

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

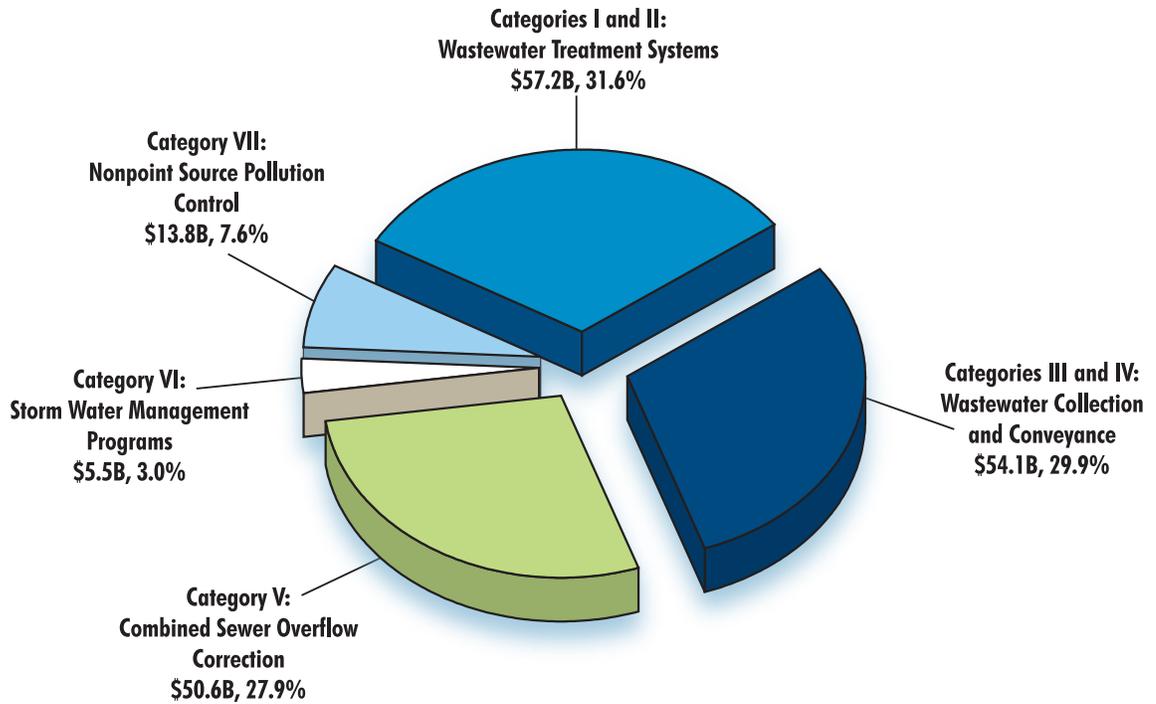


Figure ES-1. CWNS 2000 total documented needs (January 2000 dollars). This figure shows only *documented* needs. Note that NPS pollution control *modeled* needs are \$21.5 billion in January 2000 dollars (Appendix D).

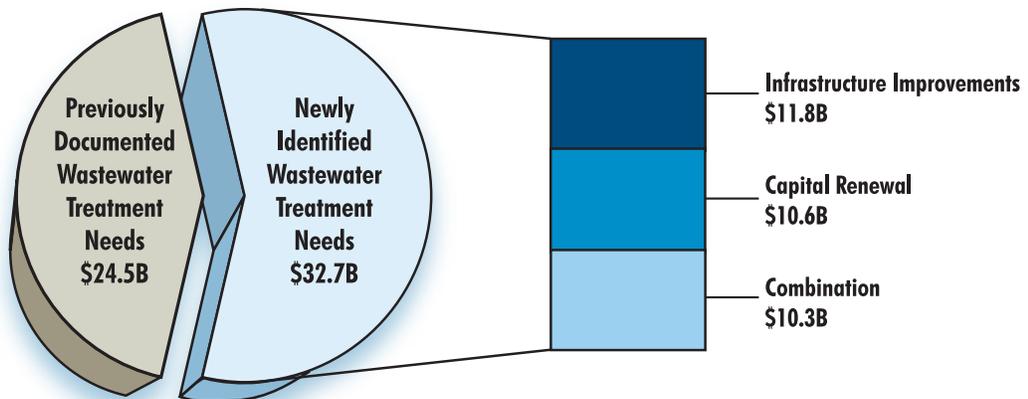


Figure ES-2. Comparison of previously documented wastewater treatment needs (from the 1996 and 2000 survey databases) and newly identified wastewater treatment needs (only in CWNS 2000 database) (January 2000 dollars).

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

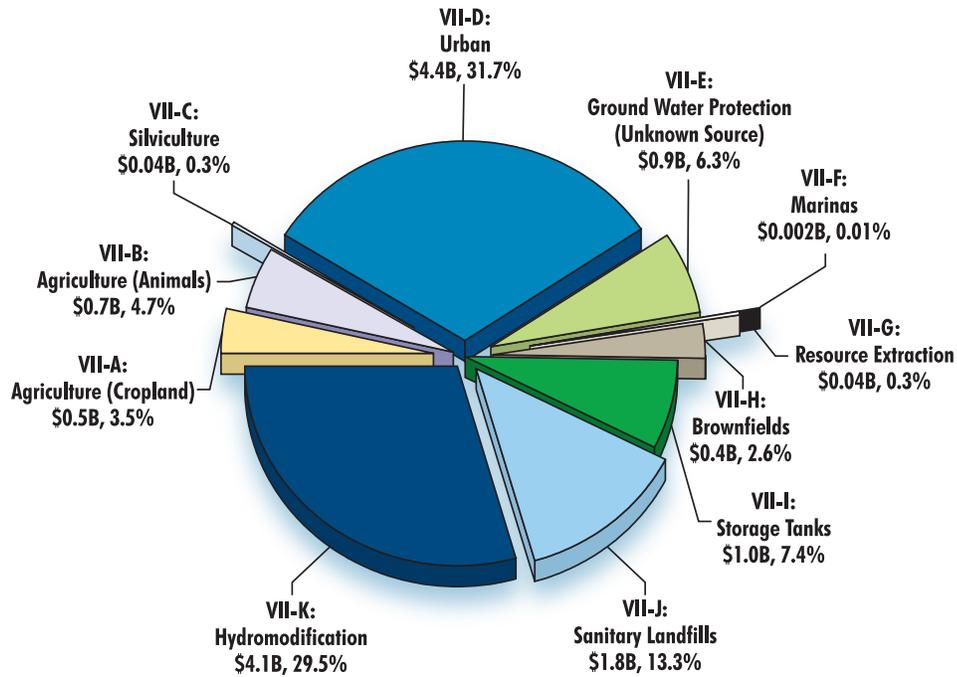


Figure ES-3. Total documented needs for NPS pollution control (Category VII) (January 2000 dollars). Note: This figure shows only *documented* needs. The NPS pollution control *modeled* needs (Figure ES-4) are \$21.5 billion in January 2000 dollars (Appendix D).

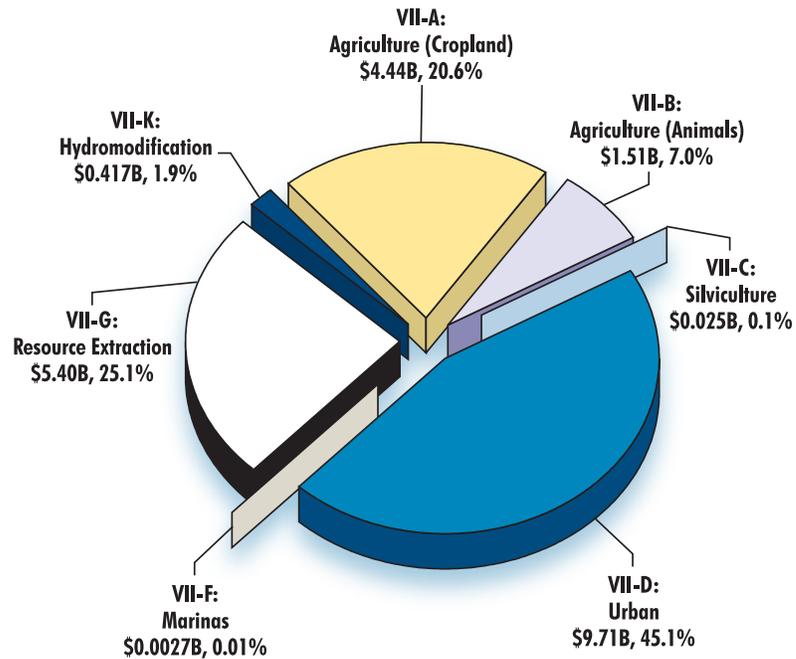


Figure ES-4. Total modeled needs for NPS pollution control (January 2000 dollars). Note: CWNS 2000 NPS Need Categories VII-E, H, I, and J were not modeled.

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.