

質問8 管理していない理由は何ですか。

回答 ア. 特に管理しなくても問題ないと思っている。

イ. 管理すべきとの指導を受けていない。

ウ. その他（具体的に： _____）

質問9 貯水槽水道の検査を受けていますか。（受けている場合は、頻度をご回答ください。）

回答 ア. 受けている [頻度 a. 年1回以上 b. 数年に1回]

イ. 受けていない

（* 質問9で「受けている」と答えた方は次の質問10にご回答ください。

「受けていない」と答えた方は質問11にご回答ください。）

質問10 検査機関の対応に満足していますか。（満足していない場合は、その理由を回答して下さい。）

回答 ア. 満足している

イ. 満足していない

（* 質問10で「満足していない」と答えた方は次の質問12にご回答ください。）

質問11 検査機関の検査を受けていない理由は何ですか。

回答 ア. 検査しなくても問題がないと思っていた。

イ. 指導を受けていない。

ウ. その他（具体的に： _____）

質問12 検査機関の検査に満足していない理由は何ですか

回答 ア. 料金が高い

イ. 説明が不十分

ウ. 適切な改善方法を示してもらっていない

エ. その他（具体的に： _____）

質問13 貯水槽水道の掃除を実施していますか。（実施の場合は、回数をご回答ください。）

回答 ア. 実施している [回数 a. 年1回以上 b. 数年に1回]

イ. 実施していない

（* 質問13で「実施している」と答えた方は次の質問14にご回答ください。

「実施していない」と答えた方は、次の質問16にご回答ください。）

質問14 清掃会社の対応に満足していますか。(満足していない場合は、その理由を回答して下さい。)

回答 ア. 満足している
イ. 満足していない

(* 質問14で「満足していない」と答えた方は次の質問15にご回答ください。)

質問15 清掃会社の対応に満足していない理由は何ですか。

回答 ア. 料金が高い
イ. 説明が不十分
ウ. きれいになっていない。消毒が不十分
エ. その他 (具体的に:)

質問16 貯水槽の清掃を実施していない理由は何ですか。

回答 ア 特に清掃をしなくても問題がないと思っていた
イ 清掃をすべきだという指導を受けていない。
ウ 清掃しなくてもきれいだと思っている
エ その他 (具体的に:)

質問17 上記の他に関連した事柄でお気づきの点がありましたら、ご自由にご記入下さい。

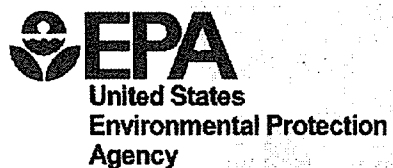
以上でアンケートを終わります。調査にご協力いただきまして誠にありがとうございました。

なお、このアンケート調査票は、平成17年10月末日までに、本調査票をお持ちいただきました**管理会社の方**にお渡しいただきますようお願い申し上げます。

またご質問等がございましたら

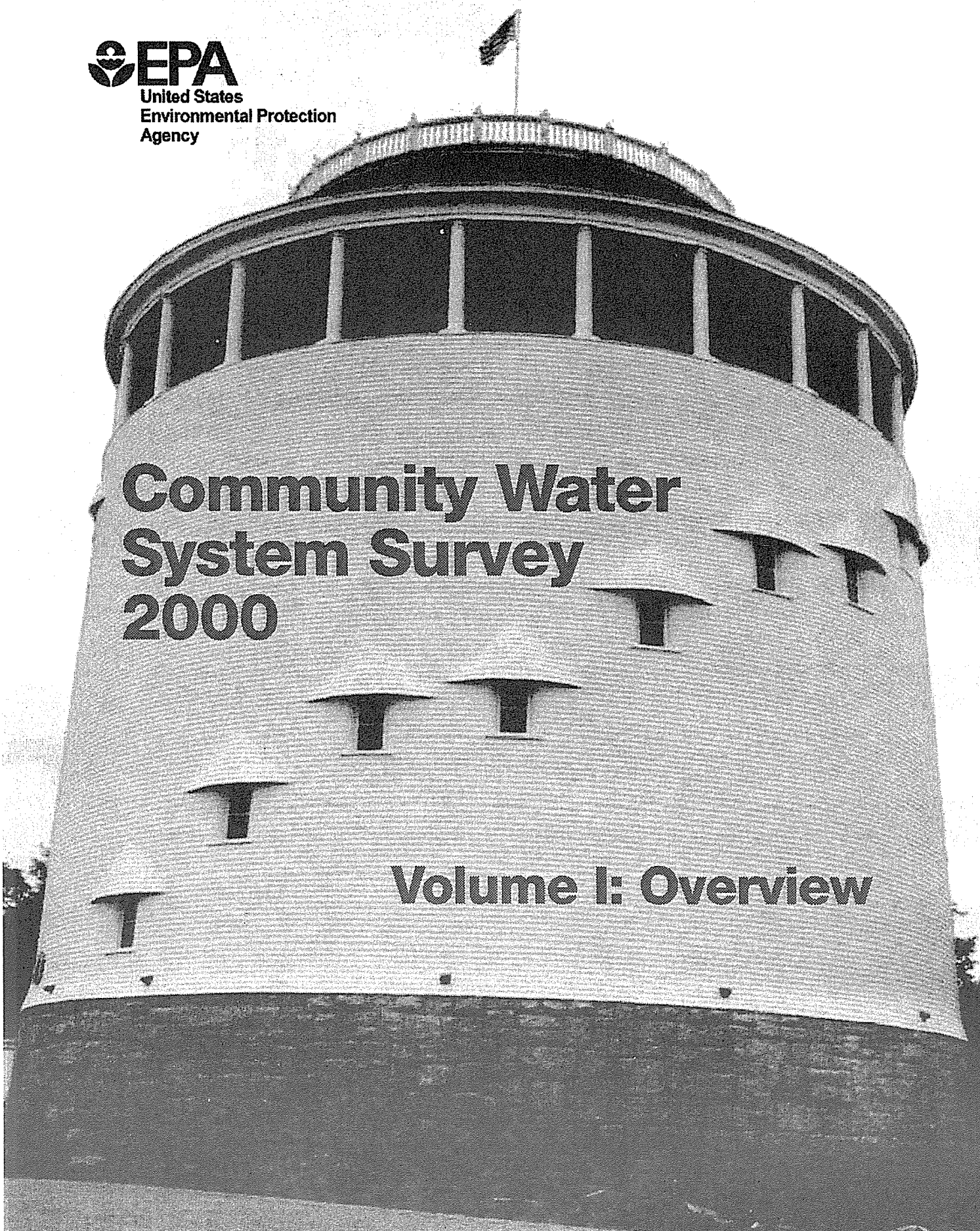
〒210-0828 神奈川県川崎市川崎区四谷上町 10-6 (財) 日本環境衛生センター内
全国給水衛生検査協会 担当: 島田までお願い申し上げます。

(Tel: 044-270-4375, Fax: 044-270-4376, E-mail: shimada@kyueikyo.jp)



Community Water System Survey 2000

Volume I: Overview



Office of Water (4607M)

EPA 815-R-02-005A

December 2002

www.epa.gov/safewater

Cover Photo: Bangor, Maine Water District Thomas Hill Standpipe. Designed by Ashley B. Tower of Tower and Wallace of New York and Holyoke, MA, the standpipe was built during 1897 by Major James M. Davis on land once owned by the Thomas brothers.

The standpipe is actually two structures: a 1.75 million gallon riveted steel tank enclosed by a 110-foot tall wooden jacket. The tank itself is 75 feet in diameter and 50 feet tall. It is topped by a "carousel," a three-ton steel drum from which 24 iron trusses reach to the sides of the building.

The wooden jacket is 85 feet in diameter. It consists of twenty-four 1-foot x 1-foot x 48-foot hard pine main posts covered by 42,000 board-feet of hard pine and 220,000 cedar shingles. The jacket sits atop a stone foundation 9 feet high and 3 1/2 feet thick. A 100-step winding staircase leads to the 12-foot wide promenade deck overlooking the City of Bangor and surrounding communities.

The standpipe is topped by a 38-foot high flagpole and a railing consisting of 192 banisters that give it the look of a large wedding cake or crown when lit at night. The entire structure was built in just 6 months.

Listed on the National Register of Historic Places and designated as an American Water Works Landmark, the standpipe continues to store water and regulate water pressure for Bangor's downtown.

Photo by Brian Fourke

Contents

CONTENTS	i
EXECUTIVE SUMMARY	iii
Study Purpose	iii
Trends and Key Findings	iii
Survey Methodology	vi
INTRODUCTION	1
Background	1
Data Presentation	3
Intended Uses of CWS Survey Data	4
Organization of the Report	6
NATIONAL PROJECTIONS SUMMARY	7
Water System Profiles	7
Operational Summary	11
Financial Summary	15
Conclusions	19
KEY FINDINGS AND TRENDS	21
Key Findings	21
Trends	35
APPENDIX A:	
TREATMENT SCHEME DEFINITIONS AND SCHEMATICS	39



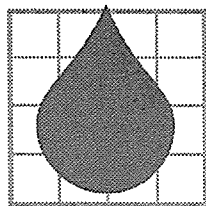
Acknowledgements

Many dedicated owners, operators, and managers of community water systems made this survey possible. We would like to thank the more than 1,200 water systems that devoted valuable time to searching through records and completing questionnaires.

The Community Water System Survey was managed by Brian C. Rourke of the EPA Office of Ground Water and Drinking Water (OGWDW). He was assisted with questions related to very large systems by Yvette Selby, also of OGWDW.

The Cadmus Group, Inc. served as prime contractor for this project. Abt Associates, Inc., a subcontractor, was responsible for data processing and contributed to the survey design and sampling plan. Three subcontractors—International Studies and Training Institute, Inc., McNenny Environmental Engineering and Consulting, and Southwest Environmental Engineering—conducted the site visits to collect data from small systems. Norfolk Data, Inc. entered the data into an electronic database.





EXECUTIVE SUMMARY

Study Purpose

The U.S. Environmental Protection Agency (EPA) conducted the 2000 Community Water System (CWS) Survey to obtain data to support its development and evaluation of drinking water regulations. EPA developed the survey database to provide critical data to support regulatory development and implementation. The Agency plans to use the data for regulatory, policy, implementation, and compliance analyses.

Regulatory Development Analyses. EPA must satisfy the requirements of various statutes and regulations for analyses of proposed regulations under the Safe Drinking Water Act (SDWA). The survey provides data on water system operations and finances that are critical to the preparation of these analyses.

Policy Development Analyses. The survey is designed to collect financial and operational data on the full range of water systems to support a variety of policy and guidance initiatives. EPA also uses the data to respond to periodic requests from Congress, federal agencies, and the public for information on the water supply industry.

Regulatory Implementation Analyses. The survey data, along with data from the Drinking Water Infrastructure Needs Survey, can be used to assess the financial capacity of water systems in general, and of small systems in particular.

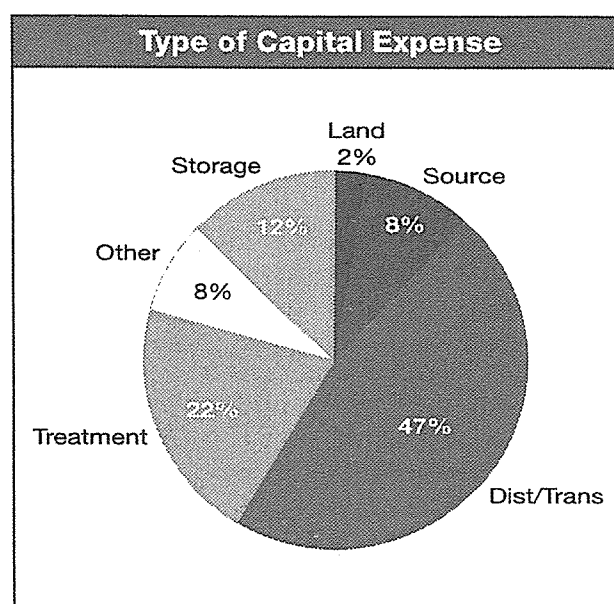
Compliance Analyses. EPA may use the survey data to develop profiles of operational and financial characteristics for different types of water systems, which can be compared to the Agency's database of compliance records in the Safe Drinking Water Information System (SDWIS). The objective of these analyses would be to identify characteristics of systems that may lead to compliance problems in the future. (The data from the survey will not be used in any enforcement actions.)

Trends and Key Findings

Most of the operating characteristics of community water systems are unchanged from 1976, when the first CWS Survey was conducted. The vast majority of systems are small and privately owned, but most people still receive their water from large publicly owned systems.

Nevertheless, there have been important changes since the first survey was conducted. They include an increase in the percentage of systems that treat their water and an overall improvement in water system financial performance. Key findings of the 2000 Survey include the following:

- While systems continue to make substantial capital investments to fund water quality improvements, totaling more than \$50 billion over the past 5 years, investment in treatment accounts for only 22 percent of systems' total capital investments. Among publicly owned systems, 23 percent of investment was for treatment. Sixteen percent of privately owned systems'



investment was for treatment. The largest share of the investment went toward distribution mains and transmission lines. Storage capacity accounted for an additional 12 percent of the total investment. The data suggest that differences between publicly owned and privately owned systems have more to do with size—publicly owned systems tend to be larger—than with ownership. (See page 18 and Volume II, Tables 69-78.)

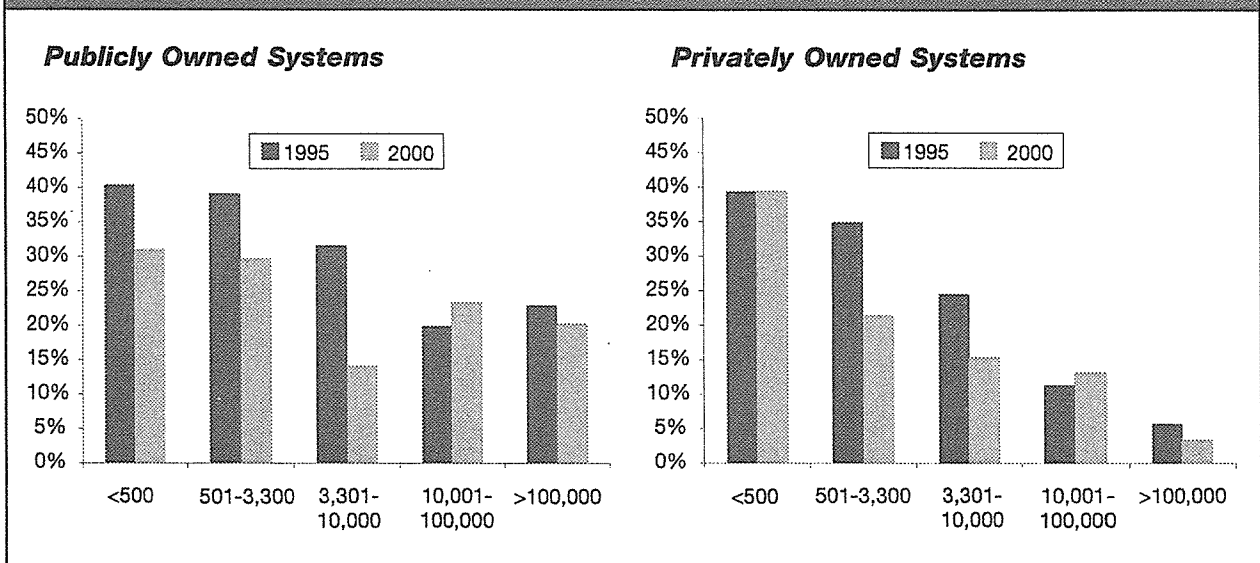
- The percentage of systems operating at a loss declined for most size categories between 1995 and 2000. Overall, average revenue and expenses increased by slightly more than inflation over the past 5 years, although many systems witnessed real declines in both revenue and expenses per gallon. The percentage of systems operating at a loss or with a deficit across all size categories is 30 percent, down from approximately 40 percent in 1995. (See page 36 and Volume II, Tables 46-66 for details on system revenue and expenses.)
- The Drinking Water State Revolving Fund is an important source of funds for capital improvements. Although most of the money for capital spending comes from other sources, the Drinking

Percentage of Capital Expenses Financed by the Drinking Water State Revolving Fund, for Publicly Owned Systems Serving up to 10,000 Persons

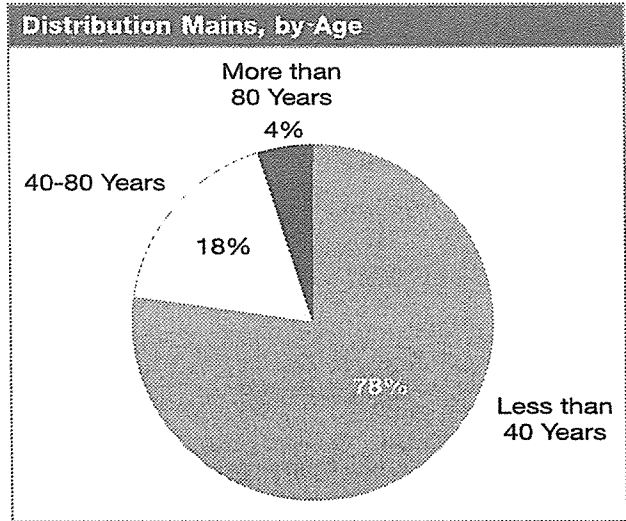
Population Served	Percentage
Less than 500	28%
501-3,300	35%
3,301-10,000	5%
All Systems <500 - 10,000	19%

Water State Revolving Fund (DWSRF) has become an important source of funds for the few years it has existed. In the years of the program included in this report, approximately 17 percent of publicly owned systems relied on the DWSRF to finance at least a portion of their capital improvements. This includes systems that received traditional DWSRF loans and systems that received loans in which all or a portion of the principal repayment is forgiven. Nearly 20 percent of all capital costs for publicly owned systems serving populations of 10,000 or fewer were financed through the DWSRF. (See page 18 and Volume II, tables 79-81.)

Percentage of Systems With Deficits or Losses by Population Service Categories



- The percentage of systems that provide treatment rose between 1976 and 2000. This trend is consistent with SDWA's emphasis on water quality monitoring and treatment. By the time of the 1996 Amendments to the Act, substantial progress had been made in reducing the number of systems that do not provide treatment. This trend continued through 2000 among small systems, but slowed among larger systems. The end of the decline among larger systems may suggest that they now have treatment in place. (See page 35 and Volume II, Table 9.)
- Very few small systems use increasing block rate structures. Only 7 percent of systems serving 500 or fewer persons use an increasing block rate to charge for water. Small systems are much more likely to use uniform rates or to charge a flat fee for water. Larger systems are more likely to use increasing block rates, with over 25 percent of systems serving more than 100,000 persons using these rates. (See page 29 for further detail.)



- While the total number of community water systems increased between 1995 and 2000, the number of small systems declined. The number of systems serving populations of 100 or fewer declined by 8 percent. The number of systems serving more than 3,300 persons, on the other hand, increased by 20 percent. (See page 35 for further detail.)
- Systems continue to invest considerable funds in their distribution networks. Over the past 5 years, systems replaced over 50,000 miles of the more than 1.8 million miles of pipe in their networks, at a cost of more than \$4 billion. The pipe in the ground is relatively new; most of it is less than 40 years old, while less than 5 percent is more than 80 years old. (See page 14 and Volume II, Tables 35-38.)

Percentage of Systems That Use Increasing Block Rates for Residential Customers

Population Served	Percentage
Less than 500	7.0%
501-3,300	15.4%
3,301-10,000	13.4%
10,001-100,000	18.3%
More than 100,000	27.5%



Community Water System Survey 2000

Final Status of Systems Selected in 2000 CWS Survey						
	Population Served					Total
	Below 500	501- 3,300	3,301- 10,000	10,001- 100,000	Over 100,000	
Sample Selected	394	209	296	510	397	1,806
System merged with another system in sample	1	0	0	3	2	6
Ineligible system	26	0	1	1	2	30
Refusals and invalid responses	28	0	127	222	142	519
Received	336	207	168	284	251	1,246
Response Rate (percent)	85%	99%	57%	56%	63%	69%

Survey Methodology

This is the fifth edition of the CWS Survey. EPA previously collected data in 1976, 1982, 1986, and 1995. As with past surveys, the Agency collected information on the most important operational and financial characteristics of community water systems. EPA took steps to improve response rates, ensure accurate responses, and reduce the burden of the survey on systems, especially small systems serving 3,300 or fewer persons. EPA sent water system experts from the Cadmus Group and 3 other companies to

collect data from small systems. It mailed the survey to medium and large systems, and provided extensive assistance through a toll-free telephone hot line.

EPA started the 2000 Survey in the summer of 1999 with the development of preliminary questionnaires and a sampling plan. The survey was designed to collect data for the year 2000. Full-scale data collection occurred from June to October 2001. The overall response rate was 69 percent; 90 percent of small systems selected participated in the survey.





1 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) defines a community water system as a public water system that serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents. Community water systems are a tremendously diverse group that resists being described in terms common to all. They range from very small, privately owned systems whose primary business is something other than water supply (such as mobile home parks) to huge, publicly owned systems serving millions of people.

The unusual architecture of the Thomas Hill Standpipe in Bangor, Maine (cover illustration) illustrates this diversity and the difficulty of characterizing large numbers of systems in more or less uniform groups. The Thomas Hill Standpipe is hardly everyone's idea of what a water storage facility should look like. Yet distinguishing and unusual features are to be found in water systems throughout the country. Because EPA is charged with protecting the water quality of over 50,000 of these systems, the challenge of this report is to describe water systems according to certain basic characteristics while still recognizing their incredible diversity.

EPA periodically collects information on the financial and operating characteristics of the public water supply industry to support the regulatory development process. The Agency conducted the 2000 Community Water System (CWS) Survey as part of this effort. EPA will use the information from this survey to prepare Economic Analyses (EAs) in support of regulatory development and to analyze economic and operating factors that affect national drinking water quality.

This report presents the information collected from the 2000 CWS Survey in two volumes. Volume I, the Overview, provides perspective on the industry by extrapolating the survey data to present a national picture of water systems. It presents the data by system size, ownership, and source of water. It also compares the 2000

data to similar data from the CWS Surveys of 1995, 1986, 1982, and 1976. Volume II, the Detailed Report, summarizes the survey findings in a series of tables that display national estimates of water system characteristics with particular application to regulatory development. Volume II also provides a detailed methodology and copies of the survey instruments.

Background

The CWS Survey was designed to collect operating and financial information from a representative sample of community water systems. To reduce the survey's burden on small systems, the data were collected from systems serving 3,300 or fewer persons through site visits by water system professionals. Systems serving more than 3,300 persons received questionnaires in the mail. Water system professionals were assigned to each system that received a mailed questionnaire to help the system respond to the survey's questions. A toll-free telephone number and an e-mail address also were provided to the systems for technical support.

Planning and design of the survey began in the summer of 1999. Through a series of planning sessions, preliminary versions of the survey instrument were developed. A separate version of the questionnaire was developed for systems serving more than 500,000 persons. These systems were asked additional questions about concentrations of several contaminants in raw and finished water and about average well depth. Questions that would not apply to very large systems were excluded from their version of the questionnaire. A pre-test of the questionnaires was conducted in July 2000 to gauge respondents' reactions to the draft questionnaires. This was followed by a full-scale pilot test in April and May 2001. Two clusters of small systems were selected for site visits and questionnaires were mailed to 40 systems.

The 2000 Survey collected some new data. Detailed data on source capacity were collected for the first time. New



Summary of 2000 CWS Survey Questionnaire	
Question Number	Summary of Question
General Information	
1	Contact information, including name, telephone number, and e-mail address of person completing the questionnaire
2	Year for which operating and financial data are provided
Operating Information	
3	System ownership
4	Form of government for publicly owned systems
5	Annual water deliveries, including unaccounted for water
6	Names of other water systems that purchased this system's water
7	Annual production, by source
8	Maximum water produced in a 24 hour period
9	System schematics
10	Data on water source by type, including daily production by source
11	Indicates whether system treats its water
12	Average daily production, peak production, and design capacity for system's treatment facilities
13	Treatment objectives
14	Treatment practices
15	Contaminant concentrations (asked only of systems serving more than 500,000 people)
16	Water treatment waste residual management
17	Treatment plant operators and SCADA
18	Water storage, including type of storage and capacity
19	Distribution mains, including miles of pipe in place by diameter, miles replaced and its cost, and age of pipe
20	Number of connections and customers served, by customer class
21	Map of service area
22	Indicate whether system has a cross-connection control program
23	Indicate type of cross-connection control program
24	Indicate elements included in cross-connection control program
Financial Information	
26	Water sales and water related revenues, by customer class
27	Non-water related revenue
28	Average annual water bill
29	Billing structure
30	Use lifeline rates
31	Water system expenses
32	Water system capital investment for previous 5 years

*New information



Final Status of Systems Selected in 2000 CWS Survey						
	Population Served					Total
	Below 500	501- 3,300	3,301- 10,000	10,001- 100,000	Over 100,000	
Sample Selected	394	209	296	510	397	1,806
System merged with another system in sample	1	0	0	3	2	6
Ineligible system	26	0	1	1	2	30
Refusals and invalid responses	28	0	127	222	142	519
Received	336	207	168	284	251	1,246
Response Rate (percent)	85%	99%	57%	56%	63%	69%

data on treatment were collected, including treatment objectives and the management of water treatment residuals. Data on contaminant concentrations were collected for systems serving over 500,000 persons. New information was collected on the type of storage and its capacity, as well as elements of cross-connection control programs.

The survey also collected system schematics and maps. Some information collected in the past was not collected in the 2000 Survey, including data about source water protection, operator certification, and systems' financial assets and liabilities.

The survey sample was drawn from the approximately 52,000 systems in the 50 states and the District of Columbia in the Safe Drinking Water Information System (SDWIS). The survey used a stratified random sample design to ensure the sample is representative. The sample was stratified to increase the efficiency of estimates based on it. Systems were grouped based on the populations they serve and their sources of water. (Details of the sampling plan are provided in Volume II.) To limit travel costs, systems serving up to 3,300 persons were selected in geographic clusters in a two-stage design. A sample of 1,806 systems was selected, including a census of all systems serving populations of 100,000 or more.

Full-scale data collection was conducted during the summer of 2001. Site visitors were sent to approximately 600 small systems and questionnaires were mailed to approximately 1,200 medium and large systems. Approximately 69 percent of the sampled systems responded to the survey. The above table summarizes the final status of the systems in the sample. Each completed questionnaire was subject to a thorough review by senior water system experts before being processed for data entry.

Data Presentation

Volumes I and II of the CWS Survey Report present tabulations of the data collected by the CWS Survey. In Volume II, the data are generally presented according to eight service categories denoted by size. Systems are assigned to each size category based on the population served, either directly (i.e., retail customers), or through the sale of water to other public water suppliers (i.e., wholesale customers). The detailed size categories are:

- 100 or fewer
- 101-500
- 501-3,300
- 3,301-10,000
- 10,001-50,000
- 50,001-100,000
- 100,001-500,000
- More than 500,000

Systems serving up to 10,000 persons are considered small. The eight size categories are different from the categories used in 1995. The 1995 Survey split the 501-3,300 category into two: 501-1,000 and 1,001-3,300. The 1995 Survey also combined the 100,001-500,000 and greater than 500,000 categories. Volume I presents data by fewer size categories:

- 500 or fewer
- 501-3,300
- 3,301-10,000
- 10,001-100,000
- More than 100,000

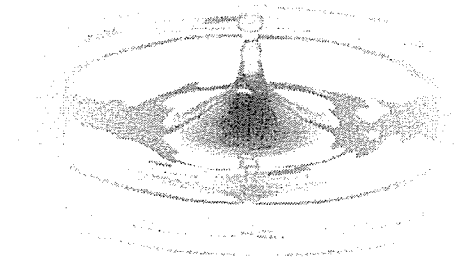
These size categories support the Agency's various analytic requirements, as discussed below. Data on treatment plants also are presented by the average daily



production, in millions of gallons. These data are shown by seven size categories:

- 0.01 millions of gallons per day (MGD) or fewer
- 0.01-0.10 MGD
- 0.1-1.0 MGD
- 1-10 MGD
- 10-100 MGD
- More than 100 MGD

Data tabulations also are presented according to ownership (public or private) and primary water source. Systems are classified based on their *primary*



Without an accurate baseline, changes imposed by regulations cannot be measured. Analyses such as these support EPA's estimates of the cost of complying with new regulations. Toward this end, data will be used in the development of the next edition of the *Baseline Handbook*.

The CWS Survey also collected data on production capacity, system storage capacity, pipe, population served, connections, and treatment facilities to support the development of SDWA burden estimates in Information Collection Requests (ICRs).

The RFA and SBREFA require the Agency to demonstrate that SDWA regulations do not impose unreasonable economic and financial burdens on small businesses or governments. The analyses required by the RFA and SBREFA can be supported by many of the same CWS Survey data elements as the EA and ICR analyses.

Policy Development Analyses

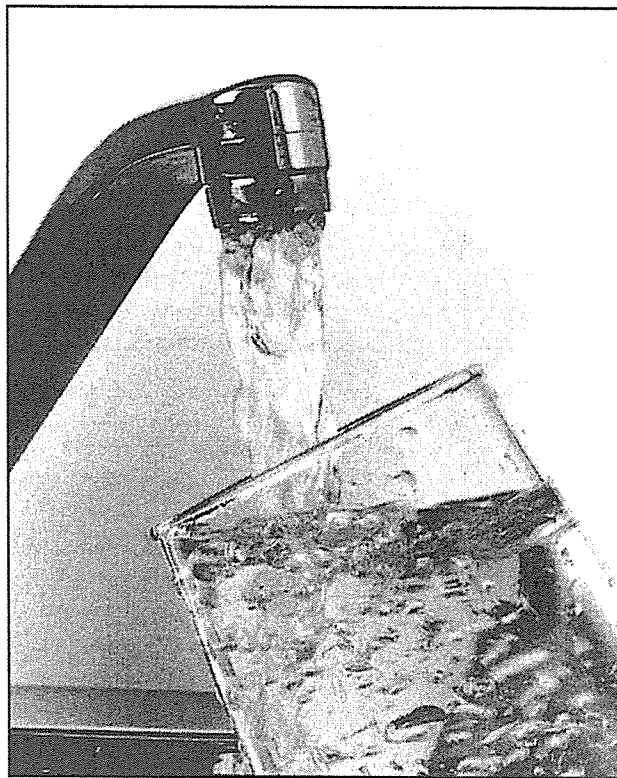
in SDWIS. The objective of this analysis is to identify the operational and financial characteristics that may result in future compliance problems. EPA can then develop guidance to target systems that may exhibit these characteristics. (While the data will support analyses of compliance issues, they will not be used in any enforcement action.)

Organization of the Report

This report has two volumes. Volume I presents an overview of the data and the key findings of the survey. It is composed of an Executive Summary, which summarizes the key findings and highlights of the survey results, and three chapters:

- **Chapter 1. Introduction.** Chapter 1 describes the background, purpose, survey methodology, intended uses, and the organization of the overall report.
- **Chapter 2. National Projection Summary.** Chapter 2 provides an aggregate perspective on basic water industry demographics and operational and financial characteristics of the industry. It presents a national profile of water systems, their customers, and their operating and financial characteristics.
- **Chapter 3. Key Findings and Trends.** This chapter discusses the principal findings of the CWS Survey. It summarizes the operational and financial survey findings and compares them to the 1995, 1986, 1982, and 1976 Surveys.

Volume II presents a detailed summary of data collected in the CWS Survey. No narrative descriptions accompany these tabulations. The results are divided between operating and financial characteristics. The



order of presentation generally corresponds to the order and organization of the survey questionnaire. The tables on system operation generally track the movement of water through the system, presenting data on source, then treatment, storage, distribution, and cross-connection control. The financial tables present data on revenue, billing rates and structure, expenses, and capital expenditures.

Volume II also describes in detail the survey methodology. It provides information on sample design and weighting, the small system site visits, the mail survey, and quality assurance. Copies of the survey questionnaires are supplied in an appendix.



NATIONAL PROJECTIONS SUMMARY

The 2000 CWS Survey collected operational and financial data for a representative, but diverse group of water systems. The systems rely on various sources of water, use a number of treatment practices, and serve populations of various sizes and customer classes. They face a variety of financial challenges. This chapter presents an overview of the operations and finances of these systems, providing a broad description of the water industry. Using data from the sample, industry totals are presented in order to establish themes and patterns that will be explored in greater detail in Chapter 3.

Number of Public Water Systems and Population Served*			
System Type	Systems		Population Served (in millions of persons)
	Number	Percentage of Total	
Community Water Systems	63,410	32.0%	258.5
Nontransient Non-community Water Systems	20,334	12.2%	6.8
Transient Non-community Water Systems	93,041	55.8%	12.9

*Data from *Factoids: Drinking Water and Ground Water Statistics for 2000*, EPA 816-K-01-004, June 2001. Excludes systems in the Commonwealths and Trust Territories.

Water System Profiles

Nearly 170,000 public water systems provide water to over 258 million people throughout the United States, according to the latest inventory of systems. Public water systems include community and non-community water systems.

The survey estimates there are 52,186 community water systems in the 50 states and the District of Columbia, which is consistent with the latest inventory data. (The differences imply some systems in the

current inventory may not be active community water systems. See Table 1 in Volume II for additional detail on the estimated number of community water systems. The survey's estimate of the population served by community water systems also is slightly lower than the current inventory data, as will be shown below.) Nearly 70 percent of public water systems are non-community systems, but the vast majority of people are served by community water systems. This is essentially unchanged from 1995.

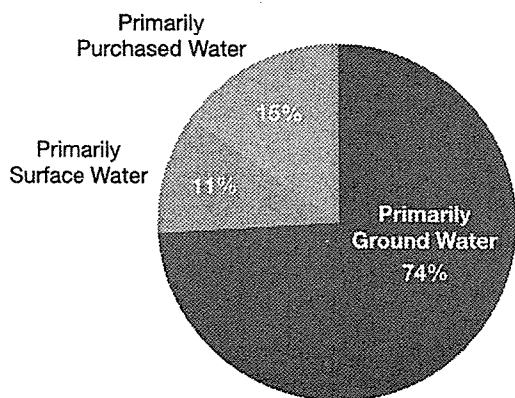
Because community water systems provide the most exposure to risks from contaminants, they are the focus of this survey. The tables that follow, and the data reported in Volume II, deal only with community water systems.

Water Source, System Ownership, and System Size

The water industry in the United States is characterized chiefly by its diversity. It includes publicly owned systems, private for-profit and not-for-profit systems, and systems that provide water only as an ancillary function of their primary business. It includes systems serving as few as 25 persons and relying largely on ground water, to large wholesalers that provide treated surface water to several million customers.

There are many ways to classify water systems. EPA regulatory analyses categorize systems by the source of water, ownership, and size of the population served. Source water characteristics are used in EPA analyses to account for operational configurations, potential sources of contamination, regulatory requirements, and costs associated with different water quality conditions. The Agency takes water system ownership into account when estimating the potential cost impacts of drinking water regulations. Publicly and privately owned systems differ in rate structure, sources of funds for capital improvements, source of water used, and size of service population. The size of the population served by a system affects the quantity of water needed; it also affects production requirements, treatment practices,

Percentage of Community Water Systems, by Primary Source of Water



operations, and financial capacity. Water production tends to involve large fixed-costs, so water systems typically exhibit economies of scale as their service populations increase. Thus, the unit cost of providing water varies according to system size.

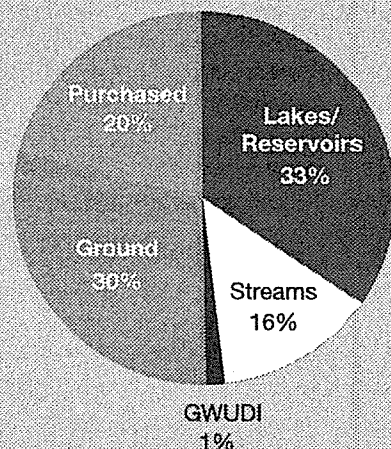
Nearly 75 percent of the nation's community water systems rely primarily on ground water. Almost 11 percent rely primarily on surface water, while the remaining 15 percent purchase either raw or treated water as their primary source.

Fifty percent of all water produced by systems comes from surface sources, including flowing streams, lakes and reservoirs, and ground water under the direct influence of surface water (GWUDI). Approximately two-thirds of surface water comes from lakes or reservoirs. An additional 31 percent comes from flowing streams, and 1 percent is GWUDI.

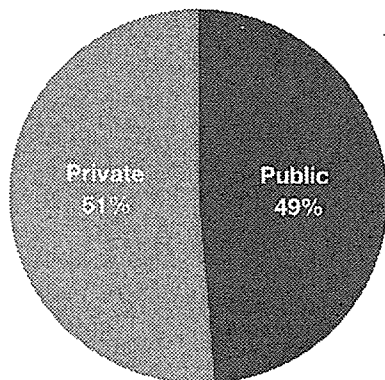
Twenty percent of water is purchased. Over 75 percent of the water purchased is treated. The remaining 30 percent of the water produced by systems comes from ground sources. The ground water is drawn from more than 105,000 wells that feed into approximately 88,000 entry points to the nation's distribution systems. (Table 2 in Volume II provides further detail on the number of systems by water source.)

Community water systems are evenly split between public and private ownership. The overwhelming majority of publicly owned systems are owned by towns, cities, counties, or other forms of local government. Of the 51 percent of systems that are privately owned, 27 percent are run as for-profit businesses and 34 percent are not-for-profit entities. Approximately 39 percent of privately owned systems, or 20 percent

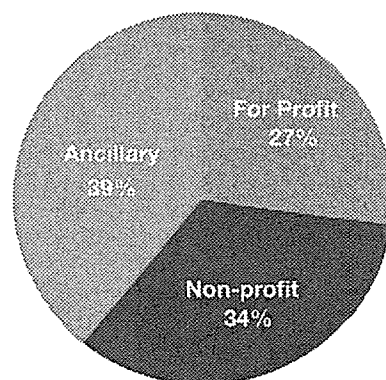
Percentage of Water Produced by Source

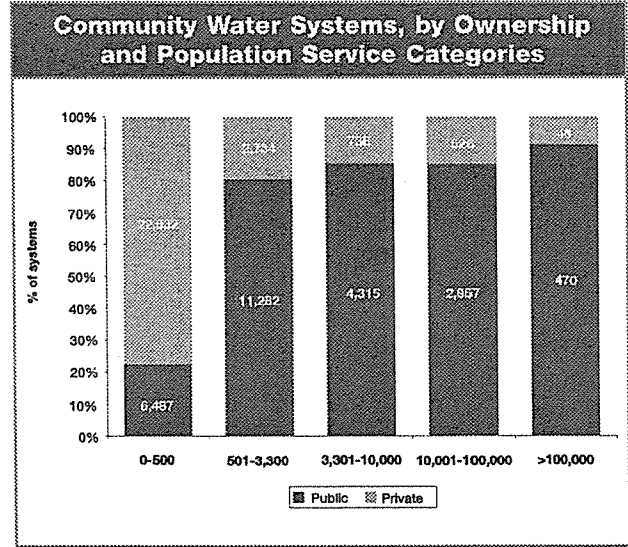
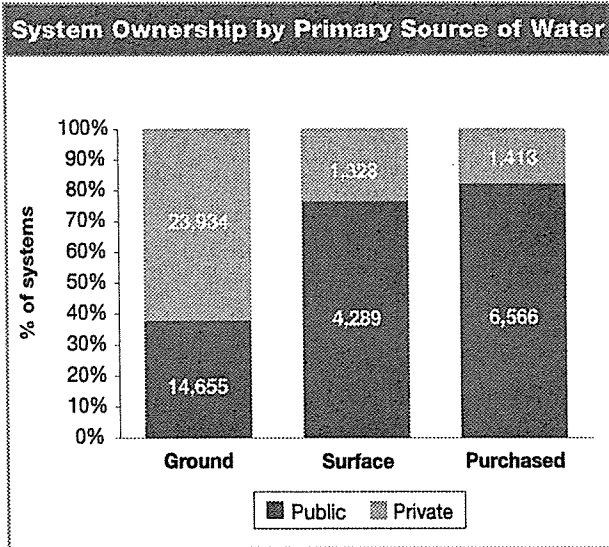


Percentage of Community Water Systems, by Ownership



Percentage of Private Community Water Systems, by Type



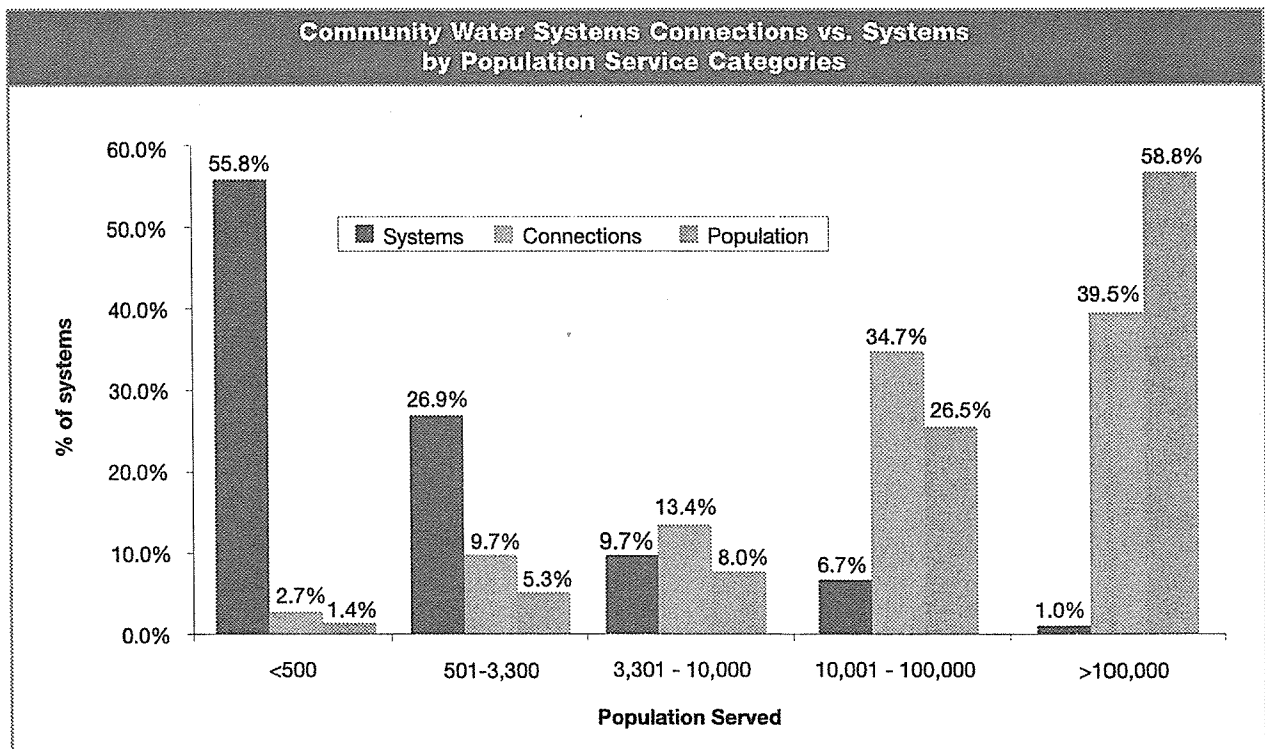


of all systems, are ancillary systems (i.e., systems whose primary business is not water supply but who provide water as an integral part of their principal business). These systems tend to serve small populations, produce smaller quantities of water, and often do not bill customers separately for water. (See Table 3 in Volume II for further detail on system ownership.)

Most systems that rely mainly on surface or purchased water are publicly owned. Publicly owned systems are

also more likely to rely primarily on purchased or surface sources.

The vast majority of water systems are relatively small; systems that serve 3,300 or fewer persons account for 83 percent of all water systems. Ten percent of systems serve 3,301 to 10,000 persons. Systems serving more than 100,000 persons account for less than 1 percent of all community water systems. Yet, most people get their water from large systems, as will be shown in the



next section. And because publicly owned systems tend to be larger, most people get their water from publicly owned systems. In fact, many of the differences between publicly and privately owned systems may be due to scale, rather than ownership, since most small systems are privately owned.

Water System Production, Customers, and Connections

According to the survey, community water systems directly serve more than 254 million individuals. They serve nearly 75 million customer connections, 91 percent of which are for residential customers. Because most connections are residential, the number of connections and the population served are correlated. The balance are commercial, industrial, or other nonresidential connections. Many systems sell water wholesale to other public water suppliers. Some systems both buy and sell water.

While systems serving more than 100,000 persons comprise less than 1 percent of all systems, they provide water to nearly 40 percent of the customer connections. On the other hand, more than one-half of all community water systems serve fewer than 500 persons, but they provide water to less than 3 percent

of all service connections. (Table 4 in Volume II provides detail on water production by system size and primary source of water.)

Wholesale deliveries account for more than one-quarter of all water delivered. The remaining deliveries are for residential and nonresidential retail customers. Residential customers account for two-thirds of retail water deliveries, and nonresidential customers account for the balance. Commercial and industrial customers receive 39 percent of the nonresidential retail water deliveries, or 13 percent of all retail deliveries. Agricultural and other customers receive the balance of the nonresidential retail deliveries. (See Table 41 in Volume II for further detail on retail water deliveries.)

Systems deliver 119,000 gallons annually per residential connection, or approximately 325 gallons

per day. While residential customers are the majority of all connections, each customer (not surprisingly) receives far less water than each nonresidential customer. Nonresidential customers receive 618,000 gallons annually, or nearly 1,700 gallons per day. Despite the fact that nonresidential customers comprise only 9 percent of all connections, they consume more than one-third of the water delivered.

