the 1996 Clean Water Needs Survey and subtracted the amounts for Categories III and IV. The then-current estimate for SSO correction (\$81.9 billion) was added. Also added were estimated needs for renewal and replacement of existing infrastructure based on a number of different assumptions. The estimates for renewal and replacement were not supported by the type of documentation EPA requires for CWNS estimates. The wastewater need reported by the WIN is \$386 billion in 2001 dollars, which is equivalent to \$377 billion in January 2000 dollars. The September 2002 EPA Gap Analysis resulted in a wastewater need estimate ranging from \$331 billion to \$450 billion with a midpoint value of \$388 billion (\$379 billion in January 2000 dollars).

Sanitary Sewer Overflows. SSOs can be caused by many factors, including peak flows that exceed system capacity; blockages; structural, mechanical, or electrical failure; and third-party actions or activities. In this report and in previous reports to Congress, some portion of the documented needs for I/I correction (Category III-A), sewer replacement/rehabilitation (Category III-B), new relief sewers (included in Category IV-B), and increased treatment plant capacity (Categories I and II) can be attributed to SSO correction. During the CWNS 2000, 27 States identified 775 facilities with SSO problems. EPA used a model to estimate the capital costs associated with wet weather SSO correction. The model is based on reducing wet weather overflows to no more than one in a collection system every 5 years. Data (e.g., population, flow) for the model were obtained from the CWNS 2000 database. The modeled estimate is \$88.5 billion. The modeled estimate should not be added to the CWNS 2000 documented needs because the needs for Categories I, II, III, and IV might already include costs to address SSOs.

Table ES-2. Comparison of the Number of Treatment Facilities and Level of Treatment in 1996 Clean Water Needs Survey and CWNS 2000.

Type of Facility	1996 Clean Water Needs Survey	CWNS 2000
Treatment facilities		
Less than secondary and partial treatment ^a	176	269
Secondary	9,388	9,156
Greater than secondary or no discharge	6,460	6,830
Total	16,024	16,255
Design capacity (mgd)	42,225	45,058
Population served by centralized systems (millions)	189.7	207.8
Total population served by centralized systems receiving secondary treatment or better ^b (millions)	172.5	201.4
Population served by centralized systems receiving secondary treatment or better ^b as percent of population receiving treatment (percent)	90.9%	96.9%
Number of collection systems	20,670	21,107

^a Flow goes to another facility for further treatment. This designation was not made in the 1996 survey. In that survey, these facilities were counted under their actual treatment level.

^b Includes population from treatment plants with no discharge to surface waters.

Future Trends in Water Pollution Control

Program Planning and Evaluation. EPA encourages States to target projects that are necessary to ensure compliance with the requirements of the CWA. EPA also promotes State use of enhanced planning and integrated targeting tools that include NPS and estuary projects along with wastewater treatment and collection system projects. The objective of these and other ongoing efforts is to manage CWSRF resources and other funds to more efficiently and effectively address State-identified high-priority problems in the watersheds of the United States. Toward this goal, the CWNS database helps States manage their data, create reports, and download the data into geographic information systems to create maps and analyze data. EPA encourages States to use the CWNS database as a system to manage information for planning and evaluation in addition to inputting data for CWNS reports to Congress.

Watershed Management. The needs in the CWNS are presented on a State-by-State basis, reflecting the responsibility that States have in achieving water quality standards and other CWA goals. Recently, however, substantial emphasis has been placed on using the watershed approach to address the water

quality goals of the CWA more holistically. This is particularly the case as States continue to develop TMDLs for impaired waters that must integrate point and nonpoint source pollutant loading controls. Rather than managing sources of pollution within political boundaries or from a single type of discharge, watershed management provides a more comprehensive perspective for both analysis and efficient use of resources. EPA and the States have made a concerted effort in the CWNS 2000 to gather information on a watershed basis, which is consistent with EPA's watershed management approach. In Chapter 5 of this report, national watershed analyses and a case study from the Long Island Sound are presented to illustrate the potential of the CWNS to organize needs information by watershed.

Infrastructure Improvements versus Capital Renewal. Since the early 1970s, EPA has documented significant improvements in the treatment of municipal wastewater. It is expected that in the future municipalities will need to focus more on capital renewal (rehabilitation and replacement) of existing infrastructure than on infrastructure improvements measured by increased population served and improved levels of treatment. This is a reasonable progression

because much of the Nation's infrastructure has reached, or soon will reach, the end of its design life.

CSO and SSO Correction. The Nation has made progress toward planning for CSO and SSO correction. For this survey, some States used Long-Term Control Plans (LTCPs) to document their expected capital expenditures for CSO correction. EPA anticipates that more LTCPs will be completed before the next survey, and as a result the quality of documented CSO correction needs will be greatly improved.

In the 1996 survey EPA recognized that SSOs occur throughout the United States and initiated work to address SSO costs in coordination with the SSO Federal Advisory Committee and other EPA workgroups. The significant increase in I/I correction (Category III-A) and sewer replacement and rehabilitation (Category III-B) needs also demonstrates that local agencies are planning for SSO correction. Because of the disparity between the modeled SSO costs described in this report and the categories of needs that are characteristic of SSO needs, EPA anticipates that more SSO needs will also be documented in the next survey.

Storm Water Management Programs and NPS Pollution Controls. Only a limited number of States were able to document storm water management program and NPS pollution control needs. The reported needs underestimate the true national needs; however, EPA anticipates that more States will be able to document these needs in the next survey and will work with States to remove the barriers that might have prevented some States from including appropriate data for these two categories in the CWNS 2000.

Individual On-site Systems. Information in the CWNS database forecasts that 1,687 new treatment facilities are needed. Of these, 634 would serve small communities with fewer than 1,000 people. Another 209 facilities would serve 1,000 to 10,000 people in communities where individual on-site systems are to be abandoned. EPA expects that the actual number of new conventional wastewater collection and treatment systems constructed will drop as more planning authorities recognize that properly designed, constructed, and operated individual on-site and decentralized systems are an appropriate and permanent solution, rather than an interim solution, to water pollution and public health problems.

Chapter 1

Introduction

CWNS

The Clean Watersheds Needs Survey. In this report, CWNS refers to the 2000 survey.

What is the purpose of the Clean Watersheds Needs Survey 2000 Report to Congress?

The United States Environmental Protection Agency (EPA), Office of Water, conducted the Clean Watersheds Needs Survey (CWNS) 2000 and prepared the *Clean Watersheds Needs Survey 2000 Report to Congress*, hereinafter referred to as “this report,” to meet the requirements set forth in the Clean Water Act (CWA). Section 516 of the CWA requires reports to Congress detailing State and national estimates and comprehensive studies on costs for compliance with the CWA.¹ This report includes a presentation and analysis of the capital investment necessary to meet the Nation’s wastewater treatment and collection system needs and, to a limited extent, its municipal storm water management program needs. EPA has also elected to include nonpoint source pollution control needs.

Why did EPA change the name of the survey to the Clean Watersheds Needs Survey?

Recognizing the importance of making the data in the CWNS 2000 consistent with EPA’s and the States’ initiatives to manage data on a watershed level, EPA modernized the CWNS database to require more detail on the geographic location of each facility. In addition, EPA changed the name of the survey from the Clean Water Needs Survey to the Clean Watersheds Needs Survey in keeping with the move to manage data at the watershed level. Although the name has changed, the acronym “CWNS” is still used, and this and future CWNS reports to Congress will be sufficiently similar to the 12 previous surveys to allow for valid comparisons of most categories.

What is the scope of the Clean Watersheds Needs Survey 2000?

EPA conducted the CWNS 2000 in partnership with the States in an attempt to identify and document the cost of projects needed to address water quality and public health problems. Those projects include both State Nonpoint Source Management Plans as defined in section 319 of the CWA and Comprehensive Conservation and Management Plans (CCMPs) as defined in section 320 of the CWA. Before the survey began, the CWNS National Workgroup, which was composed of representatives from EPA headquarters and regional offices and 15 States, developed a set of guidelines and criteria for gathering, documenting, and entering data. The needs data included in this report have met the criteria specified and are eligible for funding under the Clean Water State Revolving Fund (CWSRF) program established under Title VI of the CWA.

Because of limitations in the availability of needed data, the documented needs developed as described in the preceding paragraph do not fully account for all needs with respect to diffuse sources of pollution, including nonpoint source (NPS) pollution, sanitary sewer overflows (SSOs), and municipal storm water management programs. Therefore, for those categories of pollution, EPA has developed a second set of needs estimates based on the use of models, as described in Chapter 4 and in Appendices D and E.

The CWNS 2000, however, does not include all needs related to water quality and public health problems. The amount of data entered into the CWNS 2000 was limited by the resources available to the participating States.² As in past surveys, information about privately

¹ Section 516, paragraphs (2) and (4), specifically requires the following: “The Administrator, in cooperation with the States...shall make a detailed estimate, biennially revised, of the cost of construction of all needed publicly owned treatment works; in each of the States...and shall submit such detailed estimate and such comprehensive study of such cost to the Congress ...”.

² American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in CWNS 2000.

owned wastewater facilities or wastewater treatment facilities that serve industrial facilities, military installations, and national parks was not gathered for this survey because those facilities are not eligible for funding under CWSRF programs.

The CWNS 2000 did not request data for needs and facilities that serve American Indians, hereinafter referred to as Tribal needs. Some States, however, reported such data in the CWNS 2000.³ EPA does not include or report Tribal needs because the Indian Health Service (IHS) conducts a separate survey and provides a report to Congress annually under Public Law 86-121. The IHS reports on wastewater treatment systems, improvement of community drinking water supplies, and solid waste disposal facilities. A special set-aside of the CWSRF appropriation uses a priority list of projects, updated annually by the IHS, to provide funding for Tribal needs.

Need

A water quality or public health problem and an associated abatement cost that is eligible for funding under the CWSRF.

The CWNS 2000 defined a *need* as a water quality or public health problem and an associated abatement cost that is eligible for funding under the CWSRF. The needs data reported in the CWNS 2000 had to exist as of January 1, 2000. The information gathered by the States belonged to three broad categories: data on wastewater treatment and collection systems, data on storm water management programs, and data on NPS pollution control projects. Table 1-1 lists the data elements that could be entered for each facility in the CWNS 2000 database. Descriptions of the data gathered for each category follow.

Wastewater Treatment and Collection Systems. The CWNS 2000 includes data on the documented capital

costs required to meet the needs of the Nation's publicly owned wastewater collection and treatment infrastructure in accordance with section 516 of the CWA. Eligible costs include the replacement, rehabilitation, or expansion of collection systems and treatment plants; construction of new treatment plants; correction or elimination of combined sewer overflows (CSOs); and replacement or rehabilitation of individual on-site systems and construction of decentralized treatment systems. In addition to the needs, technical data such as flow and treatment levels for treatment plants, population, unit process, discharge location, and geographic data were collected on each wastewater treatment plant, collection system, individual on-site system, or decentralized system included in the CWNS 2000.

To complement the wastewater treatment and collection system data entered in the CWNS 2000, EPA used data from the survey to model the cost of correcting wet weather sanitary sewer overflows (SSOs) in response to the Wet Weather Water Quality Act of 2000. This act authorized a grant program to address SSO and CSO problems. The act states that the allocation of funds to the States is to be based on needs identified in the most recent CWNS. EPA developed this model because SSOs are not a specific need category in the CWNS 2000. Although funding for the new grant program was not appropriated, this report includes State-level modeled cost estimates for the control of SSOs, as well as documented cost estimates for the correction and elimination of CSOs.

Storm Water Management Programs. The documented eligible needs for this category include the capital costs for meeting the municipal requirements of the Storm Water Phase I and II National Pollutant Discharge Elimination System (NPDES) regulations. Only those storm water management programs with municipal separate storm sewer systems (MS4) that are covered by an NPDES permit can submit their needs under this category. The portion of an MS4 Phase I or II storm water management program that is eligible as a documented need in the CWNS 2000 consists of

³ The CWNS 2000 data for Tribal facilities are summarized in Appendix I.

Table 1-1. Data Elements in the CWNS 2000

Facility Summary ^a	Needs ^a	Technical
<ul style="list-style-type: none"> • Authority/Facility (A/F) Number • Facility Name • Natures (Present and/or Projected) and Changes • System Name^b • “Privately Owned” Flag • “Interim Treatment Plant” Flag^b 	<ul style="list-style-type: none"> • Needs Category • CWSRF-Eligible Needs • Documentation Information • Separate State Estimates^b • Operation and Maintenance Costs^b • Funding Information <p>Geographic^a</p> <ul style="list-style-type: none"> • Latitude and Longitude “Point of Record” (POR) • POR County • Watershed • Congressional District • Boundaries 	<ul style="list-style-type: none"> • Population (and “Small Community Exception” Flag)^c • Flow Capacities of Treatment Plants^c • Discharge Method(s) and Location(s)^c • Effluent Data^c • Concentration Details^b • Unit Process or BMP Descriptions^b • Combined Sewer Details • Responsible Entity Information (and “Tribal Flag”) • Permit Numbers and Types^d • Biosolids Handling Data^b • Pollution Problem Descriptions^{b,e} • Miscellaneous Comments^b

^a Unless otherwise indicated, data elements under these categories were required for every facility in the CWNS 2000.

^b Data elements that were not mandatory for the CWNS 2000. The States entered data for these fields voluntarily.

^c These data elements were required for wastewater treatment and collection systems.

^d This data element was required for facilities with storm water management program needs.

^e States identified SSOs under this data element.

needs for developing and implementing the program. Because the storm water regulations for Phase II were finalized in December 1999 (64 *Federal Register* 68722 *et seq.*, December 8, 1999), municipalities with Phase II needs identified as of January 1, 2000, were allowed to have their projected needs entered into the CWNS 2000 database even though the regulations did not go into effect until March 2003. Needs for Phase II MS4s must include evidence that the municipality was identified in the regulation or could be designated based on being in an urbanized area. In the CWNS 2000, few Phase II MS4 municipalities had their needs identified; it is anticipated, however, that in the next CWNS many more Phase II municipalities will identify their needs. Storm water facilities were required to enter geographic location and permit data in addition to needs information.

Nonpoint Source Control Projects. The CWNS 2000 includes documented needs for implementing

NPS management programs under section 319 and implementing CCMPs for estuaries under section 320 of the CWA. NPS pollution control projects included in the CWNS 2000 must have been included under a State’s approved Nonpoint Source Management Plan (section 319) or must have been included in an approved CCMP (section 320). CWSRF financing is available for a broad range of traditional NPS pollution control activities, such as implementing agricultural best management practices (BMPs), replacing leaking underground storage tanks, or replacing privately owned failed septic systems with new on-site systems. In addition, section 320 allows financing of a broader range of activities found in CCMPs, such as habitat restoration. For each NPS pollution control facility in the CWNS 2000, EPA required a geographic location along with the needs data. In addition, EPA conducted an alternative NPS modeled needs analysis, which is described in Appendix D.

CWNS database

The database by which States enter and update their needs data. The newly modernized CWNS database allows States to enter detailed information about each facility, including geographic coordinates, population, flow discharge locations, watershed boundaries, and funding origins.

How was the Clean Watersheds Needs Survey 2000 conducted?

Forty-eight States and the District of Columbia⁴ participated in the CWNS 2000. Guidance developed by EPA and the CWNS National Workgroup was presented to the States at a national start-up meeting in March 2000 and at several training workshops given by EPA throughout the data collection period. Although EPA and the CWNS National Workgroup set guidelines for the survey, they also frequently received input from the States participating in the survey. To maintain consistency and ensure the quality of information gathered during the survey, EPA and the National Workgroup held monthly conference calls to clarify issues and develop necessary responses. EPA also provided information to the States through the Internet, e-mail, and written correspondence. It was through these discussions that EPA and the States determined, for example, that SSOs were difficult to document and that modeling of wet weather SSO costs would be needed. During the course of the survey, EPA concluded that costs for correcting SSOs were included in only some of the needs documented by the States and that the results from the SSO model would show a more complete picture of the costs to control wet weather SSOs. The CWNS National Workgroup and EPA also evaluated the possible use of cost models for storm water management program needs and NPS pollution control needs. These needs categories tend to be difficult to document using the established documentation criteria; therefore, this report also includes alternative model-based analyses in Appendices D and E.

In coordination with a subcommittee of the CWNS National Workgroup, EPA modernized the CWNS database to be used by States in updating their needs data. The new CWNS database allows States to enter detailed information about each facility, specifically discharge locations (by latitude and longitude), watershed boundaries, and funding awards. The States are able to link directly into the database, continually update their data, generate reports, and download the data into a geographic information system (GIS) to create maps. These capabilities enable States to use the CWNS as a management tool rather than simply a reporting vehicle. The criteria for submitting and updating information described earlier, as well as the level of State participation in the CWNS 2000, have continued to improve the quality of the data in the CWNS database.

The CWNS 2000 data collection period (April 1, 2000, to January 4, 2002) was an extensive 21-month effort by EPA and the States. The States were primarily responsible for gathering and updating the data included in the CWNS 2000. In March 2000 EPA provided an inventory of data from the 1996 Clean Water Needs Survey to each State to begin the CWNS 2000 data-collection effort. One of the most frequently used data-collection methods was distribution of an “in-State” survey form to the communities in the State. In addition, State coordinators worked with the various program offices in their States to ensure that the most accurate data were compiled. Data in the CWNS 2000 were organized by facility for all types of water pollution control, including storm water management programs and NPS pollution control projects. For each facility in the database, a State entered the needs and technical data specific to that facility. Although the term *facility* typically refers to a wastewater treatment facility or some other structure, for NPS pollution control it refers to a place. The types of NPS pollution control projects vary considerably, ranging from installing a pumpout system at a single marina to implementing county-wide conservation tillage programs on numerous farms. The CWNS database contains information on 30,142 facilities. Of these, 27,702 are wastewater treatment

⁴ American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in CWNS 2000.

and collection facilities (including CSOs), 2,088 are NPS pollution control projects, and 352 are storm water management program facilities.

Once the States had gathered all the required documentation and entered the data into the CWNS database, they submitted selected documentation to EPA for review and acceptance. EPA evaluated the technical and needs data entered for each facility. The review process adhered to the policy and procedures established at the beginning of the CWNS 2000 to evaluate and accept needs estimates and enhance national consistency and data integrity. Participation was another key factor that affected the quality of CWNS 2000 data. The level of effort that States put forth in reporting their CWNS 2000 data varied considerably. Thus, availability of resources (e.g., staff, time, information) to each State further affected the data quality and the total needs reported nationally in the CWNS 2000. EPA used monthly conference calls, the Internet, *News Alerts*, and e-mail to promote participation in the survey, as well as to assist the States with technical difficulties encountered when entering data.

What are the specific objectives of the Clean Watersheds Needs Survey 2000?

The primary objective of every CWNS is to improve on the information from previous surveys, thereby capturing a more accurate representation of the national needs. The following are the key objectives of the CWNS 2000:

- Update and improve the validity, accuracy, and quality of all needs information by redocumenting outdated information from the 1996 survey.
- Improve the documentation of needs for NPS pollution control, storm water management programs, and the correction of SSOs and CSOs.
- Provide geographic data for all facilities, including latitude, longitude, Congressional district, and watershed boundaries used to support a watershed-based needs analysis.

Documented needs

Needs that have met the CWNS 2000 documentation requirement and were accepted by EPA. Only documented needs are used to report the total needs in this report.

- Update and improve the quality of technical data such as population, flow, treatment level, and discharge method and location.
- Raise awareness of the CWNS among State commissioners and program managers, and emphasize its importance as a management tool for priority planning, funding, and watershed-based management.

What data are presented in this report to Congress?

The needs data from each EPA-accepted facility are presented in this report. All needs included in the survey had to exist on January 1, 2000. As mentioned earlier, EPA and the States made a concerted effort to improve data quality by evaluating the needs carried over from previous Clean Water Needs Surveys. States followed a strict redocumentation protocol that required documentation for every need up to \$20 million in the CWNS 2000 to be dated no later than January 1, 1990. An additional requirement was placed on facilities with total needs greater than \$20 million: documentation for these needs could not be dated prior to January 1, 1994. (A more detailed discussion of the documentation criteria is included in Chapter 2.) Only needs eligible for CWSRF funding are included in the CWNS 2000; however, not all water quality improvement projects were included in the CWNS 2000. Furthermore, data on projects entered into the CWNS 2000 database that did not meet documentation criteria were included separately in this report as Separate State Estimates (SSEs). This report also summarizes the technical data (e.g., population, flow, effluent) for every facility included in the CWNS 2000.

Modeled needs

Estimate or need developed using a model to compensate for needs categories where limited information was available.

Key results and analyses of the needs and technical data are included in Chapter 3. Chapter 4 presents the wet weather SSO model. Summaries of the CWNS 2000 data, 1996 Clean Water Needs Survey data, and CWNS 2000 technical data (population, flow, and so forth) are presented in Appendices A, B, and C, respectively.

Does EPA report documented and modeled needs in the Clean Watersheds Needs Survey 2000?

Unlike previous Clean Water Needs Surveys reports to Congress, this report does not combine documented needs with modeled needs. This is the first report, since the beginning of the Clean Water Needs Survey, in which the needs estimates included in the report rely exclusively on documented needs. For the CWNS 2000, EPA believes that the data entered into the CWNS database adequately represented the Nation's needs for wastewater collection and treatment. For other sources of pollution, such as NPS pollution, SSOs, and municipal storm water management programs, documentation was scarce or simply did not exist. Therefore, this report includes modeled national estimates for these needs categories for comparison purposes only. A discussion of the models follow.

Chapter 4 provides a more detailed description of the wet weather SSO model and the results from the modeling exercise. The CWNS 2000 has no needs category for wet weather SSOs. SSO needs are typically included in needs for secondary wastewater treatment (Category I), sewer replacement/rehabilitation and infiltration/inflow (I/I) correction (Category III), and new sewers and appurtenances (Category IV). EPA modeled SSO needs using CWNS data to better

represent the SSO needs of the country. The SSO model provides State-level estimates and includes capital costs for a combination of increasing treatment capacity, decreasing I/I, and increasing storage.

The NPS model in Appendix D modeled NPS pollution control needs at the national level. This model provides a broader view of the country's NPS needs, and the estimates from the model come closer to capturing actual total NPS needs in all States than does the documented approach. Nevertheless, it provides only a national estimate and does not disaggregate the needs by States. The national estimates of needs included in the NPS model provide a broader spectrum of NPS pollution control categories, including urban runoff, resource extraction, marinas, and hydromodification, which were not provided in the NPS modeled needs reported in the 1996 Clean Water Needs Survey.

The storm water model built on the modeling methodology used in the 1996 Clean Water Needs Survey. The model includes the costs for Phase I and Phase II municipal storm water management programs after deducting Phase I needs that should have been met. A more detailed description of the model and the results from the modeling exercise are included in Appendix E.

How does the Clean Watersheds Needs Survey 2000 facilitate a watershed approach to needs accounting?

EPA and the States have made a concerted effort to gather information on a watershed basis consistent with the watershed management concept. Unlike political boundaries, the watershed provides a comprehensive basis for both analysis and efficient use of resources. One of the objectives for the CWNS 2000 was to gather more geographic information about facilities, including latitude and longitude, as well as upstream and downstream relationships between facilities. Chapter 5 describes national watershed analyses and provides a case study from the Long Island Sound in the northeastern United States to illustrate the potential of

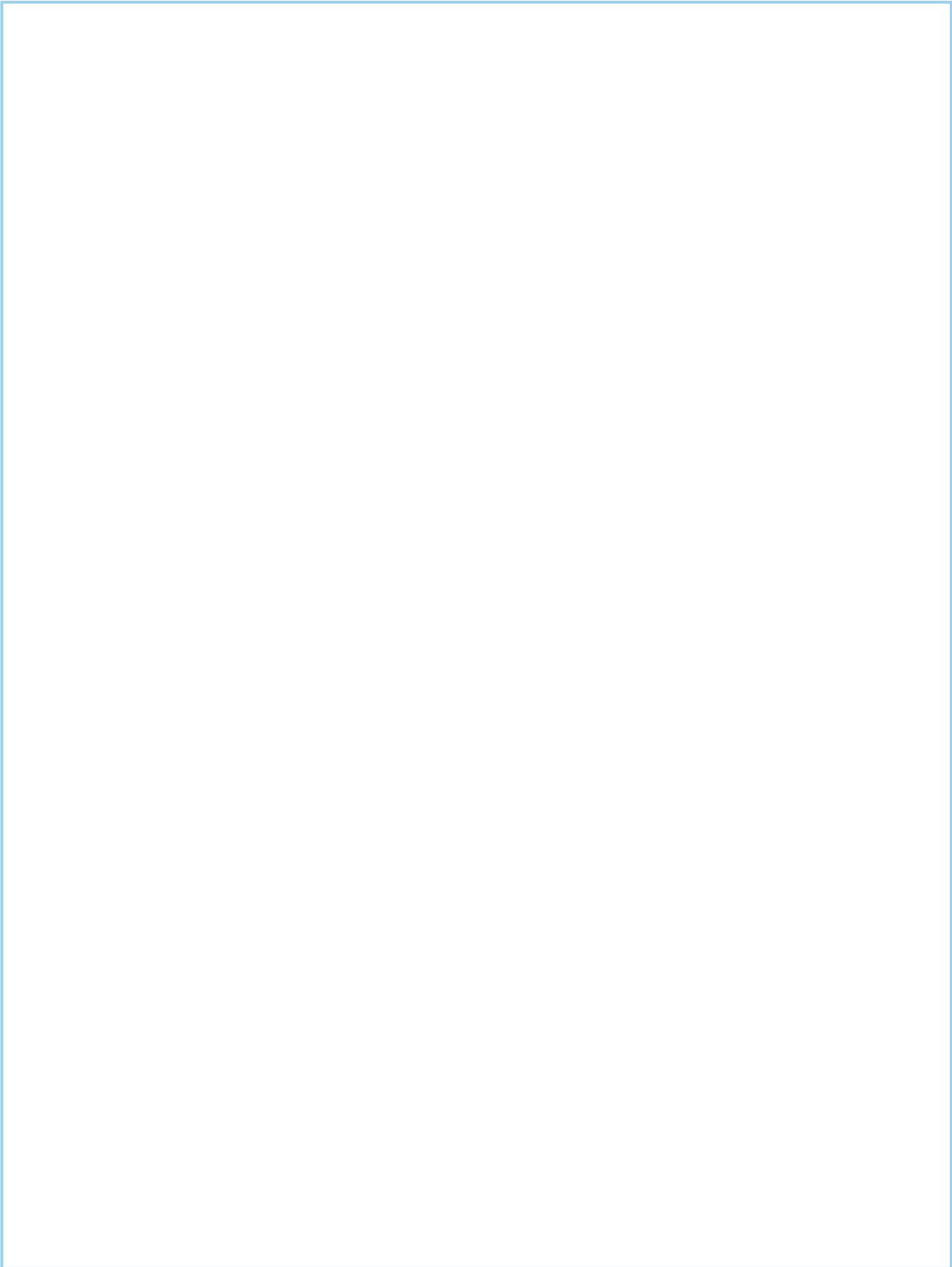
the CWNS to manage need information by watershed. A summary of the CWNS 2000 data by watershed is presented in Appendix F, Table F-1.

What is the history of the Clean Watersheds Needs Survey and what is its relationship to the Clean Water State Revolving Fund?

In 1972 EPA began collecting information about needs to meet the requirements of section 205(a) of the CWA in support of the Construction Grants Program. EPA conducted 11 biennial surveys between 1972 and 1992. For the duration of the Title II Construction Grants Program, the survey of needs focused on providing an estimate of additional publicly owned treatment works (POTWs) needed, as well as an inventory of existing wastewater conveyance and treatment facilities in the United States. Between 1972 and 1996, \$61.1 billion was awarded to municipalities through EPA's Construction Grants Program. In 1987 Congress extended Federal aid for wastewater treatment construction under Title VI of the CWA and provided grants to capitalize the CWSRF. The amendments resulted in a transition toward State and local government responsibility for financing clean water projects. As of January 1, 2000, capitalization

grants under the CWSRF Program totaling \$16.2 billion had been awarded to States. States in turn provided assistance of \$28.2 billion, mostly in the form of loans, to municipalities. By June 20, 2002, capitalization grants awarded to the States totaled \$19.5 billion, and States in turn provided assistance of \$38.7 billion.

Following the 1987 CWA Amendments and the establishment of Title VI and the CWSRF Program, the scope of the 1992 Needs Survey was broadened by adding new needs categories for municipal storm water management programs and NPS pollution control projects to reflect those new funding opportunities. With the inception of the Drinking Water Infrastructure Needs Survey in 1995, EPA changed the frequency of CWNS updates from every 2 years to every 4 years. EPA continued to expand the scope of the survey as water quality problems were nationally recognized. The CWNS 2000 also continued the effort begun by the 1996 Clean Water Needs Survey to improve on the needs data reported for storm water management programs and NPS pollution control facilities, in addition to the needs for the Nation's wastewater treatment and collection system infrastructure.



Chapter 2

Methods for Documenting Needs

This chapter describes the approach used to review the documentation of needs reported in the CWNS 2000. EPA and the States worked together to determine the specific requirements and criteria for the documentation submitted. The needs reported by the States in the CWNS 2000 had to be eligible for funding under the CWSRF. In addition, the CWNS 2000 eligibility requirements developed by the CWNS National Workgroup included specific needs category definitions, six documentation criteria, and 36 documentation types. Descriptions of the needs categories and document types are provided in Appendices G and H.

What is the definition of a need?

As used in the CWNS 2000, a *need* is a water quality or public health problem and an associated abatement cost eligible for funding under the CWSRF. Needs that were not eligible for Federal assistance under Title VI of the CWA, such as operation and maintenance (O&M) costs, house connections to sewers, and costs to acquire land that is not used as part of the treatment process, were not reported as eligible needs in the CWNS 2000. The CWNS 2000 also did not include needs for American Indian reservations because the Indian Health Service conducts a separate survey and provides a report to Congress annually under Public Law 86-121.

What were the Clean Watersheds Needs Survey 2000 needs categories?

The CWNS 2000 used nine categories to describe and report the needs for water pollution control projects. Table 2-1 lists the nine categories. Categories I through IV were used for wastewater treatment and collection

Table 2-1. CWNS 2000 Needs Categories

Category I: Secondary Wastewater Treatment
Category II: Advanced Wastewater Treatment
Category III-A: Infiltration/Inflow Correction
Category III-B: Sewer Replacement/Rehabilitation
Category IV-A: New Collector Sewers and Appurtenances
Category IV-B: New Interceptor Sewers and Appurtenances
Category V: Combined Sewer Overflow Correction
Category VI: Storm Water Management Programs
Category VII-A: NPS Control: Agriculture (Cropland)
Category VII-B: NPS Control: Agriculture (Animals)
Category VII-C: NPS Control: Silviculture
Category VII-D: NPS Control: Urban
Category VII-E: NPS Control: Ground Water Protection (Unknown Source)
Category VII-F: NPS Control: Marinas
Category VII-G: NPS Control: Resource Extraction
Category VII-H: NPS Control: Brownfields
Category VII-I: NPS Control: Storage Tanks
Category VII-J: NPS Control: Sanitary Landfills
Category VII-K: NPS Control: Hydromodification
Category VIII: Confined Animal–Point Source ^a
Category IX: Mining–Point Source ^a

^a Categories VIII and IX were generally not CWSRF-eligible and were recorded as SSEs.

needs; Categories V and VI were for wet weather needs; and Category VII, which was divided into 11 subcategories, was for NPS needs. For the CWNS 2000, Category VII was expanded (since the 1996 Clean Water Needs Survey) to better capture needs associated with NPS pollution. These changes are highlighted in Table 2-2. Category VIII, Confined Animal–Point Source, and Category IX, Mining–Point Source, were

Table 2-2. A Comparison of the 1996 Clean Water Needs Survey and CWNS 2000 NPS Pollution Control Needs Categories

Category	1996 Clean Water Needs Survey Category	CWNS 2000 Category
Category VII-A	NPS Control: Agriculture (Cropland)	Same as in 1996
Category VII-B	NPS Control: Agriculture (Animals)	Same as in 1996
Category VII-C	NPS Control: Silviculture	Same as in 1996
Category VII-D	NPS Control: Urban	Same as in 1996
Category VII-E	NPS Control: Ground Water Protection (Unknown Source)	Same as in 1996
Category VII-F	NPS Control: Estuaries	NPS Control: Marinas
Category VII-G	NPS Control: Wetlands Protection	NPS Control: Resource Extraction
Category VII-H	Not present in 1996	NPS Control: Brownfields
Category VII-I	Not present in 1996	NPS Control: Storage Tanks
Category VII-J	Not present in 1996	NPS Control: Sanitary Landfills
Category VII-K	Not present in 1996	NPS Control: Hydromodification

recorded as SSEs in the CWNS 2000 database because those facilities were not CWSRF-eligible unless they were publicly owned. More detailed descriptions of the CWNS 2000 needs categories are provided in Appendix G, Table G-1.

What time period was covered?

The CWNS 2000 took a snapshot in time, compiling short-term and long-term needs that could be documented in accordance with nationally uniform standards. All needs reported in the CWNS 2000 existed as of January 1, 2000, and were eligible for CWSRF assistance under the CWA. Unlike wastewater infrastructure planning during the 1970s and 1980s, which used a 20-year planning horizon (as a result of the Title II Construction Grants Program), current wastewater infrastructure planning horizons vary considerably across the United States. After the CWSRF program was established, communities began to plan and estimate their wastewater infrastructure projects over a shorter period of time. Now this planning horizon is often only 5 or 10 years. A few States, however, project their needs for up to a 20-year period. As a result, the CWNS 2000 cannot provide a comprehensive estimate of national or State wastewater needs in a uniform planning horizon. Other recent studies, such as the Water Infrastructure Network

Report and EPA's Gap Analysis (see Chapter 3), have been developed to provide a more comprehensive picture of the Nation's needs. It should be noted that the aggregate capital expenditures contained in this report represent a simple summation of expenditures that might be made at different points in time over a multiyear planning horizon. No attempt has been made to predict the time pattern of these expenditures or to discount them to arrive at a present value sum.

What are documented needs?

For the CWNS 2000, States were required to justify an existing water quality or public health problem for a facility by providing EPA with written studies, plans, or other information describing a solution to the identified problem. Such documentation had to meet criteria that EPA and the CWNS National Workgroup had established to ensure the national consistency and credibility of the data included in this report. In addition, the documentation could include a cost estimate, although submission of separate documentation for cost data was acceptable. Similar to the requirements for needs documentation, cost estimates had to meet certain criteria to ensure national consistency and the credibility of the data. These requirements are summarized under "What costs were considered eligible?" later in this chapter. The CWNS

National Workgroup also developed the following criteria for redocumentation of outdated needs: for documenting needs greater than \$20 million (January 2000 dollar base), the documentation date had to be January 1, 1994, or later; for all other needs, the documentation date had to be January 1, 1990, or later. The redocumentation requirement applied to both the cost data and justification of a water quality or public health problem.

What were the documentation requirements?

For conducting the CWNS 2000, it was necessary to have consistent documentation criteria for accepting and reporting a facility's needs. For each facility, the water quality or public health problems had to be current, and the documentation had to include project-specific data. EPA, in consultation with the CWNS National Workgroup, established six documentation criteria, adopted from the CWSRF Program, that the States were required to use to justify the needs for a facility in the CWNS 2000:

1. A description of the water quality impairment and information on the potential source. The problem description should include specific pollutant source information; a general statement about water quality impairment does not meet this criterion.
2. The location of the problem, which should be included as a latitude/longitude point; in the case of a watershed (for NPS projects), it may be entered as a polygon.
3. One or more specific pollution control measures or BMPs used to address the problem.
4. The cost to implement each pollution control measure or BMP. General estimates for the problem area are not permitted; only site-specific data may be used to generate the costs.
5. The source of the costs (e.g., an engineer's estimate, facility plan, cost of comparable practices, estimates from equipment suppliers) for each solution.

Facility

A project and location involved in water quality management, such as a wastewater treatment plant or sewer system, a municipal separate storm sewer system, or an NPS pollution control project. Although the term *facility* is typically thought of as wastewater treatment facility or some other structure, for NPS pollution control it refers to a place. Data in the CWNS 2000 were collected and organized by facility for all types of water pollution control.

6. The total costs for all pollution control measures and BMPs documented for a facility. (All costs are converted to January 1, 2000, dollars for the *CWNS 2000 Report to Congress*.)

The documentation submitted for all types of facility needs in the CWNS 2000, including storm water management program and NPS pollution control needs, was required to meet the six criteria. Meeting the criteria could be demanding on the States' resources and resulted in the submission of many types of documents for review.

What types of documentation were accepted?

To maintain consistency in documentation of needs from State to State, the CWNS National Workgroup approved a list of 36 acceptable types of documentation. Table H-1 in Appendix H lists and describes the approved types of documentation for the CWNS 2000. Generally, if a document was one of the approved document types, EPA accepted it for needs justification as long as it included sufficient details concerning the proposed project—a definition of the problem and a description of the solution to the problem.

Once a State adequately documented a water quality or public health problem, EPA accepted the documentation for the purposes of the CWNS 2000, regardless of whether a documented cost estimate was available. States could use a separate document to

justify cost estimates. This approach allowed States to use a wide variety of documents to justify needs rather than being restricted to only those containing cost data. Nationally derived and EPA-approved construction cost curves were available in the CWNS 2000 database system to calculate a cost when information was insufficient to support and document a cost estimate. The cost curves were available to calculate costs for Categories I, II, IV, and V, which include new treatment plants, increased treatment plant capacity, increased level of treatment, new collector sewers, new interceptor sewers, septic tank upgrades, and CSO abatement. The cost curves in the CWNS 2000 were unchanged from those available in the 1996 Clean Water Needs Survey except for the adjustment for the base year.

What costs were considered eligible?

The Clean Water State Revolving Fund Funding Framework, which EPA issued in October 1996, requires that all projects must be “capital” projects, such as constructing wastewater treatment facilities to meet water quality or NPDES permit requirements, or planting trees and shrubs, purchasing equipment, and conducting environmental cleanups for projects that control nonpoint sources of pollution (USEPA, 1996). O&M costs, ineligible for CWSRF funding, were not included in the CWNS 2000 needs.

Eligible costs for municipal storm water management programs (Category VI) included the CWSRF-eligible portions of both the Phase I and Phase II storm water programs. Phase II MS4s were not required to be covered by an NPDES storm water permit until March 10, 2003. The documentation submitted for those facilities had to include evidence that the municipality was identified in the regulation or was potentially designated based on being in an urbanized area.

Eligible costs for the NPS pollution control cost categories (in Category VII) were specifically related to the types of NPS pollution sources. For a cost estimate to be accepted into the CWNS 2000, the documentation had to clearly indicate the types of BMPs used, the

number of BMPs used per facility, the cost for each BMP, and the specific location of the NPS pollution. Typical NPS pollution control projects entered into the CWNS 2000 include implementing agriculture BMPs, replacing leaking underground storage tanks, and replacing privately owned failed septic systems and installing new on-site systems.

What is the difference between documented needs and Separate State Estimates?

In cases where documentation for the needs did not meet all six basic criteria or where the needs could not be estimated using the cost curves, EPA reported the documented needs as SSEs with the concurrence of the States. For the purposes of this report, SSE needs are not reported in the total needs displayed in the key results (Chapter 3); however, SSEs are reported separately in Chapter 3, and at the State level in Tables A-11 through A-13 in Appendix A. SSE designation implies only that the documented needs were not available (or did not meet the CWNS 2000 eligibility criteria) for a particular project. In addition, designating cost information as an SSE for a facility did not prevent the reporting of other technical data (e.g., population, flow, effluent) associated with the facility. States were permitted to report any needs estimates they deemed justified in the CWNS as SSEs without EPA review.

How did documentation requirements differ for small communities?

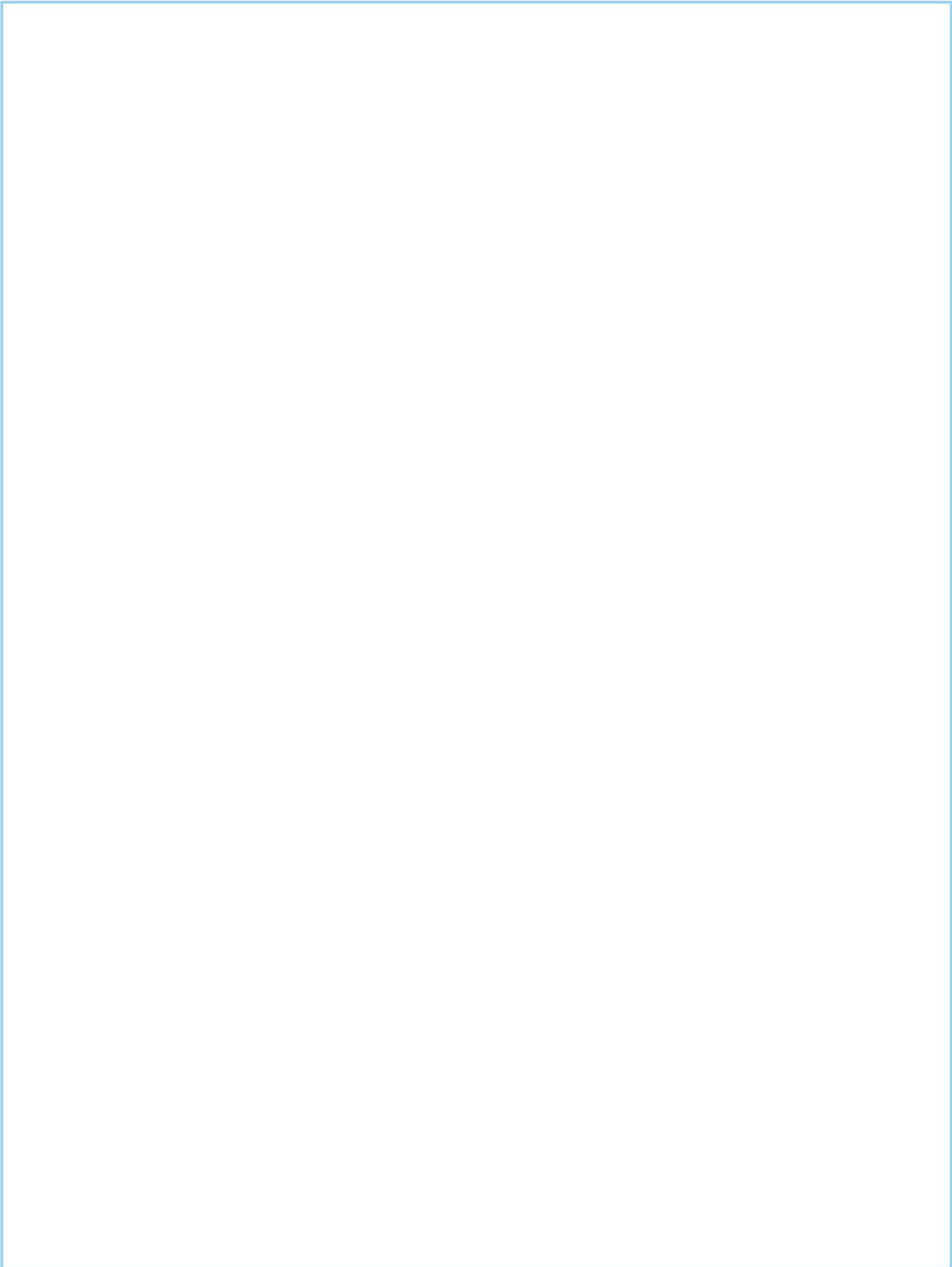
Small communities tend to have fewer resources available for monitoring and facility evaluations, which form the basis of the reports—facility plans, engineer reports, and capital improvement plans—used as documentation for the CWNS 2000. As a result, national small community needs tend to be underestimated in this report because small communities often did not have acceptable documentation of their needs.

To more fully capture the needs of small communities, EPA and the CWNS National Workgroup established

guidelines to allow small communities to use alternative forms of documentation that were not acceptable from larger communities. Small communities with a January 2000 population of fewer than 3,500 people were allowed to use alternative documentation when standard documentation was not available.¹ In general, alternative documentation for small communities required a description of the proposed project, an explanation of

why the project was necessary (e.g., public health or water quality problem), and a statement of how the project would benefit the community. This information was submitted on a standardized survey form that required signatures from suitable community and State officials. As with standard documents, if cost estimates were not provided, the State could use construction cost curves for Categories I, II, IV, and V to estimate the costs.

¹ Standard document types are listed in Appendix H, Table H-1, document types 1 through 27. Alternative documents available for communities with current populations of fewer than 3,500 people are listed as document types 28 through 31 in the same table.



Chapter 3

Key Results

Need

A water quality or public health problem and an associated abatement cost that is eligible for funding under the CWSRF.

What are the total needs for the Nation?

The total CWSRF-eligible needs for the Nation as of January 1, 2000, are \$181.2 billion (Table 3-1). Appendix A (Tables A-1 and A-2) presents the total CWSRF-eligible needs for all categories and by State. Unlike the previous two surveys (1992 and 1996), which combined documented and modeled needs, all of the needs presented in this chapter are documented.¹ The needs for wastewater treatment (Categories I and II) are \$57.2 billion, or 31.6 percent of the total needs. Needs for wastewater collection (Categories III and IV) amount to \$54.1 billion, or 29.9 percent of the total needs. Category V (Combined Sewer Overflow Correction) needs are \$50.6 billion (27.9 percent), and Category VI (storm water management programs) needs are \$5.5 billion (3.0 percent). Nonpoint source pollution control needs (Category VII) total \$13.8 billion (7.6 percent). These needs are presented in Figure 3-1. As discussed later, the storm water management program and NPS pollution control needs presented in this report underestimate the Nation's needs because only a limited number of States were able to dedicate resources toward identifying and reporting those needs.

Figure 3-2 displays the geographic distribution of the total documented needs by State. The largest total needs occur in New York and California, which is similar to the results of the 1996 Clean Water Needs Survey. New York has \$20.4 billion in needs, while California has more than \$14.4 billion in needs. New Jersey and Illinois each have needs in excess of \$10 billion.

Three-fourths (75.5 percent) of the total needs reported are concentrated in 16 States, while 22 States and the

Table 3-1. Total Documented Needs Reported in the CWNS 2000 (January 2000 dollars in billions)

Needs Category	Total Needs
Publicly Owned Wastewater Treatment and Collection Systems and Storm Water Management Programs	
I Secondary wastewater treatment	36.8
II Advanced wastewater treatment	20.4
III-A Infiltration/inflow correction	8.2
III-B Sewer replacement/rehabilitation	16.8
IV-A New collector sewers and appurtenances	14.3
IV-B New interceptor sewers and appurtenances	14.8
V Combined sewer overflow correction	50.6
VI Storm water management programs	5.5
Total Categories I-VI	167.4
Nonpoint Source Pollution Control	
VII-A Agriculture (cropland)	0.5
VII-B Agriculture (animals)	0.7
VII-C Silviculture	0.04
VII-D Urban	4.4
VII-E Ground water protection (unknown source)	0.9
VII-F Marinas	0.002
VII-G Resource extraction	0.04
VII-H Brownfields	0.4
VII-I Storage tanks	1.0
VII-J Sanitary landfills	1.8
VII-K Hydromodification	4.1
Total Category VII	13.8
Grand Total	181.2

Notes:

- 1) Nonpoint source pollution control modeled needs are \$21.5 billion in January 2000 dollars (Appendix D).
- 2) Costs for operation and maintenance are not CWSRF-eligible and therefore are not included.
- 3) See Appendix A, Tables A-1 and A-2, for needs by category and State. Needs estimates presented in Table 3-1 may vary slightly from those presented in the text because of rounding.

¹ A separate discussion of the SSO model is presented in Chapter 4. The NPS pollution control model is described in Appendix D, and the storm water model is discussed in Appendix E.

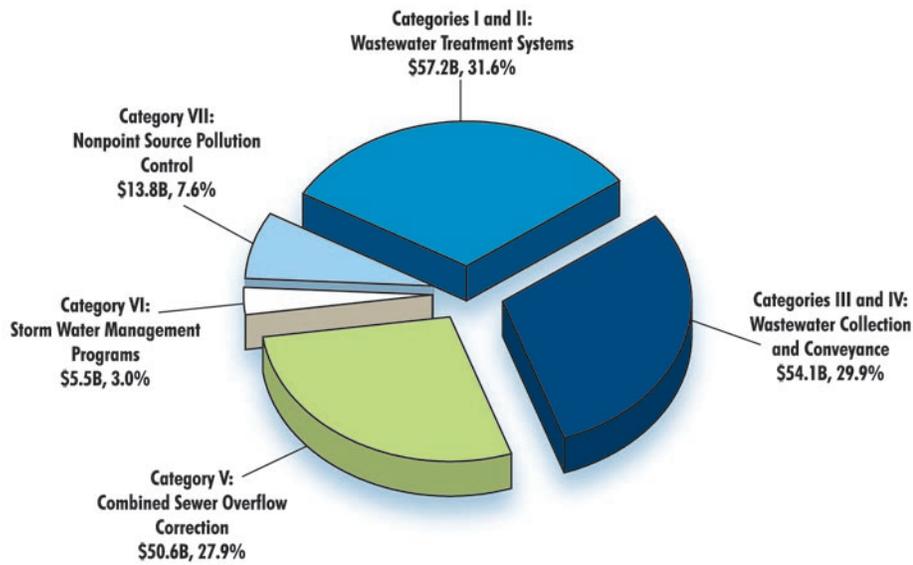


Figure 3-1. CWNS 2000 total documented needs (January 2000 dollars). The figure shows only *documented* needs. Note that nonpoint source pollution control *modeled* needs are \$21.5 billion in January 2000 dollars (Appendix D).

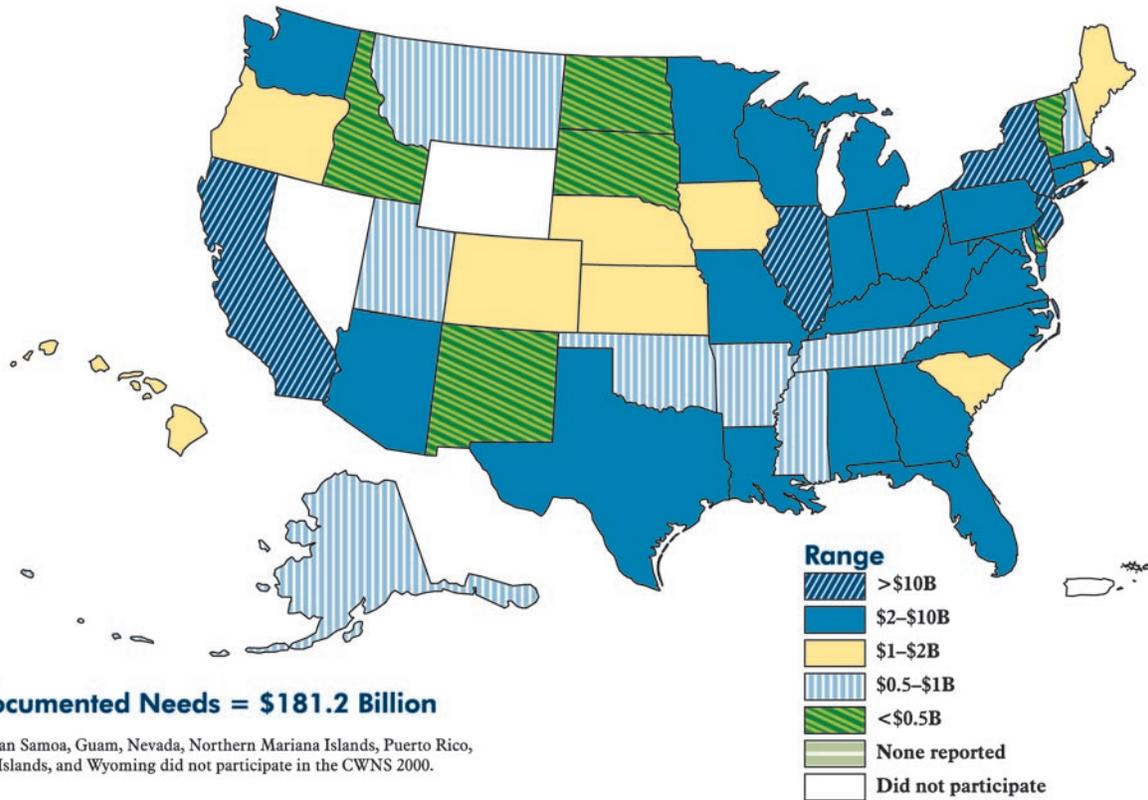


Figure 3-2. Geographic distribution of total documented needs (January 2000 dollars in billions).

District of Columbia report less than 1 percent of the total needs each.

What are the recent trends in the Nation's municipal wastewater treatment infrastructure needs?

In 1972 more than 4,800 facilities were providing less than secondary treatment or discharging raw sewage into the Nation's waters. As a result of the CWA and its associated funding mechanisms, significant progress has been made to improve wastewater treatment across the Nation. Construction Grants provided municipalities with \$61.1 billion from 1972 though 1996 toward meeting the goals of the CWA. In addition, \$16.2 billion had been awarded to States through the CWSRF Program as of January 1, 2000. In turn, the States provided assistance of \$28.2 billion to municipalities, mainly through loans. Tables 3-2 and 3-3 present the current status of the level of treatment based on past needs surveys and the anticipated progress based on the needs reported in this report.² To report this progress, the States invest a significant effort in each survey to identify new projects and update previously identified projects. States also examine individual facilities to determine whether proposed projects have been built and whether subsequent planning documents show consolidation or splitting of specific construction projects.

The 1992 Needs Survey reported an inventory of 15,613 operational treatment plants serving approximately 180.6 million people. About 32.2 percent and 26.4 percent of the U.S. population were served by secondary and greater-than-secondary treatment plants, respectively. About 8.4 percent of the population was served by 868 facilities providing less-than-secondary treatment. In 1996 the number of operational facilities increased to 16,024; in 2000, to 16,255. Since 1992 the number of

facilities providing less-than-secondary treatment has declined by 94.5 percent, and the population served by these facilities has been reduced from 21.7 million people to 6.4 million people. In comparison to 1992, an additional 27.2 million people receive centralized collection and wastewater treatment, and 69 percent of the U.S. population is served by municipal wastewater treatment plants that provide secondary or better levels of treatment.

Table 3-3 shows the projected improvements in wastewater treatment infrastructure if the secondary and advanced wastewater treatment needs (Categories I and II) are met. Information for this table was taken from the 1996 Clean Water Needs Survey when States did not have the resources to update data for all their facilities or when States and territories did not participate in the CWNS 2000. The number of facilities providing secondary or more advanced treatment is projected to increase by 8.2 percent from 14,048 to 15,202. Based on the needs presented, EPA projects that a total of 17,674 operational facilities will serve a future population of 269 million people, or 83 percent of the U.S. population. EPA expects that the projected increase in centralized collection and treatment systems might be lower than expected for the next survey as more planning authorities recognize that properly designed, constructed, and operated on-site



Photo by Lynn Betts, courtesy of USDA NRCS

² Other related technical data discussed in this section are provided in Appendix C, Table C-4.

Table 3-2. Improvements in Treatment Level of the Nation's Municipal Wastewater Treatment Facilities

Level of Treatment	1992 Number of Facilities	1996 Number of Facilities	Change 1992–1996	2000 Number of Facilities	Change 1992–2000	Change 1996–2000
No Discharge ^a	1,981	2,032	2.6%	1,938	-2.2%	-4.6%
Less Than Secondary ^b	868	176	-79.7%	47	-94.5%	-73.3%
Secondary	9,086	9,388	3.3%	9,156	0.8%	-2.5%
Greater Than Secondary	3,678	4,428	20.4%	4,892	33.0%	10.5%
Total Facilities	15,613	16,024	2.6%	16,255 ^c	4.1%	1.4%

Note: A secondary treatment level is defined as meeting an effluent quality of 30 mg/L for biochemical oxygen demand (BOD) and suspended solids.

^a No discharge refers to facilities that do not discharge effluent to surface waters (e.g., spray irrigation, ground water recharge).

^b Includes facilities granted section 301(h) waivers from secondary treatment for discharges to marine waters. As of January 1, 2000, waivers for 34 facilities in the CWNS 2000 database had been granted or were pending.

^c The number of facilities includes 222 facilities that provide partial treatment and whose flow goes to another facility for further treatment.

Table 3-3. Projected Infrastructure Improvements If All CWNS 2000 Needs Are Met

Indicator	Existing	Projected ^a	Change
Total number of operational treatment facilities	16,255 ^b	17,674 ^b	8.7%
Treatment facilities providing secondary or more advanced treatment	14,048	15,202	8.2%
Treatment facilities providing less-than-secondary treatment	47	27	-42.6%
Treatment facilities with granted or pending section 301(h) waivers	34	26	-23.5%
Treatment facilities without section 301(h) waivers	13	1	-92.3%
Total design capacity of treatment facilities (in mgd)	45,058	50,041	11.1%
Total population served by wastewater treatment facilities (in millions)	207.8	269.0	29.5%

Note: This table contains information from EPA-reviewed and accepted facilities and information from facilities that were not reviewed by EPA. EPA did not review facilities for which States did not have the resources to update their data or facilities in States and territories that did not participate in the CWNS 2000. In such circumstances, information for this table was taken from the 1996 Clean Water Needs Survey.

^a Projected infrastructure levels if all needs are met.

^b These numbers include totals for facilities that are no discharge or provide only partial treatment.

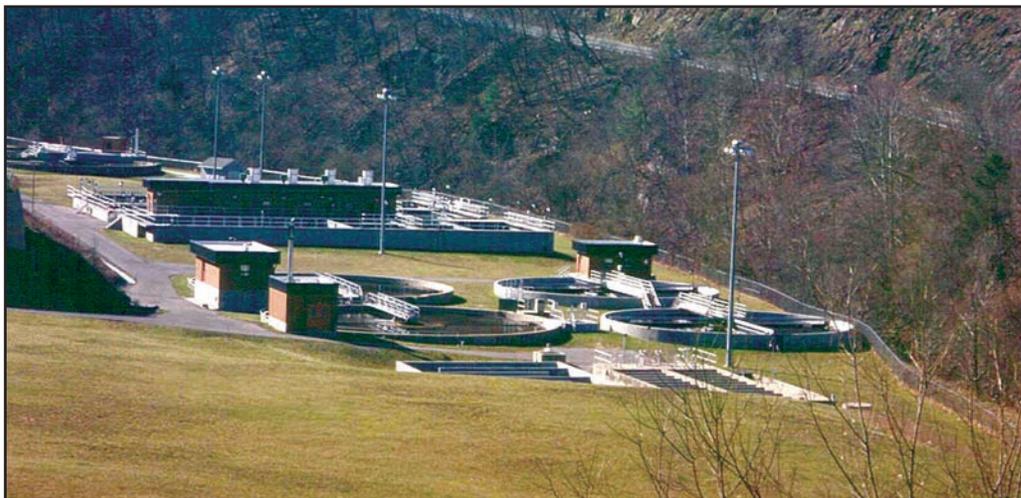


Photo courtesy of Virginia Department of Health

systems should be considered a permanent part of the wastewater infrastructure rather than an interim solution.

The number of facilities that provide less-than-secondary treatment is projected to decline from 47 facilities serving 6.4 million people to 27 facilities serving 3.9 million people, nearly all of whom (99.99 percent) will be served by facilities with section 301(h) waivers. Section 301(h) of the CWA provides an opportunity for a facility that discharges to marine waters to obtain a waiver from the act's secondary treatment requirements, provided the facility can show compliance with a number of stringent criteria intended to ensure that the less-than-secondary discharge will not adversely affect the marine environment.

As the Nation moves into the new millennium, continued improvements in infrastructure might be measured not by population served and improved levels of treatment but by measures of capital infrastructure renewal (that is, projects that focus on rehabilitation, replacement, and process improvement of existing infrastructure). This is a reasonable progression because a significant portion of the Nation's infrastructure has reached, or soon will reach, the end of its projected useful life.

How have the wastewater treatment and collection needs changed?

The needs reported, in January 2000 dollars, for the wastewater treatment and collection categories (Categories I through V) increased from \$133.7 billion to \$161.9 billion, a \$28.2 billion (or 21.1 percent) increase from the 1996 Clean Water Needs Survey to the CWNS 2000 (Table 3-4). This change reflects, in part, facility improvements for meeting increasingly stringent water quality standards for treatment plant effluents, SSO correction, and maintenance of existing infrastructure. Four needs categories account for the most significant increase in needs since the 1996 Clean Water Needs Survey: Category I increased by \$7.4 billion; Category III-A, by \$4.5 billion; Category III-B, by \$9.1 billion; and Category IV-B, by \$2.9 billion.

Secondary treatment

A treatment level that meets an effluent quality of 30 mg/L (30-day average) of both BOD₅ and total suspended solids.

Advanced treatment

A treatment level that is more stringent than secondary or produces a significant reduction in nonconventional pollutants present in the wastewater effluent.

Analysis of the CWNS 2000 needs categories with substantial changes in need from 1996 revealed a distinct pattern. Overall, 125 wastewater treatment and collection system facilities had total needs that increased by more than \$100 million over their total reported needs in 1996. The increased needs from these facilities account for \$38.7 billion (24 percent) of the total wastewater treatment and collection system needs in the CWNS 2000. A small proportion of the facilities analyzed (less than 5 percent) have increases greater than \$100 million in at least one need category from the same category need in the 1996 Clean Water Needs Survey. The impact of these facilities on the overall increase in needs is substantial and disproportionate to the number of facilities reporting needs. For example, the increase of secondary wastewater treatment (Category I) needs from facilities where Category I needs increased by \$100 million accounted for 22.1 percent of the total Category I needs but represented only 0.4 percent of the total number of facilities reporting Category I needs.

About \$19.0 billion in Category I (secondary wastewater treatment) needs and \$13.7 billion in Category II (advanced wastewater treatment) needs are new needs entered for the CWNS 2000. These needs, totaling \$32.7 billion, are a subset of the \$57.2 billion in Category I and II needs reported in Table 3-4. The remaining \$17.8 billion in Category I needs and \$6.7 billion in Category II needs were entered for the same facilities in the 1996 Clean Water Need Survey and updated for the CWNS 2000. These needs are either carried forward or associated with projects that

Table 3-4. Comparison of Total Needs for the 1992 Needs Survey, 1996 Clean Water Needs Survey, and CWNS 2000 (January 2000 dollars in billions)

Needs Category		1992 ^a	1996 ^a	2000
Publicly Owned Wastewater Treatment and Collection Systems and Storm Water Management Programs				
I	Secondary wastewater treatment	39.3	29.4	36.8
II	Advanced wastewater treatment	19.4	19.4	20.4
III-A	Infiltration/inflow correction	3.4	3.7	8.2
III-B	Sewer replacement/rehabilitation	4.6	7.7	16.8
IV-A	New collector sewers and appurtenances	22.5	12.0	14.3
IV-B	New interceptor sewers and appurtenances	18.4	11.9	14.8
V	Combined sewer overflow correction	51.7 ^b	49.6	50.6
VI	Storm water management programs	0.1 ^b	8.2 ^b	5.5
Nonpoint Source Pollution Control Projects				
VII-A	Agriculture (cropland)	4.7 ^b	4.2 ^b	0.5
VII-B	Agriculture (animals)	3.4 ^b	2.3 ^b	0.7
VII-C	Silviculture	3.0 ^b	3.9 ^b	0.04
VII-D	Urban	–	1.1	4.4
VII-E	Ground water protection: unknown source	1.4	1.1	0.9
	Estuaries ^c	0.01	0.04	–
	Wetlands ^c	0.04	0.01	–
VII-F	Marinas	–	–	0.002
VII-G	Resource extraction	–	–	0.04
VII-H	Brownfields	–	–	0.4
VII-I	Storage tanks	–	–	1.0
VII-J	Sanitary landfills	–	–	1.8
VII-K	Hydromodification	–	–	4.1
Total Needs		172.0	154.6	181.2
Treatment Categories I and II only		58.7	48.8	57.2
Collection and conveyance Categories III and IV only		48.9	35.3	54.1
Category I to V subtotal		159.3	133.7	161.9

^a The needs from 1992 and 1996 were inflated to January 2000 dollars for comparison with CWNS 2000 data.

^b Modeled needs.

^c Documented needs for estuaries and wetlands were provided by States during the 1992 and 1996 surveys, but they are no longer reported as individual categories.

provided updated cost estimates for Category I or II. Of the \$32.7 billion in new Category I and II needs, 54.4 percent of the needs are from California, New York, Arizona, Texas, Florida, and Maryland.

Approximately 36.1 percent (\$11.8 billion) of the \$32.7 billion is associated with projects that result in infrastructure improvements to improve the performance of the plant, such as increasing the effluent level (e.g., from secondary to advanced treatment), or increasing the plant capacity to keep up with population growth (Table 3-5). Infrastructure improvements also include the construction of new wastewater treatment plants. Capital renewal projects accounted for 32.4 percent (\$10.6 billion) of the \$32.7 billion in new needs. Capital renewal projects sustain the current level of performance of the plant by implementing rehabilitation, refurbishing, or replacing capital assets to restore an asset, facility, or system to its original condition and function, without increasing treatment capacity or effluent level. Examples include replacing coarse bubble diffusers with fine bubble diffusers or switching from disinfection by chlorination to ultraviolet disinfection, or any other project that does not significantly enhance the performance of the plant. Capital renewal does not include costs for routine operation and maintenance at the wastewater treatment plant. The remaining \$10.3 billion (31.5 percent) is associated with projects that represent a combination of infrastructure improvements and capital infrastructure renewal.

Category III-A and III-B needs are for I/I correction and sewer replacement and rehabilitation. I/I occurs when flow from wet weather conditions enters collection systems through various means, such as pipe cracks and broken joints. Sixty-seven percent of the Category III-A needs were reported for facilities that also require rehabilitation or replacement to correct the documented I/I problems. Facilities requiring rehabilitation or replacement of sewers made up \$10.4 billion (62 percent) of the total Category III-B needs of \$16.8 billion. The remainder of the Category III-A and III-B needs are for facilities that require improvements in addition to rehabilitation and replacement, such

Table 3-5. Wastewater Treatment (Category I and II) Needs Entered During the CWNS 2000 (January 2000 dollars in billions)

Wastewater Treatment Plant Investment	January 2000 Dollars (billions)	Percent of Total	Number of Facilities
Infrastructure improvements	11.8	36.1	1,942
Capital renewal	10.6	32.4	1,571
Combination of infrastructure improvements and capital renewal	10.3	31.5	492
Total	32.7	100.0	4,005

as replacing worn-out pumps or adding supervisory control and data acquisition (SCADA) computer systems. The increase in Category III-A and III-B needs since the 1996 Clean Water Needs Survey demonstrates that communities are beginning to plan for the correction of problems that are symptomatic of SSOs and, to a lesser extent, CSOs. A total of \$3.5 billion in Category III-A needs was reported for facilities that States identified as having SSO problems. To further investigate the total capital costs of correcting SSOs for the CWNS 2000, EPA developed an SSO model, which is described in Chapter 4.

What are the needs for the correction of combined sewer overflows?

Wet weather events are known to cause a variety of water quality problems throughout the Nation. Under various circumstances, precipitation in the form of snow or rain generates runoff that can be contaminated by a number of different pollutant sources (e.g., industrial operations, roadways, land use practices). Where combined sewer systems are in use, wet weather contributes to CSOs. CSOs contain not only storm water but also untreated human and industrial waste, toxic materials, and debris. These materials can be a major water pollution concern for cities with combined sewer systems.

In December 2001 EPA released a report to Congress titled *Implementation and Enforcement of the Combined*



Photo courtesy of USEPA OWM

Sewer Overflow Control Policy, hereinafter called the CSO Report. In the CSO Report, EPA documented that 772 communities with CSOs in 31 States and the District of Columbia have been issued 859 CSO NPDES permits that regulate 9,471 CSO discharge points (USEPA, 2001a). In many cases, the facility associated with a CSO community or a CSO permit in the CSO Report is one of the 799 facilities from 33³ states and the District of Columbia with CSO correction needs reported in the CWNS 2000. However, because of the complexity associated with permitting CSOs and the varied ownership, in particular for satellite collection systems, the number of facilities reported here cannot be directly compared to either the number of CSO permits or the number of CSO communities reported in the CSO Report.

As with other needs categories, States were requested to enter documented needs when available. During the CWNS 2000, States began to enter cost estimates from Long-Term Control Plans (LTCPs). Thirty-four facilities from 10 states documented CSO (Category V) needs using LTCPs. Needs documented in LTCPs account for 7.7 percent of the Category V needs reported in this survey. LTCPs provide the most reliable estimates for the CSO control “Presumption Approach” in the 1994 CSO Policy. (See explanation in the following paragraph.)

When LTCPs or other engineering and planning documents were not available, States could use cost

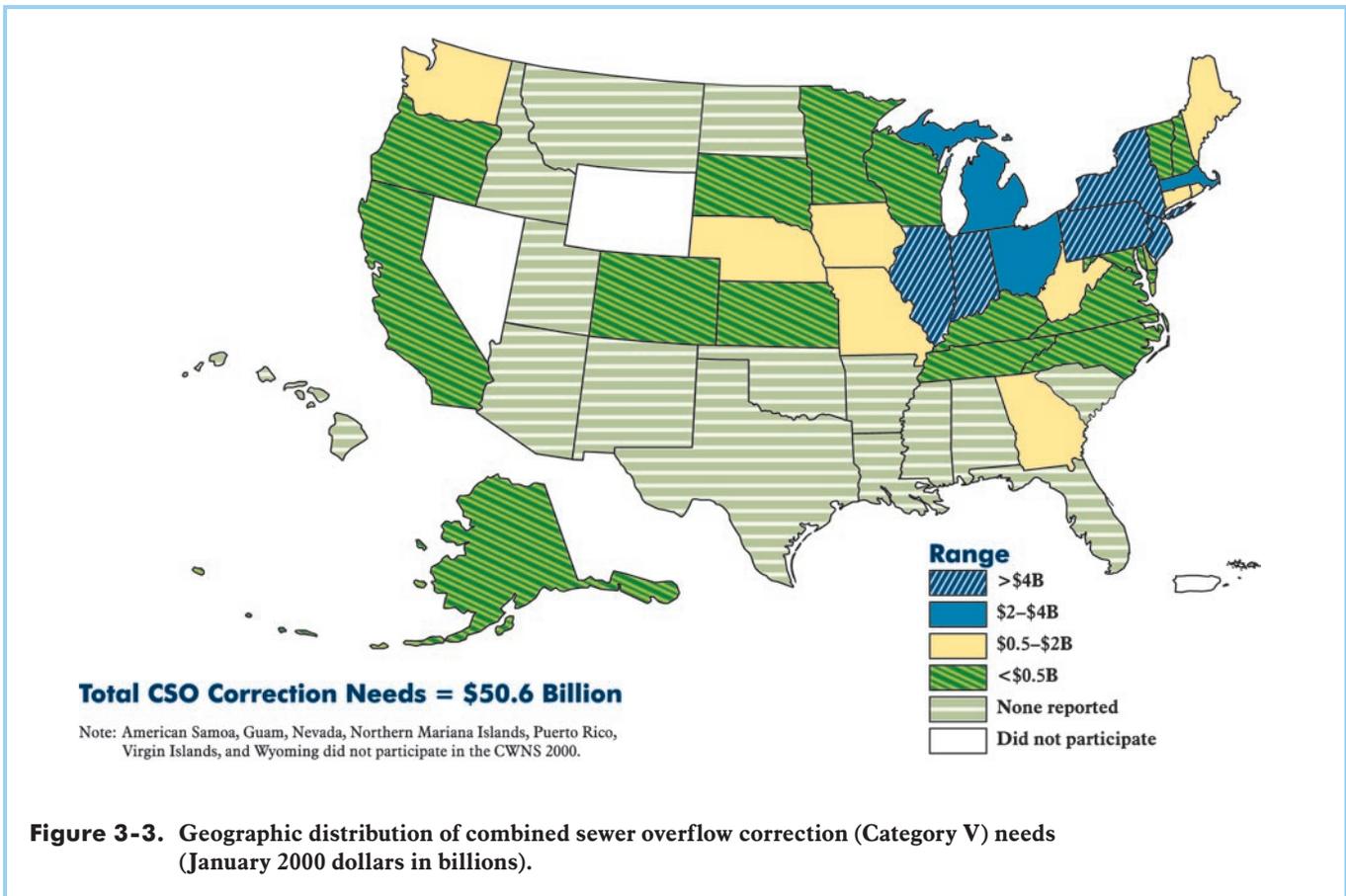
curves to estimate Category V needs. The cost curve methodology for CWNS 2000 was the same as that used in the 1996 Clean Water Needs Survey. The cost curves are based on the approach in the 1994 CSO Policy. The approach calls for capturing 85 percent of the flows that enter the combined sewer system during wet weather events and providing those flows with the equivalent of primary clarification, solids and floatables disposal, and disinfection of the effluent (USEPA, 1994).

EPA is reporting a documented need of \$50.6 billion for control of CSOs. As indicated above, this estimate is based primarily on the “Presumption Approach” in the 1994 CSO Policy. Figure 3-3 shows the geographic distribution of Category V needs. In the CWNS 2000, 799 facilities in 33 states and the District of Columbia reported Category V needs. The largest Category V needs continue to be concentrated in Illinois, Indiana, Massachusetts, Michigan, New Jersey, New York, Ohio, and Pennsylvania. These eight States account for 76.3 percent of the total Category V needs. These results are similar to those of the 1996 Clean Water Need Survey, in which the same eight States accounted for 77.8 percent of the total Category V needs. Appendix C, Table C-5, presents the number of facilities with Category V needs by State and the total Category V needs for the 1996 Clean Water Needs Survey (inflated to January 2000 dollars) and the CWNS 2000.

What are the needs for municipal storm water management programs?

In response to the 1987 Amendments to the CWA, EPA published regulations implementing Phase I of the NPDES Storm Water Program in 1990. Under Phase I, EPA required NPDES permit coverage for storm water discharges from “medium” and “large” MS4s. The Phase I MS4 requirements are applicable to systems located in incorporated areas or in counties that EPA has identified as having MS4s serving populations of more than 100,000 and systems that the EPA Administrator or the State has designated. The Phase II Final Rule, also a result of the 1987 CWA Amendments, was published in the *Federal Register* on

³ Colorado and North Carolina are not listed in the *Implementation and Enforcement of the Combined Sewer Overflow Control Policy* (December 2001); however, they have identified Category V needs for CSO correction in the CWNS 2000.



December 8, 1999. It requires NPDES permit coverage for storm water discharges from “small” MS4s, defined as systems serving populations ranging from 99,999 people to a lower limit based on the U.S. Census Bureau’s definition of an urbanized area (USEPA, 1999).⁴

Twenty States reported \$5.5 billion in needs for developing and implementing municipal storm water management programs (Category VI) under Phases I and II during the CWNS 2000. Appendix A, Table A-1, presents the storm water management program needs by State.

Large and medium MS4s account for \$4.9 billion, or 89 percent of the total storm water management program needs. Small MS4s account for the remaining 11 percent or \$0.6 billion in storm water management program needs, and these needs may include both Phase I and Phase II costs.⁵ The geographic distribution of storm water management program needs is presented in

Figure 3-4. Texas, Arizona, Florida, Maryland, and California reported \$2.23 billion, \$1.25 billion, \$0.68 billion, \$0.46 billion, and \$0.35 billion in storm water management program needs, respectively. These five States, from a total of 20 States reporting documented storm water needs, account for 90.3 percent of the total



Photo courtesy of the City of San Diego, CA

⁴ The U.S. Census Bureau currently defines *urbanized area* as a densely settled territory that contains 50,000 or more people.

⁵ Phase I regulations are applicable to large and medium MS4s, as well as some small MS4s (serving populations of fewer than 100,000 people) that participated in Phase I for various reasons. Some small MS4s are included in the Phase I program as “co-permittees” because they are interconnected with nearby medium or large MS4s. Small MS4s already in the Phase I program will not be required to develop a Phase II program.

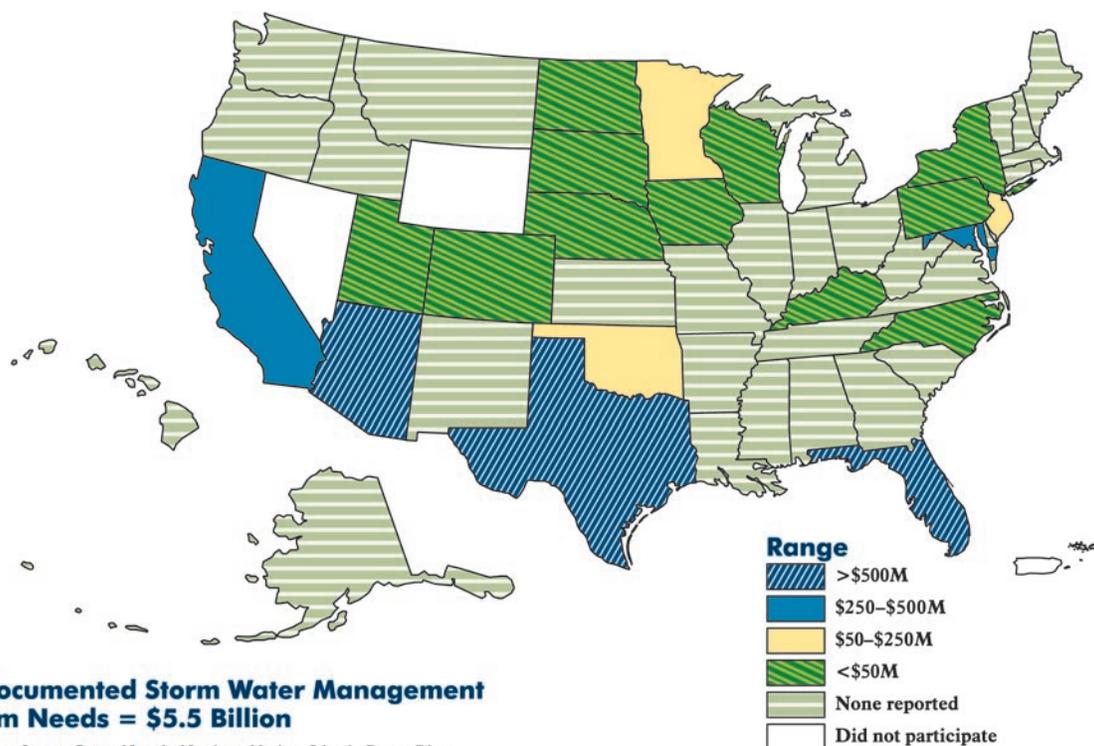


Figure 3-4. Geographic distribution of storm water management program (Category VI) needs (January 2000 dollars in millions).

storm water management program needs documented in the CWNS 2000.

As of February 2000 approximately 1,017 Phase I MS4 storm water program NPDES permits, covering 886 municipal entities (USEPA, 2000a) in 43 states, had been issued or were in the final stages of being issued. A total of 119 municipal entities in 14 States have documented Phase I storm water management needs in the CWNS 2000. Moreover, 19 additional Phase I municipal entities in some of those 14 States and 5 additional States documented their needs (\$2.5 billion, January 2000 dollars) for storm water management programs during the 1996 Clean Water Needs Survey. The storm water facilities in the CWNS 2000 represents 16 percent of the 886 municipal entities covered by Phase I NPDES permits, indicating that not all of the Phase I needs have been fully captured by this survey. Lack of resources to document storm water management program needs in the format required for the CWNS 2000 and the inability of States to obtain the required data from various municipal

entities are possible reasons for the 745 municipal entities' not including their Phase I storm water management needs in either the 1996 survey or the CWNS 2000.

In addition to the lack of documented needs for Phase I storm water management programs, it is likely that some States did not have documentation of Phase II storm water management program needs available for submission as part of the CWNS 2000 because the deadline for permit coverage for MS4s under the Phase II program is March 10, 2003.

What are the documented needs for nonpoint source pollution control?

The States have reported for many years that NPS pollution is the most significant source of remaining water quality impairment in the United States. In EPA's most recently published *National Water Quality Inventory*, which summarizes the State water quality reports submitted to the Agency under section 305(b) of the Clean Water Act, the States have, for example,

identified agriculture as causing or contributing to 48 percent of remaining water body impairments in the United States (USEPA, 2002b). The States have also listed hydrologic modification, habitat modification, urban runoff, forestry, and resource extraction as top contributors of water quality impairment. NPS pollution is also a significant contributor to impairments of lakes and coastal estuaries. Nevertheless, despite the evident significance of NPS pollution, the cost of remediating NPS pollution has remained difficult to quantify.

During the 1992 and 1996 surveys, the documentation of NPS pollution control (Category VII) needs was very limited; EPA reported modeled needs in those surveys for three need categories (Table 3-4). For the CWNS 2000, EPA and the States made a concerted effort to report documented NPS pollution control needs. As with previous surveys, documenting NPS pollution control projects for this survey presented a challenge to the States. The States found that obtaining information

to justify water quality or public health problems for individual projects and providing acceptable estimates of the costs to alleviate the pollution problem were often difficult or that the available information did not meet the CWNS 2000 documentation requirements.

Thirty-three States provided documented needs totaling \$13.8 billion for NPS pollution control (7.6 percent of total needs), which is an increase of \$10.9 billion from the \$2.9 billion (January 2000 dollars) in documented needs reported in the 1996 Clean Water Needs Survey. This shows that an increasing number of States are succeeding in their efforts to document NPS pollution control needs. The number of States reporting NPS pollution control needs increased from 28 States in the previous survey to 33 States in this survey. Figure 3-5 shows the geographic distribution of NPS pollution control needs. Florida and New Jersey had the largest NPS pollution control needs, with \$3.2 billion and \$2.8 billion, respectively. Missouri, Wisconsin, and New York also had more than \$1 billion

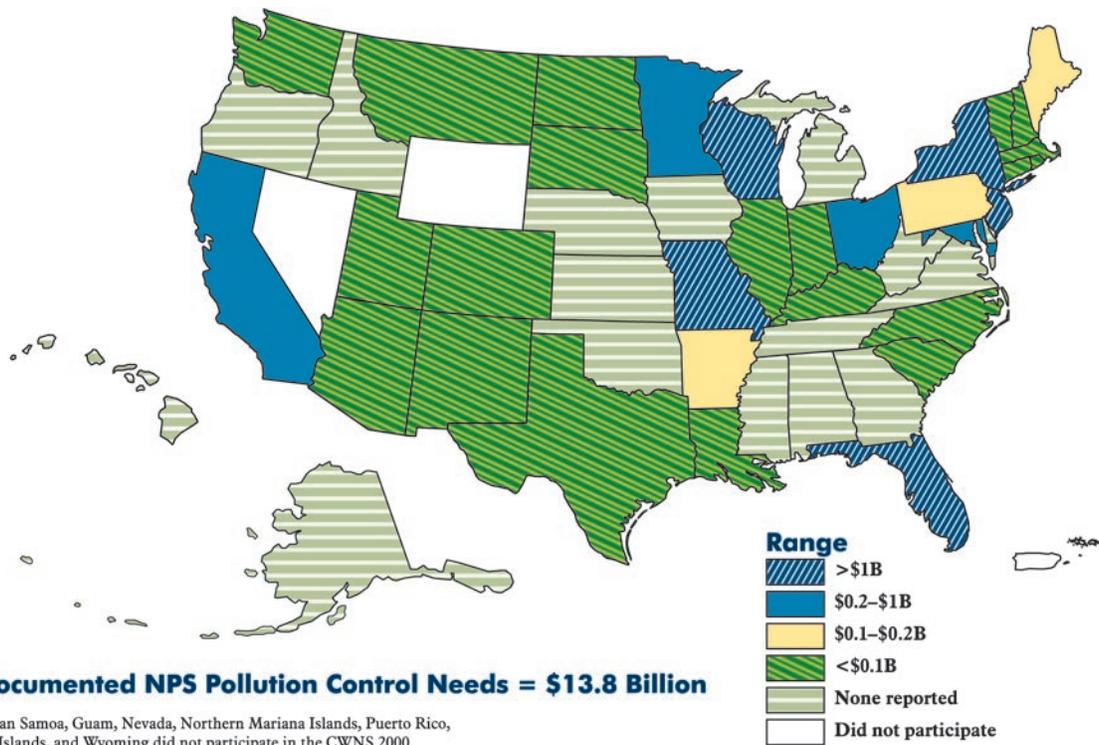


Figure 3-5. Geographic distribution of nonpoint source pollution control (Category VII-A through VII-K) needs (January 2000 dollars in billions).



Photo courtesy of USDA NRCS

each in NPS pollution control needs, and four other States (Maryland, Minnesota, California, and Ohio) each had NPS pollution control needs of greater than \$0.2 billion. NPS pollution control needs in the urban, hydromodification, sanitary landfills, and storage tanks categories account for approximately 82.3 percent of the total needs reported for Category VII (Table 3-6). Less than \$1 billion in needs was reported for the remaining NPS pollution control categories (Table 3-6). Appendix A, Table A-2, presents the NPS pollution control needs by State and NPS pollution control category.

Only five NPS pollution control need categories with identical characteristics were reported for both the 1996 Clean Water Needs Survey and the CWNS 2000:

- Agriculture–Cropland (Category VII-A)
- Agriculture–Animals (Category VII-B)
- Silviculture (Category VII-C)
- Urban (Category VII-D)
- Ground Water Protection–Unknown Source (Category VII-E)

NPS pollution control needs for these five categories increased by \$4.1 billion in the CWNS 2000. The increase in NPS pollution control needs can be attributed, in part, to an increase of \$0.3 billion for Category VII-A, \$0.5 billion for Category VII-B, and \$3.5 billion for Category VII-D. Needs for Category VII-C, however, decreased by \$0.16 billion between the

Table 3-6. NPS Pollution Control Needs Reported in the CWNS 2000 (January 2000 dollars in billions).

NPS Pollution Control Need Category	Total Needs	Percent of Total
Agriculture–Cropland (VII-A)	0.5	3.5
Agriculture–Animals (VII-B)	0.7	4.7
Silviculture (VII-C)	0.04	0.3
Urban (VII-D)	4.4	32.0
Ground Water Protection–Unknown Source (VII-E)	0.9	6.3
Marinas (VII-F)	0.002	0.01
Resource Extension (VII-G)	0.04	0.3
Brownfields (VII-H)	0.4	2.6
Storage Tanks (VII-I)	1.0	7.4
Sanitary Landfills (VII-J)	1.8	13.3
Hydromodification (VII-K)	4.1	29.5
Total	13.8	

1996 Clean Water Needs Survey and the CWNS 2000; Category VII-E needs remained the same.

What are the needs for urban and rural communities?

Geographic data from the CWNS 2000 and information on urbanized areas from the U.S. Census Bureau were used to determine the breakdown of needs in urban and rural areas in the contiguous United States.⁶ An urbanized area, as currently defined by the U.S. Census Bureau, consists of densely settled territory that contains 50,000 or more people. The breakdown of urban and rural total⁷ documented needs is \$118.1



Photo by Jeff Vanuga, courtesy of USDA NRCS

⁶ Urbanized areas from the U.S. Census Bureau were delineated to provide a better separation of urban and rural territory, population, and housing in the vicinity of large places. The geographic coordinates of needs locations were intersected with the urbanized area coverage.

⁷ The total urban and rural documented needs (\$118.1 billion) do not equal the total documented needs (\$181.2 billion) because of geographic data limitations in the CWNS 2000. Thus, a difference of \$63.1 billion is not accounted for in the urban and rural documented needs.

billion (67.1 percent) and \$57.8 billion (32.9 percent) respectively. The total urban needs for Categories I through VI are \$112.4 billion; the total rural needs for these categories are less than half as much, \$53 billion. For urban areas, a majority of the needs are under Categories V (\$40.8 billion), I (\$24.8 billion), III-B (\$13.1 billion), and II (\$11.2 billion). Categories III-A, IV-A and B, and VI each have less than \$10 billion in urban area needs. A majority of the needs for rural areas are in Category I, \$11.5 billion; Categories II, IV-A, and V each have approximately \$9 billion in needs. Almost equal amounts of NPS pollution control needs were documented for urban and rural areas: urban areas account for \$5.6 billion, and rural areas account for \$4.6 billion in needs.

What are the needs for small communities?

Small communities, defined as communities with populations of fewer than 10,000 people and an average daily wastewater flow of less than 1 million gallons,

have estimated needs of approximately \$16 billion (see Appendix A, Table A-3), representing about 10 percent of the \$161.9 billion documented wastewater treatment and collection system (Categories I through V) needs for the country. Wastewater treatment needs (Categories I and II), conveyance needs (Categories III and IV), and CSO correction needs (Category V) for small communities are \$4.8 billion, \$9.4 billion, and \$1.9 billion, respectively. State-by-State presentations of various aspects of small community needs are provided in Tables A-3 through A-10 and Table A-13 in Appendix A.

Figure 3-6 shows the geographic distribution of small community needs by State. Two-thirds of the wastewater treatment and collection facilities with documented needs are for serving small communities. Thirty-four percent of small communities have documented needs. With few exceptions, small community facilities are a large majority of the total number of publicly owned facilities in each State. It is noteworthy that 90 percent

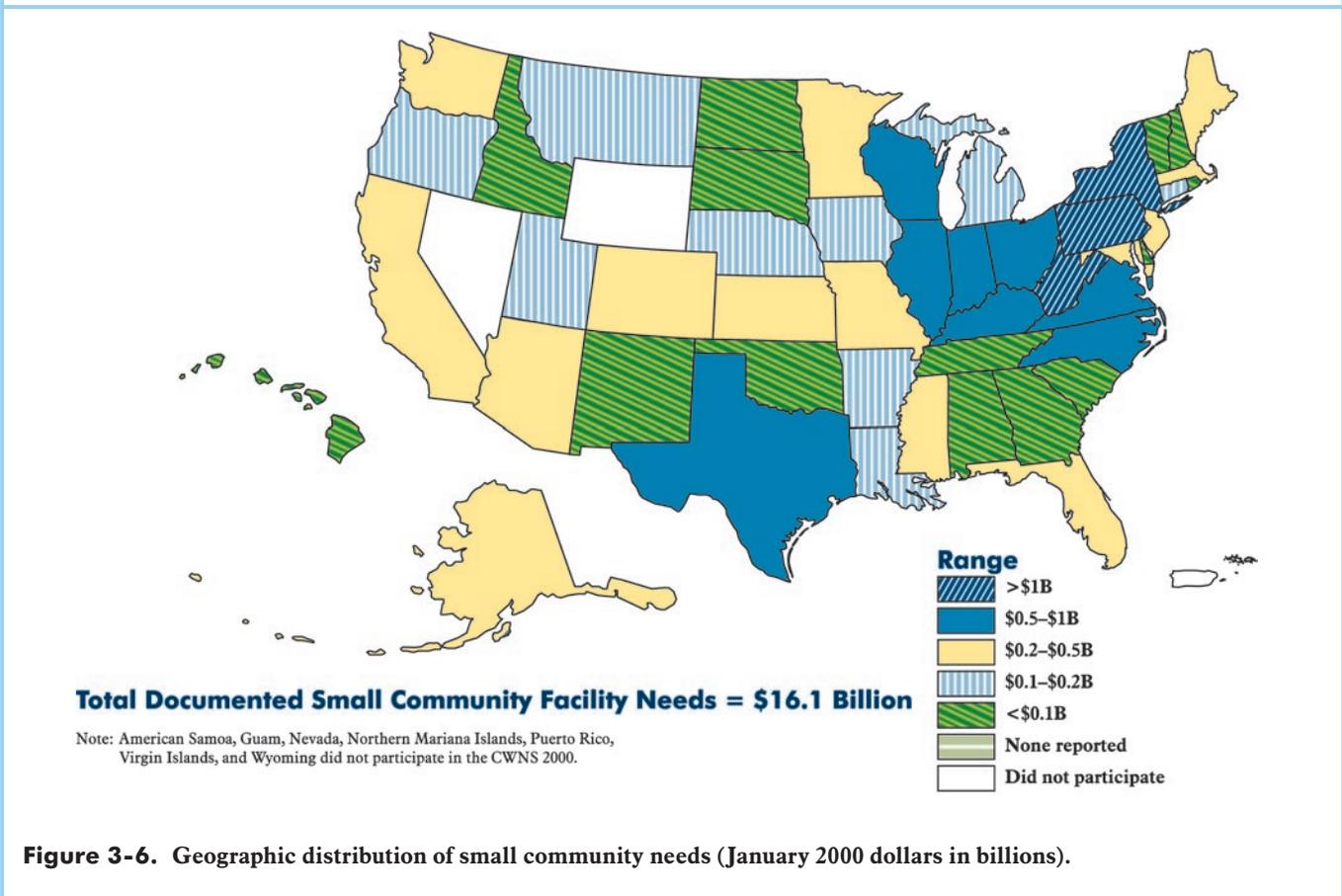


Figure 3-6. Geographic distribution of small community needs (January 2000 dollars in billions).

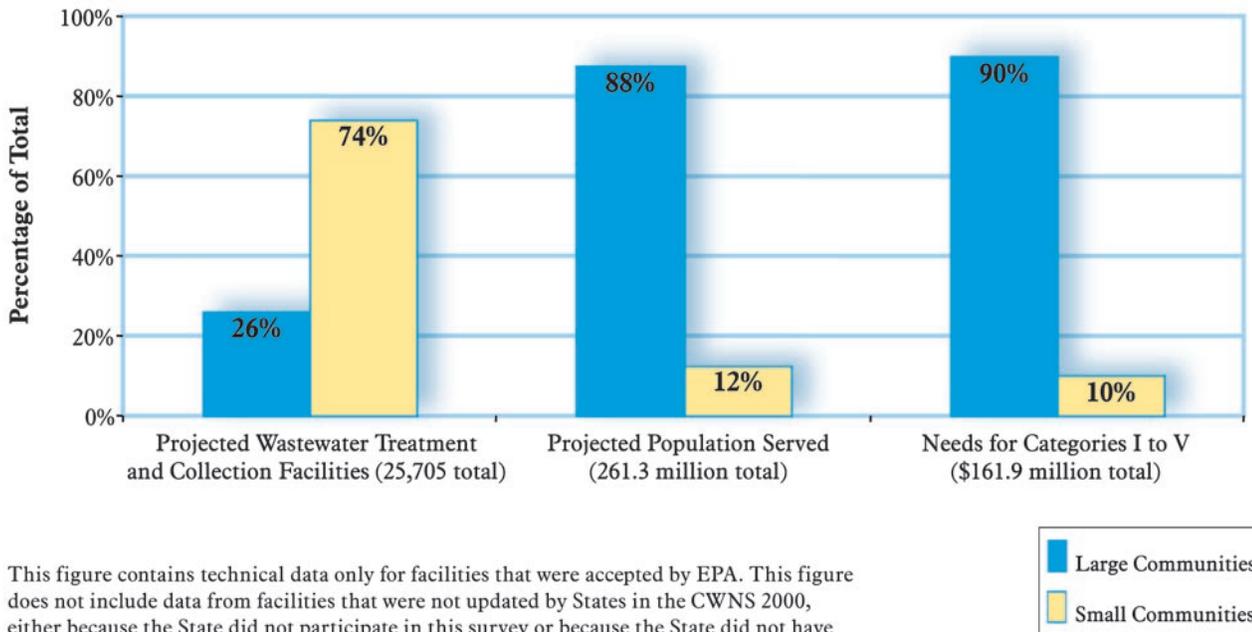
or more of the facilities in five States (Alaska, Kansas, Nebraska, North Dakota, and West Virginia) serve small communities. Moreover, in 10 additional States small community facilities constitute 80 to 90 percent of the publicly owned facilities.

Figure 3-7 shows a comparison of the number of facilities, population served, and needs for small and large communities in the Nation. About 74 percent of wastewater treatment and collection facilities serve small communities, yet those facilities serve only 12 percent (32 million people) of the total population.

Approximately 13 percent of the facilities that will serve small communities (2,514 out of 19,036 facilities) are not projected to have centralized collection and treatment systems. These communities will be served mostly by individual on-site systems. For communities with populations of fewer than 1,000 people, the percentage of facilities that are not projected to have centralized collection and treatment systems

increases to approximately 21 percent. For the other small community levels (between 1,000 and 3,500 and between 3,500 and 10,000 people), 6 percent and 5 percent of the facilities are not projected to have centralized treatment and collection systems.

Of the 1,687 new treatment facilities identified in the CWNS 2000, 843 facilities will serve small communities where abandonment of individual on-site system is expected to occur. The majority (75 percent) of the new small community treatment plants that are replacing individual on-site systems will serve populations of fewer than 1,000 people. The 843 facilities will provide service to approximately 707,000 people and account for \$0.6 billion in Category I and II needs and \$1.2 billion in Category IV-A and IV-B needs. Twenty-one new decentralized systems are planned for small communities where abandonment of individual on-site system is expected to occur. These 21 facilities will serve approximately 20,000 people



This figure contains technical data only for facilities that were accepted by EPA. This figure does not include data from facilities that were not updated by States in the CWNS 2000, either because the State did not participate in this survey or because the State did not have resources to update the facilities. Because of these analysis methods, numbers in this figure cannot be directly compared to Appendix C or Table 3-3.

Figure 3-7. Small versus large community comparison for documented needs and technical information from projected facilities, if these needs are met.

and account for \$0.04 billion in needs (Categories I, II, IV-A, and IV-B).

Approximately 37 percent of the facilities in the Nation serve communities with populations of fewer than 1,000 people (Figure 3-8). The documented need for wastewater treatment and collection systems for these facilities is \$3.8 billion, constituting 24 percent of the total documented need of \$16 billion for all small communities. For communities serving between 1,000 and 3,500 people, the documented need for wastewater treatment and collection systems is \$6.6 billion, which represents 41 percent of the total documented need for small communities. Finally, for communities that serve between 3,500 and 10,000 people, the documented need is \$5.7 billion, or 35 percent of the total need for small communities.

What are the Separate State Estimates?

To maintain national consistency when documenting needs, the CWNS National Workgroup established strict standards governing the form and content of

acceptable need documentation, as described previously in Chapter 2. In those instances in which EPA determined that State documentation did not meet the required criteria, the needs were reported as SSEs. In other cases, States themselves recognized that fully acceptable documentation was simply not available, but they still wished to have their needs recognized as being a potential demand on State resources; such estimates also were reported as SSEs.

Nearly all of the States reported some needs that did not meet the documentation criteria established by the CWNS National Workgroup. The types of needs reported for the CWNS 2000 as SSEs in this report generally fall into the following groups:

- Documentation that did not meet the criteria for acceptable documentation as per the CWNS 2000 guidelines.
- Unsewered communities where a public health or water quality problem has not been properly identified and documented.

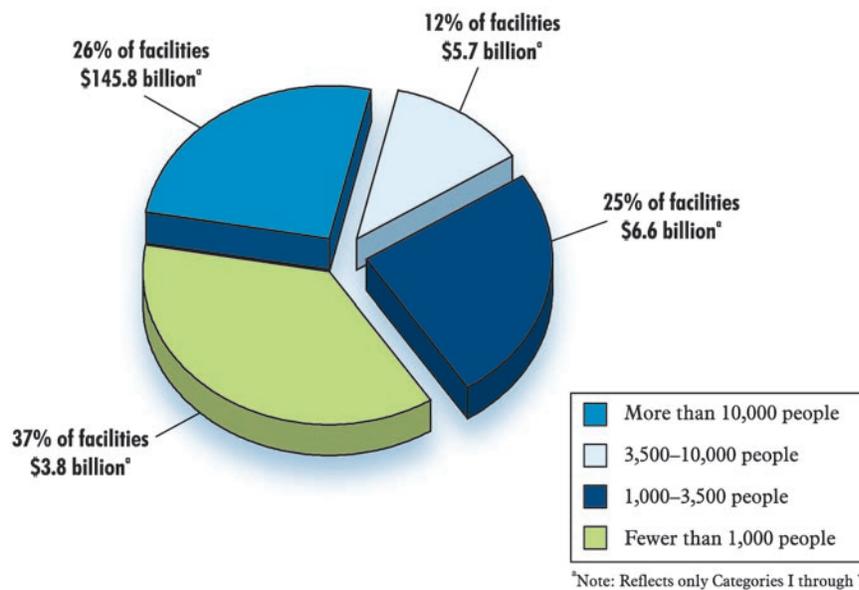


Figure 3-8. Percentage of projected facilities, if all documented needs are met, by population range, and their documented needs.

Separate State Estimate

Needs that have not met the CWNS 2000 documentation requirements described in Chapter 2.

- NPS pollution control, CSO correction, and storm water control problems for which formal studies documenting a water quality or public health problem have not yet been completed.
- Upgrade or expansion of wastewater treatment systems based on *anticipated* changes to State regulations or water quality standards.

The level of effort put forth by each State to include SSEs in the CWNS 2000 was voluntary. Therefore, the reported SSEs do not represent the total need that would be reported if State resources permitted a more thorough assessment. The States could report SSEs for all of the categories (I through VII). Tables A-11, A-12, and A-13 in Appendix A provide a State-by-State presentation of the total SSEs for each category. The SSEs represent a total of \$4.6 billion in addition to those needs meeting the EPA documentation criteria. The largest SSEs are for Category VII (\$1.3 billion) and for Category I (\$0.9 billion); these two categories make up 48 percent of the SSEs. The smallest reported SSEs are for Categories V and VI, which account for only \$0.09 billion and \$0.05 billion of the total \$4.6 billion in SSEs. The other categories with SSEs are Categories II (\$0.61 billion), III-A (\$0.21 billion), III-B (\$0.17 billion), IV-A (\$0.62 billion), and IV-B (\$0.65 billion). Category VIII, Confined Animal–Point Source, and Category IX, Mining–Point Source, were added to the CWNS 2000 to enhance the States' ability to monitor their pollution control efforts. Needs related to Categories VIII and IX are recorded as SSEs in the CWNS 2000 database because those categories are not CWSRF-eligible.

Realizing that documentation criteria for NPS pollution control activities continue to evolve, EPA encouraged

the States to submit all NPS pollution control documentation for review, including the cases where needs would be reported as SSEs. As a result, 11 States reported \$1.3 billion in NPS pollution control needs as SSEs, in addition to the \$13.8 billion in NPS pollution control needs that satisfied the required documentation criteria. As individual States progress in developing their NPS pollution control programs, it is anticipated that more detailed, specific documentation and cost data will become available, thus increasing both documented needs and SSEs for NPS pollution control in the future.

The State of New York submitted a proposed project for dredging and disposal of polychlorinated biphenyl (PCB)-contaminated sediments from the Hudson River costing \$0.45 billion for inclusion as an eligible NPS category need in the CWNS 2000. These needs were not included in the CWNS 2000 NPS needs because this project had already been included under the Superfund priority list; however, these needs were included as an SSE need for Category VII-D. Moreover, a nonmunicipal entity was identified as a potentially responsible party for the cleanup. EPA's decision regarding the current policy of including projects from the Superfund priority list was made too late to include these needs in the CWNS 2000. EPA plans to address this issue with the National Workgroup as part of the planning process for the next needs survey.

Twenty-nine States reported SSEs totaling \$1.6 billion for small communities. This estimate is 10 percent of the total documented need for small communities, \$16.1 billion. In comparison, the total amount of SSEs for small and non-small communities is \$4.6 billion and constitutes less than 3 percent of the total documented need of \$181.2 billion. Details of the preceding estimates for individual categories at the State level are presented in Appendix A, Table A-13.

How does the Clean Watersheds Needs Survey compare with other needs initiatives?

Determining estimated costs for the necessary investment in the Nation's clean water infrastructure is

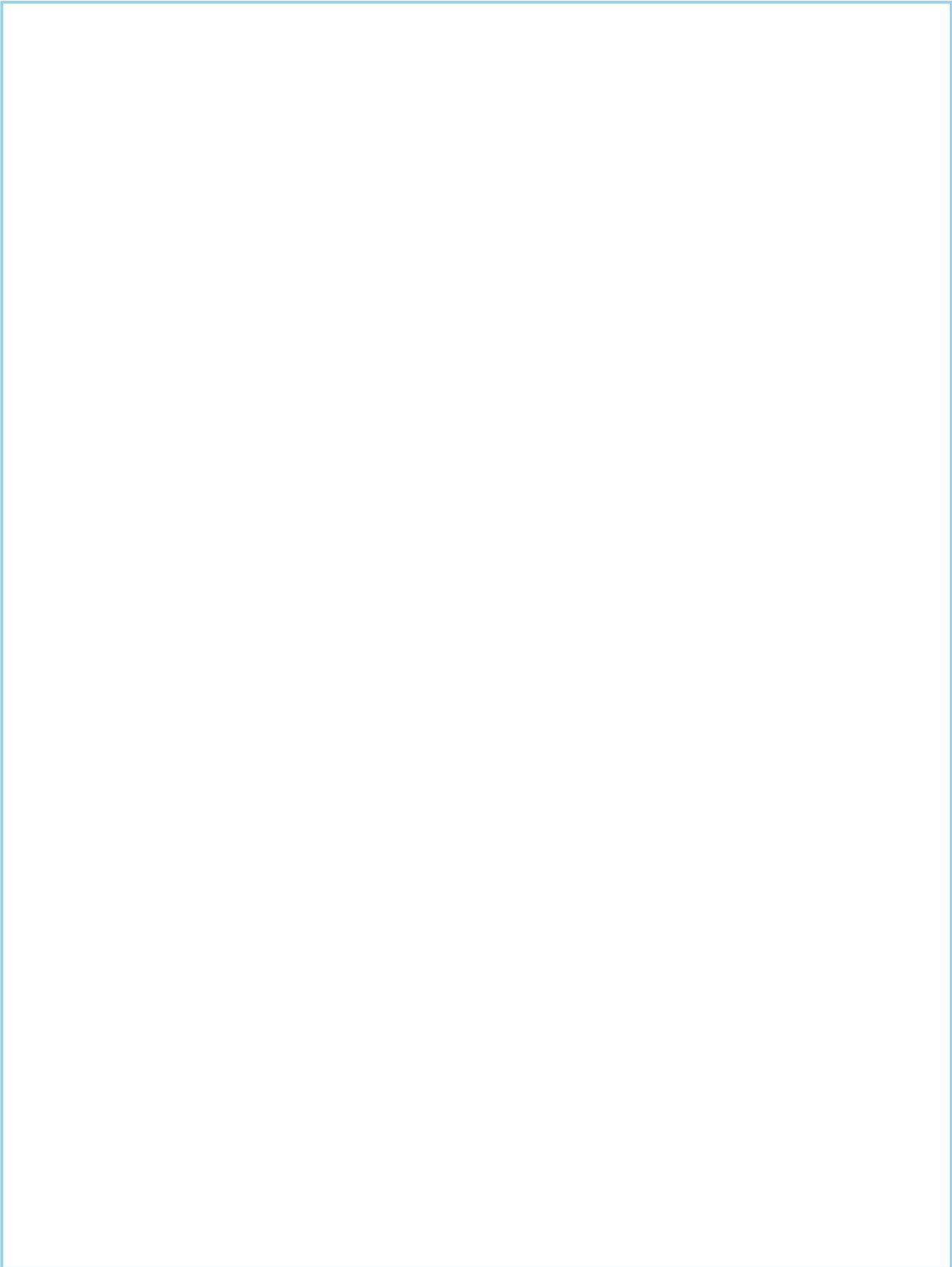
an activity that has recently been undertaken by EPA's Office of Water, as well as by associations of water and wastewater service providers, local governments and their ratepayers, and other interested parties. The following discussion of these other "needs" assessment activities is intended to provide additional background and context for this report to Congress.

Water Infrastructure Network Report. The Water Infrastructure Network (WIN) is a broad-based coalition of local elected officials; drinking water and wastewater service providers; state environmental and health administrators; and engineering, construction, and environmental associations. The WIN projected the needs for a 20-year period from 2000 through 2019. The wastewater need reported by the WIN is \$386 billion in 2001 dollars, which is equivalent to \$377 billion in January 2000 dollars (WIN, 2000).

The Clean Water and Drinking Water Infrastructure Gap Analysis. EPA conducted a study to identify whether there is a gap between the projected investment needed over the next 20 years (2000 through 2019) and current levels of spending for wastewater and drinking water (USEPA, 2002a). The purpose of the study was to gain a better understanding of the full range of financial challenges faced by the wastewater and drinking water industry. The scope of the report was limited to a description of the characteristics of the water and wastewater industry

and a discussion of methods for calculating the capital and operation and maintenance gaps. The analysis found that a significant funding gap could develop if the Nation's wastewater and drinking water systems continue to maintain current spending and operation practices. The gap largely disappears if municipalities increase spending at a real rate of growth of 3 percent (above the rate of inflation) per year. The Gap Analysis estimated wastewater needs ranging from \$331 billion to \$450 billion. The resulting midpoint is a need of \$388 billion (\$379 billion in January 2000 dollars).

The approaches used in the Gap Analysis and the WIN Report are similar. Both started with numbers from the 1996 Clean Water Needs Survey and subtracted the amounts for Categories III and IV. An early estimate for SSO correction (\$81.9 billion) was added. Also added were estimated needs for renewal and replacement of existing infrastructure based on a number of different assumptions. The WIN Report used a value of 1/30 of the Net Capital Stock as a forecast of the costs associated with renewal and replacement of the existing system. The Gap Analysis presents several alternative scenarios to address the amount of overlap between SSO and replacement needs. The Gap Analysis also includes a range of estimates for the rate of replacement of the existing capital stock, then takes the midpoint estimate from the range. The estimates for renewal and replacement in both reports were not supported by the type of documentation EPA requires for CWNS estimates.



Chapter 4

Sanitary Sewer Overflows

What are sanitary sewer overflows and why are they important?

Sanitary sewer overflows (SSOs) are releases of raw sewage from a sanitary sewer collection system before the wastewater reaches the headworks of a wastewater treatment plant. The most immediate health risks associated with SSOs are the release of bacteria, viruses, and other pathogens onto streets and into receiving waters.

What causes sanitary sewer overflows and how can they be reduced or prevented?

SSOs can be caused by many factors, including peak flows that exceed system capacity (wet weather SSOs); blockages; I/I; structural, mechanical, or electrical failure; and third-party actions or activities. Because SSOs have so many causes, good practice would dictate that municipalities implement a comprehensive set of

capital and noncapital measures to prevent them. These measures can collectively be referred to as capacity assurance, management, operation, and maintenance (CMOM) programs.

SSOs caused by capacity problems in collection systems are typically addressed through a combination of capital improvements that increase the design capacity of the collection system or treatment plant and remove bottlenecks. Also important are flow reduction measures, including I/I reduction and O&M activities that restore the effective capacity to near the design capacity.

SSOs caused by blockages or structural, mechanical, or electrical failures can be reduced through improved collection system management and effective O&M programs. Such programs can include relatively minor capital improvements, such as providing backup pumps, and noncapital measures like routine sewer cleaning.



Photo courtesy of USEPA OWM

Is it possible that sanitary sewer overflows needs are already included in the documented needs for Categories I, II, III, and IV?

There is no CWNS category specifically for SSO correction. Some of the documented costs reported by the States, particularly in Categories I, II, III, and IV, do include costs for SSO correction. However, EPA was not able to determine what portion of these documented costs could be specifically attributed to SSO control. For example, a community might have an identified

need to expand an existing treatment plant, but EPA could not determine how much of that expansion is needed to accommodate population growth and how much is needed to address SSOs.

Why did EPA use a model to develop sanitary sewer overflow needs estimates for this report?

EPA used a model and included the model’s results in this report because the Agency was concerned that the CWNS 2000 documented needs would not fully capture the SSO needs for the Nation. Some municipalities have indicated that they did not submit documented needs for SSO correction, such as I/I correction or sewer rehabilitation/replacement, because of the perceived low priority of these projects. The model is based on reducing wet weather overflows within a collection system to one every 5 years. “One in 5 years” is a level of control that could be reasonably estimated by a model at this time using available information.

In addition, the model includes estimates of the cost of reducing SSOs caused by conditions other than wet weather, such as SSOs caused by blockages or structural, mechanical, or electrical failures.

What are the CWNS 2000 modeled needs estimates for sanitary sewer overflows?

The national estimate for the capacity-related elements of future SSO controls that correspond to achieving one wet weather overflow in a collection system every 5 years is \$88.5 billion. This estimate is provided only to give a rough idea of the capital investment required. The actual level of investment needed can be determined only through a case-by-case analysis of each system. The costs of improved system management and O&M activities necessary to actually achieve the desired level of control would be in addition to this estimated cost. The modeled estimates are illustrated geographically in Figure 4-1, and the State-by-State estimates are presented in Table 4-1.

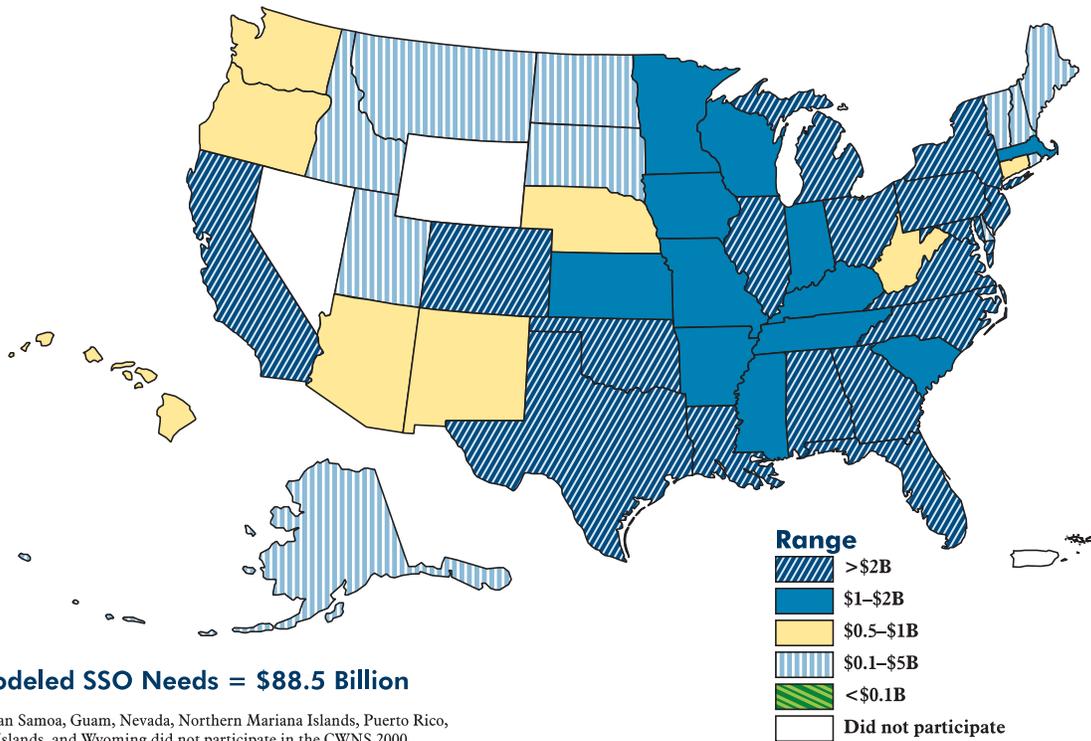


Figure 4-1. State-level needs estimate for one wet weather SSO per collection system in 5 years (January 2000 dollars in billions).

Table 4-1. State-Level Estimates for Capital Investments to Restrict SSOs to One Wet Weather Overflow Per System in 5 Years^a

State	January 2000 Dollars in Millions	State	January 2000 Dollars in Millions
Alabama	2,440	New Hampshire	268
Alaska	187	New Jersey	3,044
Arizona	540	New Mexico	704
Arkansas	1,432	New York	3,313
California	3,321	North Carolina	2,471
Colorado	2,387	North Dakota	426
Connecticut	798	Ohio	3,688
Delaware	246	Oklahoma	2,533
Florida	5,788	Oregon	677
Georgia	2,995	Pennsylvania	3,813
Hawaii	722	Rhode Island	233
Idaho	287	South Carolina	1,797
Illinois	3,019	South Dakota	436
Indiana	1,040	Tennessee	1,837
Iowa	1,439	Texas	12,876
Kansas	1,292	Utah	454
Kentucky	1,036	Vermont	135
Louisiana	3,112	Virginia	2,237
Maine	239	Washington	923
Maryland	2,330	West Virginia	664
Massachusetts	1,023	Wisconsin	1,846
Michigan	2,456	Wyoming	0 ^b
Minnesota	1,509	American Samoa	0 ^b
Mississippi	1,346	N. Mariana Islands	0 ^b
Missouri	1,847	Guam	0 ^b
Montana	275	Puerto Rico	0 ^b
Nebraska	971	Virgin Islands	0 ^b
Nevada	0 ^b	Total	88,452

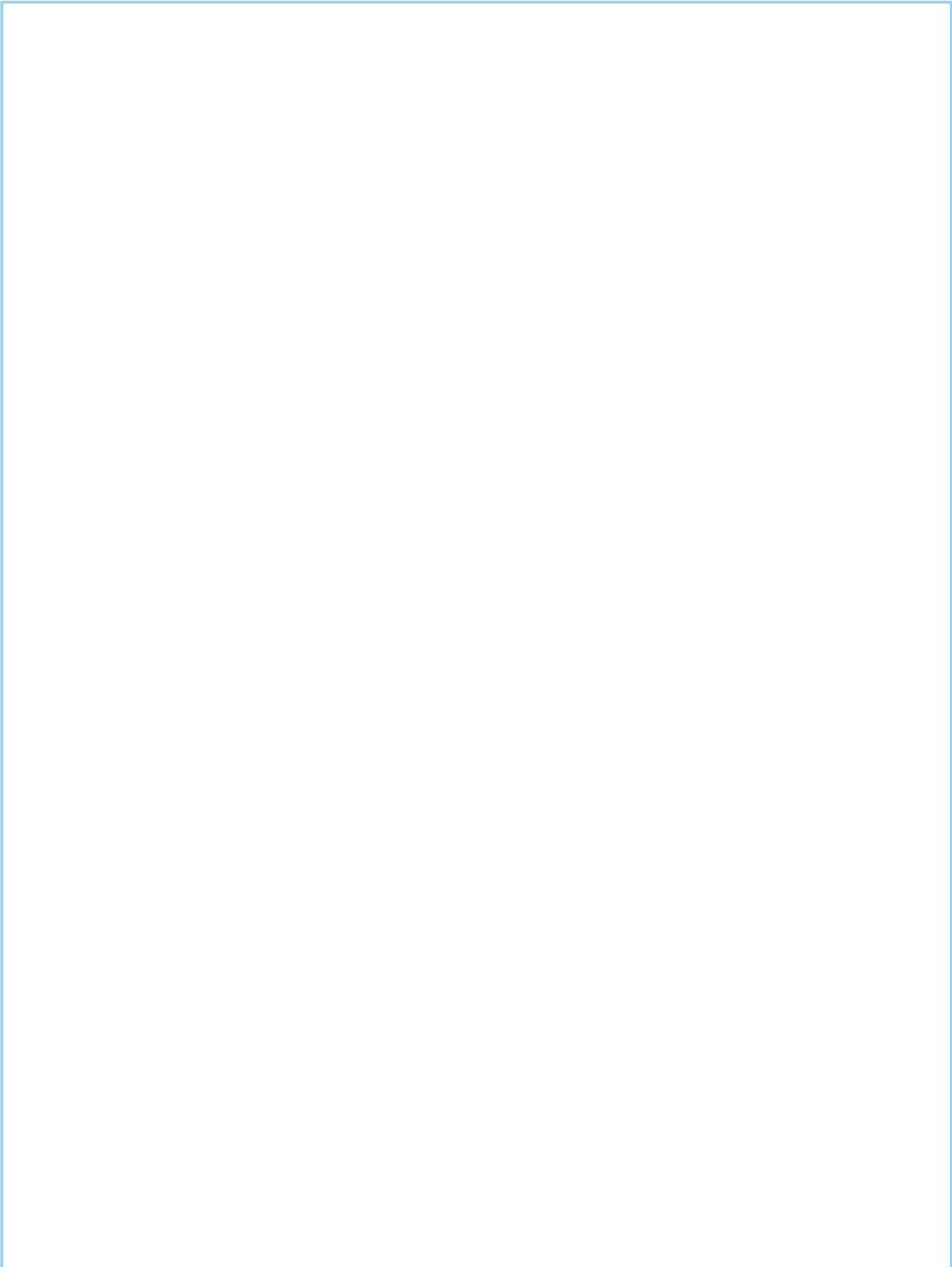
^a The modeled costs were based on information entered into the CWNS database on or before September 5, 2001. This date was chosen because EPA wanted to have estimates available for use in the allocation formula the Agency was to develop for the grant program authorized by the Wet Weather Water Quality Act of 2000. An estimate based on information in the CWNS database a few months later, when the data entry period officially ended (January 31, 2002), was not significantly different.

^b American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in the CWNS 2000.

What are the limitations of the modeled sanitary sewer overflow estimates?

Caution must be exercised in using the modeled SSO estimates for the following reasons:

- The modeled needs should not be added to documented needs because the documented needs for Categories I, II, III, and IV might already include costs to address SSOs.
- The model was developed to provide national and state-level estimates of SSO needs. It would be inappropriate to use the model to develop facility-by-facility estimates because facilities must be evaluated individually.
- The model generated a capital cost estimate for every separate sanitary sewer system for which data were available from the CWNS 2000 database, regardless of whether other information did not support the existence of SSO problems.
- The modeled cost reported here does not include an estimate of the cost for improved collection system management and O&M, which can be a significant factor in reducing or eliminating SSOs.
- The model provided an estimate of a combination of I/I correction, increased storage capacity, and increased treatment capacity. It is not possible to separate out the costs for each of these elements.
- The cost estimates provided by the model give only a rough idea of the order of magnitude of investment needed for municipal sanitary sewers.
- The model used only five rainfall regions for the entire United States.
- The model assumed that additional storage is available across the entire collection system.



Chapter 5

Watershed-Based Needs Accounting

How can watershed-based needs accounting enhance water quality-based planning and priority setting?

The reporting of needs in previous surveys had limited geographic focus because data were reported as an aggregation of individual facility information by State. Many States are now moving toward developing and enhancing their environmental protection programs with a different geographic focus—the watershed. The watershed protection approach to environmental management is a strategy that focuses on hydrology, sound science, and stakeholder/partner participation.

A watershed is a geographic area in which water, sediments, and dissolved materials drain to a common outlet such as a point on a larger stream, a lake, an underlying aquifer, an estuary, or an ocean. Because watersheds are defined by natural hydrology, not artificial political boundaries, they represent the most logical basis for managing water resources. A watershed-based management approach allows an agency to consider not only the water resource itself but also the land from which the water drains and the activities undertaken on that land. This type of planning helps agencies target the principal water quality problems regardless of their source. As a result, many water quality and ecosystem problems can be solved more effectively at the watershed level than at the individual waterbody or discharger level.

The watershed approach benefits the economy, the environment, and communities. It facilitates program integration, promotes public participation, and focuses energy on environmental results. Coordinating efforts across traditional program areas (for example, drinking water protection, pollution control, fish and

wildlife habitat protection, transportation, and power generation) allows managers to look at *all* the issues in watersheds. The result is a better understanding of the cumulative impact of many different human activities.

Users of the CWNS 2000 might want to obtain needs information on a watershed basis for several reasons. Setting water quality guidelines or standards at the watershed level allows States to assess both the point and nonpoint pollution sources in watersheds, track funding requirements over time, conduct project-specific analyses, and address problems in the most cost-effective manner. With limited resources at all levels of government, watershed-based planning and assessment allows States to focus on their highest environmental priorities. Using the CWNS database to download data can facilitate this process.

Figure 5-1 shows the documented needs in the CWNS 2000 according to watershed boundaries at the subregion level. The CWNS 2000 results indicate that most of the needs are in a small number of watersheds: 90 percent of documented needs are in 24 percent of the Nation's watersheds.

Because the CWNS now has coordinate information as well as watershed references, locations can be overlaid on any scale of watershed. This flexibility allows people at the Federal, State, and local levels to obtain information in a usable format. For example, CWNS data can be integrated with other EPA systems such as Envirofacts, Enviromapper, Surf Your Watershed, and water quality modeling systems like EPA's BASINS (Better Assessment Science Integrating Point and Nonpoint Source). CWNS data can also assist with

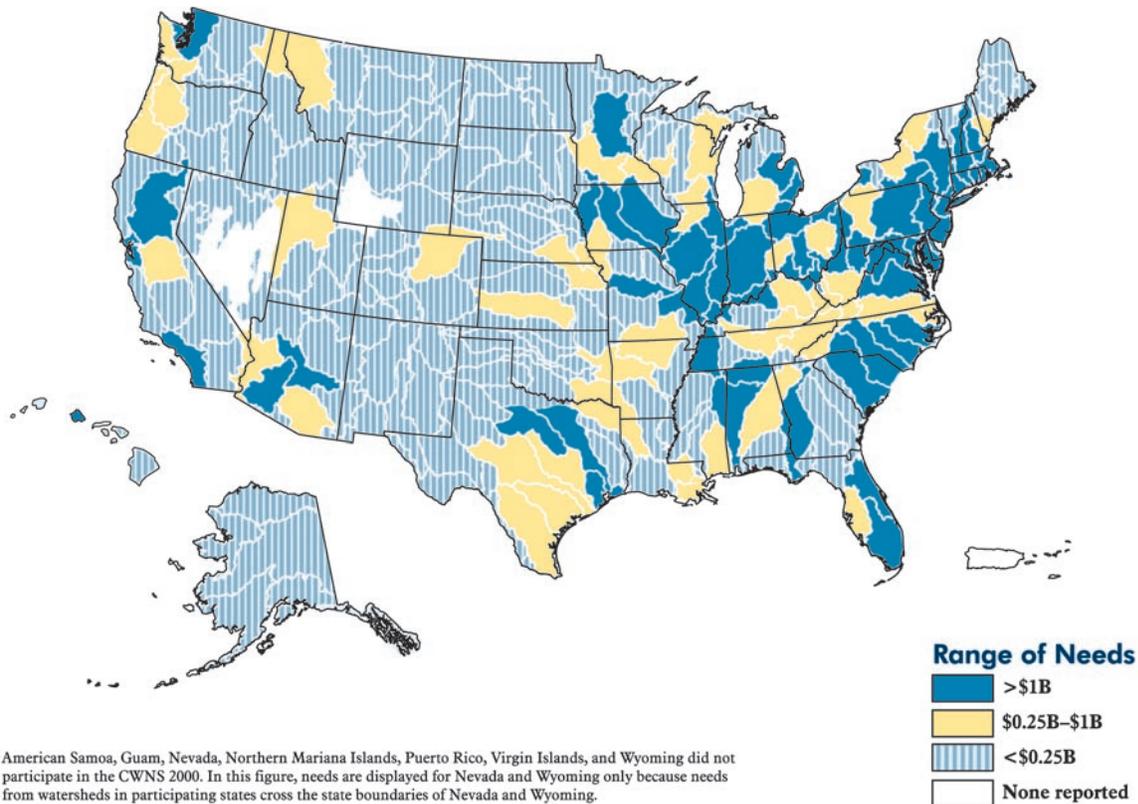


Figure 5-1. Geographic distribution of total documented needs by 4-digit watershed (January 2000 dollars in billions).

the development of environmental indicators (e.g., pounds of pollutants removed from the environment) and priority setting using other watershed-referenced information, such as data on 303(d) impaired waterbodies, and subsequent TMDL development.

The CWNS 2000 takes a geography-centered approach because location provides essential information for solving water quality problems. The ability to see on a map the spatial relationships of factors that contribute to priority issues and the management actions designed to address those issues can be powerful. Once those spatial relationships are established, questions about the effectiveness of management actions arise.

The following coastal analysis and case study on Long Island Sound show the benefits of accounting for needs on a watershed basis. Watershed-based needs accounting links the land uses in the watershed to all

the potential sources of pollution in the watershed and to the eligible needs from the CWNS 2000 for the waterbody. All of the tables and figures in this section present cost estimates or technical data from the CWNS 2000. With this information, a State can determine the total effort required to meet water quality standards for a particular waterbody, assuming all needs are addressed. Watershed management can offer a strong foundation for uncovering the many stressors that affect a watershed. The result is information better suited for helping managers to determine what actions are needed to protect or restore the resource.

How do coastal needs differ from inland needs?

The georeferencing of needs data to the watershed level permits various types of spatial analyses, one of which examines coastal needs. Coastal areas are economically and ecologically productive and diverse,

yet they face increasing pressure to produce a high-quality environment for commerce, industry, tourism, and development. Coastal land is the most developed in the Nation, supporting more than 53 percent of the population. The coastal population is expected to grow at a slightly faster pace and account for more people than the rest of the Nation over the next 20 years. Between 1994 and 2015, the coastal population is projected to increase by 28 million people (20 percent), compared to a 22 million (18 percent) increase in inland areas (Culliton, 1998).

The *National Coastal Condition Report* (USEPA, 2001b) describes environmental conditions in coastal areas using information from 1990 to 2000. The report presents summaries of data from monitoring, assessment, and advisory programs to create a benchmark of coastal conditions from which future progress can be measured. Indicators were calculated for water clarity, dissolved oxygen, coastal wetland loss, eutrophic condition, sediment contamination,

benthic index, and fish tissue contamination. The needs surveys can provide data with a level of detail similar to that of the coastal condition report, such that those indicators can be used in conjunction with needs survey data to prioritize projects or track progress as needs are addressed.

Figure 5-2 shows coastal watersheds, as defined by the National Oceanic and Atmospheric Administration (NOAA), in the United States. The CWNS 2000 data for these coastal watersheds were compared with the inland watershed data. Coastal watersheds have a higher proportion of needs in Categories I, III-B, VI, and VII (Figure 5-3). Although coastal watersheds take up only 11 percent of the land area in the contiguous United States (252 million acres of the 2.4 billion acres of land area), they account for almost 50 percent of total needs. Based on 2000 U.S. Census figures, per capita needs are \$685 and \$565 for coastal and inland populations.

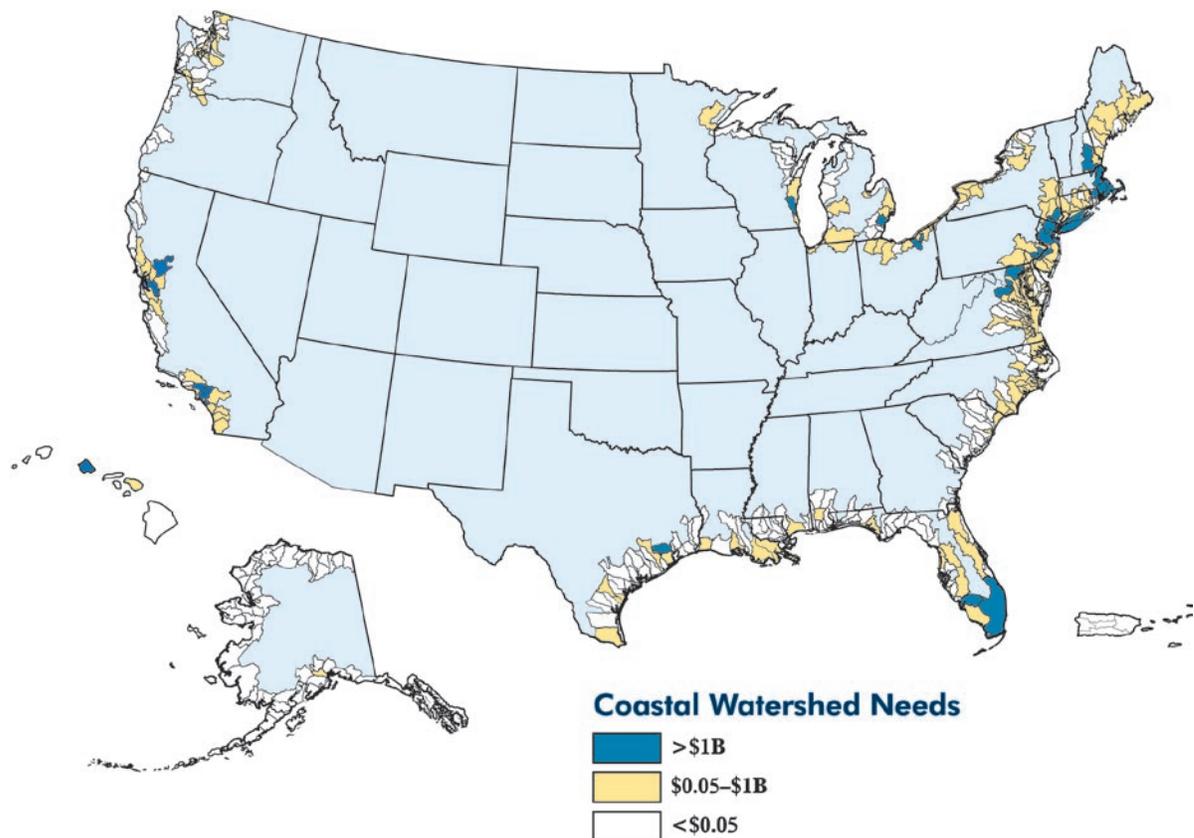


Figure 5-2. Watersheds in United States classified as coastal by NOAA (January 2000 dollars in billions).

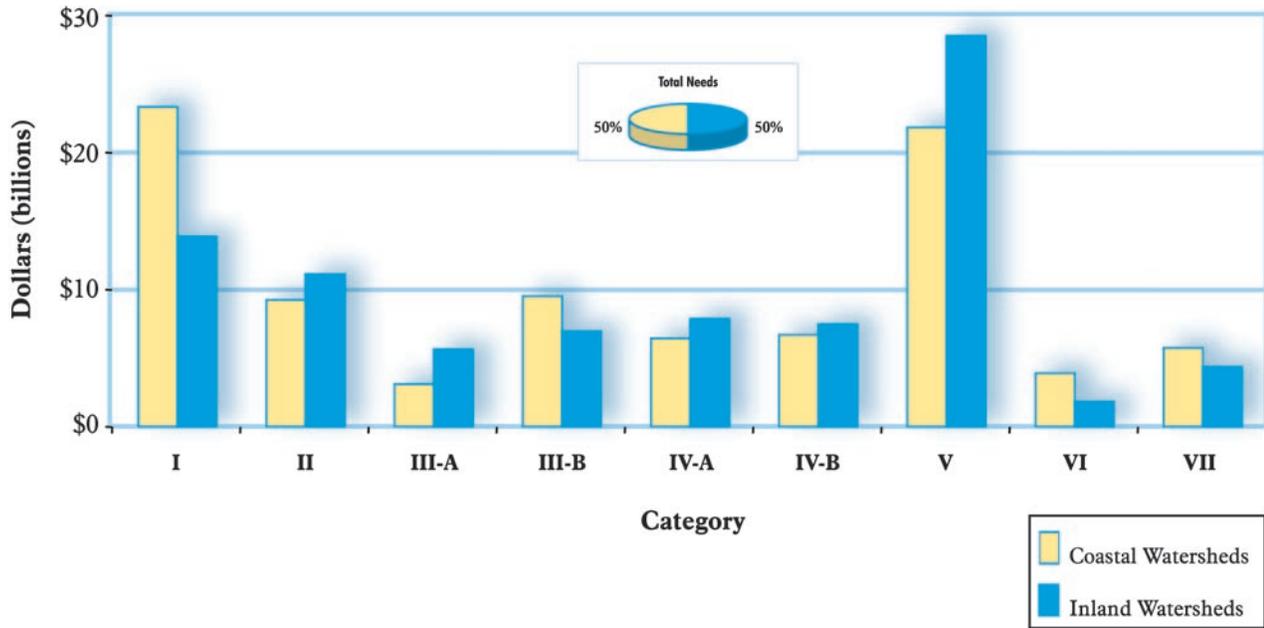


Figure 5-3. Total documented needs in coastal and inland watersheds (January 2000 dollars in billions).

Technical data can also be analyzed by watershed. Figure 5-4 displays the population receiving five levels of wastewater treatment, distinguished according to location in either coastal or inland watersheds. Less-than-secondary treatment is more prevalent in coastal watersheds (5 percent of the total coastal population of 104.9 million receiving treatment) than in inland watersheds (less than 1 percent of the total inland population of 102.5 million receiving treatment) because the CWA section 301(h) program grants waivers from the act’s secondary treatment requirements to facilities whose discharge to marine waters will not adversely affect the environment. Forty-six percent of the 104.9 million coastal residents are served by secondary treatment, while 37 percent of the 102.5 million inland residents are served by secondary treatment. Fifteen percent more people in inland watersheds receive advanced treatment: 56 percent of the inland population receives treatment at an advanced level, and 41 percent of the coastal population receives advanced treatment. No discharge, a level

of treatment used to identify evaporative facilities, is slightly less prevalent in inland watersheds (5 percent) compared to coastal watersheds (6 percent). Partial treatment, in which wastewater is sent to another facility for further treatment, is also approximately the same in both coastal watersheds (1 percent) and inland watersheds (2 percent).

Figure 5-5 shows the geographic distribution of watersheds that have populations receiving greater than secondary treatment. Populations of more than 100,000 people receiving advanced wastewater treatment appear clustered around major metropolitan areas.

The design capacity for treatment facilities in 2000 is displayed by watershed in Figure 5-6. Again, the higher range for design capacity is clustered around major metropolitan areas. Inland watersheds provide a total design capacity of 23,640 million gallons per day for 154 million people, while coastal watersheds provide a total design capacity of 19,914 mgd for 130 million people.

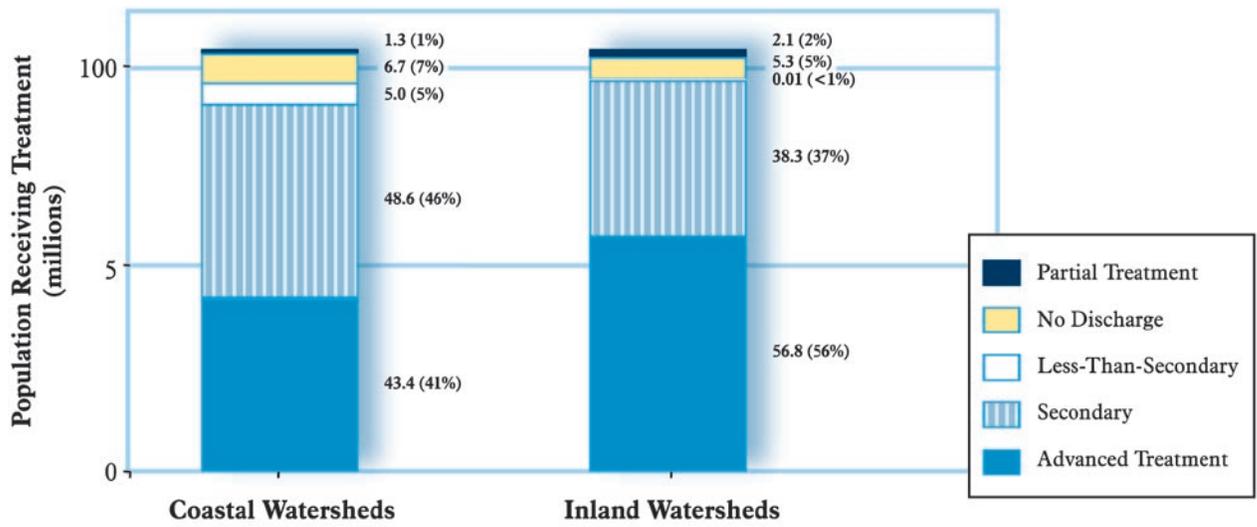


Figure 5-4. Percentage of the population receiving various forms of wastewater treatment.

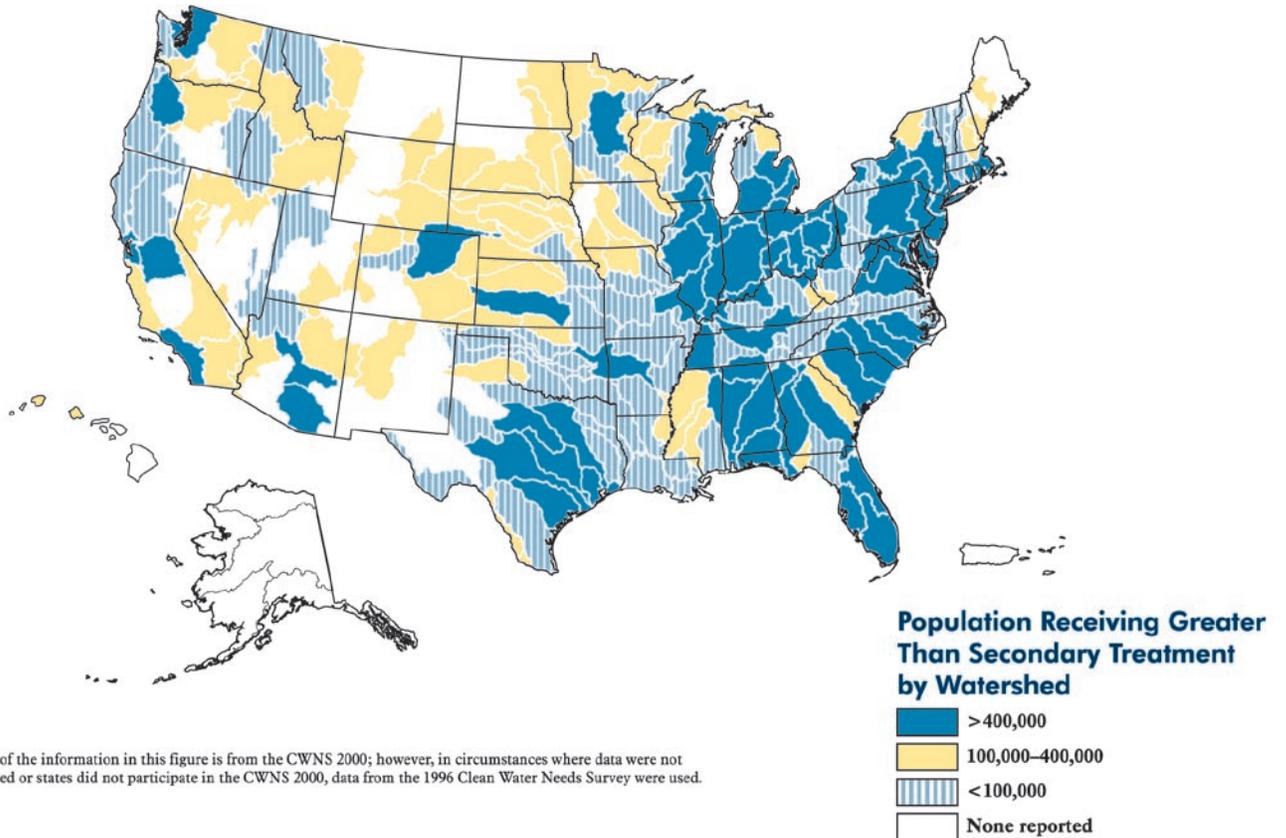


Figure 5-5. Geographic distribution of watersheds classified by population receiving greater than secondary treatment.

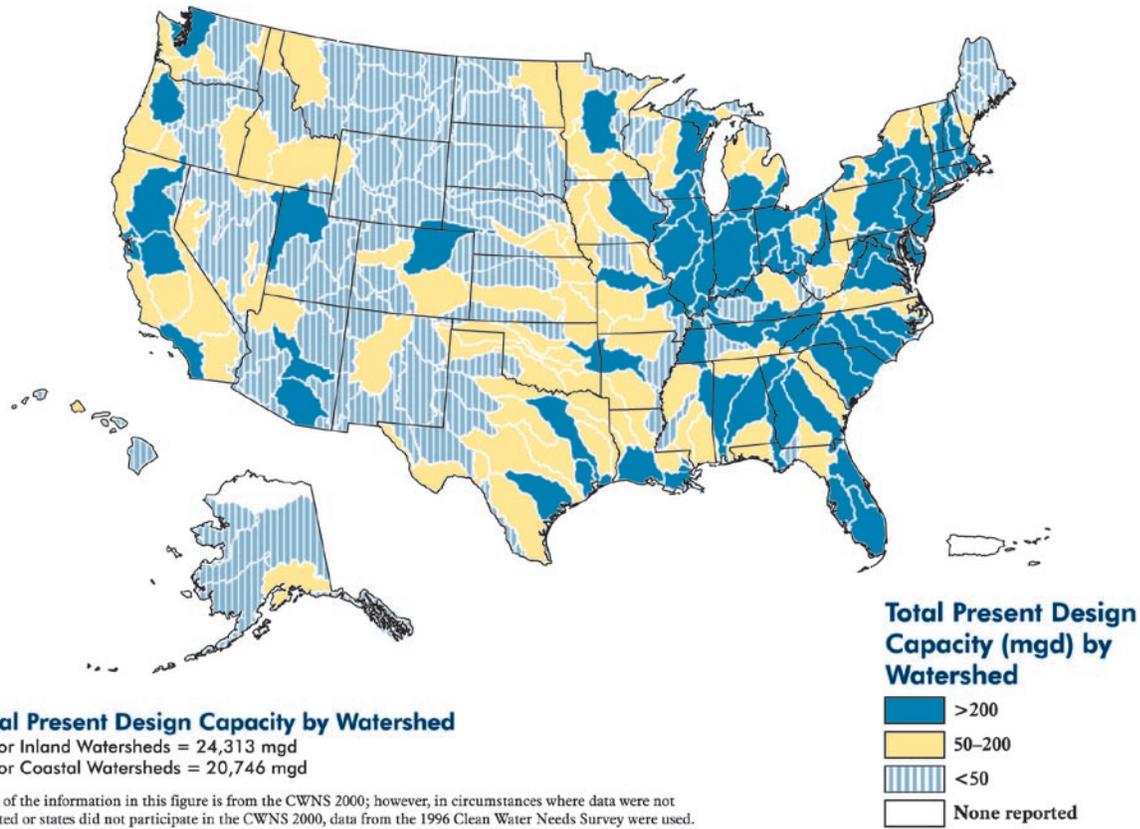


Figure 5-6. Geographic distribution of watersheds classified by total present design capacity for treatment facilities in operation in 2000.

Case Study: Long Island Sound drainage basin

The Long Island Sound exemplifies the broad-scale influence of multiple watersheds on a single waterbody. In 1987 the Long Island Sound was designated an “Estuary of National Significance.” The estuary provides the regional economy more than \$5 billion a year while also offering feeding, breeding, nesting, and nursery areas for animals and plants. More than 8 million people live in the Long Island Sound area. Associated development has increased some types of pollution, altered land surfaces, reduced open spaces, and restricted access to the Sound. The Long Island Sound is an estuary that receives 90 percent of its fresh water from three major rivers—the Thames, the Housatonic, and the Connecticut. The Sound’s watershed extends into Canada and covers an area of about 16,000 square miles (Figure 5-7). Despite significant improvements in water quality and coastal zone management, the Sound

continues to have serious problems, particularly hypoxia (oxygen deficiency), which is caused by excessive nitrogen loading from sewage treatment plants and polluted runoff into the Sound (LISS, 2001).

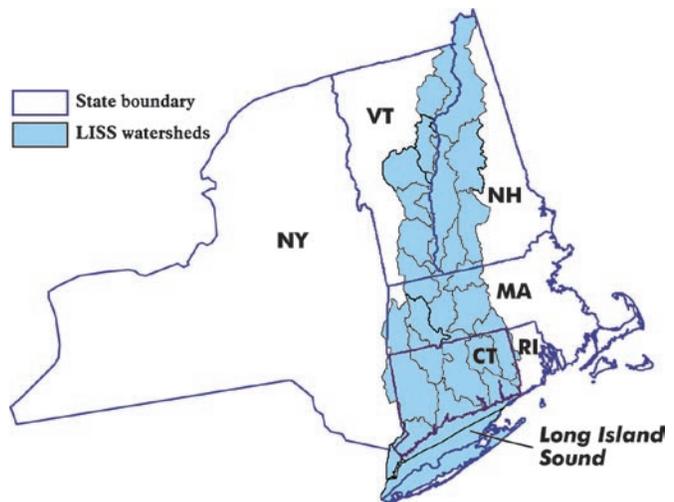
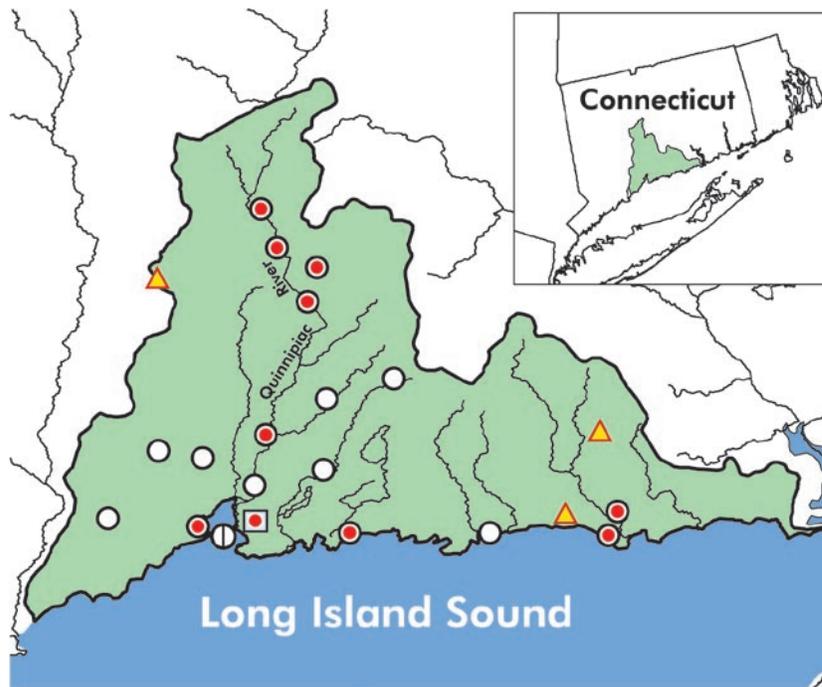


Figure 5-7. Long Island Sound watersheds.

The Long Island Sound Study (LISS) is a research and management project begun in 1985 by the Federal government, Connecticut, and New York. The National Estuary Program, under the Clean Water Act, now funds the LISS. The study is a cooperative effort involving researchers, regulators, user groups, and other concerned organizations and individuals working to protect and improve the health of the Sound by implementing a CCMP. The CCMP prescribed dividing the Long Island Sound drainage basins into zones for total nitrogen load management. One of these zones encompasses the Quinnipiac River watershed, which has a drainage area of 327,900 acres. The location of the Quinnipiac River watershed and costs to meet needs identified for it are shown in Figure 5-8.

In 1999 EPA began coordinating with the Connecticut, Housatonic, and Thames River Basins; Block Island Sound; and the New York Harbor States to identify nitrogen sources, evaluate the impact of the nitrogen loads on dissolved oxygen concentrations in the Long Island Sound, and establish a nitrogen reduction program and schedule. Managing needs on a watershed basis will allow for prioritization and allocation of efforts for implementing nitrogen load reduction. Figure 5-9 shows the multiple watersheds that affect the Sound and associated costs for projects to control point and nonpoint source pollution. Table 5-1 draws on data from the CWNS 2000 to show the level of wastewater treatment for facilities draining to the Long Island Sound.



Legend	CWNS Need Categories	Needs (\$ Millions)
Rivers	Secondary treatment	\$137
Quinnipiac River watershed	Advanced treatment	\$174
	Infiltration/inflow correction	\$7
Facility Nature	Sewer replacement/rehabilitation	\$0
Combined sewer	New collectors and appurtenances	\$14
Separate sewer	New interceptors and appurtenances	\$19
Individual on-site system area	CSO control	\$289
Treatment plant	Storm water management programs	\$0
Nonpoint source discharge location	Nonpoint source pollution control	\$16
	Total needs	\$656

Figure 5-8. Location of Quinnipiac River watershed, facility locations, and watershed’s needs (January 2000 dollars in millions).

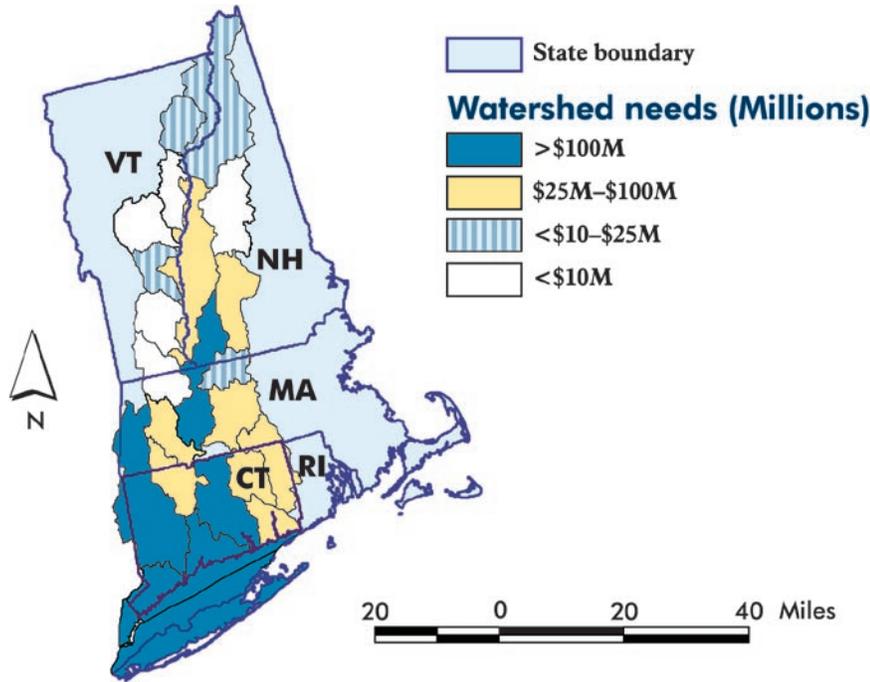


Figure 5-9. Total documented needs in Long Island Sound watersheds (January 2000 dollars in millions).

Table 5-1. Level of Wastewater Treatment for Facilities Draining to Long Island Sound

Level of Treatment	Less Than Secondary	Secondary	Advanced Treatment	No Discharge	Partial Treatment	Total
Existing						
Number of facilities	-	184	57	95	85	421
Design capacity (mgd)	-	2,217	354	6	3	2,579
Number of people served	-	8,784,320	2,045,961	98,236	—	10,928,517
Projected						
Number of facilities	-	145	100	89	122	456
Design capacity (mgd)	-	1,981	561	21	0	2,563
Number of people served	-	7,123,036	3,900,688	257,483	—	11,281,207

What are some other benefits of taking a watershed approach to needs accounting?

By taking a watershed approach to needs accounting, greater attention is placed on protecting or restoring the resource and on achieving real ecological results than on meeting administrative requirements. A more thorough understanding of threats and conditions in watersheds provides a stronger basis for targeting priority concerns. The CWNS 2000 provides financial

and technical data useful for planning and priority setting at a variety of geographic scales. These data can be used to generate maps from the CWNS 2000, such as Figures 5-5 and 5-6, to which maps generated with data from future surveys can be compared to visualize how wastewater trends in watersheds have changed since the CWNS 2000. CWNS watershed data can also help in developing program and technical tools such as how-to guides, models, case studies, and environmental indicators.

Chapter 6

Concluding Remarks

All the needs presented in this report existed as of January 1, 2000, and are eligible for CWSRF assistance under the CWA. Unlike wastewater infrastructure planning during the 1970s and 1980s, which used a 20-year planning horizon, current wastewater infrastructure planning horizons vary considerably across the United States. Often this planning horizon is now only 5 or 10 years. This report also differs from the reports presented to Congress in the 1970s and 1980s in that the information gathered by the States now includes data on storm water management programs and a wide variety of NPS pollution control projects in

addition to data on wastewater treatment and collection systems. The planning horizons of the storm water and NPS projects included in the CWNS 2000 range from less than 5 years to 20 years or more.

The 21-month data collection period was an extensive effort by EPA and the States. Although the level of effort that States put forth in reporting their CWNS 2000 data varied considerably because of resource and data availability, numerous advances were made toward increasing the value of the CWNS 2000 data beyond the CWA-mandated reporting requirements.



Photo courtesy of USDA NRCS

EPA believes that more State water quality managers will recognize the ancillary analytical opportunities that the CWNS database provides and will begin using the CWNS data to accomplish multiple objectives. EPA also expects that some of the parameters in future needs surveys will change as water quality management programs continue to address a broader spectrum of water quality problems. The issues described below have emerged as key areas of emphasis during this survey and are currently considered likely to drive the scope and objectives of future surveys.

Watershed Management and Total Maximum Daily Loads. The needs in the CWNS are presented on a State-by-State basis, reflecting the responsibility that States have in achieving water quality standards and other CWA goals. Recently, however, substantial emphasis has been placed on using the watershed approach to address the water quality goals of the CWA more holistically. This is particularly the case as States continue to develop Total Maximum Daily Loads (TMDLs) for impaired waters on a watershed basis, integrating point and nonpoint source pollutant loadings. Rather than managing sources of pollution within political boundaries or from a single type of discharge, the watershed approach provides a more comprehensive perspective for both analysis and efficient use of resources. For example, the CWNS database can be used to summarize ongoing or planned projects in a watershed to facilitate the development of TMDL implementation plans.

EPA anticipates that more States will adopt the watershed approach to more efficiently manage available resources in a watershed and improve communication and coordination among the multiple agencies responsible for water pollution control. EPA and the States have made a concerted effort in the CWNS 2000 to gather information on a watershed basis consistent with the watershed management concept. In Chapter 5 of the report, national watershed analyses and a case study from the Long Island Sound are presented to illustrate the potential of the CWNS to organize needs information by watershed.

New approaches for managing the investments in municipal wastewater infrastructure. Since the early 1970s, Federal, State, and local governments have made significant investments in wastewater infrastructure systems. Most of these investments were directed toward enlarging the capacity of sewers and treatment plants to serve a growing population and to upgrade the level of treatment to secondary treatment and beyond. EPA expects that a large portion of future investments might be directed to rehabilitation, replacement, and other activities that maintain the original capacity and treatment levels or increase efficiency. This is a reasonable expectation because much of the Nation's infrastructure (especially sewers) has reached, or soon will reach, the end of its original design life. New management techniques, including "asset management" and "life cycle cost analysis" will enable municipalities to make more intelligent investments in their wastewater infrastructure.

Asset management is a technique that will enable municipalities to determine the type of capital investment to make and when to make it to maintain the original capacity and function. The intent is to make a series of small, but significant, investments in operation and maintenance rather than letting a system deteriorate to the point of catastrophic failure, at which complete reconstruction might be required. Life cycle cost analysis is an approach in which initial investments in capital projects are determined based on the cost to build, operate, and maintain the facility over its entire useful life rather than on the initial construction cost alone.

CSO and SSO Correction. The Nation has made progress toward planning for CSO and SSO correction. As this survey shows, some States have begun to use long-term control plans to document expected capital expenditures for CSO correction. EPA anticipates that more long-term control plans will be completed before the next survey, and as a result the quality of the CSO correction needs will be greatly improved. In the 1996 Clean Water Needs Survey, EPA recognized that SSOs occur throughout the United States and

initiated work to address SSO costs in coordination with the SSO Federal Advisory Committee and other EPA workgroups. The significant increase in I/I correction (Category III-A) and sewer replacement and rehabilitation (Category III-B) needs also demonstrates that local agencies are planning for SSO correction. Because of the disparity between the modeled SSO costs described in this report and the categories of needs characteristic of SSO needs, EPA expects that more SSO needs will be documented in the next survey.

Storm Water Management Programs and NPS

Pollution Controls. Only a limited number of States were able to document storm water management program and NPS pollution control needs. As a result, the needs reported underestimate the actual national needs in those categories. EPA anticipates that more States will be able to document these needs in the next survey, and the Agency will work with States to remove the barriers that might have prevented some States from including appropriate data for these two categories in the CWNS 2000.

Use of Decentralized Wastewater Treatment and

Individual On-site Systems. In April 1997 EPA responded to an inquiry by Congress, noting that “Adequately managed decentralized wastewater systems are a cost-effective and long-term option for meeting public health and water quality objectives, particularly in less-densely populated areas” (USEPA, 1997a). No estimate of national cost savings was given, although an evaluation of case studies in the study suggested that decentralized systems are cost-effective, particularly in rural areas. Using both centralized and decentralized wastewater systems can be cost-effective in urban fringe areas, depending on site conditions and the distance to an existing centralized system with available capacity. The response to Congress identified several

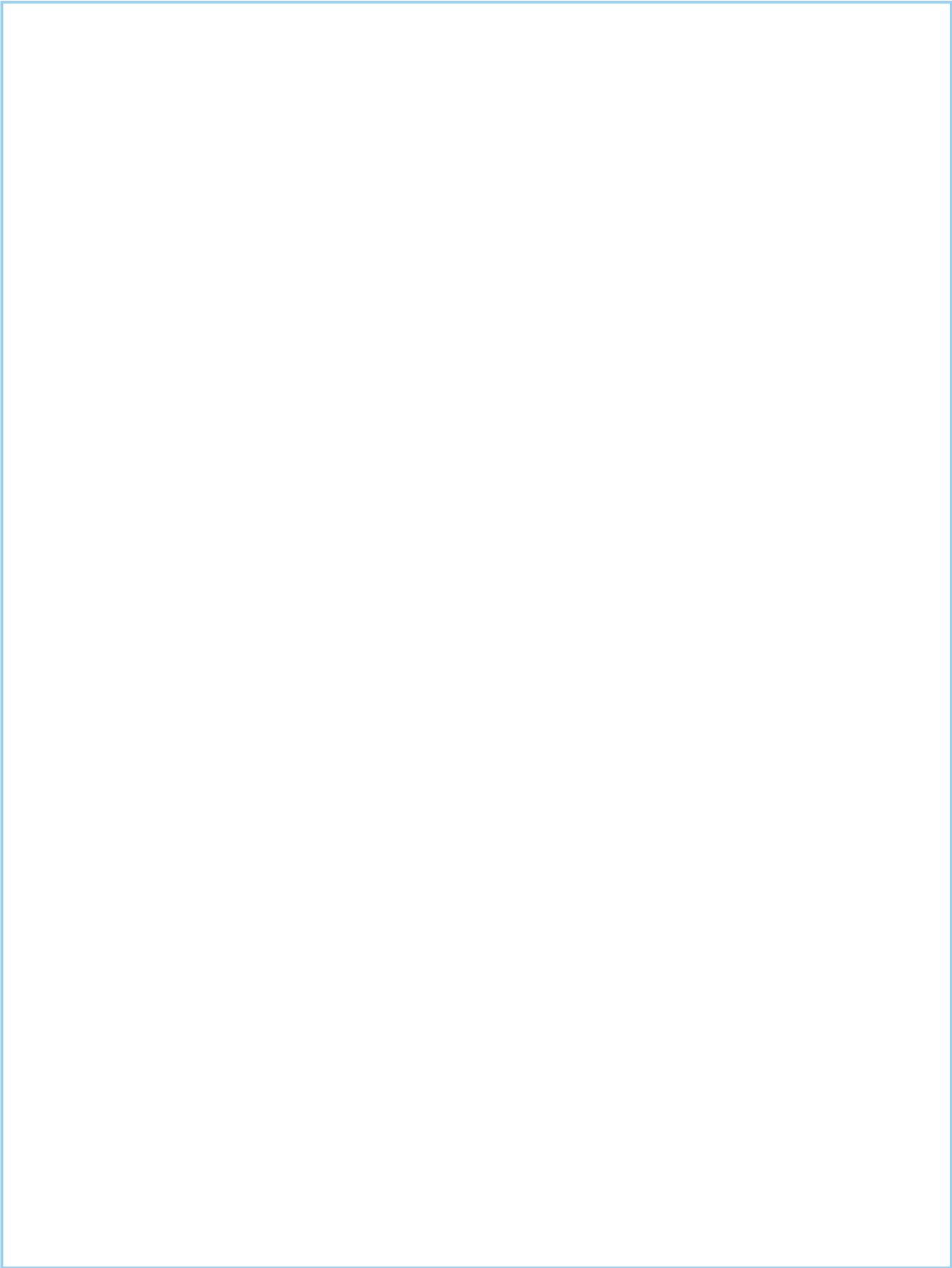
barriers to implementing these systems, including public misconceptions and lack of public knowledge. The work to remove these barriers is not yet completed.

Based on the needs presented in this report, EPA projects that 1,687 new treatment facilities will be constructed. Of these facilities, 634 facilities will serve communities with fewer than 1,000 people where abandonment of individual on-site systems is projected. Another 209 facilities are projected for communities with between 1,000 and 10,000 people. EPA expects that the projected increase in centralized collection and treatment systems might be lower in the next survey as more planning authorities recognize that properly designed, constructed, and operated on-site or decentralized systems should be considered a permanent part of the wastewater infrastructure rather than an interim solution.

Planning and Targeting. EPA encourages States to target projects that are necessary to ensure compliance with the requirements of the CWA. EPA also promotes States’ use of enhanced planning and integrated targeting tools that include NPS and estuary projects along with wastewater treatment and collection system projects. The objective of these and other ongoing efforts is to manage CWSRF resources and other funds to more efficiently and effectively address high-priority problems in the watersheds of the United States.



Photo by Randall McCune, courtesy of Michigan Travel Bureau



Glossary

Note: Definitions are provided to help the reader understand the terms used throughout the report. They are not intended to be used for legal purposes.

301(h) Waiver of Secondary Treatment for Marine Discharges

A variance (authorized under section 301(h) of the Clean Water Act) from secondary treatment requirements for treatment facilities that discharge to marine waters.

advanced treatment

A level of treatment that is more stringent than secondary treatment or produces a significant reduction in nonconventional pollutants present in the wastewater treated by a facility. Needs reported in this category (Category II) are necessary to attain incremental reductions in pollutant concentrations beyond basic secondary treatment. See Appendix G, Table G-1, Category II.

best management practice (BMP)

A practice or combination of practices determined to be an effective and practicable (including technological, economic, and institutional considerations) means of controlling point and nonpoint source pollutants at levels compatible with environmental quality goals.

brownfields

Land that was developed for industrial purposes and then abandoned, which might have residual contamination. See Appendix G, Table G-1, Category VII-H.

Clean Water State Revolving Fund (CWSRF)

A State-managed revolving fund that provides loans for specific water pollution control purposes. Under

the CWSRF Program, States and municipalities are primarily responsible for financing, constructing, and managing wastewater treatment facilities. The CWSRF Program is based on the 1987 Amendments to the Clean Water Act, which replaced the Construction Grants program with the CWSRF Program.

collection system

A system of collector and/or interceptor sewers that collects wastewater from a community.

collector sewers

Pipes used to collect and carry wastewater from a sanitary or industrial wastewater source to an interceptor sewer that conveys the wastewater to a treatment facility. See Appendix G, Table G-1, Category IV-A.

combined sewer overflow (CSO)

Discharge of a mixture of storm water and untreated wastewater that occurs when the capacity of a combined sewer system is exceeded during a rainstorm. See Appendix G, Table G-1, Category V.

combined sewer system

Sewer system designed to convey both domestic sanitary wastewater and storm water.

community

With respect to wastewater treatment, a group of residences, businesses, and/or industries sharing a common treatment or conveyance facility.

Comprehensive Conservation and Management Plan (CCMP)

A management plan that summarizes findings, identifies and establishes priorities for addressing environmental problems, identifies environmental quality goals, and presents action plans and compliance schedules for pollution control and resource management.

concentrated animal facility (feedlot)

A facility for the controlled feeding of animals that tends to concentrate large amounts of animal waste that cannot be absorbed by the soil and therefore might be carried to nearby streams or lakes by rainfall runoff. Facilities with fewer than 1,000 animal units are generally considered nonpoint sources. Facilities with more than 1,000 animal units or facilities with water quality problems that discharge directly to waters of the United States are considered point sources and are regulated through National Pollutant Discharge Elimination System permitting.

conveyance needs

The cost estimate to construct, expand, or upgrade sewer collection systems for transporting wastewater to treatment facilities. See Appendix G, Table G-1, Categories IV-A and IV-B.

design year needs

The cost estimate for building publicly owned wastewater treatment facilities eligible for assistance under the Clean Water Act to serve the population expected within 20 years. For the CWNS 2000, the design year is 2020.

drainage basin

A geographic area in which water, sediments, and dissolved materials drain to a common outlet, typically a point on a larger stream, a lake, an underlying aquifer, an estuary, or an ocean. A watershed is also sometimes referred to as the “drainage basin” of the receiving water body. See *watershed*.

estuarine protection

Activities necessary to develop and implement Comprehensive Conservation and Management Plans (CCMPs) for protecting estuaries under the National

Estuary Program created by Clean Water Act section 320. Estuary protection activities focus on restoring and maintaining the chemical, physical, and biological integrity of the estuary and controlling nonpoint sources of pollution.

estuary

The zone along a coastline where freshwater systems and rivers meet and mix with salty ocean waters (such as a bay, mouth of a river, salt marsh, or lagoon).

facility

A project and location involved in water quality management, such as a wastewater treatment plant or sewer system, a municipal separate storm sewer system, or a nonpoint source (NPS) pollution control project. Although the term *facility* is typically construed as wastewater treatment facility or some other structure, for NPS pollution control it refers to a place. Data in the CWNS 2000 were collected and organized by facility for all types of water pollution control.

facility plan

Any plan or study that directly relates to the construction of treatment works necessary to comply with the Clean Water Act. A facility plan investigates needs and provides information on the cost-effectiveness of alternatives. A recommended plan and an environmental assessment of the recommendations are also presented in a facility plan. A facility plan includes a description of the treatment works for which construction drawings and specifications are to be prepared. The description includes preliminary engineering data, cost estimates for design and construction of the treatment works, and a schedule for completion of design and construction.

fertilizer

Any organic or inorganic material of natural or synthetic origin that is added to soil to supply elements essential to plant growth.

ground water protection

Activities addressed in a State's ground water protection strategy that must be a part of the Nonpoint

Source Management Program under section 319(i) of the Clean Water Act to build State institutional capabilities to protect ground water resources from nonpoint sources of contamination. Activities include demonstrations, enforcement, technical assistance, education, and training. Wellhead protection and underground injection control for Class V wells, as well as water conservation programs, may be included.

headworks

With respect to a treatment facility, the initial component into which the influent wastewater flows.

herbicide

A chemical substance designed to kill or inhibit the growth of plants, especially weeds.

hydromodification

Alteration of the hydrologic characteristics of waters and of their aquatic habitat, including flows, morphology, bottom sediments, and riparian vegetation and related characteristics. Subcategories of hydromodification include channelization and channel modification, dams, and streambank and shoreline erosion. Needs to address some aspects of hydromodification are addressed in the CWNS 2000.

hypoxia

Oxygen deficiency in aquatic ecosystems, which is a symptom of eutrophication. Eutrophication is the process by which a water body becomes rich in organic nutrients such as phosphate and nitrate from runoff, treatment plant discharges, and other sources, thereby promoting the growth of algae. The rapid growth of algae depletes the water body of oxygen and impedes the survival of other species.

infiltration/inflow correction

Control of the problem of penetration into a sewer system of water other than wastewater from the ground through such means as defective pipes or manholes (infiltration) or from drains, storm sewers, and other improper means of entry into the system (inflow). See Appendix G, Table G-1, Category III-A.

interceptor sewer

A major sewer line that receives wastewater flows from collector sewers. An interceptor sewer carries wastewater directly to the treatment facility or to another interceptor. See Appendix G, Table G-1, Category IV-B.

lagoon

With respect to wastewater treatment, a pond in which algae, sunlight, and oxygen interact to restore wastewater to a quality often equal to that of the effluent from the secondary treatment stage. Lagoons are widely used by small communities to provide wastewater treatment. A lagoon might not have a discharge to surface waters under normal (dry-weather) operation.

Municipal Compliance Plan (MCP)

A strategy that describes the necessary treatment technology and estimated costs and also outlines the proposed sources, methods, and schedules of financing the wastewater treatment facility needed for a municipality to achieve compliance with regulations (including both construction and operation and maintenance).

municipal separate storm sewer system (MS4)

Any pipe, ditch, or gully, or system of pipes, ditches, or gullies, that is owned or operated by a governmental body or other entity and used for collecting and conveying storm water.

National Pollutant Discharge Elimination System (NPDES)

A provision under sections 301 and 402 of the Clean Water Act that prohibits discharge of pollutants into waters of the United States unless authorized by a permit issued by EPA or (where delegated) a State or a Tribal government on an Indian reservation.

need

A water quality or public health problem and an associated abatement cost that is eligible for funding under the CWSRF.

nonpoint source (NPS)

Technically, a source of water pollution that is not regulated as a point source. More colloquially, the term *nonpoint source* refers to any source of water pollution that results from land runoff, precipitation, atmospheric deposition, drainage, seepage, or hydrologic modification. The primary categories of pollution treated as nonpoint sources are agriculture, silviculture, urban runoff (including on-site wastewater treatment systems, but excluding storm water discharges regulated under section 402(p) of the Clean Water Act), hydromodification, marinas and recreational boating, and abandoned mines (except where regulated by a permit issued under section 402 of the Clean Water Act).

nutrient

An element or compound that is essential for the growth and development of an organism; for example, carbon, nitrogen, or phosphorus.

on-site wastewater treatment system

Any combination of unit processes or best management practices designed to receive, treat, and dispose of wastewater from individual structures (such as homes and businesses). Examples are septic tanks and holding tanks.

pesticide

Any chemical agent used to control plant or animal pests. Pesticides include insecticides, herbicides, fungicides, nematocides, and rodenticides.

point source

A single point of origin for pollutants or a specific outlet through which pollutants are introduced into a receiving water body. Wastewater treatment plant outfalls and combined sewer overflow points of discharge are typical point sources of pollution.

primary treatment

The first stage of wastewater treatment, which includes removal of floating debris and solids by screening and sedimentation.

publicly owned treatment works (POTW)

A wastewater treatment facility owned by a public entity, such as a city, a county, or a special sanitary district.

redocumentation

The process by which documentation dated prior to 1990 supporting an individual facility's needs was updated or revised for the CWNS 2000. Facilities with needs in excess of \$20 million had to be updated or revised as necessary by documentation dated January 1, 1994, or later.

replacement/rehabilitation of sewers

Reinforcement or reconstruction of structurally deteriorating sewers (beyond normal maintenance). See Appendix G, Table G-1, Category III-B.

riparian vegetation

Vegetation present on the banks of a river or stream or on the shore of a lake.

sanitary sewer

A sewer designed to carry only domestic sanitary sewage and no storm water.

sanitary sewer overflow (SSO)

A discharge of raw domestic sewage from a separate sewer system before the sanitary wastewater reaches the headworks of a wastewater treatment facility.

secondary wastewater treatment

The minimum level of treatment that must be maintained by all treatment facilities except those facilities granted waivers under section 301(h) of the Clean Water Act. Treatment levels are specific in terms of the concentration of conventional pollutants in the wastewater effluent discharged from a facility after treatment. Secondary treatment typically requires a treatment level that will meet an effluent quality of 30 mg/L of both BOD₅ and total suspended solids, although secondary treatment levels required for some lagoon systems might be less stringent. In addition, the secondary treatment must remove 85 percent of BOD₅ and total suspended solids from the influent wastewater. See Appendix G, Table G-1, Category I.

separate sewer system/sanitary sewer system

A sewer system designed to exclude storm water and used to convey only domestic sanitary wastewater.

Separate State Estimates (SSE)

Needs that are not included in EPA's estimates for the CWNS 2000 because the needs are justified with documents other than the established documentation types or they have no written documentation.

silviculture

Care and cultivation of forest trees (e.g., forestry). See Appendix G, Table G-1, Category VII-C.

small community

A community with a population of fewer than 10,000 people and a total wastewater flow of less than 1 million gallons per day.

storm sewer

A sewer that carries only runoff from storm events.

storm water

Runoff water resulting from precipitation. See Appendix G, Table G-1, Category VI.

treatment facility

A structure designed to treat wastewater, storm water, or flows from combined sewers prior to their discharge to the environment. Treatment is accomplished by subjecting the wastewater to a combination of physical, chemical, and/or biological processes that reduce the concentration of contaminants.

urban nonpoint source runoff

Wet weather runoff from urbanized areas not included in Phase I or Phase II of the Storm Water Permit Program. Includes runoff from construction activities occupying less than 1 acre. See Appendix G, Table G-1, Category VII-D.

urbanized area

As defined by the U.S. Census Bureau, densely settled territory that contains 50,000 or more people.

wastewater

Dissolved or suspended waterborne waste material. *Sanitary* or *domestic wastewater* refers to liquid material collected from residences, offices, and institutions. *Industrial wastewater* refers to wastewater from manufacturing facilities. *Municipal wastewater* is a general term applied to any liquid treated in a municipal treatment facility and usually includes a mixture of sanitary and pretreated industrial wastes.

wastewater infrastructure

The pipes and appurtenances for the collection, treatment, and disposal of sewage in a community. The level of treatment depends on the size of the community, the type of discharge, or the designated use of the receiving water.

water quality criteria

Specific levels of water quality that, if achieved, are expected to render a body of water suitable for its designated use. The criteria are based on specific levels of pollutants that would make the water harmful if used for purposes such as drinking, swimming, farming, fish production, or industrial processes.

water quality standards

State-adopted and EPA-approved ambient standards for water bodies. The standards cover the use of the water body and the water quality criteria that must be met to protect the designated use or uses.

watershed

A geographic area in which water, sediments, and dissolved materials drain to a common outlet, typically a point on a larger stream, a lake, an underlying aquifer, an estuary, or an ocean. A watershed is sometimes referred to as the "drainage basin" of the receiving water body.

wetland protection

Activities to protect and restore wetlands that are an integral part of a Nonpoint Source Management Program or part of implementation or development of a Comprehensive Conservation and Management Plan under the Clean Water Act section 320 National Estuary Program.

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Appendix A

*Summary of
Clean Watersheds Needs Survey 2000
Cost Estimates*

Table A-1 summarizes by State the CWNS 2000 assessment of total needs for wastewater treatment and collection facilities, storm water management programs, and NPS pollution control projects. The needs represent the capital investment necessary to plan, design, build, replace, or rehabilitate publicly owned wastewater treatment and collection facilities (Categories I through V) and establish and implement storm water management programs (Category VI). The NPS pollution control Category (VII) includes costs for agriculture, silviculture, urban, ground water protection, marinas, resource extraction, brownfields, storage tanks, sanitary landfills, and hydromodification. These needs include all planning, design, and construction activities eligible for funding under the CWSRF in accordance with Title VI of the Clean Water Act. Needs estimates presented in Table A-1 might vary slightly from those presented in Tables ES-1, 3-1, and 3-4 and the text because of independent rounding.

Table A-1. CWNS 2000 Total Needs (January 2000 dollars in millions)

State	Category of Need										Total (I-V)
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VI	VII	
Alabama	2,720	14	951	135	1,168	386	66	0	0	0	2,720
Alaska	560	306	7	7	65	163	7	5	0	0	560
Arizona	6,199	726	2,368	126	240	319	1,081	0	1,251	88	4,860
Arkansas	500	37	117	22	24	41	71	0	0	188	312
California	14,402	3,916	3,748	111	3,114	82	1,853	426	352	800	13,250
Colorado	1,340	183	812	5	179	16	37	9	48	51	1,241
Connecticut	2,349	399	923	85	16	170	161	500	0	95	2,254
Delaware	288	33	23	0	68	58	4	102	0	0	288
District of Columbia	1,478	305	37	14	64	0	0	1,019	37	2	1,439
Florida	9,966	299	2,853	129	562	1,191	1,012	0	680	3,240	6,046
Georgia	2,336	114	205	1,004	25	9	61	918	0	0	2,336
Hawaii	1,743	575	19	471	441	88	149	0	0	0	1,743
Idaho	207	119	29	3	18	18	20	0	0	0	207
Illinois	11,888	795	103	27	1,204	95	169	9,450	0	45	11,843
Indiana	7,222	626	171	65	419	291	176	5,468	0	6	7,216
Iowa	1,954	240	22	23	79	36	19	1,534	1	0	1,953
Kansas	1,419	373	100	213	2	65	270	396	0	0	1,419
Kentucky	2,797	654	101	193	280	756	592	217	3	1	2,793
Louisiana	2,370	410	146	1,167	216	240	189	0	0	2	2,368
Maine	1,102	176	7	3	31	88	16	653	0	128	974
Maryland	4,779	1,239	837	94	739	407	369	396	456	242	4,081
Massachusetts	4,675	874	249	59	92	662	406	2,324	0	9	4,666
Michigan	4,092	837	73	107	307	301	30	2,437	0	0	4,092
Minnesota	2,319	660	101	42	281	45	104	6	120	960	1,239
Mississippi	856	92	129	156	152	184	143	0	0	0	856
Missouri	4,998	725	22	720	297	301	193	1,180	0	1,560	3,438
Montana	516	170	70	14	55	100	60	0	0	47	469
Nebraska	1,194	149	56	7	11	11	75	861	24	0	1,170

continued

Table A-1. (continued)

State	Category of Need										Total (I-V)	
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VI	VII		
Nevada	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
New Hampshire	906	127	47	7	33	6	135	485	0	66	840	
New Jersey	12,827	2,818	368	339	610	1,007	411	4,385	89	2,800	9,938	
New Mexico	206	94	15	9	42	18	21	0	0	7	199	
New York	20,422	9,853	776	75	2,072	538	173	5,497	16	1,422	18,984	
North Carolina	5,927	423	1,737	291	205	1,725	1,535	3	1	7	5,919	
North Dakota	52	27	0 ^a	2	17	0	1	0	4	1	47	
Ohio	8,722	1,219	391	1,493	112	725	533	3,623	0	626	8,096	
Oklahoma	586	85	25	1	207	33	45	0	190	0	396	
Oregon	1,477	540	155	4	654	16	34	74	0	0	1,477	
Pennsylvania	8,060	845	204	121	119	963	197	5,431	17	163	7,880	
Rhode Island	1,415	109	113	12	52	345	119	633	0	32	1,383	
South Carolina	1,309	551	334	1	13	283	125	0	0	2	1,307	
South Dakota	142	16	29	0	44	13	6	2	14	18	110	
Tennessee	604	66	45	48	107	58	36	244	0	0	604	
Texas	9,152	2,009	813	235	1,323	616	1,890	0	2,225	41	6,886	
Utah	848	347	74	0 ^a	97	98	217	0	5	10	833	
Vermont	144	45	32	0 ^a	0 ^a	33	2	31	0	1	143	
Virginia	3,519	727	777	111	358	516	570	460	0	0	3,519	
Washington	2,744	1,000	52	226	136	198	521	608	0	3	2,741	
West Virginia	2,529	298	12	134	47	691	478	869	0	0	2,529	
Wisconsin	3,338	588	141	54	365	260	462	342	16	1,110	2,212	
Wyoming	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
American Samoa	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Guam	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
N. Mariana Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Puerto Rico	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Virgin Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	
Total	181,198	36,833	20,419	8,165	16,762	14,265	14,844	50,588	5,549	13,773	161,876	

Categories

I Secondary wastewater treatment	III-B Sewer replacement/rehabilitation	V Combined sewer overflow correction
II Advanced wastewater treatment	IV-A New collector sewers and appurtenances	VI Storm water management programs
III-A Infiltration/inflow correction	IV-B New interceptor sewers and appurtenances	VII NPS pollution control (see Table A-2 for totals by subcategory)

Note: NR = not reported. American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in the CWNS 2000.

^a Estimate is less than \$0.5 million.

Table A-2 summarizes the CWNS 2000 assessment of total documented needs for NPS pollution control projects by State. The total documented needs for the CWSRF-eligible projects represent the capital investment necessary to implement activities in approved State NPS Management Plans under section 319 and to develop and implement a Comprehensive Conservation and Management Plan under section 320 of the Clean Water Act. These needs have met the established documentation criteria and are eligible for funding under Title VI of the Clean Water Act. Needs estimates presented in Table A-2 might vary slightly from those presented in Tables ES-1, 3-1, and 3-4; and the text because of independent rounding.

Table A-2. CWNS 2000 Total Needs for NPS Pollution Control Projects (January 2000 dollars in millions)

State	Category VII Needs											Total
	A	B	C	D	E	F	G	H	I	J	K	
Alabama	0	0	0	0	0	0	0	0	0	0	0	0
Alaska	0	0	0	0	0	0	0	0	0	0	0	0
Arizona	23	3	0 ^a	61	0 ^a	0	0	0	0	0	1	88
Arkansas	54	112	0	13	0	0	6	0	0	0	3	188
California	36	44	0	26	290	0	4	0	0	0	400	800
Colorado	0	0	0	50	1	0	0	0	0	0	0	51
Connecticut	4	3	0	45	0	0	0	6	0	0	37	95
Delaware	0	0	0	0	0	0	0	0	0	0	0	0
District of Columbia	0	0	0	0	0	0	0	0	0	0	2	2
Florida	0	0	0	2,432	0	0	0	0	0	0	808	3,240
Georgia	0	0	0	0	0	0	0	0	0	0	0	0
Hawaii	0	0	0	0	0	0	0	0	0	0	0	0
Idaho	0	0	0	0	0	0	0	0	0	0	0	0
Illinois	31	0	0	0	0	0	0	0	0	0	14	45
Indiana	3	1	0	2	0 ^a	0	0	0	0	0	0	6
Iowa	0	0	0	0	0	0	0	0	0	0	0	0
Kansas	0	0	0	0	0	0	0	0	0	0	0	0
Kentucky	0	0	0	0	0	1	0	0	0	0	0	1
Louisiana	0	0	0	2	0	0	0	0	0	0	0	2
Maine	0	22	43	7	0	0	0	0	51	0	5	128
Maryland	0	0 ^a	0	2	0	0	0	0	7	176	57	242
Massachusetts	0	0	0	0	0	0	0	0	0	5	4	9
Michigan	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota	10	168	0	10	0 ^a	0	0	291	479	0	2	960
Mississippi	0	0	0	0	0	0	0	0	0	0	0	0
Missouri	8	14	0 ^a	203	0	0	5	0	477	23	830	1,560
Montana	0	0	0	47	0	0	0	0	0	0	0	47
Nebraska	0	0	0	0	0	0	0	0	0	0	0	0

continued

Table A-2. (continued)

State	Category VII Needs											Total
	A	B	C	D	E	F	G	H	I	J	K	
Nevada	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
New Hampshire	0	0	0	0	0	0	0	0	0	66	0	66
New Jersey	1	4	0	148	430	0	0 ^a	10	0	893	1,314	2,800
New Mexico	0	0	0	0	2	0	0	5	0	0	0	7
New York	59	115	0	104	127	1	0	26	5	626	359	1,422
North Carolina	0	0	0	7	0	0	0	0	0	0	0	7
North Dakota	0	0	0	1	0 ^a	0	0	0	0	0	0	1
Ohio	170	26	1	352	4	0	22	0	0	0	51	626
Oklahoma	0	0	0	0	0	0	0	0	0	0	0	0
Oregon	0	0	0	0	0	0	0	0	0	0	0	0
Pennsylvania	8	8	0	147	0	0	0	0	0	0	0	163
Rhode Island	0	0	0	0	1	0	0	0	0	31	0	32
South Carolina	0	0	0	0	0	0	0	0	0	0	2	2
South Dakota	3	11	0	2	0 ^a	0	0	0	0	0	2	18
Tennessee	0	0	0	0	0	0	0	0	0	0	0	0
Texas	0	0	0	41	0 ^a	0	0	0	0	0	0	41
Utah	1	4	0	1	0	0	1	0	0	0	3	10
Vermont	0	0	0	1	0	0	0	0	0	0	0	1
Virginia	0	0	0	0	0	0	0	0	0	0	0	0
Washington	0	0	0	3	0	0	0	0	0	0	0	3
West Virginia	0	0	0	0	0	0	0	0	0	0	0	0
Wisconsin	69	118	0	709	11	0	0	18	0	11	174	1,110
Wyoming	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
American Samoa	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Guam	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
N. Mariana Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Puerto Rico	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Virgin Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Total	480	653	44	4,416	866	2	38	356	1,019	1,831	4,068	13,773

Categories

A Agriculture (cropland)
 B Agriculture (animals)
 C Silviculture
 D Urban

E Ground water protection (unknown source)
 F Marinas
 G Resource extraction
 H Brownfields

I Storage tanks
 J Sanitary landfills
 K Hydromodification

Notes:

1) NPS pollution control *modeled* needs are \$21.5 billion in January 2000 dollars (Appendix D).

2) NR = not reported. American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in the CWNS 2000.

^a Estimate is less than \$0.5 million.

Table A-3 provides a summary of all publicly owned small community wastewater treatment and collection facilities identified in the CWNS 2000 by State, as well as any associated SSEs. For the purpose of this table, wastewater treatment and collection facilities refers to centralized wastewater treatment plants, centralized wastewater collection systems, decentralized systems, individual on-site system areas, and facilities that treat and convey wastewater that do not fit in one of the previous classifications. Tables A-4, A-5, and A-6 provide further breakdown of small community information based on different population ranges. Needs estimates presented in Table A-3 might vary slightly from those presented in Figure 3-7 and summed totals from Tables A-4, A-5, and A-6 due to independent rounding.

The first column of this table includes information on the projected number of small community wastewater treatment and collection system facilities and the small community percentage of the total number of wastewater treatment and collection system facilities for each State. The number of facilities includes those with documented needs or SSEs and those that did not report any needs. This percentage represents the small community facilities compared to the total wastewater and collection system facilities in the State. For example, 55 percent of Alabama's projected wastewater treatment and collection system facilities are for small communities. Column 2 depicts only the small community facilities with documented wastewater treatment and collection system needs and reflects a portion of all small community facilities with and without needs presented in Column 1. The remaining columns show the small community wastewater treatment and collection system documented needs and SSEs as of January 1, 2000, and the respective percentage of the total CWNS 2000 wastewater treatment and collection system documented needs and SSEs.

Table A-3. CWNS 2000 Comparison of Small Community Facilities' Needs and Total Needs (January 2000 dollars in millions)

State	All Projected Small Community Facilities		Projected Small Community Facilities With Documented Needs		Documented Needs for Small Communities		Separate State Estimates for Small Communities	
	Number	Percent	Number	Percent	\$ Million	Percent	\$ Million	Percent
Alabama	158	55	77	51	85	3	0	0
Alaska	219	91	136	91	295	53	29	97
Arizona	178	66	164	66	380	8	0	0
Arkansas	440	83	69	77	100	32	0	0
California	79	35	43	24	216	2	0	0
Colorado	313	70	177	74	223	18	0	0
Connecticut	113	51	30	27	190	8	19	29
Delaware	39	71	14	64	78	27	0	0
District of Columbia	0	0	0	0	0	0	0	0
Florida	105	29	68	32	265	4	0	0
Georgia	247	60	21	39	36	2	13	2
Hawaii	18	53	6	29	35	2	0	0
Idaho	207	82	53	65	84	40	1	100
Illinois	738	69	130	45	536	5	3	100
Indiana	380	71	173	60	635	9	19	53
Iowa	882	89	171	76	196	10	0	0
Kansas	684	90	179	76	223	16	0 ^a	0
Kentucky	298	75	252	74	659	24	0 ^a	0

continued

Table A-3. (continued)

State	All Projected Small Community Facilities		Projected Small Community Facilities With Documented Needs		Documented Needs for Small Communities		Separate State Estimates for Small Communities	
	Number	Percent	Number	Percent	\$ Million	Percent	\$ Million	Percent
Louisiana	305	74	115	59	134	6	1	20
Maine	160	75	68	60	319	33	43	90
Maryland	280	77	219	74	445	11	27	6
Massachusetts	104	36	58	29	333	7	0	0
Michigan	545	71	34	39	184	4	10	36
Minnesota	751	87	239	85	297	24	226	84
Mississippi	643	87	228	82	300	35	58	73
Missouri	840	84	218	72	281	8	15	100
Montana	207	88	86	79	181	39	7	88
Nebraska	508	94	127	86	109	9	0	0
Nevada	NR	NR	NR	NR	NR	NR	NR	NR
New Hampshire	93	71	43	57	71	8	1	100
New Jersey	389	55	131	38	462	5	0	0
New Mexico	37	54	22	49	23	12	0	0
New York	708	71	314	62	1,112	6	7	70
North Carolina	407	52	221	58	961	16	19	28
North Dakota	353	96	59	88	23	48	0	0
Ohio	1,032	77	398	72	794	10	56	20
Oklahoma	433	86	52	68	47	12	0	0
Oregon	206	72	44	65	136	9	59	56
Pennsylvania	1,741	79	539	77	1,785	23	277	68
Rhode Island	6	15	2	7	3	0	0	0
South Carolina	102	44	9	11	20	2	0	0
South Dakota	43	78	24	69	25	24	0 ^a	0
Tennessee	222	64	18	46	35	6	0	0
Texas	1,407	65	582	68	752	11	12	71
Utah	300	80	68	54	122	15	7	41
Vermont	85	76	12	48	37	26	1	100
Virginia	284	69	159	66	648	18	0	0
Washington	226	65	63	56	200	7	0 ^a	0
West Virginia	620	91	255	84	1,345	53	663	99
Wisconsin	901	86	423	85	662	30	6	100
Wyoming	NR	NR	NR	NR	NR	NR	NR	NR
American Samoa	NR	NR	NR	NR	NR	NR	NR	NR
Guam	NR	NR	NR	NR	NR	NR	NR	NR
N. Mariana Islands	NR	NR	NR	NR	NR	NR	NR	NR
Puerto Rico	NR	NR	NR	NR	NR	NR	NR	NR
Virgin Islands	NR	NR	NR	NR	NR	NR	NR	NR
Total	19,036	74	6,593	65	16,082	10	1,579	48

Note: NR = not reported. American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in the CWNS 2000.

^a Estimate is less than \$0.5 million.

Table A-4 provides the subset of Table A-3 data for the needs for small community facilities estimated to be serving populations in the range of 3,500 to 10,000 people if all documented needs are met.

Table A-4. CWNS 2000 Comparison of Small Community Facilities' Needs and Total Needs: Facilities Serving Populations of 3,500 to 10,000 People (January 2000 dollars in millions)

State	All Projected Small Community Facilities		Projected Small Community Facilities With Documented Needs		Documented Needs for Small Communities		Separate State Estimates for Small Communities	
	Number	Percent	Number	Percent	\$ Million	Percent	\$ Million	Percent
Alabama	24	8	12	8	19	1	0	0
Alaska	5	2	3	2	17	3	15	50
Arizona	26	10	23	9	115	2	0	0
Arkansas	55	10	7	8	9	3	0	0
California	19	8	17	9	105	1	0	0
Colorado	41	9	24	10	83	7	0	0
Connecticut	54	24	15	13	136	6	11	17
Delaware	13	24	5	23	31	11	0	0
District of Columbia	0	0	0	0	0	0	0	0
Florida	46	13	29	14	142	2	0	0
Georgia	70	17	8	15	9	0	9	2
Hawaii	12	35	4	19	28	2	0	0
Idaho	18	7	6	7	15	7	0	0
Illinois	159	15	39	13	307	3	3	100
Indiana	48	9	30	10	179	2	2	6
Iowa	42	4	8	4	16	1	0	0
Kansas	42	6	22	9	123	9	0 ^a	0
Kentucky	57	14	51	15	233	8	0	0
Louisiana	40	10	18	9	44	2	1	20
Maine	39	18	20	18	121	12	35	73
Maryland	27	7	22	7	117	3	7	2
Massachusetts	54	19	35	18	190	4	0	0
Michigan	119	16	10	11	55	1	3	11
Minnesota	79	9	15	5	53	4	69	26
Mississippi	76	10	29	10	104	12	29	36
Missouri	77	8	29	10	70	2	3	20
Montana	16	7	13	12	81	17	0	0
Nebraska	21	4	12	8	28	2	0	0
Nevada	NR	NR	NR	NR	NR	NR	NR	NR
New Hampshire	36	27	23	31	54	6	0	0
New Jersey	208	29	75	22	266	3	0	0
New Mexico	9	13	6	13	13	7	0	0
New York	156	16	70	14	389	2	7	70
North Carolina	80	10	49	13	338	6	0 ^a	0
North Dakota	10	3	6	9	6	13	0	0
Ohio	109	8	52	9	226	3	18	7

continued

Table A-4. (continued)

State	All Projected Small Community Facilities		Projected Small Community Facilities With Documented Needs		Documented Needs for Small Communities		Separate State Estimates for Small Communities	
	Number	Percent	Number	Percent	\$ Million	Percent	\$ Million	Percent
Oklahoma	35	7	7	9	6	2	0	0
Oregon	40	14	10	15	50	3	9	9
Pennsylvania	397	18	121	17	552	7	83	20
Rhode Island	4	10	1	4	1	0	0	0
South Carolina	31	13	5	6	15	1	0	0
South Dakota	7	13	7	20	8	8	0	0
Tennessee	47	14	4	10	17	3	0	0
Texas	337	16	135	16	332	5	9	53
Utah	41	11	24	19	56	7	0	0
Vermont	19	17	6	24	26	18	0	0
Virginia	51	12	31	13	215	6	0	0
Washington	49	14	14	12	74	3	0	0
West Virginia	65	10	51	17	497	20	39	6
Wisconsin	85	8	39	8	119	5	0	0
Wyoming	NR	NR	NR	NR	NR	NR	NR	NR
American Samoa	NR	NR	NR	NR	NR	NR	NR	NR
Guam	NR	NR	NR	NR	NR	NR	NR	NR
N. Mariana Islands	NR	NR	NR	NR	NR	NR	NR	NR
Puerto Rico	NR	NR	NR	NR	NR	NR	NR	NR
Virgin Islands	NR	NR	NR	NR	NR	NR	NR	NR
Total	3,095	12	1,242	12	5,690	4	352	11

Note: NR = not reported. American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in the CWNS 2000.

* Estimate is less than \$0.5 million.

Table A-5 provides the subset of Table A-3 data for the needs for small community facilities estimated to be serving populations in the range of 1,000 to 3,500 people if all documented needs are met.

Table A-5. CWNS 2000 Comparison of Small Community Facilities' Needs and Total Needs: Facilities Serving Populations of 1,000 to 3,500 People (January 2000 dollars in millions)

State	All Projected Small Community Facilities		Projected Small Community Facilities With Documented Needs		Documented Needs for Small Communities		Separate State Estimates for Small Communities	
	Number	Percent	Number	Percent	\$ Million	Percent	\$ Million	Percent
Alabama	86	30	46	30	48	2	0	0
Alaska	14	6	8	5	20	4	0	0
Arizona	65	24	61	25	161	3	0	0
Arkansas	150	28	27	30	46	15	0	0
California	24	11	16	9	101	1	0	0
Colorado	102	23	55	23	62	5	0	0
Connecticut	42	19	8	7	41	2	3	5
Delaware	10	18	3	14	25	9	0	0
District of Columbia	0	0	0	0	0	0	0	0
Florida	45	13	29	14	102	2	0	0
Georgia	112	27	12	22	23	1	2	0
Hawaii	5	15	2	10	6	0	0	0
Idaho	61	24	27	33	47	23	0	0
Illinois	319	30	59	20	184	2	0	0
Indiana	175	33	86	30	350	5	15	42
Iowa	188	19	79	35	120	6	0	0
Kansas	160	21	64	27	48	3	0	0
Kentucky	128	32	112	33	267	10	0 ^a	0
Louisiana	126	31	53	27	56	2	0	0
Maine	80	37	38	34	173	18	5	10
Maryland	54	15	39	13	122	3	11	3
Massachusetts	29	10	16	8	132	3	0	0
Michigan	273	36	19	22	118	3	6	21
Minnesota	198	23	39	14	113	9	109	41
Mississippi	141	19	63	23	97	11	15	19
Missouri	206	20	63	21	91	3	6	40
Montana	59	25	30	28	59	13	6	75
Nebraska	102	19	38	26	43	4	0	0
Nevada	NR	NR	NR	NR	NR	NR	NR	NR
New Hampshire	31	24	8	11	11	1	1	100
New Jersey	133	19	41	12	150	2	0	0
New Mexico	18	26	9	20	5	3	0	0
New York	299	30	134	26	455	2	0	0
North Carolina	169	22	102	27	425	7	14	21
North Dakota	59	16	23	34	9	19	0	0
Ohio	308	23	113	21	301	4	15	5

continued

Table A-5. (continued)

State	All Projected Small Community Facilities		Projected Small Community Facilities With Documented Needs		Documented Needs for Small Communities		Separate State Estimates for Small Communities	
	Number	Percent	Number	Percent	\$ Million	Percent	\$ Million	Percent
Oklahoma	132	26	16	21	19	5	0	0
Oregon	75	26	19	28	56	4	25	24
Pennsylvania	737	33	229	33	897	11	148	36
Rhode Island	1	3	1	4	2	0	0	0
South Carolina	50	22	4	5	4	0	0	0
South Dakota	13	24	8	23	11	11	0 ^a	0
Tennessee	98	28	11	28	17	3	0	0
Texas	599	28	242	28	273	4	3	18
Utah	61	16	29	23	47	6	5	29
Vermont	42	38	5	20	8	6	1	100
Virginia	125	30	67	28	263	7	0	0
Washington	83	24	29	26	108	4	0	0
West Virginia	186	27	104	34	544	22	153	23
Wisconsin	277	26	132	27	303	14	5	83
Wyoming	NR	NR	NR	NR	NR	NR	NR	NR
American Samoa	NR	NR	NR	NR	NR	NR	NR	NR
Guam	NR	NR	NR	NR	NR	NR	NR	NR
N. Mariana Islands	NR	NR	NR	NR	NR	NR	NR	NR
Puerto Rico	NR	NR	NR	NR	NR	NR	NR	NR
Virgin Islands	NR	NR	NR	NR	NR	NR	NR	NR
Total	6,450	25	2,418	24	6,563	4	548	17

Note: NR = not reported. American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in the CWNS 2000.

^a Estimate is less than \$0.5 million.

Table A-6 provides the subset of Table A-3 data for the needs for small community facilities estimated to be serving populations of fewer than 1,000 people if all documented needs are met.

Table A-6. CWNS 2000 Comparison of Small Community Facilities' Needs and Total Needs: Facilities Serving Populations of Fewer Than 1,000 People (January 2000 dollars in millions)

State	All Projected Small Community Facilities		Projected Small Community Facilities With Documented Needs		Documented Needs for Small Communities		Separate State Estimates for Small Communities	
	Number	Percent	Number	Percent	\$ Million	Percent	\$ Million	Percent
Alabama	48	17	19	13	19	1	0	0
Alaska	200	83	125	83	257	46	14	47
Arizona	87	32	80	32	104	2	0	0
Arkansas	235	45	35	39	44	14	0	0
California	36	16	10	6	11	0	0	0
Colorado	170	38	98	41	77	6	0	0
Connecticut	17	8	7	6	13	1	4	6
Delaware	16	29	6	27	22	8	0	0
District of Columbia	0	0	0	0	0	0	0	0
Florida	14	4	10	5	19	0	0	0
Georgia	65	16	1	2	4	0	0 ^a	0
Hawaii	1	3	0	0	0	0	0	0
Idaho	128	51	20	25	20	10	1	100
Illinois	260	24	32	11	46	0	0	0
Indiana	157	29	57	20	103	1	2	6
Iowa	652	66	84	37	57	3	0	0
Kansas	482	64	93	40	54	4	0 ^a	0
Kentucky	113	29	89	26	159	6	0	0
Louisiana	139	34	44	23	34	1	0	0
Maine	41	19	10	9	25	3	2	4
Maryland	199	55	158	54	205	5	10	2
Massachusetts	21	7	7	4	9	0	0	0
Michigan	153	20	5	6	12	0	0 ^a	0
Minnesota	474	55	185	66	131	11	50	19
Mississippi	426	58	136	49	101	12	16	20
Missouri	557	55	126	42	122	4	6	40
Montana	132	56	43	39	40	9	2	25
Nebraska	385	72	77	52	39	3	0	0
Nevada	NR	NR	NR	NR	NR	NR	NR	NR
New Hampshire	26	20	12	16	5	1	0	0
New Jersey	48	7	15	4	44	0	0	0
New Mexico	10	14	7	16	4	2	0	0
New York	253	26	110	22	266	1	0	0
North Carolina	158	20	70	18	197	3	4	6
North Dakota	284	78	30	45	8	17	0	0
Ohio	615	46	233	42	268	3	22	8

continued

Table A-6. (continued)

State	All Projected Small Community Facilities		Projected Small Community Facilities With Documented Needs		Documented Needs for Small Communities		Separate State Estimates for Small Communities	
	Number	Percent	Number	Percent	\$ Million	Percent	\$ Million	Percent
Oklahoma	266	53	29	38	20	5	0	0
Oregon	91	32	15	22	28	2	23	22
Pennsylvania	607	27	189	27	337	4	45	11
Rhode Island	1	3	0	0	0	0	0	0
South Carolina	21	9	0	0	0	0	0	0
South Dakota	23	42	9	26	5	5	0	0
Tennessee	77	22	3	8	3	0	0	0
Texas	471	22	205	24	148	2	0	0
Utah	198	53	15	12	18	2	2	12
Vermont	24	21	1	4	3	2	0	0
Virginia	108	26	61	25	171	5	0	0
Washington	94	27	20	18	18	1	0 ^a	0
West Virginia	369	54	100	33	302	12	472	70
Wisconsin	539	51	252	51	238	11	0 ^a	0
Wyoming	NR	NR	NR	NR	NR	NR	NR	NR
American Samoa	NR	NR	NR	NR	NR	NR	NR	NR
Guam	NR	NR	NR	NR	NR	NR	NR	NR
N. Mariana Islands	NR	NR	NR	NR	NR	NR	NR	NR
Puerto Rico	NR	NR	NR	NR	NR	NR	NR	NR
Virgin Islands	NR	NR	NR	NR	NR	NR	NR	NR
Total	9,491	37	2,933	29	3,810	2	675	21

Note: NR = not reported. American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in the CWNS 2000.

^a Estimate is less than \$0.5 million.

Table A-7 summarizes the CWNS 2000 assessment of total needs for small communities by State for wastewater treatment and collection facilities (Categories I through V) and NPS Pollution Control (Category VII). EPA derived the small community needs shown from the total needs using the criteria defined in Chapter 3 in the section “What are the needs for small communities?” Tables A-8, A-9, and A-10 provide further breakdown of small community information based on different population ranges.

These small community design year needs have met the established documentation criteria and represent the capital investment necessary to plan, design, build, replace, or rehabilitate publicly owned wastewater treatment facilities needed to serve the projected estimated design year population of small communities. These are the funds necessary to provide adequate wastewater treatment systems and NPS pollution control in compliance with the Clean Water Act for those small communities that could document their needs. Storm water management programs and most NPS pollution control needs were not included in this table since by definition small community facilities require population data. Facilities with storm water and NPS pollution control needs do not have population data; therefore, those facilities cannot be considered as serving small communities. The exception is NPS pollution control needs associated with individual on-site system disposal areas, where the needs could be included in VII-D (Urban) or VII-E (Ground water protection (unknown source)).

Table A-7. CWNS 2000 Total Small Community Needs (January 2000 dollars in millions)

State	Category of Need									Total (I-V)
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VII	
Alabama	85	3	11	11	14	42	4	0	0	85
Alaska	295	132	7	1	20	130	5	0	0	295
Arizona	380	44	73	18	6	194	45	0	0	380
Arkansas	100	12	14	2	0 ^a	37	35	0	0	100
California	216	129	16	7	26	38	0 ^a	0	0	216
Colorado	223	121	49	2	10	13	27	0	1	222
Connecticut	190	61	19	6	0	66	38	0	0	190
Delaware	78	2	16	0	2	58	0	0	0	78
District of Columbia	0	0	0	0	0	0	0	0	0	0
Florida	265	24	83	12	16	114	16	0	0	265
Georgia	36	13	13	3	0 ^a	5	2	0	0	36
Hawaii	35	26	0	0	2	7	0	0	0	35
Idaho	84	39	4	3	6	15	17	0	0	84
Illinois	536	87	10	12	8	75	31	313	0	536
Indiana	635	91	29	20	30	100	37	328	0 ^a	635
Iowa	196	101	5	0 ^a	12	16	3	59	0	196
Kansas	223	64	21	23	1	21	93	0	0	223
Kentucky	659	150	15	25	35	332	101	1	0	659
Louisiana	134	24	34	13	10	26	27	0	0	134
Maine	319	67	7	1	11	54	16	163	0	319
Maryland	445	80	62	16	40	97	94	56	0	445
Massachusetts	333	50	53	5	23	174	28	0	0	333

continued

Table A-7. (continued)

State	Category of Need									Total (I-V)
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VII	
Michigan	184	41	4	15	4	77	5	38	0	184
Minnesota	297	207	24	14	18	10	23	0	1	296
Mississippi	300	59	14	31	33	121	42	0	0	300
Missouri	281	73	2	3	18	143	42	0	0	281
Montana	181	81	5	9	26	45	15	0	0	181
Nebraska	109	79	9	1	6	9	5	0	0	109
Nevada	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
New Hampshire	71	13	10	5	3	4	36	0	0	71
New Jersey	462	73	43	51	90	141	59	5	0	462
New Mexico	23	7	0 ^a	0 ^a	7	6	3	0	0	23
New York	1,112	248	112	60	41	412	106	131	2	1,110
North Carolina	961	82	79	72	53	446	229	0	0	961
North Dakota	23	8	0 ^a	1	13	0	1	0	0 ^a	23
Ohio	794	139	44	32	7	231	96	244	1	793
Oklahoma	47	25	3	1	12	6	0 ^a	0	0	47
Oregon	136	72	23	1	25	12	3	0	0	136
Pennsylvania	1,785	312	58	43	15	839	111	407	0	1,785
Rhode Island	3	1	0 ^a	0	0	1	0	0	1	2
South Carolina	20	5	1	0 ^a	2	12	0	0	0	20
South Dakota	25	6	1	0	9	7	0	2	0	25
Tennessee	35	5	5	5	4	12	4	0	0	35
Texas	752	192	39	69	80	203	169	0	0 ^a	752
Utah	122	31	1	0 ^a	5	41	44	0	0	122
Vermont	37	16	10	0 ^a	0 ^a	10	1	0	0	37
Virginia	648	126	20	18	5	315	164	0	0	648
Washington	200	107	0 ^a	20	49	24	0	0	0	200
West Virginia	1,345	123	9	21	16	606	411	159	0	1,345
Wisconsin	662	276	48	13	33	244	48	0	0	662
Wyoming	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
American Samoa	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Guam	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
N. Mariana Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Puerto Rico	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Virgin Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Total	16,082	3,727	1,105	665	846	5,591	2,236	1,906	6	16,076

Categories

I Secondary wastewater treatment	III-B Sewer replacement/rehabilitation	V Combined sewer overflow correction
II Advanced wastewater treatment	IV-A New collector sewers and appurtenances	VII NPS pollution control
III-A Infiltration/inflow correction	IV-B New interceptor sewers and appurtenances	

Note: NR = not reported. American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in the CWNS 2000.

^a Estimate is less than \$0.5 million.

Table A-8 provides the subset of Table A-7 data for the needs for small community facilities estimated to be serving populations in the range of 3,500 to 10,000 people.

Table A-8. CWNS 2000 Total Small Community Needs: Facilities Serving Populations of 3,500 to 10,000 People
(January 2000 dollars in millions)

State	Category of Need									Total (I-V)
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VII	
Alabama	19	1	6	0 ^a	5	7	0	0	0	19
Alaska	17	4	0	0 ^a	11	2	0	0	0	17
Arizona	115	12	31	17	1	44	10	0	0	115
Arkansas	9	2	1	0 ^a	0 ^a	3	3	0	0	9
California	105	43	4	3	21	34	0 ^a	0	0	105
Colorado	83	33	33	0 ^a	6	0	11	0	0	83
Connecticut	136	46	16	4	0	45	25	0	0	136
Delaware	31	0	9	0	2	20	0	0	0	31
District of Columbia	0	0	0	0	0	0	0	0	0	0
Florida	142	19	40	5	12	59	7	0	0	142
Georgia	9	4	4	1	0	0 ^a	0	0	0	9
Hawaii	28	21	0	0	2	5	0	0	0	28
Idaho	15	7	3	1	1	0 ^a	3	0	0	15
Illinois	307	32	4	9	4	8	16	234	0	307
Indiana	179	28	2	4	2	30	10	103	0	179
Iowa	16	12	0 ^a	0	3	0	1	0	0	16
Kansas	123	27	10	15	0 ^a	2	69	0	0	123
Kentucky	233	43	2	14	19	125	29	1	0	233
Louisiana	44	9	9	1	2	8	15	0	0	44
Maine	121	12	0	0 ^a	2	5	6	96	0	121
Maryland	117	18	25	3	3	22	10	36	0	117
Massachusetts	190	17	40	5	15	93	20	0	0	190
Michigan	55	12	0	5	0	19	0	19	0	55
Minnesota	53	15	16	6	8	4	4	0	0	53
Mississippi	104	8	10	8	17	44	17	0	0	104
Missouri	70	23	1	2	8	23	13	0	0	70
Montana	81	30	2	1	11	24	13	0	0	81
Nebraska	28	18	6	0	0	0	4	0	0	28
Nevada	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
New Hampshire	54	4	10	5	2	1	32	0	0	54
New Jersey	266	43	28	31	44	74	46	0	0	266
New Mexico	13	4	0 ^a	0	4	2	3	0	0	13
New York	389	59	28	15	14	156	32	85	0	389

continued

Table A-8. (continued)

State	Category of Need									Total (I-V)
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VII	
North Carolina	338	12	34	29	32	147	84	0	0	338
North Dakota	6	2	0	0	4	0	0	0	0	6
Ohio	226	37	15	21	4	44	19	86	0 ^a	226
Oklahoma	6	4	0	0	1	1	0	0	0	6
Oregon	50	30	4	0 ^a	16	0	0	0	0	50
Pennsylvania	552	74	23	15	9	178	30	223	0	552
Rhode Island	1	0	0	0	0	0	0	0	1	0
South Carolina	15	5	1	0 ^a	0	9	0	0	0	15
South Dakota	8	2	0	0	3	3	0	0	0	8
Tennessee	17	1	1	2	4	6	3	0	0	17
Texas	332	78	18	34	34	86	82	0	0	332
Utah	56	8	0	0 ^a	2	21	25	0	0	56
Vermont	26	11	8	0	0 ^a	7	0	0	0	26
Virginia	215	49	8	1	0 ^a	83	74	0	0	215
Washington	74	31	0	5	29	9	0	0	0	74
West Virginia	497	51	4	7	5	228	159	43	0	497
Wisconsin	119	38	19	3	9	40	10	0	0	119
Wyoming	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
American Samoa	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Guam	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
N. Mariana Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Puerto Rico	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Virgin Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Total	5,690	1,039	475	272	371	1,721	885	926	1	5,689

Categories

I Secondary wastewater treatment	III-B Sewer replacement/rehabilitation	V Combined sewer overflow correction
II Advanced wastewater treatment	IV-A New collector sewers and appurtenances	VII NPS pollution control
III-A Infiltration/inflow correction	IV-B New interceptor sewers and appurtenances	

Note: NR = not reported. American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in the CWNS 2000.

^a Estimate is less than \$0.5 million.

Table A-9 provides the subset of Table A-7 data for the needs for small community facilities estimated to be serving populations in the range of 1,000 to 3,500 people.

Table A-9. CWNS 2000 Total Small Community Needs: Facilities Serving Populations of 1,000 to 3,500 People (January 2000 dollars in millions)

State	Category of Need									Total (I-V)
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VII	
Alabama	48	0a	3	10	6	26	3	0	0	48
Alaska	20	17	0	0	1	2	0	0	0	20
Arizona	161	19	28	1	3	91	19	0	0	161
Arkansas	46	4	7	1	0 ^a	19	15	0	0	46
California	101	80	12	0 ^a	5	4	0	0	0	101
Colorado	62	42	13	2	2	0 ^a	3	0	0	62
Connecticut	41	12	3	2	0	15	9	0	0	41
Delaware	25	2	7	0	0	16	0	0	0	25
District of Columbia	0	0	0	0	0	0	0	0	0	0
Florida	102	3	37	6	4	46	6	0	0	102
Georgia	23	9	6	2	0 ^a	5	1	0	0	23
Hawaii	6	4	0	0	0	2	0	0	0	6
Idaho	47	20	1	2	4	10	10	0	0	47
Illinois	184	40	6	3	4	48	11	72	0	184
Indiana	350	47	14	13	12	39	14	211	0	350
Iowa	120	58	3	0	6	2	1	50	0	120
Kansas	48	20	11	6	1	5	5	0	0	48
Kentucky	267	66	9	10	11	125	46	0	0	267
Louisiana	56	6	17	11	7	10	5	0	0	56
Maine	173	40	7	1	8	40	10	67	0	173
Maryland	122	22	34	10	12	18	7	19	0	122
Massachusetts	132	27	11	0 ^a	8	79	7	0	0	132
Michigan	118	23	4	10	2	55	5	19	0	118
Minnesota	113	92	2	4	8	3	4	0	0	113
Mississippi	97	23	1	20	13	31	9	0	0	97
Missouri	91	24	1	1	9	47	9	0	0	91
Montana	59	27	3	4	7	16	2	0	0	59
Nebraska	43	34	2	1	3	2	1	0	0	43
Nevada	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
New Hampshire	11	7	0	0	1	2	1	0	0	11
New Jersey	150	22	13	15	33	57	6	4	0	150
New Mexico	5	2	0 ^a	0 ^a	2	1	0 ^a	0	0	5
New York	455	124	47	29	15	153	41	45	1	454

continued

Table A-9. (continued)

State	Category of Need									Total (I-V)
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VII	
North Carolina	425	49	35	30	19	198	94	0	0	425
North Dakota	9	4	0	0 ^a	5	0	0 ^a	0	0	9
Ohio	301	44	14	8	2	62	30	140	1	300
Oklahoma	19	10	0 ^a	1	8	0 ^a	0	0	0	19
Oregon	56	31	15	0 ^a	7	2	1	0	0	56
Pennsylvania	897	162	23	19	5	453	62	173	0	897
Rhode Island	2	1	0 ^a	0	0	1	0	0	0	2
South Carolina	4	0	0 ^a	0	2	2	0	0	0	4
South Dakota	11	1	0	0	5	3	0	2	0	11
Tennessee	17	3	5	3	0	5	1	0	0	17
Texas	273	71	18	25	37	64	58	0	0	273
Utah	47	19	1	0	3	13	11	0	0	47
Vermont	8	4	1	0 ^a	0 ^a	3	0	0	0	8
Virginia	263	50	12	13	1	130	57	0	0	263
Washington	108	69	0	11	18	10	0	0	0	108
West Virginia	544	59	5	6	6	214	139	115	0	544
Wisconsin	303	146	21	7	17	99	13	0	0	303
Wyoming	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
American Samoa	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Guam	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
N. Mariana Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Puerto Rico	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Virgin Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Total	6,563	1,639	452	287	322	2,228	716	917	2	6,561

Categories

I Secondary wastewater treatment	III-B Sewer replacement/rehabilitation	V Combined sewer overflow correction
II Advanced wastewater treatment	IV-A New collector sewers and appurtenances	VII NPS pollution control
III-A Infiltration/inflow correction	IV-B New interceptor sewers and appurtenances	

Note: NR = not reported. American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in the CWNS 2000.

^a Estimate is less than \$0.5 million.

Table A-10 provides the subset of Table A-7 data for the needs for small community facilities estimated to be serving populations of fewer than 1,000 people.

Table A-10. CWNS 2000 Total Small Community Needs: Facilities Serving Populations of Fewer Than 1,000 People
(January 2000 dollars in millions)

State	Category of Need									Total (I-V)
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VII	
Alabama	19	2	3	1	3	9	1	0	0	19
Alaska	257	111	7	0 ^a	8	126	5	0	0	257
Arizona	104	12	14	0 ^a	2	59	17	0	0	104
Arkansas	44	6	6	0 ^a	0	16	16	0	0	44
California	11	7	0 ^a	4	0 ^a	0	0	0	0	11
Colorado	77	46	2	1	2	12	13	0	1	76
Connecticut	13	3	0 ^a	0 ^a	0	6	4	0	0	13
Delaware	22	0	0	0	0	22	0	0	0	22
District of Columbia	0	0	0	0	0	0	0	0	0	0
Florida	19	2	5	0 ^a	0	10	2	0	0	19
Georgia	4	0	3	0	0	0	1	0	0	4
Hawaii	0	0	0	0	0	0	0	0	0	0
Idaho	20	11	0	0 ^a	1	4	4	0	0	20
Illinois	46	15	0	0	1	19	4	7	0	46
Indiana	103	16	13	2	15	30	13	14	0 ^a	103
Iowa	57	30	1	0 ^a	2	14	1	9	0	57
Kansas	54	17	1	2	0 ^a	14	20	0	0	54
Kentucky	159	41	4	2	5	82	25	0	0	159
Louisiana	34	8	8	2	1	8	7	0	0	34
Maine	25	15	0	0	1	9	0	0 ^a	0	25
Maryland	205	39	3	3	25	57	78	0	0	205
Massachusetts	9	5	2	0 ^a	1	1	0	0	0	9
Michigan	12	6	0	0	2	4	0	0	0	12
Minnesota	131	100	6	4	2	3	15	0	1	130
Mississippi	101	28	2	3	4	47	17	0	0	101
Missouri	122	26	0 ^a	1	2	73	20	0	0	122
Montana	40	23	0	4	8	5	0 ^a	0	0	40
Nebraska	39	27	1	1	2	7	1	0	0	39
Nevada	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
New Hampshire	5	2	0	0 ^a	0	0 ^a	3	0	0	5
New Jersey	44	8	2	5	13	9	7	0 ^a	0	44
New Mexico	4	1	0	0 ^a	0 ^a	3	0	0	0	4
New York	266	65	37	16	11	103	33	0	1	265

continued

Table A-10. (continued)

State	Category of Need									Total (I-V)
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VII	
North Carolina	197	21	11	12	2	101	50	0	0	197
North Dakota	8	3	0 ^a	0 ^a	4	0	1	0	0 ^a	8
Ohio	268	58	15	3	1	125	47	19	0	268
Oklahoma	20	10	3	0 ^a	3	4	0 ^a	0	0	20
Oregon	28	11	4	0 ^a	2	10	1	0	0	28
Pennsylvania	337	76	12	8	1	209	20	11	0	337
Rhode Island	0	0	0	0	0	0	0	0	0	0
South Carolina	0	0	0	0	0	0	0	0	0	0
South Dakota	5	3	1	0	1	0 ^a	0	0	0	5
Tennessee	3	1	0	0	0	1	1	0	0	3
Texas	148	43	3	10	9	54	29	0	0 ^a	148
Utah	18	4	0	0	0 ^a	6	8	0	0	18
Vermont	3	0 ^a	1	0	0	1	1	0	0	3
Virginia	171	27	0	4	4	103	33	0	0	171
Washington	18	7	0 ^a	4	2	5	0	0	0	18
West Virginia	302	13	0 ^a	7	5	164	113	0 ^a	0	302
Wisconsin	238	91	8	3	7	105	24	0	0	238
Wyoming	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
American Samoa	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Guam	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
N. Mariana Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Puerto Rico	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Virgin Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Total	3,810	1,040	178	102	152	1,640	635	60	3	3,807

Categories

I Secondary wastewater treatment	III-B Sewer replacement/rehabilitation	V Combined sewer overflow correction
II Advanced wastewater treatment	IV-A New collector sewers and appurtenances	VII NPS pollution control
III-A Infiltration/inflow correction	IV-B New interceptor sewers and appurtenances	

Note: NR = not reported. American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in the CWNS 2000.

^a Estimate is less than \$0.5 million.

Table A-11 summarizes the total SSE needs, which are the needs that the States believe to be legitimate but that either were justified with documents outside the established documentation criteria of the CWNS 2000 or had no written documentation. The SSEs are optional and are in addition to the documented needs.

Table A-11. CWNS 2000 Total Separate State Estimates (January 2000 dollars in millions)

State	Category of Need												Total (I-V)
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VI	VII	VIII	IX	
Alabama	0	0	0	0	0	0	0	0	0	0	0	0	0
Alaska	30	13	0	0	1	15	1	0	0	0	0	0	30
Arizona	0	0	0	0	0	0	0	0	0	0	0	0	0
Arkansas	0	0	0	0	0	0	0	0	0	0	0	0	0
California	4	1	0	1	0	0	0	0	0	2	0	0	2
Colorado	25	0	25	0	0	0	0	0	0	0	0	0	25
Connecticut	66	0	2	0	0	42	22	0	0	0	0	0	66
Delaware	0	0	0	0	0	0	0	0	0	0	0	0	0
District of Columbia	0	0	0	0	0	0	0	0	0	0	0	0	0
Florida	0	0	0	0	0	0	0	0	0	0	0	0	0
Georgia	577	56	340	7	3	10	161	0	0	0	0	0	577
Hawaii	0	0	0	0	0	0	0	0	0	0	0	0	0
Idaho	1	1	0	0	0	0	0	0	0	0	0	0	1
Illinois	3	3	0 ^a	0	0	0	0	0	0	0	0	0	3
Indiana	36	13	7	14	0 ^a	0	1	0	0	1	0	0	35
Iowa	0	0	0	0	0	0	0	0	0	0	0	0	0
Kansas	0 ^a	0 ^a	0	0 ^a	0	0	0	0	0	0	0	0	0 ^a
Kentucky	0 ^a	0	0	0	0	0 ^a	0 ^a	0	0	0	0	0	0 ^a
Louisiana	5	0	0	3	2	0	0	0	0	0	0	0	5
Maine	52	8	0	8	0	24	9	0	0	3	0	0	49
Maryland	501	74	75	7	89	111	65	0	43	37	0	0	421
Massachusetts	28	2	0	18	0	3	5	0	0	0	0	0	28
Michigan	28	3	0	16	7	0	2	0	0	0	0	0	28
Minnesota	286	183	6	36	14	2	27	0	0	18	0	0	268
Mississippi	80	17	5	15	0	15	28	0	0	0	0	0	80
Missouri	15	13	0	0	0	0	2	0	0	0	0	0	15
Montana	7	4	0	0	0 ^a	3	0 ^a	0	0	0	0	0	7
Nebraska	0 ^a	0	0	0	0	0	0	0	0 ^a	0	0	0	0
Nevada	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
New Hampshire	1	0	0	0	0	1	0 ^a	0	0	0	0	0	1
New Jersey	285	0	0	0 ^a	7	0	0	21	7	248	2	0	28
New Mexico	0	0	0	0	0	0	0	0	0	0	0	0	0

continued

Table A-11. (continued)

State	Category of Need											Total (I-V)	
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VI	VII	VIII		IX
New York	459	8	0	0	2	0	0	0	0	449	0 ^a	0	10
North Carolina	68	11	28	9	2	9	9	0	0	0	0	0	68
North Dakota	11	0	0	4	7	0	0	0	0	0	0	0	11
Ohio	784	72	43	34	24	21	20	60	0	510	0	0	274
Oklahoma	5	0	4	0	0	0	1	0	0	0	0	0	5
Oregon	106	51	14	23	6	6	4	0	0	2	0	0	104
Pennsylvania	425	171	39	4	5	118	67	5	0	16	0	0	409
Rhode Island	0 ^a	0	0	0	0 ^a	0	0	0	0	0	0	0	0 ^a
South Carolina	0	0	0	0	0	0	0	0	0	0	0	0	0
South Dakota	0 ^a	0	0	0	0	0	0 ^a	0	0	0	0	0	0 ^a
Tennessee	0	0	0	0	0	0	0	0	0	0	0	0	0
Texas	19	1	0 ^a	3	0	2	11	0	0	0	2	0	17
Utah	17	2	10	0	0	3	2	0	0	0	0	0	17
Vermont	1	0	1	0	0	0	0	0	0	0	0	0	1
Virginia	0	0	0	0	0	0	0	0	0	0	0	0	0
Washington	0 ^a	0 ^a	0	0	0	0 ^a	0	0	0	0	0	0	0 ^a
West Virginia	670	220	7	6	4	226	207	0 ^a	0	0	0	0	670
Wisconsin	8	0	0	0	0	4	2	0	0	2	0	0	6
Wyoming	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
American Samoa	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Guam	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
N. Mariana Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Puerto Rico	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Virgin Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Total	4,603	927	606	208	173	615	646	86	50	1,288	4	0	3,261

Categories

I Secondary wastewater treatment	IV-A New collector sewers and appurtenances	VII NPS pollution control
II Advanced wastewater treatment	IV-B New interceptor sewers and appurtenances	VIII Confined animals - point source
III-A Infiltration/inflow correction	V Combined sewer overflow correction	IX Mining - point source
III-B Sewer replacement/rehabilitation	VI Storm water management programs	

Note: NR = not reported. American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in the CWNS 2000.

^a Estimate is less than \$0.5 million.

Table A-12 summarizes CWNS 2000 SSEs for NPS-related activities. The subcategory totals provided here are summarized in the Category VII column of Table A-11.

Table A-12. CWNS 2000 Total Separate State Estimates for NPS Pollution Control Projects
(January 2000 dollars in millions)

State	Category VII Needs											Total
	A	B	C	D	E	F	G	H	I	J	K	
Alabama	0	0	0	0	0	0	0	0	0	0	0	0
Alaska	0	0	0	0	0	0	0	0	0	0	0	0
Arizona	0	0	0	0	0	0	0	0	0	0	0	0
Arkansas	0	0	0	0	0	0	0	0	0	0	0	0
California	0	0	0	2	0	0	0	0	0	0	0	2
Colorado	0	0	0	0	0	0	0	0	0	0	0	0
Connecticut	0	0	0	0	0	0	0	0	0	0	0	0
Delaware	0	0	0	0	0	0	0	0	0	0	0	0
District of Columbia	0	0	0	0	0	0	0	0	0	0	0	0
Florida	0	0	0	0	0	0	0	0	0	0	0	0
Georgia	0	0	0	0	0	0	0	0	0	0	0	0
Hawaii	0	0	0	0	0	0	0	0	0	0	0	0
Idaho	0	0	0	0	0	0	0	0	0	0	0	0
Illinois	0	0	0	0	0	0	0	0	0	0	0	0
Indiana	1	0 ^a	0	0	0	0	0	0	0	0	0	1
Iowa	0	0	0	0	0	0	0	0	0	0	0	0
Kansas	0	0	0	0	0	0	0	0	0	0	0	0
Kentucky	0	0	0	0	0	0	0	0	0	0	0	0
Louisiana	0	0	0	0	0	0	0	0	0	0	0	0
Maine	0	0	0	0	0	0	0	0	3	0	0	3
Maryland	0	0	0	0	0	0	0	0	0	37	0	37
Massachusetts	0	0	0	0	0	0	0	0	0	0	0	0
Michigan	0	0	0	0	0	0	0	0	0	0	0	0
Minnesota	0 ^a	0	0	6	0 ^a	0	0	0	12	0	0 ^a	18
Mississippi	0	0	0	0	0	0	0	0	0	0	0	0
Missouri	0	0	0	0	0	0	0	0	0	0	0	0
Montana	0	0	0	0	0	0	0	0	0	0	0	0
Nebraska	0	0	0	0	0	0	0	0	0	0	0	0
Nevada	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
New Hampshire	0	0	0	0	0	0	0	0	0	0	0	0
New Jersey	0	67	0	0	181	0	0	0	0	0	0	248
New Mexico	0	0	0	0	0	0	0	0	0	0	0	0
New York	0	0	0	449	0	0	0	0	0	0	0	449

continued

Table A-12. (continued)

State	Category VII Needs											Total
	A	B	C	D	E	F	G	H	I	J	K	
North Carolina	0	0	0	0	0	0	0	0	0	0	0	0
North Dakota	0	0	0	0	0	0	0	0	0	0	0	0
Ohio	3	2	0 ^a	502	0	0	1	0	0	0 ^a	2	510
Oklahoma	0	0	0	0	0	0	0	0	0	0	0	0
Oregon	0	0	0	0 ^a	0	0	0	0	0	0	2	2
Pennsylvania	8	8	0	0	0 ^a	0	0	0	0	0	0	16
Rhode Island	0	0	0	0	0	0	0	0	0	0	0	0
South Carolina	0	0	0	0	0	0	0	0	0	0	0	0
South Dakota	0	0	0	0	0	0	0	0	0	0	0	0
Tennessee	0	0	0	0	0	0	0	0	0	0	0	0
Texas	0	0	0	0	0	0	0	0	0	0	0	0
Utah	0	0	0	0	0	0	0	0	0	0	0	0
Vermont	0	0	0	0	0	0	0	0	0	0	0	0
Virginia	0	0	0	0	0	0	0	0	0	0	0	0
Washington	0	0	0	0	0	0	0	0	0	0	0	0
West Virginia	0	0	0	0	0	0	0	0	0	0	0	0
Wisconsin	0	0	0	2	0	0	0	0	0	0	0	2
Wyoming	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
American Samoa	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Guam	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
N. Mariana Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Puerto Rico	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Virgin Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Total	12	77	0^a	961	181	0	1	0	15	37	4	1,288

Categories

A Agriculture (cropland)

B Agriculture (animals)

C Silviculture

D Urban

E Ground water protection (unknown source)

F Marinas

G Resource extraction

H Brownfields

I Storage tanks

J Sanitary landfills

K Hydromodification

Note: NR = not reported. American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in the CWNS 2000.

^a Estimate is less than \$0.5 million.

Table A-13 summarizes the SSE needs for small communities. EPA derived small community needs shown in this table from the total SSEs using the criteria defined in Chapter 3 in the report section “What Are the Needs for Small Communities?” These needs are shown by category of need in each State and U.S. Territory. The SSE needs are optional and are in addition to the documented needs.

Table A-13. CWNS 2000 Total Separate State Estimates for Small Community Facilities (January 2000 dollars in millions)

State	Category of Need									Total (I–V)
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VII	
Alabama	0	0	0	0	0	0	0	0	0	0
Alaska	29	12	0	0	1	15	1	0	0	29
Arizona	0	0	0	0	0	0	0	0	0	0
Arkansas	0	0	0	0	0	0	0	0	0	0
California	0	0	0	0	0	0	0	0	0	0
Colorado	0	0	0	0	0	0	0	0	0	0
Connecticut	19	0	0	0	0	13	6	0	0	19
Delaware	0	0	0	0	0	0	0	0	0	0
District of Columbia	0	0	0	0	0	0	0	0	0	0
Florida	0	0	0	0	0	0	0	0	0	0
Georgia	13	2	0 ^a	2	2	4	3	0	0	13
Hawaii	0	0	0	0	0	0	0	0	0	0
Idaho	1	1	0	0	0	0	0	0	0	1
Illinois	3	3	0 ^a	0	0	0	0	0	0	3
Indiana	19	4	5	9	0 ^a	0	1	0	0	19
Iowa	0	0	0	0	0	0	0	0	0	0
Kansas	0 ^a	0 ^a	0	0 ^a	0	0	0	0	0	0 ^a
Kentucky	0 ^a	0	0	0	0	0 ^a	0 ^a	0	0	0 ^a
Louisiana	1	0	0	1	0	0	0	0	0	1
Maine	43	8	0	3	0	23	9	0	0	43
Maryland	27	7	0	0 ^a	1	11	8	0	0	27
Massachusetts	0	0	0	0	0	0	0	0	0	0
Michigan	10	3	0	0 ^a	7	0	0	0	0	10
Minnesota	226	162	3	33	9	2	17	0	0	226
Mississippi	58	11	3	9	0	14	21	0	0	58
Missouri	15	13	0	0	0	0	2	0	0	15
Montana	7	4	0	0	0	3	0 ^a	0	0	7
Nebraska	0	0	0	0	0	0	0	0	0	0
Nevada	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
New Hampshire	1	0	0	0	0	1	0 ^a	0	0	1
New Jersey	0	0	0	0	0	0	0	0	0	0
New Mexico	0	0	0	0	0	0	0	0	0	0

continued

Table A-13. (continued)

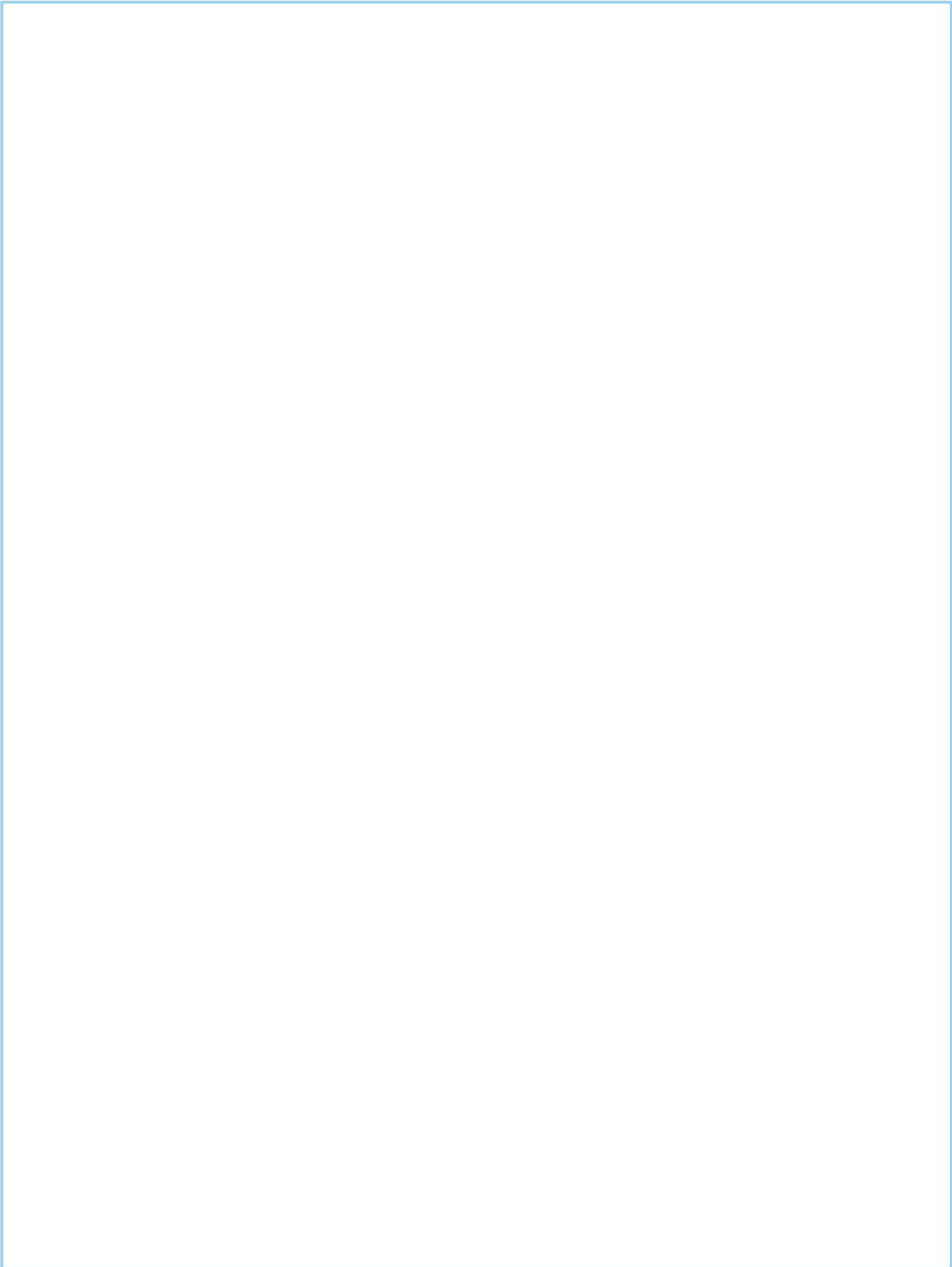
State	Category of Need									Total (I-V)
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VII	
New York	7	7	0	0	0	0	0	0	0	7
North Carolina	19	6	0	4	1	5	3	0	0	19
North Dakota	0	0	0	0	0	0	0	0	0	0
Ohio	56	19	5	7	1	8	16	0	0	56
Oklahoma	0	0	0	0	0	0	0	0	0	0
Oregon	59	33	3	9	4	6	4	0	0 ^a	59
Pennsylvania	277	101	6	3	4	102	56	5	0 ^a	277
Rhode Island	0	0	0	0	0	0	0	0	0	0
South Carolina	0	0	0	0	0	0	0	0	0	0
South Dakota	0 ^a	0	0	0	0	0	0 ^a	0	0	0 ^a
Tennessee	0	0	0	0	0	0	0	0	0	0
Texas	12	0 ^a	0	0	0	2	10	0	0	12
Utah	7	2	0	0	0	3	2	0	0	7
Vermont	1	0	1	0	0	0	0	0	0	1
Virginia	0	0	0	0	0	0	0	0	0	0
Washington	0 ^a	0 ^a	0	0	0	0 ^a	0	0	0	0 ^a
West Virginia	663	218	7	5	3	224	206	0	0	663
Wisconsin	6	0	0	0	0	4	2	0	0	6
Wyoming	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
American Samoa	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Guam	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
N. Mariana Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Puerto Rico	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Virgin Islands	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Total	1,579	616	33	85	33	440	367	5	0^a	1,579

Categories

I Secondary wastewater treatment	III-B Sewer replacement/rehabilitation	V Combined sewer overflow correction
II Advanced wastewater treatment	IV-A New collector sewers and appurtenances	VII NPS pollution control
III-A Infiltration/inflow correction	IV-B New interceptor sewers and appurtenances	

Note: NR = not reported. American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming did not participate in the CWNS 2000.

^a Estimate is less than \$0.5 million.



Appendix B

*Summary of
1996 Clean Water Needs Survey
Cost Estimates*

Table B-1 summarizes the results of the 1996 Clean Water Needs Survey of documented needs by State. All values from the 1996 Clean Water Needs Survey have been adjusted to millions of January 2000 dollars. These design year needs were derived from those documented during the 1996 Clean Water Needs Survey. This table is provided for use in comparing the results of the 1996 Clean Water Needs Survey and the CWNS 2000.

Table B-1 is comparable to Table A-1 for 2000 estimates for Categories I through VI. Category VII needs are not directly comparable because the Category VII subcategories changed between the surveys.

Table B-1. 1996 Clean Water Needs Survey Total Documented Needs (January 2000 dollars in millions)

State	Category of Need										Total (I-V)
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VI	VII	
Alabama	875	184	108	5	269	161	148	0	0	0	875
Alaska	540	439	0	0 ^a	37	40	0	18	0	6	534
Arizona	2,478	809	611	10	76	674	207	0	55	36	2,387
Arkansas	290	133	22	11	41	50	33	0	0	0	290
California	13,062	5,521	2,025	41	1,091	255	696	1,215	2,205	13	10,844
Colorado	507	146	246	2	59	27	10	13	0 ^a	4	503
Connecticut	1,956	280	769	46	13	192	171	485	0	0	1,956
Delaware	238	24	11	2	1	41	35	124	0	0	238
District of Columbia	672	77	22	0	0	0	0	493	0	80	592
Florida	5,952	1,391	1,779	12	178	975	821	0	465	331	5,156
Georgia	1,706	134	850	32	16	31	235	408	0	0	1,706
Hawaii	924	261	0	0	508	77	78	0	0	0	924
Idaho	347	170	17	1	13	60	86	0	0	0	347
Illinois	12,217	539	263	61	404	193	294	10,415	0	48	12,169
Indiana	5,480	144	86	45	28	126	98	4,953	0	0	5,480
Iowa	944	152	27	28	35	85	59	527	31	0	913
Kansas	1,527	257	158	140	36	59	288	589	0	0	1,527
Kentucky	2,559	546	29	120	99	448	378	930	9	0	2,550
Louisiana	792	182	172	33	182	141	82	0	0	0	792
Maine	843	122	5	26	13	84	50	542	0	1	842
Maryland	1,521	352	243	9	156	228	246	127	42	118	1,361
Massachusetts	4,123	905	57	50	40	444	379	2,246	1	1	4,121
Michigan	5,480	701	14	15	87	168	362	4,133	0	0	5,480
Minnesota	897	503	31	38	78	105	84	29	0	29	868
Mississippi	875	259	90	92	75	210	148	0	0	1	874
Missouri	3,111	559	33	283	263	150	285	985	21	532	2,558
Montana	132	53	5	6	15	29	11	1	4	8	120
Nebraska	622	124	45	7	7	16	106	272	39	6	577
Nevada	39	10	0	2	4	6	17	0	0	0	39

continued

Table B-1. (continued)

State	Category of Need										
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VI	VII	Total (I-V)
New Hampshire	825	81	31	9	18	46	179	461	0	0	825
New Jersey	7,697	2,202	285	275	275	827	389	3,348	0	96	7,601
New Mexico	178	52	32	4	30	40	12	0	0	8	170
New York	17,607	3,748	6,610	82	1,295	363	389	4,429	33	658	16,916
North Carolina	4,362	308	1,258	151	90	1,338	1,019	1	178	19	4,165
North Dakota	103	71	0	0	22	0	1	0	0 ^a	9	94
Ohio	8,048	921	275	830	211	398	592	4,660	143	18	7,887
Oklahoma	352	79	84	105	19	14	51	0	0	0	352
Oregon	2,129	671	323	70	121	71	63	757	50	3	2,076
Pennsylvania	6,720	1,028	179	16	47	778	205	4,415	17	35	6,668
Rhode Island	1,339	139	65	2	26	364	163	573	0 ^a	7	1,332
South Carolina	1,708	646	287	16	31	294	418	0	9	7	1,692
South Dakota	142	39	1	0 ^a	29	14	19	16	24	0	118
Tennessee	962	159	72	63	153	151	238	110	0	16	946
Texas	5,248	1,516	813	576	969	393	981	0	0	0	5,248
Utah	342	151	0	0	30	90	66	0	5	0	337
Vermont	352	54	59	4	1	39	16	179	0	0	352
Virginia	4,363	821	1,184	172	177	571	640	617	181	0	4,182
Washington	1,294	315	6	90	21	61	151	600	35	15	1,244
West Virginia	1,830	268	25	31	30	332	287	857	0	0	1,830
Wisconsin	2,246	464	113	36	285	288	195	59	39	767	1,440
Wyoming	42	18	10	1	3	5	5	0	0	0	42
American Samoa	45	5	0	0	0	36	4	0	0	0	45
Guam	53	40	0	0 ^a	0	8	5	0	0	0	53
N. Mariana Islands	54	28	0	0	0 ^a	6	20	0	0	0	54
Puerto Rico	1,448	572	4	44	20	371	437	0	0	0	1,448
Virgin Islands	101	78	0	1	22	0	0	0	0	0	101
Total	140,299	29,451	19,434	3,695	7,749	11,973	11,952	49,587	3,586	2,872	133,841

Categories

I Secondary wastewater treatment	III-B Sewer replacement/rehabilitation	V Combined sewer overflow correction
II Advanced wastewater treatment	IV-A New collector sewers and appurtenances	VI Storm water management programs
III-A Infiltration/inflow correction	IV-B New interceptor sewers and appurtenances	VII NPS pollution control

^a Estimate is less than \$0.5 million.

Table B-2 summarizes the States' 1996 assessments of needs that either were justified with documents outside the established documentation criteria of the 1996 Clean Water Needs Survey or had no written documentation. The SSEs were optional and were in addition to the documented needs (see Table B-1). These estimates are provided for use in comparing the results of the 1996 Clean Water Needs Survey and the CWNS 2000. All values from the 1996 Clean Water Needs Survey have been adjusted to January 2000 dollars in millions.

Table B-2 is comparable to Table A-11 for 2000 estimates for Categories I through VI. Needs for Category VII are not directly comparable because the Category VII subcategories changed between the surveys.

Table B-2. 1996 Clean Water Needs Survey Separate State Estimates (January 2000 dollars in millions)

State	Category of Need										Total (I-V)
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VI	VII	
Alabama	18	5	10	1	0	0	2	0	0	0	18
Alaska	27	6	0	0	0	10	5	0	0	6	21
Arizona	169	25	16	0	0 ^a	22	78	0	11	17	141
Arkansas	793	211	77	125	109	142	127	2	0	0	793
California	2,917	1,732	4	29	434	138	457	0	123	0	2,794
Colorado	57	1	55	0	0	0	1	0	0	0	57
Connecticut	840	108	533	4	0	7	5	183	0	0	840
Delaware	144	50	0	4	0	59	29	0	2	0	142
District of Columbia	0	0	0	0	0	0	0	0	0	0	0
Florida	2	0	0	0	0 ^a	0	2	0	0	0	2
Georgia	610	100	165	37	22	99	138	49	0	0	610
Hawaii	1,491	404	0	191	519	197	180	0	0	0	1,491
Idaho	181	140	3	4	8	13	13	0	0	0	181
Illinois	1,068	95	38	9	20	11	54	1	0	840	228
Indiana	976	99	52	18	8	36	34	729	0	0	976
Iowa	29	14	0	0	0	0	15	0	0	0	29
Kansas	70	1	37	0	0	0	32	0	0	0	70
Kentucky	377	76	28	34	59	132	45	3	0	0	377
Louisiana	597	139	45	19	25	163	175	0	31	0	566
Maine	842	7	0	4	0	25	11	795	0	0	842
Maryland	5	1	0	0	0	0	0	0	4	0	1
Massachusetts	2,609	190	67	108	9	452	256	15	1,443	69	1,097
Michigan	29	23	0	0 ^a	1	4	1	0	0	0	29
Minnesota	179	86	14	10	11	25	33	0	0	0	179
Mississippi	255	57	52	42	38	51	13	0	2	0 ^a	253
Missouri	1,250	103	0	0	0 ^a	80	61	576	0	430	820
Montana	38	17	0	0	4	4	4	0	8	1	29
Nebraska	209	5	1	1	0 ^a	9	0 ^a	178	15	0	194
Nevada	557	393	79	0 ^a	1	18	66	0	0 ^a	0	557

continued

Table B-2. (continued)

State	Category of Need										Total (I-V)
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VI	VII	
New Hampshire	474	27	18	17	10	189	102	111	0	0	474
New Jersey	1,186	362	0	7	294	43	125	317	5	33	1,148
New Mexico	0	0	0	0	0	0	0	0	0	0	0
New York	3,041	1,217	566	80	147	360	329	304	38	0	3,003
North Carolina	4,206	126	480	59	33	340	213	0	2,954	1	1,251
North Dakota	0	0	0	0	0	0	0	0	0	0	0
Ohio	1,117	193	113	75	39	305	146	200	46	0 ^a	1,071
Oklahoma	179	27	109	22	4	3	14	0	0	0	179
Oregon	25	0	0	11	13	1	0	0	0	0	25
Pennsylvania	3,693	468	160	7	14	560	296	2,136	0	52	3,641
Rhode Island	0	0	0	0	0	0	0	0	0	0	0
South Carolina	77	40	6	3	0	9	19	0	0 ^a	0	77
South Dakota	10	5	0	0	2	1	0 ^a	0	2	0	8
Tennessee	1,078	259	38	144	138	242	240	0	17	0	1,061
Texas	2,013	663	277	50	131	193	699	0	0	0	2,013
Utah	835	151	0	0	22	555	102	0	5	0	830
Vermont	81	37	8	0	0	17	9	9	1	0	80
Virginia	455	151	33	26	13	103	72	1	56	0	399
Washington	822	109	29	84	61	58	343	137	1	0	821
West Virginia	1,138	282	2	24	41	321	432	36	0	0	1,138
Wisconsin	794	82	26	0	0	43	8	0	635	0	159
Wyoming	78	42	13	8	11	2	2	0	0 ^a	0	78
American Samoa	0	0	0	0	0	0	0	0	0	0	0
Guam	0	0	0	0	0	0	0	0	0	0	0
N. Mariana Islands	0	0	0	0	0	0	0	0	0	0	0
Puerto Rico	253	88	1	6	1	75	82	0	0	0	253
Virgin Islands	0	0	0	0	0	0	0	0	0	0	0
Total	37,894	8,417	3,155	1,263	2,242	5,117	5,070	5,782	5,399	1,449	31,046

Categories

I Secondary wastewater treatment	III-B Sewer replacement/rehabilitation	V Combined sewer overflow correction
II Advanced wastewater treatment	IV-A New collector sewers and appurtenances	VI Storm water management programs
III-A Infiltration/inflow correction	IV-B New interceptor sewers and appurtenances	VII NPS pollution control

^a Estimate is less than \$0.5 million.



Appendix C

*Summary of
Clean Watersheds Needs Survey 2000
Technical Information*

Table C-1 summarizes the number of treatment facilities and collection systems in operation in 2000 in each State and U.S. Territory.

Table C-1. Number of Operational Treatment Facilities and Collection Systems in 2000

State	Treatment Facilities	Collection Systems	State	Treatment Facilities	Collection Systems
Alabama	272	275	New Hampshire	85	117
Alaska	45	46	New Jersey	156	575
Arizona	118	132	New Mexico	55	64
Arkansas	335	367	New York ^a	588	1,048
California ^a	586	797	North Carolina	491	617
Colorado ^a	311	391	North Dakota	282	284
Connecticut	91	137	Ohio	765	1,008
Delaware	18	42	Oklahoma	489	495
District of Columbia	1	1	Oregon	207	254
Florida	277	317	Pennsylvania	779	1,553
Georgia	352	403	Rhode Island	21	34
Hawaii	21	21	South Carolina	186	206
Idaho	168	207	South Dakota ^a	271	274
Illinois	721	1,018	Tennessee	246	281
Indiana	404	482	Texas	1,363	1,675
Iowa	726	756	Utah	97	164
Kansas	634	673	Vermont	81	97
Kentucky	224	255	Virginia	227	290
Louisiana	355	382	Washington	235	331
Maine	137	171	West Virginia	212	289
Maryland	156	201	Wisconsin	592	823
Massachusetts	126	230	Wyoming ^b	96	121
Michigan	396	663	American Samoa ^b	2	2
Minnesota	514	655	Guam ^b	7	7
Mississippi	303	352	N. Mariana Islands ^b	2	2
Missouri	678	751	Puerto Rico ^b	30	30
Montana	194	204	Virgin Islands ^b	12	12
Nebraska	464	469			
Nevada ^b	51	56	Total	16,255	21,107

^a California, Colorado, New York, and South Dakota did not have the resources to complete the updating of these data.

^b Results presented in this table for American Samoa, Guam, Northern Mariana Islands, Nevada, Puerto Rico, Virgin Islands, and Wyoming are from the 1996 survey because these States and Territories did not participate in the CWNS 2000.

Table C-2 summarizes the number of treatment facilities and collection systems projected to be in operation in each State and U.S. Territory if all documented needs are met.

Table C-2. Number of Operational Treatment Facilities and Collection Systems If All Documented Needs Are Met

State	Treatment Facilities	Collection Systems	State	Treatment Facilities	Collection Systems
Alabama	279	285	New Hampshire	85	120
Alaska	50	51	New Jersey	164	600
Arizona	232	258	New Mexico	58	68
Arkansas	360	406	New York ^a	657	1,175
California ^a	579	799	North Carolina	518	702
Colorado ^a	331	430	North Dakota	282	286
Connecticut	99	159	Ohio	837	1,213
Delaware	18	49	Oklahoma	487	496
District of Columbia	1	1	Oregon	219	270
Florida	302	346	Pennsylvania	1,013	1,936
Georgia	345	405	Rhode Island	20	36
Hawaii	27	27	South Carolina	187	222
Idaho	177	219	South Dakota ^a	273	276
Illinois	754	1,056	Tennessee	251	286
Indiana	424	510	Texas	1,469	1,850
Iowa	744	775	Utah	114	188
Kansas	665	712	Vermont	84	100
Kentucky	301	369	Virginia	254	383
Louisiana	371	405	Washington	240	337
Maine	145	184	West Virginia	404	626
Maryland	180	303	Wisconsin	628	974
Massachusetts	141	267	Wyoming ^b	96	121
Michigan	403	673	American Samoa ^b	2	2
Minnesota	518	661	Guam ^b	6	7
Mississippi	372	475	N. Mariana Islands ^b	2	2
Missouri	729	848	Puerto Rico ^b	30	30
Montana	208	218	Virgin Islands ^b	12	12
Nebraska	475	483			
Nevada ^b	52	56	Total	17,674	23,748

^a California, Colorado, New York, and South Dakota did not have the resources to complete the updating of these data.

^b Results presented in this table for American Samoa, Guam, Northern Mariana Islands, Nevada, Puerto Rico, Virgin Islands, and Wyoming are from the 1996 survey because these States and Territories did not participate in the CWNS 2000.

Table C-3 shows, for five flow ranges, the number of treatment facilities in operation in 2000 and the number projected to be in operation if all documented needs are met. The number of facilities and their cumulative flow (in millions of gallons per day) are shown for each of the flow ranges.

Table C-3. Number of Treatment Facilities by Flow Range

Treatment Facilities in Operation in 2000 ^{a,b}		
Existing Flow Range (mgd)	Number of Facilities	Total Existing Flow (mgd)
0.001 to 0.100	6,583	290
0.101 to 1.000	6,462	2,339
1.001 to 10.000	2,665	8,328
10.001 to 100.000	487	12,741
100.001 and greater	46	11,201
Other ^c	12	—
Total	16,255	34,899

Treatment Facilities in Operation in 2000 If All Documented Needs Are Met ^{a,b}		
Design Flow Range (mgd)	Number of Facilities	Total Future Design Flow Capacity (mgd)
0.001 to 0.100	6,112	298
0.101 to 1.000	7,223	2,750
1.001 to 10.000	3,525	12,081
10.001 to 100.000	748	19,873
100.001 and greater	64	15,040
Other ^c	2	—
Total	17,674	50,042

^a California, Colorado, New York, and South Dakota did not have the resources to complete the updating of these data.

^b Results presented in this table for American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming are from the 1996 survey because these States and Territories did not participate in the CWNS 2000.

^c Flow data for these facilities were unavailable.

Table C-4 shows, by level of treatment, the number of treatment facilities in operation in 2000 and the number projected to be in operation if all documented needs are met. The number of facilities, their cumulative capacities (in millions of gallons per day), and the population served are shown for each level of treatment. The population served number is then presented as a percentage of the total 2000 U.S. population.

Table C-4. Number of Treatment Facilities by Level of Treatment

Treatment Facilities in Operation in 2000 ^{a,b}				
Level of Treatment	Number of Facilities	Present Design Capacity (mgd)	Number of People Served	Percent of U.S. Population
Less than Secondary ^c	47	1,023	6,426,062	2.3
Secondary	9,156	19,268	88,221,896	32.0
Greater than Secondary	4,892	22,165	100,882,207	36.6
No Discharge ^d	1,938	2,039	12,283,047	4.5
Partial Treatment ^e	222	563	—	—
Total	16,255	45,058	207,813,212^f	75.4

Treatment Facilities in Operation in 2000 If All Documented Needs Are Met ^{a,b}				
Level of Treatment	Number of Facilities	Future Design Capacity (mgd)	Number of People Served	Percent of U.S. Population
Less than Secondary ^c	27	481	3,851,000	1.2
Secondary	9,463	20,008	103,716,058	31.9
Greater than Secondary	5,739	26,239	140,251,554	43.2
No Discharge ^d	2,221	2,579	21,224,596	6.5
Partial Treatment ^e	224	734	—	—
Total	17,674	50,041	269,043,208^f	82.8

^a California, Colorado, New York, and South Dakota did not have the resources to complete the updating of these data.

^b Results presented in this table for American Samoa, Guam, Nevada, Northern Mariana Islands, Puerto Rico, Virgin Islands, and Wyoming are from the 1996 survey because these States and Territories did not participate in the CWNS 2000.

^c Less-than-secondary facilities include facilities granted or pending section 301(h) waivers from secondary treatment for discharges to marine waters.

^d No-discharge facilities do not discharge treated wastewater to the Nation's waterways. These facilities dispose of wastewater via methods such as industrial reuse, irrigation, or evaporation.

^e These facilities provide some treatment to wastewater and discharge their effluents to wastewater facilities for further treatment and discharge.

^f This table does not include the results for approximately 3.3 million people (present) and 3.5 million people (future) that are receiving centralized collection because the data related to flow and effluent levels were not complete for the CWNS 2000.

Table C-5 presents the number of CSO facilities with documented needs identified during the 1996 Clean Water Needs Survey and the CWNS 2000.

Table C-5. Number of Facilities With CSO Correction Needs and Total CSO Correction Needs: 1996 and 2000
(January 2000 dollars in millions)

State	Number of Facilities with CSO Needs in 1996	Number of Facilities with CSO Needs in 2000	1996 CSO Needs (\$ Millions)	2000 CSO Needs (\$ Millions)
Alabama	0	0	0	0
Alaska	1	1	18	5
Arizona	0	0	0	0
Arkansas	0	0	0	0
California	4	1	1,215	426
Colorado	1	1	13	9
Connecticut	10	6	485	500
Delaware	2	1	124	102
District of Columbia	1	1	493	1,019
Florida	0	0	0	0
Georgia	7	2	408	918
Hawaii	0	0	0	0
Idaho	0	0	0	0
Illinois	104	105	10,415	9,450
Indiana	119	107	4,953	5,468
Iowa	16	14	527	1,534
Kansas	3	3	589	396
Kentucky	15	12	930	217
Louisiana	0	0	0	0
Maine	46	48	542	653
Maryland	7	8	127	396
Massachusetts	28	25	2,246	2,324
Michigan	48	21	4,133	2,437
Minnesota	1	1	29	6
Mississippi	0	0	0	0
Missouri	12	7	985	1,180
Montana	1	0	1	0
Nebraska	3	2	272	861
Nevada ^a	0	0	0	NR
New Hampshire	5	4	461	485
New Jersey	37	39	3,348	4,385
New Mexico	0	0	0	0
New York	64	83	4,429	5,497
North Carolina	1	1	1	3

continued

Table C-5. (continued)

State	Number of Facilities with CSO Needs in 1996	Number of Facilities with CSO Needs in 2000	1996 CSO Needs (\$ Millions)	2000 CSO Needs (\$ Millions)
North Dakota	0	0	0	0
Ohio	110	109	4,660	3,623
Oklahoma	0	0	0	0
Oregon	5	2	757	74
Pennsylvania	110	123	4,415	5,431
Rhode Island	3	3	573	633
South Carolina	0	0	0	0
South Dakota	3	1	16	2
Tennessee	3	2	110	244
Texas	0	0	0	0
Utah	0	0	0	0
Vermont	20	4	179	31
Virginia	4	3	617	460
Washington	16	11	600	608
West Virginia	56	45	857	869
Wisconsin	3	3	59	342
Wyoming ^a	0	0	0	NR
American Samoa ^a	0	0	0	NR
Guam ^a	0	0	0	NR
N. Mariana Islands ^a	0	0	0	NR
Puerto Rico ^a	0	0	0	NR
Virgin Islands ^a	0	0	0	NR
Total	869	799	49,587	50,588

Note: NR = not reported. American Samoa, Guam, Northern Mariana Islands, Nevada, Puerto Rico, Virgin Islands, and Wyoming did not participate in the CWNS 2000.

^a Results presented in this table for American Samoa, Guam, Northern Mariana Islands, Nevada, Puerto Rico, Virgin Islands, and Wyoming are from the 1996 survey because these States and Territories did not participate in the CWNS 2000.

Table C-6 presents the number of storm water facilities with needs identified in the CWNS 2000 by the size of the MS4.

Table C-6. Number of Facilities With MS4 Storm Water Needs and Total MS4 Needs (January 2000 dollars in millions)

State	Small MS4 Facilities (<100,000 people)		Medium MS4 Facilities (100,000 through 249,999 people)		Large MS4 Facilities (>250,000 people)	
	Number of Facilities ^a	Needs (\$ Millions)	Number of Facilities ^a	Needs (\$ Millions)	Number of Facilities ^a	Needs (\$ Millions)
Alabama	0	0	0	0	0	0
Alaska	0	0	0	0	0	0
Arizona	7	137	5	174	5	941
Arkansas	0	0	0	0	0	0
California	18	182	5	45	5	124
Colorado	10	20	1	14	1	14
Connecticut	0	0	0	0	0	0
Delaware	0	0	0	0	0	0
District of Columbia	0	0	0	0	1	37
Florida	46	150	20	325	17	205
Georgia	0	0	0	0	0	0
Hawaii	0	0	0	0	0	0
Idaho	0	0	0	0	0	0
Illinois	0	0	0	0	0	0
Indiana	0	0	0	0	0	0
Iowa	1	1	0	0	0	0
Kansas	0	0	0	0	0	0
Kentucky	0	0	1	3	0	0
Louisiana	0	0	0	0	0	0
Maine	0	0	0	0	0	0
Maryland	1	0 ^b	6	47	5	409
Massachusetts	0	0	0	0	0	0
Michigan	0	0	0	0	0	0
Minnesota	2	9	0	0	1	111
Mississippi	0	0	0	0	0	0
Missouri	0	0	0	0	0	0
Montana	0	0	0	0	0	0
Nebraska	7	7	1	17	0	0
Nevada	NR	NR	NR	NR	NR	NR
New Hampshire	0	0	0	0	0	0
New Jersey	47	89	0	0	0	0
New Mexico	0	0	0	0	0	0

continued

Table C-6. (continued)

State	Small MS4 Facilities (<100,000 people)		Medium MS4 Facilities (100,000 through 249,999 people)		Large MS4 Facilities (>250,000 people)	
	Number of Facilities ^a	Needs (\$ Millions)	Number of Facilities ^a	Needs (\$ Millions)	Number of Facilities ^a	Needs (\$ Millions)
New York	6	5	0	0	2	11
North Carolina	0	0	2	1	1	0 ^b
North Dakota	3	4	0	0	0	0
Ohio	0	0	0	0	0	0
Oklahoma	0	0	0	0	1	190
Oregon	0	0	0	0	0	0
Pennsylvania	0	0	10	17	0	0
Rhode Island	0	0	0	0	0	0
South Carolina	0	0	0	0	0	0
South Dakota	7	14	0	0	0	0
Tennessee	0	0	0	0	0	0
Texas	0	0	1	21	31	2,204
Utah	0	0	1	5	0	0
Vermont	0	0	0	0	0	0
Virginia	0	0	0	0	0	0
Washington	0	0	0	0	0	0
West Virginia	0	0	0	0	0	0
Wisconsin	5	16	0	0	0	0
Wyoming	NR	NR	NR	NR	NR	NR
American Samoa	NR	NR	NR	NR	NR	NR
Guam	NR	NR	NR	NR	NR	NR
N. Mariana Islands	NR	NR	NR	NR	NR	NR
Puerto Rico	NR	NR	NR	NR	NR	NR
Virgin Islands	NR	NR	NR	NR	NR	NR
Total	160	634	53	669	70	4,246

Note: NR = not reported. American Samoa, Guam, Northern Mariana Islands, Nevada, Puerto Rico, Virgin Islands, and Wyoming did not participate in the CWNS 2000.

^a The number of facilities on this table does not reflect the number of MS4s in a particular state. The number of facilities reflects how many records were entered into the CWNS 2000 database, and one facility can cover multiple MS4s or multiple facilities can cover one MS4.

^b Estimate is less than \$0.5 million.

Table C-7 shows, by treatment level, the number of facilities in operation in 2000 and the population served at the State level. The number of facilities and population served are shown for each level of treatment and for each State and U.S. Territory.

Table C-7. Number of Treatment Facilities and Population Served per State by Level of Treatment for Year 2000

State	Number of Facilities Providing Listed Effluent Level				Population Served by Listed Effluent Level			
	Less than Secondary ^a	Secondary	Greater than Secondary	No Discharge ^b	Less than Secondary ^a	Secondary	Greater than Secondary	No Discharge ^b
Alabama	0	130	129	8	0	732,009	1,994,219	7,593
Alaska	5	30	0	9	207,994	108,879	0	21,920
Arizona	0	17	18	81	0	111,767	2,215,703	1,378,004
Arkansas	0	118	207	9	0	726,471	803,753	12,155
California ^c	5	182	77	309	4,198,270	12,159,009	7,919,130	3,577,181
Colorado ^c	0	246	38	22	0	1,556,854	2,142,434	7,788
Connecticut	0	49	38	4	0	1,266,574	813,536	1,210
Delaware	0	3	11	4	0	10,476	728,997	13,070
District of Columbia ^d	0	0	1	0	0	0	1,298,601	0
Florida	0	17	84	175	0	238,764	6,155,714	4,931,819
Georgia	0	227	80	35	0	1,721,572	2,594,389	89,249
Hawaii	2	5	2	12	532,378	139,609	20,286	89,512
Idaho	0	107	5	55	0	562,008	265,812	60,303
Illinois	0	415	301	1	0	683,543	9,811,768	572
Indiana	0	125	274	0	0	410,940	3,416,852	0
Iowa	0	707	9	3	0	1,925,926	181,763	1,393
Kansas	0	355	79	197	0	694,512	1,277,425	101,964
Kentucky	0	123	94	0	0	1,242,187	921,134	0
Louisiana	1	184	163	1	3,000	2,268,451	878,478	207
Maine	12	116	2	7	9,303	624,604	16,038	5,956
Maryland	0	75	75	6	0	949,367	2,045,325	3,920
Massachusetts	1	77	35	7	20,074	4,235,095	822,135	17,043
Michigan	0	204	120	68	0	1,254,599	6,161,491	108,121
Minnesota	1	411	100	0	42	967,813	2,073,977	0
Mississippi	0	195	75	1	0	1,139,734	507,809	524
Missouri	0	578	77	21	0	3,757,717	451,630	2,663
Montana	0	107	5	80	0	397,988	89,635	63,564
Nebraska	0	298	19	146	0	977,825	155,078	64,166
Nevada ^c	0	44	3	4	0	139,996	252,229	237,442
New Hampshire	1	70	2	10	25,409	555,435	17,890	7,984
New Jersey	0	94	55	1	0	6,762,536	1,090,502	34,307
New Mexico	0	57	1	17	0	898,530	7,150	135,338

continued

Table C-7. (continued)

State	Number of Facilities Providing Listed Effluent Level				Population Served by Listed Effluent Level			
	Less than Secondary ^a	Secondary	Greater than Secondary	No Discharge ^b	Less than Secondary ^a	Secondary	Greater than Secondary	No Discharge ^b
New York ^c	0	360	178	27	0	11,273,282	3,748,413	116,814
North Carolina	0	313	134	33	0	1,056,606	2,576,092	112,989
North Dakota	0	254	1	27	0	468,946	21,531	5,909
Ohio	0	169	593	2	0	1,401,922	7,404,543	956
Oklahoma	0	249	39	199	0	1,716,478	712,679	151,004
Oregon	1	101	67	37	625	1,333,432	1,219,279	33,050
Pennsylvania	2	360	397	2	1,476	6,237,683	4,157,929	2,314
Rhode Island	0	19	2	0	0	687,805	10,184	0
South Carolina	0	123	53	7	0	1,769,072	549,626	30,628
South Dakota ^c	0	234	8	29	0	268,874	164,144	14,467
Tennessee	0	110	130	5	0	1,459,559	1,700,862	4,193
Texas	2	524	661	160	1,070	2,538,924	14,025,086	640,857
Utah	0	49	4	44	0	1,636,148	190,027	134,011
Vermont	0	48	31	2	0	90,497	193,684	722
Virginia	0	157	60	2	0	2,166,150	2,318,144	1,373
Washington	0	201	7	27	0	2,847,237	894,801	31,127
West Virginia	3	142	63	0	2,205	581,527	374,677	0
Wisconsin	0	283	279	26	0	573,346	3,250,360	20,360
Wyoming ^c	0	78	3	14	0	244,075	87,923	3,030
American Samoa ^c	2	0	0	0	5,511	0	0	0
Guam ^c	2	2	0	2	62,639	9,236	0	4,275
N. Mariana Islands ^c	0	2	0	0	0	1,118	0	0
Puerto Rico ^c	6	22	2	0	1,336,535	581,405	151,290	0
Virgin Islands ^c	1	10	1	0	19,531	58,294	50	0
Total	47	9,156	4,892	1,938	6,426,062	88,221,896	100,882,207	12,283,047

^a Less-than-secondary facilities include facilities granted or pending section 301(h) waivers from secondary treatment for discharges to marine waters.

^b No-discharge facilities do not discharge treated wastewater to the Nation's waterways. These facilities dispose of wastewater via methods such as industrial reuse, irrigation, or evaporation.

^c California, Colorado, New York, and South Dakota did not have the resources to complete updating of these data.

^d The reported population served for the District of Columbia includes populations from Maryland and Virginia that receive wastewater treatment at the Blue Plains facility in the District of Columbia.

^e Results presented in this table for American Samoa, Guam, Northern Mariana Islands, Nevada, Puerto Rico, Virgin Islands, and Wyoming are from the 1996 survey because these States and Territories did not participate in the CWNS 2000.

Table C-8 shows, by treatment level, the number of facilities that will be in operation if all documented needs are met and the population served at State level. The number of facilities and population served are shown for each level of treatment and for each State and U.S. Territory.

Table C-8. Number of Treatment Facilities and Population Served per State by Level of Treatment If All Documented Needs Are Met

State	Number of Facilities Providing Listed Effluent Level				Population Served by Listed Effluent Level			
	Less than Secondary ^a	Secondary	Greater than Secondary	No Discharge ^b	Less than Secondary ^a	Secondary	Greater than Secondary	No Discharge ^b
Alabama	0	128	135	10	0	850,278	2,330,863	18,170
Alaska	5	31	0	13	346,571	211,131	0	42,808
Arizona	0	9	32	188	0	70,767	2,729,902	3,167,290
Arkansas	0	122	229	9	0	1,071,716	1,395,634	20,200
California ^c	3	171	85	310	2,618,003	16,439,258	10,261,833	5,208,425
Colorado ^c	0	254	51	20	0	1,932,072	2,709,427	9,363
Connecticut	0	22	70	7	0	492,536	2,022,618	9,910
Delaware	0	3	11	4	0	14,294	791,212	14,179
District of Columbia ^d	0	0	1	0	0	0	1,446,672	0
Florida	0	18	88	195	0	338,758	8,846,624	8,882,498
Georgia	0	190	114	35	0	1,798,412	4,613,062	130,884
Hawaii	2	7	2	16	768,000	231,900	42,258	231,879
Idaho	0	114	9	52	0	763,978	434,133	91,246
Illinois	0	438	310	2	0	921,010	11,723,762	863
Indiana	0	123	294	0	0	460,829	4,131,955	0
Iowa	0	718	15	3	0	2,263,449	289,360	1,595
Kansas	0	338	119	204	0	613,118	2,113,860	124,192
Kentucky	0	177	107	5	0	2,099,101	1,540,928	9,883
Louisiana	0	137	230	1	0	2,587,405	1,257,299	220
Maine	12	120	4	9	11,338	780,367	25,914	16,977
Maryland	0	79	88	13	0	293,355	3,447,507	7,048
Massachusetts	1	77	45	13	32,368	3,707,305	1,119,261	56,924
Michigan	0	207	122	70	0	1,332,723	6,626,003	124,612
Minnesota	1	397	116	2	70	1,000,278	2,608,888	587
Mississippi	0	250	100	4	0	960,652	1,627,486	2,652
Missouri	0	623	83	21	0	5,198,472	668,613	4,530
Montana	0	110	9	86	0	500,250	197,470	95,212
Nebraska	0	283	36	154	0	903,404	542,114	76,484
Nevada ^c	0	45	3	4	0	292,934	285,015	365,653
New Hampshire	1	61	9	13	35,450	725,157	108,043	14,975
New Jersey	0	79	70	8	0	7,138,560	1,623,823	101,959
New Mexico	0	33	5	20	0	1,058,474	113,452	159,168

continued

Table C-8. (continued)

State	Number of Facilities Providing Listed Effluent Level				Population Served by Listed Effluent Level			
	Less than Secondary	Secondary	Greater than Secondary	No Discharge ^b	Less than Secondary ^a	Secondary	Greater than Secondary	No Discharge ^b
New York ^c	0	392	214	32	0	10,760,456	5,189,868	291,070
North Carolina	0	262	186	55	0	719,930	4,799,511	374,303
North Dakota	0	252	3	27	0	566,119	33,978	6,834
Ohio	0	175	659	3	0	1,502,828	8,676,938	1,156
Oklahoma	0	243	43	201	0	1,848,131	792,888	160,835
Oregon	1	99	76	43	164	1,747,092	1,793,014	49,482
Pennsylvania	0	500	481	5	0	6,505,193	4,978,940	4,665
Rhode Island	0	14	6	0	0	585,710	191,301	0
South Carolina	0	106	73	7	0	2,339,472	1,625,231	49,951
South Dakota ^c	0	233	9	31	0	364,006	296,726	16,541
Tennessee	0	111	133	5	0	1,808,794	2,418,761	5,516
Texas	0	551	719	175	0	3,607,777	20,948,926	907,461
Utah	0	48	7	56	0	2,040,695	466,271	256,001
Vermont	0	45	37	2	0	115,109	260,306	1,020
Virginia	0	168	77	3	0	2,720,537	4,338,245	4,797
Washington	0	203	7	30	0	4,127,624	1,092,419	61,861
West Virginia	0	305	98	0	0	983,278	494,256	0
Wisconsin	0	272	310	38	0	583,944	3,688,193	32,476
Wyoming ^c	0	77	4	14	0	355,741	130,372	5,532
American Samoa ^c	2	0	0	0	39,200	0	0	0
Guam ^c	0	4	0	2	0	112,910	0	4,545
N. Mariana Islands ^c	0	2	0	0	0	37,139	0	0
Puerto Rico ^c	0	27	3	0	0	3,176,760	321,090	0
Virgin Islands ^c	0	10	2	0	0	54,870	39,786	0
Total	27	9,463	5,739	2,221	3,851,000	103,716,058	140,251,554	21,224,596

^a Less-than-secondary facilities include facilities granted or pending section 301(h) waivers from secondary treatment for discharges to marine waters.

^b No-discharge facilities do not discharge treated wastewater to the Nation's waterways. These facilities dispose of wastewater via methods such as industrial reuse, irrigation, or evaporation.

^c California, Colorado, New York, and South Dakota did not have the resources to complete the updating of these data.

^d The reported population served for the District of Columbia includes populations from Maryland and Virginia that receive wastewater treatment at the Blue Plains facility in the District of Columbia.

^e Results presented in this table for American Samoa, Guam, Northern Mariana Islands, Nevada, Puerto Rico, Virgin Islands, and Wyoming are from the 1996 survey because these States and Territories did not participate in the CWNS 2000.

Table C-9 presents the treatment facilities represented in the CWNS 2000 as having less than secondary effluent discharges and no 301(h) waivers from secondary treatment for discharges to marine waters. The present and future effluent levels, flow design, and population receiving treatment are shown for each facility, in addition to the Category I needs for the facility. Technical data are of January 1, 2000.

Table C-9. Technical Data and Costs for Facilities With Less-Than-Secondary Effluent Levels That Do Not Have 301(h) Waivers

State	Facility Name	Present Effluent	Future Effluent	Present Flow Design (mgd)	Future Flow Design (mgd)	Present Population Receiving Treatment	Future Population Receiving Treatment	Documented Category I Needs (January 2000) \$ millions
CA	Gustine WWTP ^a	Advanced Primary	Secondary	2.8	1.18	4,044	6,435	3.1
CA	Joint WPCP ^{b, c}	Advanced Primary	Secondary	400	400	2,660,000	3,000,000	488.1
LA	Kelley Land Subdivision ^c	Advanced Primary	Secondary	0.05	0.202	3,017	3,450	0.5
MN	Barry Imhoff Tank ^d	Primary (45 mg/L < BOD)	Primary (45 mg/L < BOD)	0.01	0.01	42	70	0
OR	Dufur STP ^c	Advanced Primary	Secondary	0.043	0.043	625	825	0
PA	Nescopeck WWTP ^c	Primary (45 mg/L < BOD)	Secondary	0.11	0.25	1,377	1,150	2.2
PA	Teagarden MA ^c	Primary (45 mg/L < BOD)	None	0.01	0	99	0	0
TX	Rio Del Sol WWTP ^c	Primary (45 mg/L < BOD)	None	0.08	0	540	0	0
TX	Taft ISD - San Antonio Water System ^c	Primary (45 mg/L < BOD)	None	0.005	0	530	0	0
WV	Brushfork Area Collection System ^f	Primary (45 mg/L < BOD)	None	0.196	0	55	0	0
WV	Chattaroy PSD STP ^c	Primary (45 mg/L < BOD)	None	0.17	0	806	0	0
WV	Route 219 Area Collection System ^c	Primary (45 mg/L < BOD)	None	0.1	0	1,344	0	0
VI	St. Thomas WWTF ^g	Primary (45 mg/L < BOD)	Secondary	3.4	3.5	22,831	26,212	29.9

^a After January 2000 the facility's discharge method was converted to land application, and the facility is now considered as having secondary treatment.

^b This facility is under consent order to achieve secondary treatment by December 31, 2002.

^c This facility will increase its level of treatment.

^d State has verified the effluent levels for this facility.

^e This treatment plant is to be abandoned, and its flow will go to another facility.

^f This treatment plant has been abandoned (after January 2000), and its flow goes to another facility.

^g The plant underwent construction after January 2000 and now achieves secondary treatment.

Appendix D

*Nonpoint Source Pollution Control
Modeled Estimate*

Why were nonpoint source needs modeled?

Estimating the overall costs of addressing NPS pollution throughout the United States has long constituted a major challenge to EPA and to other groups. The States have reported for many years that NPS pollution is the most significant source of remaining water quality impairments in the United States. In EPA's most recently published *National Water Quality Inventory*, which summarizes the State water quality reports submitted to the Agency under section 305(b) of the Clean Water Act, the States have, for example, identified agriculture as causing or contributing to 48 percent of remaining waterbody impairments in the United States. The States also list hydrologic modification, habitat modification, urban runoff, forestry, and resource extraction as top contributors to water quality impairment. NPS pollution is a significant contributor to impairments of lakes and coastal estuaries as well.

Despite the evident significance of NPS pollution, the cost of remediating such pollution has remained difficult to quantify. The chief difficulty lies in the vast number of potential sources of NPS pollution, including more than 300 million acres of agricultural production managed by well over a million producers and production entities; hundreds of millions of acres of forestland and rangeland; many thousands of small communities that contribute urban NPS pollution; tens of thousands of abandoned mines; tens of millions of septic tanks, cesspools, and other on-site wastewater treatment systems; and many other significant sources of pollution. Not all of these sources are causing pollution problems or require remediation; however, a great many of these sources do need new or improved practices to control NPS pollution.

Given the vast array of sources of NPS pollution, to date States have been unable to identify all of them. Similarly, States have not been able to develop or identify to the degree necessary other documentation required for the "documented needs" approach used in the CWNS 2000, as discussed in Section 2 of this report (e.g.,

description of the water quality impairment, its location, BMPs used to address the problem, and the cost of each BMP). For example (as shown in Appendix A, Table A-2, of this report), by using the documented needs approach, only 15 States were able to estimate any costs for cropland or animal agriculture, despite the fact that agriculture constitutes the most significant source of NPS pollution in the Nation. Similarly, only 16 States were able to estimate costs for hydromodification (the second most reported source of impairment to rivers and streams in State 305(b) reports); only 2 States were able to estimate costs for silviculture (forestry); and only half could do so for urban sources.

To address this analytical shortcoming, EPA has supplemented the documented needs approach used in the CWNS 2000 with the continued use of a modeled approach that estimates the current expenditures to prevent and control NPS pollution from selected source categories. The modeled approach thus estimates the additional resources ("needs") necessary to address the identified NPS problem(s) in only those select categories. The modeled approach in the CWNS 2000 is broader than the modeled approach used in the 1996 Clean Water Needs Survey, including several source categories not previously included; it now includes seven major source categories. Although this modeled approach is still limited, EPA believes it captures a substantial portion of the Nation's total NPS capital needs and therefore provides critical information that readers of this report should consider in conjunction with the documented needs discussed earlier in this document.

It is important to note that ultimately a documented approach will provide a more accurate and complete assessment of national NPS needs, as well as better information at the State and watershed levels. During the next 10 to 15 years, EPA expects that State programs will generate the sort of improved data needed. States are developing TMDLs for all impaired waters, which will identify the NPS pollutant loads (and therefore the ultimate load reductions) needed to achieve water quality standards in each impaired waterbody. Moreover, using Section 319 funds and

other funding sources, States are now beginning to develop watershed-based plans for watersheds significantly affected by NPS pollution. Such plans describe the pollutant sources, the pollutant load reductions to be achieved from relevant categories and subcategories of nonpoint sources in the watershed, and the BMPs to be implemented. States will use these watershed-based plans as the basis for their implementation activities in impaired watersheds, working in partnership with other Federal and State agencies and with local communities to solve their NPS problems. Thus, EPA hopes eventually to be able to thoroughly document all NPS needs across the United States, and to do so on a watershed-by-watershed basis.

Finally, it must be noted that for two reasons the modeled NPS needs represent only a partial picture of the true total NPS needs. First, certain source categories were omitted altogether because of a lack of data with which to obtain an acceptable modeled estimate. Second, even for the categories modeled, the full array of BMPs and behavioral changes that would be needed to fully address the Nation's NPS problems within those source categories have not been accounted for because of data and time constraints.

What are the NPS modeled needs results?

Table D-1 and Figure D-1 present estimated total capital needs. Categories VII-D and VII-G together contribute approximately \$15.0 billion to the total modeled NPS capital needs estimate. Approximately 98 percent (\$9.4 billion) of the total capital needs for Category VII-D (\$9.63 billion) are for implementing on-site wastewater treatment systems. Categories VII-A and VII-B, with needs estimated to be approximately \$5.9 billion, account for the largest remaining share of the total capital needs.

How were NPS needs estimated for the CWNS 2000?

The CWNS 2000 expands the total number of NPS categories beyond what was modeled in the 1996 Clean Water Needs Survey. The 1996 survey modeled only

Table D-1. Estimated CWSRF-Eligible Needs for Selected NPS Categories (January 2000 dollars in billions)

CWNS Category		Estimated Total Capital Needs	Percent of Total
VII-A	Agriculture (Cropland) ^a	4.44	20.6
VII-B	Agriculture (Animals)	1.51	7.0
VII-C	Silviculture	0.025	0.1
VII-D	Urban	9.71	45.1
VII-F	Marinas	0.0027	0.01
VII-G	Resource Extraction	5.40	25.1
VII-K	Hydromodification ^a	0.417	1.9
Total		21.50	100.0

^aThe value presented is the midpoint of the needs range determined by the analysis.

agricultural cropland, animal feeding operations, and silviculture.

It is important to note that only CWSRF-eligible needs were modeled. For example, operation and maintenance costs for BMPs are not eligible for CWSRF funding and therefore were not included in the modeling analysis. Furthermore, in some cases, such as silviculture and resource extraction, needs pertain to sources on Federal land. Needs on Federal lands, however, were generally *not included* in the analysis because such needs presumably would be addressed by Federal agencies and not by the CWSRF. (Hydromodification is an exception to this rule; refer to the explanation for the Hydromodification category at number 6 in the list below.)

For the purposes of this analysis, the categories are defined as follows:

- 1. Agriculture (cropland)** includes those croplands identified in the U.S. Department of Agriculture's (USDA) *National Resources Inventory* with an erosion level higher than *T*. (The *T* value is the maximum average annual soil loss that will permit current production levels to be maintained economically and indefinitely.)
- 2. Agriculture (animals)** was defined as animal feedlots with fewer than 500 animal units. That number had been chosen in accordance with one of the options

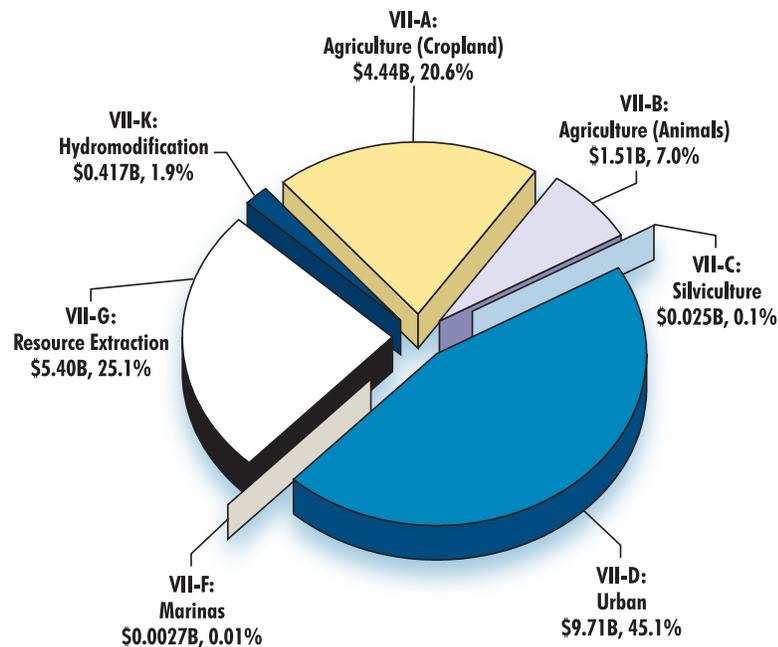


Figure D-1. Total modeled needs for NPS pollution control (January 2000 dollars). Note: CWNS 2000 NPS Need Categories VII-E, H, I, and J were not modeled.

in the proposed Concentrated Animal Feeding Operation (CAFO) rule (68 FR 7176). The final CAFO rule defined a CAFO as an operation with 1,000 or more animal units. This change does not substantially alter the modeled NPS needs estimate for agriculture (animals).

- Silviculture** includes *only* needs to address timber harvest. Costs for maintenance of forest roads, which is considered operation and maintenance and thus not CWSRF-eligible, are actually considerable, and would have greatly inflated the estimate for silviculture. Furthermore, the estimated compliance rate for implementation of timber harvest practices under current regulatory schemes is fairly high, thus lowering the total additional needs figure.
- Urban** includes NPS needs associated with on-site wastewater treatment systems, existing residential development, and construction sites covering less than 1 acre. The on-site wastewater treatment system analysis includes only the need for repairing or replacing leaking systems, not for building new systems in new subdivisions. This is because the

latter need is not included in Category VII-D of the documented NPS needs but is subsumed under Categories I and II. The residential construction site limit is placed at 1 acre because this is the permitting limit under the Storm Water Phase II rule (and therefore areas larger than 1 acre do not qualify as nonpoint sources).

- Resource Extraction** includes *only* abandoned coal mines because that was the only category of resource extraction for which the data available to model needs were adequate.
- Hydromodification** includes *only* dissolved oxygen mitigation for dams. However, because EPA was unable to separate Federal dams from private dams because of the format in which data were available, the estimate for dams includes Federal dams even though those would not be addressed through CWSRF funds. This category *does not* attempt to address the much broader range of hydrologic modification and habitat modification, although States have identified these as their second and third most important sources of impairment to rivers and

streams. Those sources were not modeled because of a lack of quality data to support such an analysis. Inclusion of those sources would likely inflate the total for the hydromodification category alone into the tens or even hundreds of billions of dollars.

The major water pollution problems associated with the source categories addressed by the practices costed for the modeled NPS approach are the following:

- Erosion and sediment runoff (agriculture, silviculture, abandoned mine lands, and residential construction).
- Pathogen and nutrient export (agriculture and on-site wastewater treatment systems).
- Acid mine drainage (abandoned mine lands).
- Depletion of dissolved oxygen (dams).
- Fuel spills (petroleum hydrocarbons from marinas).

It is important to note that the source categories for the modeled NPS needs do not exactly match those for the documented NPS needs. This is because the modeled NPS needs were largely based on information accumulated in prior years by EPA for particular source categories, and from information sources where sufficient data were available to actually scale-up NPS need estimates to the national level. Therefore, the following categories are *not* included in the modeled NPS needs, although a few States were able to provide some documented needs for these categories to EPA:

- Ground Water Protection: Unknown Source (VII-E)
- Brownfields (VII-H)
- Storage Tanks (VII-I)
- Sanitary Landfills (VII-J)

What was the basic methodology used to model NPS needs?

Although the specific methodologies used to determine needs differ to some extent among the NPS categories, the methodology for each category followed five steps.

1. Estimate the magnitude of the problem.
2. Identify applicable BMPs.
3. Estimate unit costs for the BMPs and multiply by the number of BMPs or acreage required to alleviate the NPS pollution.
4. Estimate total public and private sector expenditures incurred to date.
5. Subtract expenditures incurred (step 4) from costs (step 3) to estimate total needs.

How was the magnitude of the problem estimated for each NPS pollution category?

To estimate the magnitude of the problem, each source category analysis identified the number of facilities or acres that generate NPS pollution and could negatively affect water quality. The number and size of each source of pollution were estimated using various data sources, including the USDA's *National Resource Inventory*, USDA's 1997 *Census of Agriculture*, various Federal and State silviculture databases, the U.S. Department of the Interior's Abandoned Mine Lands database, the National Small Flows Clearinghouse, and the Tennessee Valley Authority.

How were BMPs identified for each NPS pollution category?

The second step involved identifying a set of applicable BMPs for each NPS category. The selected BMPs were chosen because of their acceptance by government agencies, as indicated in guidance issued by USDA and EPA, and confirmed through expert interviews.¹ The BMPs evaluated do not necessarily represent the only applicable management practices for each source category. Rather, they reflect management practices that government agencies have accepted, that are widely used, and for which at least some reliable cost data are available. The BMPs used to estimate costs to control pollutants from each source category are shown in Table D-2.

¹ BMPs for animal feeding operations were selected using the least-cost model that was being used to support development of what were then the proposed (but are now the final) effluent limitations guidelines for these facilities.

How were total costs estimated for each NPS pollution category?

The third step entailed estimating costs for each BMP and then applying those unit costs to the relevant NPS categories. Where a range of BMP costs was found for a specific practice, an average cost was used. For on-site wastewater treatment system analysis, average costs of repair and replacement were estimated based on the estimated number of failing systems. For abandoned coal mine lands, unit costs are not necessarily relevant; instead the analysis used estimated costs for cleaning up abandoned coal mine land sites identified by the States as posing threats to the environment.

Some BMP unit costs and management practices were adjusted for regional differences where data supporting such variation were available. This was particularly true for estimating silviculture BMP unit costs. For agriculture, conservation tillage costs were estimated using national unit costs, although variations in BMP usage by crop type were taken into account. Regional

BMP cost differences were not considered in analyses of marinas and dams.

Where cost data on BMPs were limited or unreliable, best professional judgment was used by consulting with experts at the USDA, the Conservation Technology Information Center, the U.S. Forest Service, and the U.S. Department of the Interior.

Total national costs were estimated by multiplying BMP unit costs by the number of acres of land to which BMPs would be applied for cropland and silviculture and the number of NPS facilities for animal feeding operations.

How were total expenditures estimated for each NPS pollution category?

The fourth step involved estimating total public and private expenditures already incurred for BMPs that have been implemented to address NPS pollution problems. Those expenditures had funded a broad

Table D-2. BMPs Used as Basis for Cost Estimates

NPS Category	Types of BMPs		
	Erosion and Sediment Control	Pathogens and Nutrients	Other
Agriculture (cropland)	conservation tillage, conservation buffers, and crop nutrient management	crop nutrient management plans	NA
Agriculture (animals)	NA	comprehensive nutrient management plans and facility upgrades	NA
Silviculture	pre-harvest planning, selective haul road location, water turnouts, water bars, streamside management zones, culverts, fords, temporary bridges, seeding, and mulching	NA	NA
Urban Development (On-site Wastewater Treatment Systems)	NA	replacement and repair	NA
Urban Development (Residential Construction)	silt fences, construction entrances, and seeding	NA	NA
Marinas ^a	NA	NA	booms, drain guards, and drain inlet filters
Resource Extraction ^b	NA	NA	site reclamation
Hydromodification (Dams)	NA	NA	low dissolved oxygen mitigation

Note: NA = not applicable.

^a Marina BMPs are designed primarily to prevent spillage of petroleum hydrocarbon products.

^b Site reclamation for abandoned coal mines is meant primarily to address acid mine drainage as well as sediment runoff.

array of endeavors, ranging from developing nutrient management plans to retrofitting dams with equipment to increase dissolved oxygen levels.

The expenditures included costs incurred by owners or operators to implement structural and nonstructural BMPs and funds appropriated by the public sector to create incentives for operators to implement such practices.² Structural BMPs are engineered structures designed to control or alter runoff. The structural BMPs evaluated for agriculture and silviculture NPS control include conservation tillage,³ riparian buffers, silt fences, and dips and bars. Nonstructural BMPs include changes in the way operators implement pollution control practices to minimize the generation of NPS pollutants. Nonstructural BMPs in the CWNS 2000 include nutrient management planning for cropland and animal feeding operations.

The accuracy of expenditure estimates varied among categories. For example, accurately estimating expenditures incurred for cropland pollution control measures posed methodological challenges because much of the required information was not readily available. Also, because EPA was not able to separate needs for federally operated dams from needs for privately operated dams, federally operated dam needs are included in Appendix D of the CWNS 2000 (even though these dams would not use CWSRF funding). Public expenditures for NPS pollution control, especially at the local level, are often not explicitly reported in published budgets. Private expenditures were even less available and had to be estimated by starting with the frequency of current practices and then applying BMP unit costs. Abandoned mine land reclamation was an exception because most of those efforts are funded through a single program created

under the Surface Mining Control and Reclamation Act. Reclamation expenditures are tracked through the Abandoned Mine Land Inventory System, which is available to the public.⁴

As mentioned previously, where usage data on BMPs were limited or unreliable, best professional judgment was used by consulting with experts at the USDA, the Conservation Technology Information Center, the U.S. Forest Service, and the U.S. Department of the Interior.

What are the major limitations of the NPS modeled needs analysis?

The modeled NPS needs do not capture all potential pollution problems for the categories analyzed. For example, categories evaluated might contribute to other surface water pollution problems, such as heavy metals and pathogen contamination, but time and budget constraints precluded consideration of those pollutants. It should be noted, however, that the animal feeding operation analysis in the CWNS 2000 evaluates facility upgrades that can reduce bacterial pathogen contamination of water, although it does not explicitly estimate costs for a suite of BMPs that would comprehensively control pathogens. Similarly, the agriculture analysis could not identify BMPs specifically designed to minimize pesticide runoff, although the BMPs used for erosion and sediment runoff can reduce export of pesticides to the surrounding environment. Finally, as mentioned above, the hydromodification category *does not* attempt to address the much broader range of hydrologic modification and habitat modification, although States have identified these as their second and third most important sources of impairment to rivers and streams. Those sources were not modeled because of a lack of data to support such an analysis.

² For abandoned mine lands, these expenditures would be used to reclaim sites; for failing on-site wastewater treatment systems, these expenditures would be used to repair or replace existing systems.

³ Although conservation tillage does not involve building a structure, it does involve altering the operator's equipment and hence results in some capital expenditures.

⁴ Although these mining funds help to pay for pollution mitigation projects, abandoned mines were included in the CWNS 2000 because the funds might not be available in a timely fashion or in a sufficient amount to fully mitigate the pollution from abandoned coal mines. Therefore, CWSRF funds might still be of use.



Appendix E

*Storm Water Management Program
Modeled Estimates*

What are the CWNS 2000 storm water modeled needs?

The total modeled national storm water needs are \$8.4 billion. This figure represents only the estimated CWSRF-eligible portion of the costs that municipal separate storm sewer systems (MS4s) are expected to incur to develop and implement storm water management programs in response to the National Pollutant Discharge Elimination System (NPDES) MS4 Storm Water Program regulations for Phases I and II. Although administrative costs for the ongoing operation of MS4 storm water management programs, as well as operation and maintenance (O&M) costs for storm water controls and best management practices (BMPs), are significant, those costs are not included in the model. State-by-state modeled results are presented in Table E-1 at the end of this appendix.

Why were storm water needs modeled for the CWNS 2000?

Although storm water represents a substantial part of the total water quality problem, few States have systematically documented their storm water needs. Therefore, EPA modeled these needs to gain an understanding of the magnitude of the financial needs for storm water management programs.

EPA developed Storm Water Program regulations for pollution from MS4s. The Phase I regulations, initiated in 1990, include MS4s located in incorporated places with populations of 100,000 or more; systems located in the 47 counties identified by EPA as having populations of more than 100,000 in unincorporated, urbanized areas; and systems designated MS4s by the EPA Administrator or the State. MS4s identified under the Phase I Storm Water Program regulations were required to submit NPDES permit applications. As of February 2000 approximately 1,017 Phase I MS4 Storm Water Program NPDES permits, covering 886 municipal entities, had been issued or were in the final stages of being issued.¹ A few small communities are included in the program because they are associated with larger systems or because they have been designated by the State. Phase II MS4s consist of

systems serving a population of fewer than 100,000 in urbanized areas with a population density of at least 1,000 persons per square mile and systems that are designated by the EPA Administrator or the State. More than 5,000 MS4s were designated as Phase II systems, although Phase II MS4 permit applications were not due until March 10, 2003.

The Phase II MS4 Storm Water Program requires permittees to develop a storm water management program that addresses six minimum control measures: (1) Public Education and Outreach, (2) Public Involvement and Participation, (3) Illicit Discharge Detection and Elimination, (4) Construction Site Runoff Control, (5) Program to Control Pollutants in Runoff from New Development and Significant Redevelopment, and (6) Pollution Prevention from Municipal Activities.

What methodology was used to model storm water needs?

To estimate the 2000 needs for Phases I and II of the Storm Water Program, EPA largely relied on modeling efforts completed for the 1996 Clean Water Needs Survey and the 1998 storm water Phase II final regulations. Those efforts were used as the basis for the CWNS 2000 modeled Category VI needs for two reasons: (1) better data on Phase I needs are not currently available, and (2) Phase II permits had not yet been issued, and therefore EPA's modeled needs are the best estimates currently available.

How were the Phase I storm water needs estimated?

To estimate the Phase I storm water needs for the CWNS 2000, EPA used the same modeling approach used in the 1996 Clean Water Needs Survey and also subtracted out needs that should have been met by the Phase I cities. These needs largely represented one-time training costs and one-time costs to develop ordinances or regulations. The resulting needs were then inflated to the January 1, 2000, base year for reporting needs.

¹ U.S. Environmental Protection Agency, *Report to Congress on the Phase I Storm Water Regulations*, February 2000.

The Phase I MS4 modeling methodology from 1996 estimated both state-by-state and national storm water needs, but it did not predict the needs for individual MS4s. The estimated needs for the Phase I MS4 Storm Water Program were modeled as follows:

1. Develop decision rules based on climatic criteria to create a set of storm water management approach groups representing broad climatic characteristics that determine the choice of storm water controls or BMPs.
2. Assign each MS4 to a storm water management approach group by applying the decision rules based on climatic criteria to each MS4.
3. Assign appropriate storm water controls or BMPs to each storm water management approach group.
4. Estimate the scale of the applicable storm water controls or BMPs for each MS4 in a storm water management approach group.
5. Use cost formulas, developed for each storm water control or BMP, to estimate the capital cost during a 20-year period for each applicable storm water control or BMP, for each MS4, in January 2000 dollars.
6. Sum the costs of all the applicable storm water controls or BMPs for an MS4 to estimate total capital costs.
7. Aggregate costs nationally and by State.

A panel of outside experts reviewed the model used to estimate the Phase I MS4 storm water needs. The peer review generated several comments related to the O&M costs as estimated by the model, but this did not affect the modeled capital needs presented in this report. Another major peer review comment is that this report presents only one estimate of needs instead of a range. EPA agrees that, depending on the complexity of each individual storm water problem and the variability of local circumstances, a range rather than a single estimate could be developed. Given the objective of the CWNS 2000 to estimate the needs for pollution control, one set of assumptions was selected for use in the report. If the model had been used for economic

analysis, a number of different assumptions would have been used to develop upper and lower cost bounds.

How were the Phase II storm water needs estimated?

The Phase II MS4 needs for the CWNS 2000 were based largely on EPA's economic analysis completed for the final Phase II rule in 1999. This economic analysis estimated that the Phase II regulations would cost \$3.50 per person per year based on 1998 data. EPA updated the population data to determine the total population affected by Phase II and applied these compliance costs (inflated to a 2000 need) to estimate 2000 Phase II MS4 needs.

To update the Phase II population from a 1998 to a 2000 estimate, EPA used the 1990 U.S. Census coverage of urbanized areas to identify Phase II cities. Phase I geographic areas and combined sewer overflow (CSO) cities were factored out of the population summation for Phase II. Because the 2000 urbanized area would not be available until summer 2002, the population figures were increased by 25 percent to account for growth in the urbanized area since 1990. Therefore, EPA estimates that 75 million people will be affected by Phase II's designation of urbanized areas.

Phase II also potentially regulates cities outside urbanized areas, including cities with a population of at least 10,000. The Phase II final regulation contained a list of these potentially regulated cities based on the 1990 Census. To account for growth in these cities since 1990 and to include other cities that might be regulated under Phase II, EPA inflated these numbers by 20 percent. When the potentially eligible Phase II population is added, the total population affected by Phase II is 89 million.

Therefore, based on a Phase II population of 89 million, the 2000 Phase II MS4 need for the CWNS 2000 is \$333 million. This estimate is similar to the 1998 EPA Phase II Rule estimate for the cost of compliance, \$297 million.

Table E-1 summarizes the EPA 2000 assessment of modeled needs estimates, by State, for Phase I and Phase II of the NPDES Municipal Storm Water Program. The modeled estimates for storm water

management programs represent the estimated capital investment necessary for the municipalities to meet the requirements of Phase I and Phase II Municipal Storm Water Management Programs.

Table E-1. CWNS 2000 Modeled Estimates for Storm Water Management Programs (January 2000 dollars in millions)

State	Phase I Need	Phase II Need	State	Phase I Need	Phase II Needs
Alabama	358	5	Nebraska	27	2
Alaska	31	0	Nevada	42	0
Arizona	149	3	New Hampshire	0	0
Arkansas	39	4	New Jersey	0	18
California	1,315	17	New Mexico	21	2
Colorado	117	9	New York	88	22
Connecticut	11	4	North Carolina	176	17
Delaware	47	0	North Dakota	0	1
District of Columbia	20	0	Ohio	106	15
Florida	1,268	10	Oklahoma	218	9
Georgia	493	4	Oregon	141	5
Hawaii	56	0	Pennsylvania	50	14
Idaho	10	2	Rhode Island	0	1
Illinois	10	20	South Carolina	93	5
Indiana	121	8	South Dakota	8	1
Iowa	36	4	Tennessee	308	5
Kansas	111	6	Texas	981	32
Kentucky	78	4	Utah	35	4
Louisiana	188	5	Vermont	0	0
Maine	0	0	Virginia	422	4
Maryland	331	1	Washington	227	5
Massachusetts	20	10	West Virginia	33	11
Michigan	37	12	Wisconsin	0	1
Minnesota	27	12	Wyoming	0	3
Mississippi	42	4			
Missouri	178	10	Total	8,063	333
Montana	0	2	TOTAL Phase I and II		8,396

Appendix F

*Summary of
Clean Watersheds Needs Survey 2000
Cost Estimates by Watershed*

Table F-1 summarizes the CWNS 2000 assessment of total needs by watershed region, subregion, and accounting unit for wastewater treatment and collection facilities, storm water facilities, and NPS pollution control. The needs represent the capital investment necessary to plan, design, build, replace, or rehabilitate publicly owned wastewater treatment and collection facilities (Categories I through V) and establish and implement storm water management programs (Category VI). The NPS pollution control (Category VII) needs include costs for agriculture, silviculture, urban, ground water protection, marinas, resource extraction, brownfields, storage tanks, sanitary landfills, and hydromodification. Needs estimates presented in Table F-1 vary from those presented in Tables ES-1, 3-1, and 3-4; the text; and Appendix A-1 because not all facilities were successfully georeferenced to a watershed.

Table F-1. CWNS 2000 Total Needs by Watershed (January 2000 dollars in millions)

Region	Subregion (4-digit watershed)	Accounting Unit (6-digit watershed)	Total	
ALASKA	Arctic Alaska	Barrow Alaska	12	
		Colville River	1	
		Eastern Arctic	1	
		Western Arctic	1	
	Northwest Alaska	Kobuk-Selawik Rivers	6	
		Noatak River-Lisburne Peninsula	2	
		Northern Seward Peninsula	24	
		Norton Sound	25	
	Southcentral Alaska	Copper River	5	
		Kenai Peninsula	15	
		Knik Arm	213	
		Kodiak-Shelikof	4	
		Prince William Sound	6	
		Western Cook Inlet	0 ^a	
	Southeast Alaska	Central Southeast Alaska	1	
		Northern Southeast Alaska	18	
		Southern Southeast Alaska	8	
	Southwest Alaska	Aleutian Islands	14	
		Kvichak-Port Heiden	3	
		Lower Kuskokwim River	92	
		Nushagak River	0 ^a	
		Upper Kuskokwim River	8	
	Yukon Alaska	Central Yukon	14	
		Chandalar-Christian Rivers	3	
		Koyukuk River	6	
		Lower Yukon	36	
		Porcupine River	1	
		Tanana River	13	
		Upper Yukon River	16	
	Alaska Total			548

continued

Table F-1. (continued)

Region	Subregion (4-digit watershed)	Accounting Unit (6-digit watershed)	Total	
ARKANSAS-WHITE-RED	Arkansas-Keystone	Arkansas-Keystone	6	
	Lower Arkansas	Lower Arkansas-Fourche La Fave	28	
		Robert S. Kerr Reservoir	396	
	Lower Canadian	Lower Canadian	44	
		Middle Canadian	6	
	Lower Cimarron	Lower Cimarron	28	
	Middle Arkansas	Middle Arkansas	335	
	Neosho-Verdigris	Neosho	100	
		Verdigris	101	
	North Canadian	Lower Beaver	4	
		Lower North Canadian	42	
		Upper Beaver	0 ^a	
	Red-Washita	Red-Lake Texoma	83	
		Red-Pease	4	
		Washita	1	
	Red headwaters	North Fork Red	3	
		Prairie Dog Town Fork Red	6	
		Salt Fork Red	0 ^a	
	Red-Sulphur	Big Cypress-Sulphur	42	
		Red-Little	51	
		Red-Saline	435	
	Upper Arkansas	Upper Arkansas	240	
	Upper Canadian	Upper Canadian	3	
	Upper Cimarron	Upper Cimarron	2	
	Upper White	Upper White	369	
	Arkansas-White-Red Total			2,329
	CALIFORNIA	Central California Coastal	Central California Coastal	116
Klamath-Northern California Coastal		Klamath	13	
		Northern California Coastal	220	
North Lahontan		North Lahontan	10	
Northern Mojave-Mono Lake		Mono-Owens Lakes	1	
		Northern Mojave	118	
Sacramento		Lower Sacramento	1,712	
		Upper Sacramento	31	
San Francisco Bay		San Francisco Bay	3,343	
San Joaquin		San Joaquin	525	
Southern California Coastal		Laguna-San Diego Coastal	706	
		Santa Ana	1,984	
		Ventura-San Gabriel Coastal	5,328	
Southern Mojave-Salton Sea		Salton Sea	28	
Tulare-Buena Vista Lakes	Tulare-Buena Vista Lakes	228		
California Total			14,363	

continued

Table F-1. (continued)

Region	Subregion (4-digit watershed)	Accounting Unit (6-digit watershed)	Total
GREAT BASIN	Bear	Lower Bear	72
		Upper Bear	0 ^a
	Black Rock Desert-Humboldt	Black Rock Desert	4
	Central Lahontan	Carson	1
		Truckee	38
	Escalante Desert-Sevier Lake	Escalante Desert-Sevier Lake	54
	Great Salt Lake	Great Salt Lake	117
		Jordan	360
		Weber	114
Great Basin Total		760	
GREAT LAKES	Eastern Lake Erie-Lake Erie	Eastern Lake Erie	1,330
		Lake Erie	39
	Northeastern Lake Michigan-Lake Michigan	Lake Michigan	30
		Northeastern Lake Michigan	16
	Northeastern Lake Ontario-Lake Ontario-St. Lawrence	Lake Ontario	118
		Northeastern Lake Ontario	154
		St. Lawrence	203
	Northwestern Lake Huron	Northwestern Lake Huron	27
	Northwestern Lake Michigan	Fox	268
		Northwestern Lake Michigan	154
	Southeastern Lake Michigan	Southeastern Lake Michigan	917
	Southeastern Lake Ontario	Oswego	717
		Southeastern Lake Ontario	224
	Southern Lake Erie	Southern Lake Erie	2,152
	Southern Lake Superior-Lake Superior	Lake Superior	21
		Southcentral Lake Superior	39
	Southwestern Lake Huron-Lake Huron	Saginaw	177
		Southwestern Lake Huron	3
	Southwestern Lake Michigan	Southwestern Lake Michigan	2,797
	Southwestern Lake Ontario	Southwestern Lake Ontario	244
	St. Clair-Detroit	St. Clair-Detroit	3,333
	Western Lake Erie	Western Lake Erie	1,750
	Western Lake Superior	Northwestern Lake Superior	51
Southwestern Lake Superior		16	
St. Louis		138	
Great Lakes Total		14,918	
HAWAII	Hawaii	Hawaii	15
	Kauai	Kauai	46
	Maui	Maui	130
	Oahu	Oahu	1,549
Hawaii Total		1,740	

continued

Table F-1. (continued)

Region	Subregion (4-digit watershed)	Accounting Unit (6-digit watershed)	Total
LOWER COLORADO	Little Colorado	Little Colorado	227
	Lower Colorado	Bill Williams	1
		Lower Colorado	769
	Lower Colorado-Lake Mead	Lower Colorado-Lake Mead	130
	Lower Gila	Lower Gila	8
		Lower Gila-Agua Fria	1,273
	Middle Gila	Middle Gila	317
		San Pedro-Willcox	76
		Santa Cruz	564
	Salt	Salt	2,715
		Verde	187
	Sonora	Rio De Bavispe	14
		Rio Sonoyta	1
	Upper Gila	Upper Gila	56
Lower Colorado Total			6,338
LOWER MISSISSIPPI	Boeuf-Tensas	Boeuf-Tensas	16
	Louisiana Coastal	Atchafalaya-Vermilion	105
		Calcasieu-Mermentau	81
	Lower Mississippi	Central Louisiana Coastal	244
		Lake Pontchartrain	17
		Lower Mississippi-New Orleans	521
	Lower Mississippi-Big Black	Big Black-Homochitto	43
		Lower Mississippi-Natchez	10
	Lower Mississippi-St. Francis	Lower Arkansas	8
		Lower White	8
		St. Francis	34
	Lower Mississippi-Yazoo	Lower Mississippi-Greenville	3
		Yazoo	110
	Lower Mississippi-Hatchie	Hatchie-Obion	156
		Lower Mississippi-Memphis	8
	Lower Mississippi-Lake Maurepas	Lake Maurepas	52
		Lower Grand	6
		Lower Mississippi-Baton Rouge	728
	Lower Red-Ouachita	Lower Ouachita	170
Lower Red		39	
Upper Ouachita		14	
Lower Mississippi Total			2,373

continued

Table F-1. (continued)

Region	Subregion (4-digit watershed)	Accounting Unit (6-digit watershed)	Total
MID ATLANTIC	Delaware	Lower Delaware	4,123
		New Jersey Coastal	1,238
		Upper Delaware	1,589
	Lower Chesapeake	James	1,210
		Lower Chesapeake	383
	Lower Hudson-Long Island	Long Island	10,687
		Lower Hudson	13,153
	Potomac	Potomac	4,828
	Richelieu	Richelieu	228
	Susquehanna	Lower Susquehanna	1,123
		Upper Susquehanna	1,071
		West Branch Susquehanna	478
	Upper Chesapeake	Upper Chesapeake	3,258
	Upper Hudson	Upper Hudson	1,717
Mid Atlantic Total			45,086
MISSOURI	Big Horn	Big Horn	3
	Chariton-Grand	Chariton	12
		Grand	20
	Cheyenne	Belle Fourche	8
		Cheyenne	23
	Elkhorn	Elkhorn	30
	Gasconade-Osage	Gasconade	9
		Osage	90
	James	James	18
	Kansas	Big Blue	21
		Kansas	482
	Loup	Loup	4
	Lower Missouri	Lower Missouri	575
		Lower Missouri-Blackwater	1,540
	Lower Yellowstone	Lower Yellowstone	9
	Milk	Milk	11
	Missouri Headwaters	Missouri Headwaters	81
	Missouri-Big Sioux	Big Sioux	78
		Lewis and Clark Lake	22
	Missouri-Little Missouri	Lake Sakakawea	1
		Little Missouri	0 ^a
	Missouri-Little Sioux	Missouri-Little Sioux	1,012
	Missouri-Marias	Marias	18
Upper Missouri		120	
Missouri-Musselshell	Fort Peck Lake	4	
	Musselshell	2	

continued

Table F-1. (continued)

Region	Subregion (4-digit watershed)	Accounting Unit (6-digit watershed)	Total
MISSOURI (continued)	Missouri-Nishnabotna	Missouri-Nishnabotna	625
	Missouri-Oahe	Cannonball-Heart-Knife	0 ^a
		Grand-Moreau	0 ^a
		Lake Oahe	9
	Missouri-Poplar	Missouri-Poplar	11
	Missouri-White	Fort Randall Reservoir	14
		White	5
	Niobrara	Niobrara	0 ^a
	North Platte	North Platte	18
	Platte	Lower Platte	155
		Middle Platte	22
	Powder-Tongue	Tongue	2
	Republican	Republican	30
	Smoky Hill	Smoky Hill	14
	South Platte	South Platte	839
	Upper Yellowstone	Upper Yellowstone	63
Missouri Total			6,000
NEW ENGLAND	Androscoggin	Androscoggin	113
	Connecticut	Lower Connecticut	1,236
		Upper Connecticut	110
	Connecticut Coastal	Connecticut Coastal	1,700
	Kennebec	Kennebec	205
	Maine Coastal	Maine Coastal	133
	Massachusetts-Rhode Island Coastal	Massachusetts-Rhode Island Coastal	4,390
	Merrimack	Merrimack	1,584
	Penobscot	Penobscot	142
	Saco	Saco	515
	St. John	St. John	36
	New England Total		
OHIO	Allegheny	Allegheny	784
	Big Sandy-Guyandotte	Big Sandy	340
		Guyandotte	108
	Cumberland	Lower Cumberland	528
		Upper Cumberland	181
	Great Miami	Great Miami	965
	Green	Green	168
	Kanawha	Kanawha	707
	Kentucky-Licking	Kentucky	647
		Licking	186
	Lower Ohio	Lower Ohio	723
Lower Ohio-Salt		819	

continued

Table F-1. (continued)

Region	Subregion (4-digit watershed)	Accounting Unit (6-digit watershed)	Total
OHIO (continued)	Middle Ohio	Middle Ohio-Little Miami	2,234
		Middle Ohio-Raccoon	305
	Monongahela	Monongahela	1,429
	Muskingum	Muskingum	377
	Scioto	Scioto	1,329
	Upper Ohio	Upper Ohio-Beaver	2,563
		Upper Ohio-Little Kanawha	322
	Wabash	Patoka-White	2,136
		Wabash	1,568
	Ohio Total		18,419
PACIFIC NORTHWEST	Kootenai-Pend Oreille-Spokane	Kootenai	7
		Pend Oreille	192
		Spokane	107
	Lower Columbia	Lower Columbia	879
	Lower Snake	Clearwater	7
		Lower Snake	9
		Salmon	0 ^a
	Middle Columbia	Deschutes	25
		John Day	4
		Middle Columbia	25
	Middle Snake	Middle Snake-Boise	56
		Middle Snake-Powder	0 ^a
	Oregon closed basins	Oregon closed basins	3
	Oregon-Washington Coastal	Northern Oregon Coastal	13
		Southern Oregon Coastal	137
		Washington Coastal	223
	Puget Sound	Puget Sound	2,091
	Upper Columbia	Upper Columbia	61
	Upper Snake	Upper Snake	103
	Willamette	Willamette	503
	Yakima	Yakima	136
	Pacific Northwest Total		4,581
RIO GRANDE	Lower Pecos	Lower Pecos	7
	Lower Rio Grande	Lower Rio Grande	176
	Rio Grande closed basins	Rio Grande closed basins	4
	Rio Grande headwaters	Rio Grande headwaters	11
	Rio Grande-Amistad	Rio Grande-Amistad	4
		Rio Grande-Fort Quitman	166
	Rio Grande-Elephant Butte	Rio Grande-Elephant Butte	89
		Upper Rio Grande	8
	Rio Grande-Falcon	Rio Grande-Falcon	43

continued

Table F-1. (continued)

Region	Subregion (4-digit watershed)	Accounting Unit (6-digit watershed)	Total
RIO GRANDE (continued)	Rio Grande-Mimbres	Mimbres	9
		Rio Grande-Caballo	3
	Upper Pecos	Upper Pecos	19
Rio Grande Total			539
SOURIS-RED-RAINY	Rainy	Rainy	16
	Red	Devils Lake-Sheyenne	9
		Lower Red	57
		Upper Red	68
	Souris	Souris	2
Souris-Red-Rainy Total			152
SOUTH ATLANTIC-GULF	Alabama	Alabama	217
		Coosa-Tallapoosa	228
	Altamaha-St. Marys	Altamaha	91
		St. Marys-Satilla	20
	Apalachicola	Apalachicola	2,190
	Cape Fear	Cape Fear	1,569
	Choctawhatchee-Escambia	Choctawhatchee	25
		Escambia	16
		Florida Panhandle Coastal	164
	Chowan-Roanoke	Albemarle-Chowan	202
		Roanoke	325
	Edisto-Santee	Edisto-South Carolina Coastal	89
		Santee	1,881
	Mobile-Tombigbee	Black Warrior-Tombigbee	2,127
		Mobile Bay-Tombigbee	91
	Neuse-Pamlico	Neuse	1,178
		Pamlico	510
	Ochlockonee	Ochlockonee	64
	Ogeechee-Savannah	Ogeechee	14
		Savannah	56
	Pascagoula	Pascagoula	298
	Peace-Tampa Bay	Peace	186
		Tampa Bay	580
	Pearl	Pearl	241
	Pee Dee	Lower Pee Dee	338
		Upper Pee Dee	798
	Southern Florida	Kissimmee	51
Southern Florida		4,342	
St. Johns	East Florida Coastal	211	
	St. Johns	956	

continued

Table F-1. (continued)

Region	Subregion (4-digit watershed)	Accounting Unit (6-digit watershed)	Total
SOUTH ATLANTIC-GULF (continued)	Suwannee	Aucilla-Waccasassa	33
		Suwannee	106
South Atlantic-Gulf Total			19,200
TENNESSEE	Lower Tennessee	Lower Tennessee	74
	Middle Tennessee-Elk	Middle Tennessee-Elk	105
	Middle Tennessee-Hiwassee	Middle Tennessee-Hiwassee	38
	Upper Tennessee	French Broad-Holston	325
		Upper Tennessee	211
Tennessee Total			753
TEXAS-GULF	Brazos headwaters	Brazos headwaters	17
		Central Texas Coastal	16
	Galveston Bay-San Jacinto	Guadalupe	47
		Lavaca	5
		San Antonio	563
	Galveston Bay-San Jacinto	Galveston Bay-Sabine Lake	314
		San Jacinto	3,486
	Lower Brazos	Little	156
		Lower Brazos	119
	Lower Colorado-San Bernard Coastal	Lower Colorado	685
		Middle Colorado-Concho	22
		Middle Colorado-Llano	34
		San Bernard Coastal	8
	Middle Brazos	Middle Brazos-Bosque	44
		Middle Brazos-Clear Fork	8
	Neches	Neches	100
	Nueces-Southwestern Texas Coastal	Nueces	95
		Southwestern Texas Coastal	366
	Sabine	Sabine	50
	Trinity	Lower Trinity	28
Upper Trinity		1,635	
Upper Colorado	Upper Colorado	10	
Texas-Gulf Total			7,808
UPPER COLORADO	Colorado headwaters	Colorado headwaters	188
	Gunnison	Gunnison	11
	Lower Green	Lower Green	11
	San Juan	Lower San Juan	15
		Upper San Juan	31
	Upper Colorado-Dirty Devil	Upper Colorado-Dirty Devil	5
	Upper Colorado-Dolores	Upper Colorado-Dolores	7
	White-Yampa	White-Yampa	13
Upper Colorado Total			281

continued

Table F-1. (continued)

Region	Subregion (4-digit watershed)	Accounting Unit (6-digit watershed)	Total
UPPER MISSISSIPPI	Chippewa	Chippewa	46
	Des Moines	Des Moines	1,038
	Lower Illinois	Lower Illinois	1,338
	Minnesota	Minnesota	271
	Mississippi Headwaters	Mississippi Headwaters	138
		Upper Mississippi-Crow-Rum	1,335
	Rock	Rock	550
	St. Croix	St. Croix	123
	Upper Illinois	Upper Illinois	10,273
	Upper Mississippi-Black-Root	Upper Mississippi-Black-Root	305
	Upper Mississippi-Iowa-Skunk-Wapsipinicon	Iowa	167
		Upper Mississippi-Skunk-Wapsipinicon	841
	Upper Mississippi-Kaskaskia-Meramec	Kaskaskia	174
		Upper Mississippi-Meramec	2,634
	Upper Mississippi-Maquoketa-Plum	Upper Mississippi-Maquoketa-Plum	67
	Upper Mississippi-Salt	Upper Mississippi-Salt	232
	Wisconsin	Wisconsin	164
Upper Mississippi Total			19,696
Grand Total			175,852

^a Estimate is less than \$0.5 million.



Appendix G

*Clean Watersheds Needs Survey 2000
Needs Categories*

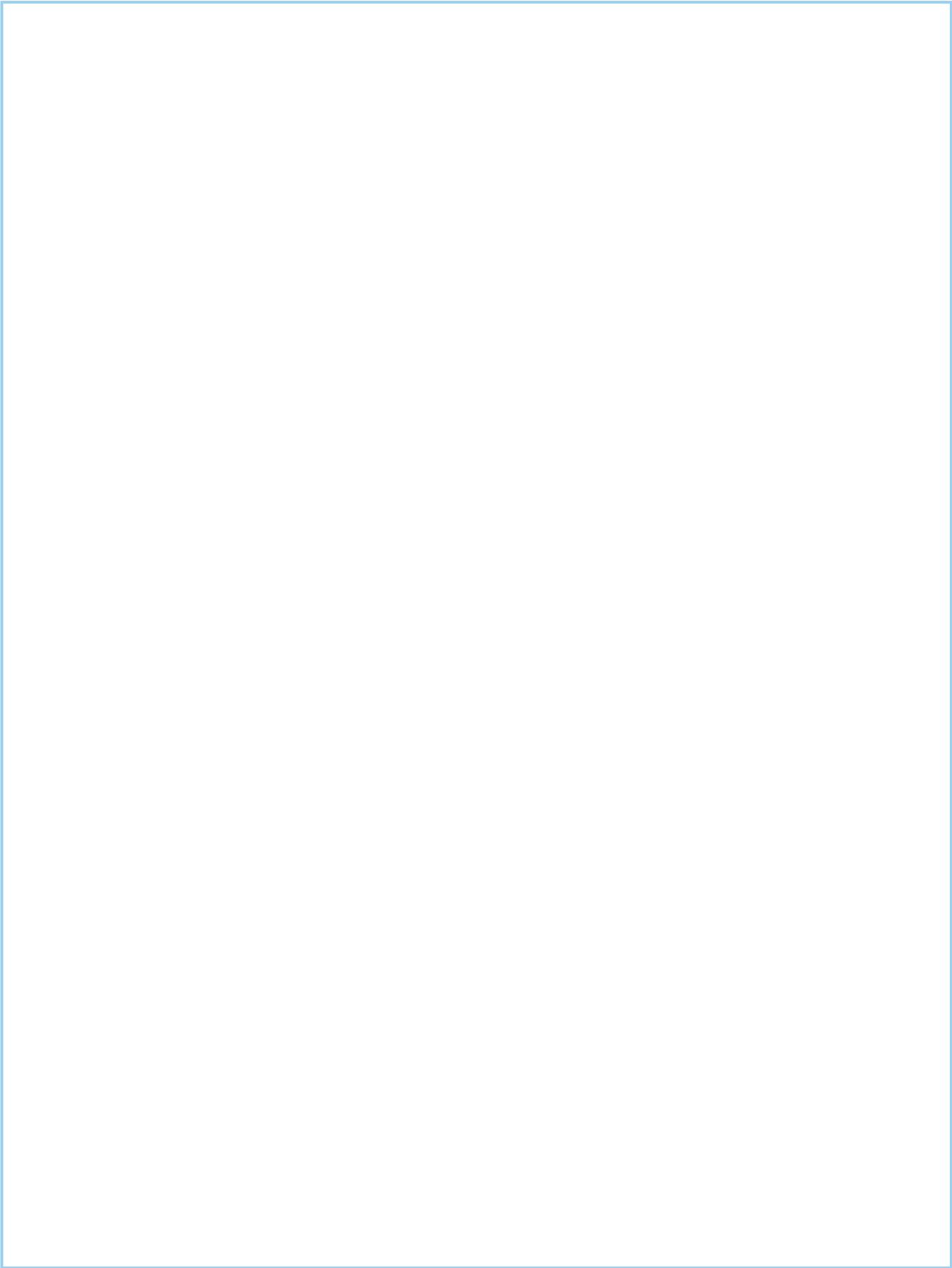
Table G-1. CWNS 2000 Needs Categories

Category	Name	Description
I	Secondary Wastewater Treatment	<p>The minimum level of treatment that must be maintained by all treatment facilities except those facilities granted waivers of Secondary Treatment for Marine Discharges under section 301(h) of the Clean Water Act. Treatment levels are specific in terms of the concentration of conventional pollutants in the wastewater effluent discharged from a facility after treatment. Secondary treatment typically requires a treatment level that will produce an effluent quality of 30 mg/L of both BOD₅ and total suspended solids, although secondary treatment levels required for some lagoon systems may be less stringent than this. In addition, the secondary treatment must remove 85 percent of BOD₅ and total suspended solids from the influent wastewater. Needs necessary to achieve a secondary treatment level should be included in this category.</p> <p>Costs associated with the construction of individual or community septic tanks and the treatment portion of decentralized types of facilities should be included in Category I.</p>
II	Advanced Wastewater Treatment	A level of treatment that is more stringent than secondary treatment or produces a significant reduction in nonconventional pollutants present in the wastewater treated by a facility. Needs reported in this category are necessary to attain incremental reductions in pollutant concentrations beyond basic secondary treatment.
III-A	Infiltration/Inflow (I/I) Correction	Control of the problem of penetration into a sewer system of water other than wastewater from the ground through such means as defective pipes or manholes (infiltration) or from sources such as drains, storm sewers, and other improper entries into the system (inflow). Included in this category are costs for correction of sewer system infiltration/inflow problems. Costs are also reported for preliminary sewer system analysis and for detailed sewer system evaluation surveys.
III-B	Sewer Replacement/Rehabilitation	Reinforcement or reconstruction of structurally deteriorating sewers. This category includes cost estimates for rehabilitation of existing sewer systems beyond those for normal maintenance. Costs are reported if the corrective actions are necessary to maintain the structural integrity of the system.
IV-A	New Collector Sewers and Appurtenances	Pipes used to collect and carry wastewater from a sanitary or industrial wastewater source to an interceptor sewer that will convey the wastewater to a treatment facility. The needs in this category include the costs of constructing new collector sewer systems and appurtenances.
IV-B	New Interceptor Sewers and Appurtenances	Major sewer lines receiving wastewater flows from collector sewers. The interceptor sewer carries wastewater directly to the treatment facility or to another interceptor. The needs in this category include costs for constructing new interceptor sewers and pumping stations necessary for conveying wastewater from collection sewer systems to a treatment facility or to another interceptor sewer. Costs for relief sewers should be included in this category.
V	Combined Sewer Overflow (CSO) Correction	Measures used to achieve water quality objectives by preventing or controlling periodic discharges of a mixture of storm water and untreated wastewater (combined sewer overflows) that occur when the capacity of a sewer system is exceeded during a rainstorm. This category does not include costs for overflow control allocatable to flood control or drainage improvement, or for treatment or control of storm water in separate storm and drainage systems.
VI	Storm Water Management Programs	Storm water is defined as runoff water resulting from precipitation. This needs category includes activities to plan and implement municipal storm water management programs pursuant to National Pollutant Discharge Elimination System permits for discharges from municipal separate storm sewer systems. These include structural and nonstructural measures that (1) reduce pollutants from runoff from commercial, industrial, and residential areas that are served by the storm sewer, (2) detect and remove illicit discharges and improper disposal into storm sewers, (3) establish and implement public outreach and involvement activities and prevent pollutants from entering municipal separate storm sewer systems, and (4) reduce pollutants in construction site runoff.
VII-A	NPS Control: Agriculture (Cropland)	All costs that address nonpoint source pollution control needs associated with agricultural activities such as plowing, pesticide spraying, irrigation, fertilizing, planting and harvesting. Some typical best management practices that could be used to address agriculture (cropland) needs are conservation tillage, nutrient management, irrigation water management, and structural best management practices (e.g., terraces, waterways).
VII-B	NPS Control: Agriculture (Animals)	All costs that address NPS pollution control needs associated with agricultural activities related to animal production such as confined animal facilities and grazing. Some typical best management practices that could be used to address agriculture (animal) needs are animal waste storage facilities, animal waste nutrient management, composting facilities, and planned grazing. If the facility has a National Pollutant Discharge Elimination System permit, these needs are classified as Category VIII, Confined Animal-Point Source.

continued

Table G-1. (continued)

Category	Name	Description
VII-C	NPS Control: Silviculture	All costs that address NPS pollution control needs associated with forestry activities, such as removal of streamside vegetation, road construction and use, timber harvesting, and mechanical preparation for the planting of trees. Some typical best management practices that could be used to address silviculture needs are preharvest planning, streamside buffers, road management, revegetation of disturbed areas and structural practices, and equipment (e.g., sediment control structures, timber harvesting equipment).
VII-D	NPS Control: Urban	All costs that address NPS pollution control needs associated with new or existing development in urban or rural settings, such as erosion, sedimentation, and discharge of pollutants (e.g., inadequately treated wastewater, oil, grease, road salts, and toxic chemicals) into water resources from construction sites, roads, bridges, parking lots, and buildings. This category also includes the remediation of privately owned individual sewage disposal systems. Some typical best management practices that could be used to address urban needs are wet ponds, construction site erosion and sediment controls, sand filters, detention basin retrofit, and new on-site sewage disposal systems. If the individual sewage disposal system is owned by a public entity, the costs should be included in Category I, Secondary Treatment, instead.
VII-E	NPS Control: Ground Water Protection (Unknown Source)	All costs that address ground water protection NPS pollution control needs such as wellhead and recharge area protection activities. Any need that can be attributed to a specific cause of ground water pollution, such as leaking storage tanks, soil contamination in a brownfield, or leachate from a sanitary landfill, should be reported in that more specific category.
VII-F	NPS Control: Marinas	All costs that address NPS pollution control needs associated with boating and marinas, such as poorly flushed waterways, boat maintenance activities, discharge of sewage from boats, and the physical alteration of shoreline, wetlands, and aquatic habitat during the construction and operation of marinas. Some typical best management practices that could be used to address needs at marinas are bulkheading, pumpout systems, and oil containment booms.
VII-G	NPS Control: Resource Extraction	All costs that address NPS pollution control needs associated with mining and quarrying activities. Some typical best management practices that could be used to address resource extraction needs are detention berms, adit closures, and seeding or revegetation. Any costs associated with facilities or measures that address point source discharges from mining and quarrying activities that have an identified owner should be included in Category IX, Mining-Point Source.
VII-H	NPS Control: Brownfields	All costs that address NPS pollution control needs associated with land that was developed for industrial purposes and then abandoned, which might have residual contamination. All costs for work at brownfields should be included in Category VII-H regardless of the activity. Some typical best management practices that could be used to address needs at brownfields are ground water monitoring wells, in situ treatment of contaminated soils and ground water, and capping to prevent storm water infiltration.
VII-I	NPS Control: Storage Tanks	All costs that address NPS pollution control needs associated with tanks designed to hold gasoline or other petroleum products or chemicals. The tanks may be located above or below ground level. Some typical best management practices that could be used to address storage tank needs are spill containment systems; in situ treatment of contaminated soils and ground water; and upgrade, rehabilitation, or removal of petroleum/chemical storage tanks. If these facilities or measures are part of addressing NPS needs at abandoned, idle, and underused industrial sites (brownfields), the costs go in Category VII-H, Brownfields.
VII-J	NPS Control: Sanitary Landfills	All costs that address NPS pollution control needs associated with sanitary landfills. Some typical best management practices that could be used to address needs at landfills are leachate collection, on-site treatment, gas collection and control, capping, and closure.
VII-K	NPS Control: Hydromodification	Costs that address NPS pollution control needs associated with best management practices for any alteration of the hydrologic characteristics of coastal and noncoastal waters, which in turn could cause degradation of water resources. Examples of such activities include channelization and channel modification, dams, and stream bank and shoreline erosion. In the case of a stream channel, hydromodification is the process whereby a stream bank is eroded by flowing water, typically resulting in the suspension of sediments in the watercourse. Some typical best management practices that could be used to address hydromodification needs are conservation easements, swales, filter strips, shore erosion control, wetland development or restoration, and bank or channel (grade) stabilization. Any work involving wetland or riparian area protection or restoration is included under this category.
VIII	Confined Animal- Point Source	Costs that address a combination of unit processes or best management practices designed to address water quality or public health problems caused by point source pollution from animal production activities that are subject to the concentrated animal feeding operations (CAFO) regulations.
IX	Mining-Point Source	Costs that address a combination of unit processes or best management practices designed to address water quality and/or public health problems caused by point source pollution from mining and quarrying activities.



Appendix I

*Summary of
Tribal Cost Estimates and Technical
Data*

Facilities with technical and needs data reported for Native Americans, herein referred to as Tribal facilities, are included in this appendix. EPA does not require States to enter data on Tribal facilities; however, 17 States chose to include this information in the CWNS 2000. Under the Indian Sanitation Facilities Act (P.L. 86-121), the Sanitation Facilities Construction Program of the Indian Health Service (IHS) identifies and annually reports to Congress the Tribal sanitation needs for improving community water supplies, wastewater treatment systems, and solid waste disposal facilities. EPA uses the annual needs estimates of the IHS to provide funding to Tribes to address their sanitation needs. To eliminate the potential of duplicative reporting with the IHS report, EPA removed the Tribal data included in the CWNS 2000 from this report to Congress. Data for 156 Tribal facilities are in the CWNS 2000 database. As of January 2000, 93 centralized treatment facilities and 97 collection systems were in operation, and another 19 treatment facilities and 24 collection systems were proposed for construction. Of the 156 facilities, 41 facilities reported no needs; 112 facilities reported needs totaling \$124 million (January 2000 dollars); and 4 facilities reported \$7 million (January 2000 dollars) in SSEs. A summary of the Tribal cost data entered by the States is presented in Tables I-1 and I-2; a summary of the technical data is presented in Tables I-3 through I-6.

Table I-1 summarizes the CWNS 2000 assessment of Tribal facilities and their needs. The number of facilities on this table does not represent the total number of Tribal facilities in the Nation because Tribal data were not required to be entered into the CWNS 2000.

Table I-1. CWNS 2000 Summary of Number of Tribal Facilities and Tribal Needs (January 2000 dollars in millions)

State	Number of Facilities Without Reported Needs	Facilities With Documented Needs		Facilities With Separate State Estimates		Totals	
		Number of Facilities	Needs	Number of Facilities	Needs	Number of Facilities	Needs
Alaska	0	0	0	1	3	1	3
Arizona	2	97	105	0	0	99	105
California	4	0	0	0	0	4	0
Maine	3	0	0	1	0 ^a	4	0 ^a
Montana	1	8	1	0	0	9	1
Nebraska	0	1	8	0	0	1	8
Nevada	1	NR	NR	NR	NR	1	NR
New Mexico	1	1	0 ^a	1	3	3	3
New York	1	0	0	0	0	1	0
North Carolina	1	0	0	0	0	1	0
North Dakota	2	0	0	0	0	2	0
Oregon ^b	0	1	0 ^a	1	1	1 ^b	1
South Dakota	8	0	0	0	0	8	0
Utah	6	0	0	0	0	6	0
Washington	10	0	0	0	0	10	0
Wisconsin	0	4	10	0	0	4	10
Wyoming	1	NR	NR	NR	NR	1	NR
Total	41	112	124	4	7	156	131

Note: NR = not reported. Nevada and Wyoming did not participate in the CWNS 2000. Technical data for these states are from the 1996 survey.

^a Estimate is less than \$0.5 million.

^b Oregon has both documented and SSE needs for the same facility.

Table I-2 summarizes by State the CWNS 2000 assessment of total needs for wastewater treatment and collection facilities, storm water facilities, and NPS pollution control facilities that are maintained by Tribal communities. Needs reported in this table represent both documented needs and SSEs. The needs represent the capital investment necessary to plan, design, build, replace, or rehabilitate publicly owned wastewater treatment and collection facilities (Categories I through V); establish and implement storm water management programs (Category VI); and control NPS pollution (Category VII).

Table I-2. CWNS 2000 Total Needs (January 2000 dollars in millions)

State	Category of Need										Total (I-V)
	Total	I	II	III-A	III-B	IV-A	IV-B	V	VI	VII ^a	
Alaska	3	1	0	1	0 ^b	1	0	0	0	0	3
Arizona	105	53	14	0	5	14	19	0	0	0 ^b	105
California	0	0	0	0	0	0	0	0	0	0	0
Maine	0 ^b	0	0	0 ^b	0	0	0 ^b	0	0	0	0 ^b
Montana	1	1	0	0	0 ^b	0	0	0	0	0	1
Nebraska	8	6	0	0	0	2	0	0	0	0	8
Nevada	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
New Mexico	3	3	0	0	0 ^b	0	0	0	0	0	3
New York	0	0	0	0	0	0	0	0	0	0	0
North Carolina	0	0	0	0	0	0	0	0	0	0	0
North Dakota	0	0	0	0	0	0	0	0	0	0	0
Oregon	1	1	0	0	0	0	0 ^b	0	0	0	1
South Dakota	0	0	0	0	0	0	0	0	0	0	0
Utah	0	0	0	0	0	0	0	0	0	0	0
Washington	0	0	0	0	0	0	0	0	0	0	0
Wisconsin	10	4	0	0	1	4	1	0	0	0	10
Wyoming	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Total	131	69	14	1	6	21	20	0	0	0^b	131

Categories

I Secondary wastewater treatment	III-B Sewer replacement/rehabilitation	V Combined sewer overflow correction
II Advanced wastewater treatment	IV-A New collector sewers and appurtenances	VI Storm water management programs
III-A Infiltration/inflow correction	IV-B New interceptor sewers and appurtenances	VII NPS pollution control

Note: NR = not reported. Nevada and Wyoming did not participate in the CWNS 2000.

^a Only Subcategory VII-B (Agriculture–Animals) had Tribal needs in the CWNS 2000.

^b Estimate is less than \$0.5 million.

Table I-3 summarizes the number of Tribal centralized treatment facilities and collection systems in operation in 2000 in each State.

Table I-3. CWNS 2000 Number of Tribal Operational Treatment Facilities and Collection Systems in 2000

State	Treatment Facilities	Collection Systems
Alaska	1	1
Arizona	49	49
California ^a	2	3
Maine	4	4
Montana	9	9
Nebraska	1	1
Nevada ^b	1	1
New Mexico	3	3
New York ^a	0	0
North Carolina	1	1
North Dakota	2	2
Oregon	0	0
South Dakota ^a	8	8
Utah	4	4
Washington	6	8
Wisconsin	1	2
Wyoming ^b	1	1
Total	93	97

^a California, New York, and South Dakota did not have the resources to complete the updating of these data.

^b Results presented in this table for Nevada and Wyoming are from the 1996 survey because these states did not participate in the CWNS 2000.

Table I-4 summarizes the number of Tribal centralized treatment facilities and collection systems projected to be in operation in each State if all needs are met.

Table I-4. CWNS 2000 Number of Tribal Operational Treatment Facilities and Collection Systems If All Documented Needs Are Met

State	Treatment Facilities	Collection Systems
Alaska	1	1
Arizona	66	70
California ^a	2	3
Maine	4	4
Montana	9	9
Nebraska	1	1
Nevada ^b	1	1
New Mexico	3	3
New York ^a	0	0
North Carolina	1	1
North Dakota	2	2
Oregon	1	1
South Dakota ^a	8	8
Utah	4	4
Washington	6	8
Wisconsin	2	4
Wyoming ^b	1	1
Total	112	121

^a California, New York, and South Dakota did not have the resources to complete the updating of these data.

^b Results presented in this table for Nevada and Wyoming are from the 1996 survey because these states did not participate in the CWNS 2000.

Table I-5 shows, for five flow ranges, the number of Tribal treatment facilities in operation in 2000 and the number projected to be in operation if all documented needs are met. The number of facilities and their cumulative flow (in millions of gallons per day) are shown for each of the flow ranges.

Table I-5. CWNS 2000 Number of Tribal Treatment Facilities by Flow Range

Treatment Facilities in Operation in 2000 ^{a,b}		
Existing Flow Range (mgd)	Number of Facilities	Total Existing Flow (mgd)
0.001 to 0.100	69	3
0.101 to 1.000	24	9
1.001 to 10.000	0	0
10.001 to 100.000	0	0
100.001 and greater	0	0
Other ^c	0	—
Total	93	12
Treatment Facilities In Operation If All Documented Needs Are Met ^{a,b}		
Design Flow Range (mgd)	Number of Facilities	Total Future Design Flow Capacity (mgd)
0.001 to 0.100	72	3
0.101 to 1.000	35	11
1.001 to 10.000	5	7
10.001 to 100.000	0	0
100.001 and greater	0	0
Other ^c	0	—
Total	112	21

^a California, New York, and South Dakota did not have the resources to complete the updating of these data.

^b Results presented in this table for Nevada and Wyoming are from the 1996 survey because these states did not participate in the CWNS 2000.

^c Flow data for these facilities were unavailable.

Table I-6 shows, by level of treatment, the number of Tribal centralized treatment facilities in operation in 2000 and the number projected to be in operation if all needs are met. The number of facilities, their cumulative capacities (in millions of gallons per day), and the population served are shown for each level of treatment. The population served number is then presented as a percentage of the total 2000 and 2020 U.S. populations.

Table I-6. CWNS 2000 Number of Tribal Treatment Facilities by Level of Treatment

Treatment Facilities in Operation in 2000 ^{a,b}				
Level of Treatment	Number of Facilities	Future Design Capacity (mgd)	Population Served	Percent of Total 2000 US Population
Less than Secondary ^c	0	0	0	0
Secondary	23	6	44,239	0
Greater than Secondary	0	0	0	0
No Discharge ^d	70	11	80,989	0
Partial Treatment ^e	0	—	—	0
Total	93	17	125,228	0
Treatment Facilities in Operation If All Documented Needs Are Met ^{a,b}				
Level of Treatment	Number of Facilities	Future Design Capacity (mgd)	Population Served	Percent of Total 2000 US Population
Less than Secondary ^c	0	0	0	0
Secondary	25	6	61,195	0
Greater than Secondary	0	0	0	0
No Discharge ^d	87	15	128,523	0
Partial Treatment ^e	0	—	—	0
Total	112	21	189,718	0

^a California, New York, and South Dakota did not have the resources to complete the updating of these data.

^b Results presented in this table for Nevada and Wyoming are from the 1996 survey because these states did not participate in the CWNS 2000.

^c Less-than-secondary facilities include facilities with granted or pending section 301(h) waivers from secondary treatment for discharges to marine waters.

^d No-discharge facilities do not discharge treated wastewater to the Nation's waterways. These facilities dispose of wastewater via methods such as industrial reuse, irrigation, or evaporation.

^e These facilities provide some treatment to wastewater and discharge their effluents to wastewater facilities for further treatment and discharge.



Office of Wastewater Management
Municipal Support Division
Municipal Technology Branch
Washington, DC 20460

www.epa.gov/owm/