United States General Accounting Office

GAO

Report to the Chairman, Subcommittee on Health and the Environment, Committee on Energy and Commerce, House of Representatives

April 1993

DRINKING WATER

Key Quality Assurance Program Is Flawed and Underfunded

GAO
United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-239165

April 9, 1993

The Honorable Henry A. Waxman
Chairman, Subcommittee on Health
and the Environment
Committee on Energy and Commerce
House of Representatives

Dear Mr. Chairman:

As requested in your August 5, 1991, letter, this report examines states' routine inspections, or sanitary surveys, of public water systems and the role these surveys play in ensuring that drinking water is safe. The report contains recommendations to the Administrator of the Environmental Protection Agency (EPA) for improving the quality of sanitary survey programs and the consistency with which states conduct surveys.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to appropriate congressional committees; the Administrator, EPA; and the Director, Office of Management and Budget. We will also make copies available to others upon request.

This work was performed under the direction of Richard L. Hembra, Director, Environmental Protection Issues, who can be reached at (202) 512-6111. Other major contributors to this report are listed in appendix I.

Sincerely yours,

J. Dexter Peach
Assistant Comptroller General

Executive Summary

Purpose

Most Americans rely on public water systems to deliver high-quality water that meets federal and state standards. One key means of ensuring the quality of drinking water is a periodic inspection, or sanitary survey, of public water systems. GAO reported in July 1992 that sanitary surveys are "one of the most effective tools that states can use to help ensure compliance and correct problems before they become serious."[1]

Concerned that financial problems may be leading many states to cut back on sanitary survey programs, the Chairman, Subcommittee on Health and the Environment, House Committee on Energy and Commerce, asked GAO to examine these programs. Among the issues GAO reviewed are (1) whether sanitary surveys are comprehensive enough to determine if public water systems are capable of providing good-quality drinking water and (2) what the results of surveys reveal about the operations and condition of water systems nationwide. GAO also provides observations on how the funding problems affecting the Environmental Protection Agency's (EPA) overall drinking water program have affected states' ability to conduct sanitary surveys.

Background

The Safe Drinking Water Act of 1974 required EPA to establish drinking water standards and monitoring requirements to ensure that public water systems deliver safe drinking water to consumers. States that adopted regulations as stringent as EPA's and met certain other conditions (including adopting sanitary survey programs) could, with the agency's approval, administer their own drinking water programs. EPA has granted such authority ("primacy") to all states but Wyoming.

While EPA has not established minimum requirements for sanitary surveys, the agency's guidance recommends that they cover all components of a water system—including its sources of water, facilities, and equipment—as well as its operations and maintenance. EPA also recommends that surveys be performed at least every 3 years.

Results in Brief

On the basis of a nationwide questionnaire and a review of 200 sanitary surveys conducted in four states (Illinois, Montana, New Hampshire, and Tennessee), GAO found that sanitary surveys are often deficient in how they are conducted, documented, and/or interpreted. Specifically, 45 states omit one or more of the key elements of surveys, such as inspections of

[1]Drinking Water: Widening Gap Between Needs and Available Resources Threatens Vital EPA Program (GAO/RCED-92-184, July 6, 1992).

the water distribution system or reviews of water system operators' qualifications. Additionally, some states do not require documentation of the inspection of items or of the surveys' results, and results are sometimes interpreted inconsistently by surveyors.

Many of the 200 sanitary surveys revealed recurring problems with water systems' equipment and management, particularly among small systems. States' questionnaire responses confirmed that problems associated with the soundness of systems' infrastructures are largely found among smaller systems. GAO's detailed review of the four states' sanitary surveys also showed that, regardless of systems' size, deficiencies previously disclosed frequently went uncorrected.

The gap between the needs and available resources of state drinking water programs, estimated in the hundreds of millions of dollars annually, has severely affected states' capabilities to conduct sanitary surveys. The problem is compounded by the lack of any minimum requirements on how surveys are to be conducted and documented. State drinking water officials explained to GAO that in the absence of such requirements, it makes more sense to emphasize other activities that are subject to greater oversight by EPA than to emphasize sanitary surveys. The result, however, has been that a key benefit of surveys—identifying and correcting problems before they become larger problems affecting water quality—has often not been realized. GAO believes that while the problems discussed in this report are correctable, effective action will depend on resolving the drinking water program's acute funding shortage.

Principal Findings

Comprehensiveness of Survey Programs Is Inconsistent

GAO's review disclosed problems in the scope of many sanitary surveys, their documentation, and the reporting and interpretation of their results. Forty-five states reported that in conducting the surveys, they do not evaluate one or more of the 14 major components and operations that EPA recommends be evaluated. While some of the components and operations cited in EPA's guidance do not necessarily apply to all water systems, many states do not evaluate water distribution systems, operators' qualifications, or other key aspects of systems' design and operations that EPA believes should be reviewed during virtually every survey.

Documentation of surveys' results is needed so that state officials can assess the surveys' adequacy and inspectors can follow up on the problems detected. However, many of the documents GAO reviewed in Illinois, New Hampshire, and Tennessee contained incomplete entries or nondescriptive language, making it difficult to assess what the inspectors found. Documentation was particularly incomplete in Montana, which does not require detailed reports of surveys' results: County inspectors' reports frequently consisted of a simple statement such as, "The system looks OK." Importantly, only 30 percent of Montana's surveys disclosed deficiencies, while 97 percent of the surveys in the other three states—where documentation was more complete—disclosed deficiencies. GAO believes this disparity raises questions about the accuracy and completeness of Montana's documentation and about the reliability of the conclusions of the inspectors' final reports.

GAO also found variation in how surveyors interpret surveys' results. For example, in New Hampshire, surveyors at two different water systems reported that storage tank vents needed screens to protect the water from contamination, but only one of the surveyors rated the deficiency as "significant." The difference in the ratings is important because, according to a New Hampshire drinking water official, significant deficiencies are followed up on to ensure corrections are made while other deficiencies are not. Concerned about such inconsistencies, New Hampshire recently developed criteria to guide surveyors on what actions to take when specific types of deficiencies are detected.

Some Water Systems in Poor Condition

The most frequent deficiency cited in states' responses to GAO's questionnaire was inadequate cross-connection programs to ensure that potable water is not mixed with contaminated water. States reported that these programs are inadequate for about 20 percent of the large water systems and 50 percent of the small systems. Other problems often cited involved (1) deficiencies in equipment maintenance and records, (2) shortfalls in water systems' general management and operations, and (3) inadequate protection of water sources.

The 200 surveys GAO examined revealed that efforts to ensure that deficiencies are corrected have often been limited. About 80 percent of the surveys disclosed deficiencies; 60 percent of these surveys cited deficiencies that had already been identified in previous surveys. Citing resource constraints, state officials told GAO that they can only follow up on the most important deficiencies—ones actually affecting water

quality—to ensure that corrective actions are taken. New Hampshire officials added that until recently, the state focused on performing surveys (an activity EPA monitors), not on ensuring that disclosed deficiencies were corrected (an activity EPA does not monitor).

Funding a Key Barrier to Correcting Problems

GAO believes that the problems identified in this report are serious but correctable. Correcting the problems, however, will require addressing the extreme shortage in funding affecting the drinking water program as a whole. As GAO's July 1992 report explained, EPA recently adopted a strategy formally acknowledging that at least in the near term, states will be unable to fulfill all of their responsibilities. The strategy therefore sets priorities in the drinking water program to ensure that it can adequately pursue the activities deemed most important in protecting public health. One effect of EPA's strategy was to downplay sanitary surveys.

GAO's July 1992 report took issue with the assertion that all key activities would still receive sufficient attention and asked that the Congress consider modifying EPA's budget request to a funding level more consistent with the agency's own risk-based determination that the program deserves high priority. The report specifically cited the lower priority given sanitary surveys and pointed out that sanitary surveys "traditionally formed the backbone of state drinking water programs."

Recommendations

To improve the quality and consistency of state sanitary survey programs, GAO recommends, among other things, that the Administrator, EPA, (1) work with states to establish minimum requirements as to how surveys should be conducted and documented; (2) assist states in developing criteria to guide surveyors as to the appropriate actions to be taken when specific types of deficiencies are detected; and (3) help states develop procedures to ensure that deficiencies are corrected. GAO recognizes, however, that progress on some of these matters will depend on the resolution of the severe funding problem affecting the drinking water program as a whole.

Agency Comments

GAO discussed its findings with officials in EPA's Office of Ground Water and Drinking Water, who generally agreed with the information presented. Their comments were included where appropriate. However, as requested, GAO did not obtain written agency comments.

Contents

Abbreviations

EPA	Environmental Protection Agency
GAO	General Accounting Office

Introduction

Most Americans obtain their drinking water from public water systems. Consumers rely on these systems to deliver high-quality water that meets federal and state drinking water standards. However, each year many public water systems are found to be in violation of these standards, and consumers served by these systems risk ingesting contaminated water. While some contaminants found in drinking water may cause only relatively mild illnesses, other contaminants have been linked to cancer, birth defects, and other serious health problems.

Meeting new and complex drinking water regulations has become increasingly difficult, particularly for small public water systems, which often lack adequate resources and technical expertise. As we reported in June 1990, routine comprehensive inspections of the design, operations, and maintenance of public water systems—or sanitary surveys—are among the most important tools states can use to help ensure the capability of these systems to deliver safe drinking water.[1] However, as we also noted in our June 1990 report, financial constraints have led many states to cut back on their sanitary surveys, though the Environmental Protection Agency's (EPA) regulations require that the states have sanitary survey programs.

Public Water Systems Serve Most Americans

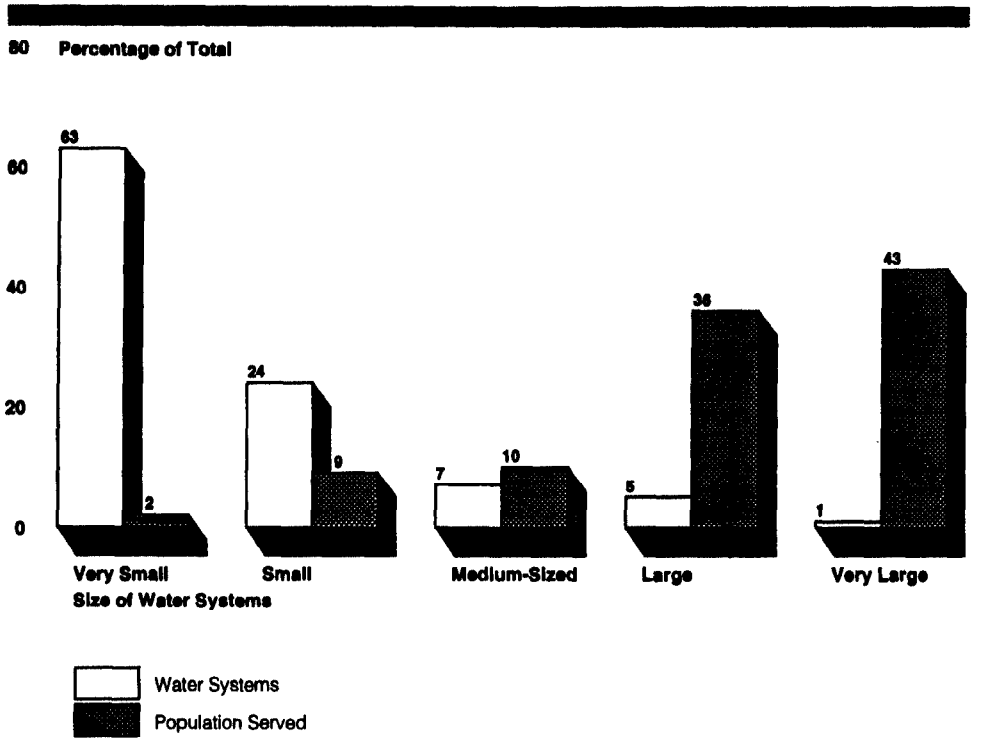
A public water system is any system that pipes water to at least 15 service connections or regularly serves an average of 25 people at least 60 days a year. Public water systems that serve the same population year-round are known as community water systems. All others, by definition, are noncommunity water systems.[2] According to EPA, there are about 198,000 public water systems, about 59,000 of which are community systems; these community systems serve over 232 million people, or 92 percent of the U.S. population.

EPA categorizes community water systems by the size of the population served. As figure 1.1 shows, small and very small community water systems account for 87 percent of all community water systems in the country, although they serve only 11 percent of the population.

[1]Drinking Water: Compliance Problems Undermine EPA Program as New Challenges Emerge (GAO/RCED-90-127, June 8, 1990).

[2]Noncommunity water systems, in turn, are categorized as either nontransient or transient. Nontransient noncommunity water systems—such as the water systems operated by some hospitals, factories, and schools, for example—serve at least 25 of the same people for at least 6 months of the year. Transient noncommunity water systems cater to transitory customers in nonresidential areas such as campgrounds, motels, and gas stations.

Figure 1.1: Community Water Systems and Population Served, by Size of System



Note: According to EPA's definitions, very small systems serve from 25 to 500 customers; small systems, 501 to 3,300; medium-sized systems, 3,301 to 10,000; large systems, 10,001 to 100,000; and very large systems, more than 100,000.

According to EPA, small and very small community water systems often lack sufficient resources and expertise to comply with the complex drinking water regulations. Of the 16,439 community water systems reported as violating drinking water regulations during fiscal year 1991, 90 percent were small or very small systems.

Public Water Systems Are Regulated Under the Safe Drinking Water Act

The Safe Drinking Water Act of 1974 established a national program to ensure that all public water systems meet minimum standards to protect public health. The act directed EPA to establish (1) national drinking water standards or treatment techniques for contaminants that could adversely affect public health and (2) requirements for monitoring the quality of drinking water and for ensuring the proper operation and maintenance of water systems.

The act also gave EPA the authority to delegate to states meeting certain requirements the primary responsibility for enforcing the drinking water program, commonly referred to as "primacy." To assist states in developing and implementing their own drinking water programs, the act authorized EPA to provide grants to the states and directed the agency to help them in administering their programs. All states but Wyoming have assumed primacy for managing their drinking water programs and receive grants from EPA to help pay for the oversight of water systems and other responsibilities.

With EPA's oversight, states with primacy enforce the requirements of the federal program and monitor the quality of drinking water provided by public water systems within their jurisdiction. Water systems are required to collect water samples at approved intervals and locations and have the samples tested in an approved laboratory. The test results are then reported to the state, which determines whether the water system is in compliance with the regulations. If violations have occurred, the state is responsible for taking appropriate enforcement action.

By the mid-1980s, many contaminants remained unregulated by EPA. In addition, water systems' compliance with requirements and states' enforcement against noncomplying systems were both uneven. Accordingly, the Congress amended the Safe Drinking Water Act in 1986 to, among other things, (1) establish deadlines to accelerate EPA's efforts to set standards, (2) establish a monitoring program for certain unregulated contaminants, (3) require EPA to issue criteria for determining which systems relying on surface water must filter their supplies, and (4) require disinfection by all public water systems. These new and more stringent requirements significantly increased responsibilities at the federal, state, and public water system levels.

Sanitary Surveys Are Important in Ensuring Safe Drinking Water

EPA's regulations require states with primacy to develop and implement sanitary survey programs for periodically inspecting public water systems. While EPA has published guidance to assist states in developing such programs, the agency's regulations do not specify what states must do during the surveys or how often states must conduct them.

According to EPA, a sanitary survey is an on-site review, evaluation, and/or inspection of the water source(s), facilities, equipment, operations, and maintenance of a public water system for the purpose of determining its

adequacy for producing and distributing safe drinking water.[3] EPA has defined two classes of sanitary surveys. A Class I survey is a comprehensive evaluation of all of a water system's components and operations, including maintenance, conducted routinely, at least every 3 years. A Class II survey is limited to specific components or operations and is conducted "as needed." This report focuses on Class I surveys because their broad coverage (1) provides useful information on the condition of a water system and (2) can detect potential problems before water quality is actually affected.

A comprehensive sanitary survey can be a powerful tool for regulators to help ensure that a water system can deliver safe drinking water to consumers. As noted by EPA's sanitary survey course coordinator, evaluating all of the components and operations that the agency recommends be evaluated during a survey can significantly reduce the risk that consumers may ingest contaminated drinking water. EPA's guidance recommends, for example, that the water distribution system be checked for areas of stagnant water ("dead-ends"), in which harmful bacteria may grow, and that "cross connections" be monitored to decrease the chances that contaminated water and potable water will mix.

A sanitary survey can also provide an opportunity for regulators to establish a "field presence" with the owners and operators of water systems and to educate them about proper monitoring and sampling procedures, as well as any upcoming changes in regulations.

Objectives, Scope, and Methodology

Concerned about a possible deterioration in state sanitary survey programs, the Chairman, Subcommittee on Health and the Environment, House Committee on Energy and Commerce, asked us to determine

- whether states are conducting sanitary surveys and, if so, how frequently;
- whether the sanitary surveys being conducted by the states are comprehensive enough to determine if water systems are capable of providing good-quality water; and
- what the results of the surveys reveal about the operations and condition of water systems.

[3]In 1988, EPA also initiated the Composite Correction Program for use by states in evaluating the performance of drinking water treatment plants at systems relying on surface water as their source of drinking water. Whereas a sanitary survey focuses on all of a water system's components and operations, this program focuses only on the portion of the system related to water treatment and does not apply to a system relying on groundwater. The goal of this program is to identify actions that can be taken with little or no cost that will optimize the performance of existing treatment plants. Since 1988, this program has been used at only about 35 water systems in eight states.

We performed the bulk of our work at the Office of Ground Water and Drinking Water at EPA headquarters, two EPA regional offices, and four state drinking water program offices. To obtain a nationwide perspective, we also used information gathered from a questionnaire that we administered to drinking water program administrators in the 49 states with primacy and to EPA's Denver regional office, which implements the program for Wyoming, the only state not adopting primacy. Our review focused on routine Class I surveys conducted at community water systems, which are the primary source of drinking water for most Americans. We reviewed EPA's guidance on sanitary surveys and interviewed EPA headquarters and regional officials.

We visited Illinois, Montana, New Hampshire, and Tennessee to obtain more detailed information. We selected these states because they have (1) active sanitary survey programs, (2) centralized records of the surveys, and (3) automated systems for tracking the frequency and/or the results of the surveys. We also wanted to select two states representative of those with predominately smaller community water systems and two states representative of those with predominately larger systems.

In each state selected, we interviewed program managers and examined sanitary survey reports for a sample of 50 randomly selected community water systems. So that we could select these water systems, drinking water officials in each of the four states provided us with a list of systems that received a comprehensive sanitary survey during fiscal year 1991, the most recent fiscal year for which data were available. For each state, we numbered the systems consecutively in the order listed by the state, obtained 50 computer-generated random numbers within the list's universe, and applied the random numbers to the state's list to make our selections.

To address the first objective, we relied primarily on the results of our nationwide questionnaire, which included questions on the frequency with which states perform sanitary surveys. We supplemented these data with information obtained at the four states through interviews with the heads of the state drinking water programs. We also determined the interval between the fiscal year 1991 sanitary survey and the next prior routine survey of each water system included in our sample.

To address the second objective, we also used the nationwide questionnaire to gather information on the comprehensiveness of sanitary

surveys (i.e., on which of the EPA-recommended elements states included or omitted when conducting sanitary surveys). At the four states, we examined the fiscal year 1991 sanitary survey reports for each of the community water systems in our sample to determine which components and operations of water systems were actually reviewed. We also analyzed EPA's guidance on the recommended coverage of a routine sanitary survey and interviewed EPA and state drinking water program officials on the appropriate scope and content of a comprehensive sanitary survey.

To address the third objective, we utilized the nationwide questionnaire to (1) obtain state officials' perceptions of what sanitary surveys reveal about the operations and condition of public water systems and (2) identify any relevant statewide studies. We also analyzed sanitary survey reports for the sample of community water systems selected in each of the four states to gather information on the systems' operations and condition and to determine the extent to which deficiencies noted in earlier surveys were being corrected. Finally, we interviewed EPA and state drinking water program officials to obtain their views on the operations and condition of water systems.

In addition to our contacts with EPA and state officials, we obtained additional information and opinions on sanitary survey programs from officials of the American Water Works Association and the National Rural Water Association. We also obtained information on the training of state personnel to perform sanitary surveys from an official of the South Carolina Environmental Training Center—the developer and instructor of EPA's course on conducting the surveys.

Our work was conducted between November 1991 and February 1993 in accordance with generally accepted government auditing standards. We discussed our findings with officials in EPA's Office of Ground Water and Drinking Water responsible for implementing the Safe Drinking Water Act, who generally agreed with the information presented. The EPA officials also agreed with our observations, as presented in chapters 2 and 3, that resource constraints have significantly contributed to the problems discussed in this report and that the resolution of the funding issue needs to be part of any effective solution. We have incorporated the officials' comments where appropriate. As requested, we did not obtain written agency comments on a draft of this report.

Sanitary Surveys of Public Water Systems Vary in Frequency and Comprehensiveness

Federal, state, and national drinking water association officials generally agree that routine Class I sanitary surveys of public water systems are an essential element of a program ensuring safe drinking water. However, while almost all states conduct these surveys, their frequency and comprehensiveness vary widely. In some cases, consumers may be getting their drinking water from systems that have not been inspected in 10 or more years or that may have significant undetected deficiencies.

The problems stem from (1) a lack of detailed federal requirements for sanitary survey programs, (2) inadequate training of inspectors, and (3) ineffective oversight by federal and state officials. Importantly, the significant resource constraints that we have cited in past reports have contributed profoundly to the problems with sanitary surveys, and addressing these constraints will need to become part of any effective solution.[1]

Frequency of Sanitary Surveys Varies Among States and Is Declining Overall

The frequency of Class I sanitary surveys varies widely among the states. At least 36 states have established policies that provide for sanitary surveys of community water systems every 3 years or less, in accordance with EPA's guidance. However, many states report that they are unable to implement their policies, and many are conducting sanitary surveys less frequently than in the past, primarily because of resource constraints. Federal and state drinking water officials generally expect the frequency of sanitary surveys to continue to decline because significant resources will have to be diverted to implement the additional requirements arising from the 1986 amendments to the Safe Drinking Water Act.

Large Majority of States Require Sanitary Surveys

EPA's regulations require, as a condition of maintaining primacy, that a state adopt "a systematic program for conducting sanitary surveys of public water systems in the state, with priority given to sanitary surveys of public water systems not in compliance with State primary drinking water regulations." While EPA's regulations do not specify the frequency with which states must conduct surveys, the agency has issued guidance recommending that a comprehensive evaluation of all of a water system's components and operations, including maintenance, be conducted on a routine basis, and no less frequently than every 3 years. Other drinking water regulations, such as the total coliform rule, for example, allow states

[1]See, for example, Drinking Water: Widening Gap Between Needs and Available Resources Threatens Vital EPA Program (GAO/RCED-92-184, July 6, 1992).

to reduce monitoring requirements at certain water systems where a sanitary survey has been conducted within 5 years.

In response to our nationwide questionnaire, 47 states reported that they have established policies for periodically conducting sanitary surveys. Overall, the intervals prescribed in states' policies range from as frequently as quarterly to as infrequently as 10 years. In at least 36 of these states, the policy is to conduct surveys at intervals of 3 years or less.

Nineteen states differentiate between the sources of systems' water, with surface water systems subject to more frequent surveys than groundwater systems. In a few instances, the state's policy incorporates other factors (e.g., the size of the population served or the type of water treatment provided) to establish how frequently water systems should be subject to sanitary surveys. In other cases, the state's policy is expressed in terms of a range of years (e.g., 3 to 5 years). For the most part, though, states set an unvarying interval for sanitary surveys of all community water systems.

Of the three states that reported having no policies on the frequency of Class I sanitary surveys, two—Alabama and Washington—indicated that they do not conduct any Class I surveys of community water systems. Alabama uses annual inspections that cover a sample of water systems' components and operations, rather than all of them, as is recommended. Washington relies on the more limited Class II surveys, which are conducted "as needed" to investigate, for example, the cause(s) of violations of drinking water standards and/or consumers' complaints. The third state, Arizona, conducts Class I surveys but does not have a specific scheduling policy. State officials explained that their inspectors conduct surveys as time permits, but that the inspectors have other competing responsibilities, which sometimes take precedence over this task.

Thus, overall, most states' policies for scheduling sanitary surveys have incorporated the intervals recommended in EPA's guidance, and many states call for surveys to be conducted more frequently than every 3 years. However, as discussed in the next section, the key issue is whether states are able to achieve their goals.

Many States Are Not Conducting Surveys as Often as EPA Recommends

An analysis of responses to our nationwide questionnaire indicates that many states are conducting sanitary surveys less often than their policies prescribe and less often than the frequency recommended by EPA's guidance. Overall, we found that at least 26 of the states are not

conducting sanitary surveys at a rate necessary to achieve EPA's recommended interval of 3 years.

To obtain an indication of how frequently a state is conducting Class I sanitary surveys and how long surveying all of the systems would take, we (1) determined the average number of surveys the state conducted during fiscal years 1989, 1990, and 1991 and (2) compared the average annual number of surveys conducted to the total number of community water systems in the state. If, for example, a state has 1,800 community water systems and has been performing an average of 300 sanitary surveys per year, it would take the state 6 years to review all of the systems.

Our analysis indicates that 21 states are meeting or surpassing EPA's recommended interval of 3 years. Two states reported that they do not conduct Class I sanitary surveys of community water systems, as mentioned earlier, and three states did not provide sufficient data with which to analyze the frequency of their sanitary surveys. For the remaining 24 states, our analysis indicates that EPA's recommended interval is not being met—sometimes by wide margins. For example, Indiana conducted an average of 60 Class I sanitary surveys of community water systems per year during fiscal years 1989 through 1991. At this rate, it would take 16 years to survey all of the state's systems. West Virginia's rate was considerably slower: The state has only been able to conduct an average of 5 Class I sanitary surveys per year. The West Virginia program manager told us that financial constraints and staff shortages have prevented the state from performing sanitary surveys. However, with a recent appropriation of $500,000 for hiring and training additional staff, the state hopes to improve this performance.

Frequency of Sanitary Surveys Continues to Decline

In response to our nationwide questionnaire, 11 states reported that they are conducting sanitary surveys more frequently than in 1988, but 23 states reported that they are conducting surveys less frequently. This downward trend is borne out further by the precipitous drop in the number of sanitary surveys conducted by several states in recent years. For example, Connecticut decreased the number of sanitary surveys it conducted from an average of 235 surveys per year for fiscal years 1989 and 1990 to 80 surveys in fiscal year 1991. Idaho, which conducted an average of 341 sanitary surveys per year for fiscal years 1989 and 1990, did not conduct any Class I surveys in fiscal year 1991. States cited several reasons for the decline, including the need to perform higher-priority work that is required by the Safe Drinking Water Act, staff shortages, and financial constraints.

Program managers in three of the four states we visited also indicated that while they are presently meeting their goals for the frequency of sanitary surveys, they are having increasing difficulty doing so. For the most part, the managers attributed their difficulty to the same reasons cited by their counterparts in the 23 states that are conducting surveys less often than in the past. In Tennessee, for example, the program manager told us that he had to use individuals formerly assigned to conduct sanitary surveys to track the increasing amounts of compliance data supplied by water systems as a result of the 1986 amendments to the Safe Drinking Water Act.

To make the best use of limited resources, some states plan a maximum interval between sanitary surveys (e.g., 3 years), but give priority to the water systems that warrant the most attention. Mississippi, Rhode Island, and Tennessee, for example, schedule sanitary surveys first for water systems having significant compliance and/or operational problems, then, as time permits, schedule surveys for the remaining water systems that are due for surveys.

Focusing sanitary surveys on noncomplying water systems is understandable in light of the constraints facing many states. However, as the number and complexity of drinking water regulations increase, so will the number of water systems with significant compliance or operational problems. Moreover, we believe the importance of conducting surveys of systems not outwardly having major problems—and providing the ounce of prevention that will address minor problems before they become major ones—should not be discounted.

Flaws in Sanitary Surveys Sometimes Limit Their Usefulness

Perhaps of greater concern than sanitary surveys' declining frequency are questions about the quality of the ones that are conducted. When properly conducted, sanitary surveys can provide invaluable information on water systems' design and operations and can identify minor deficiencies for correction before they become major problems. We found, however, that key elements of an effective sanitary survey are often omitted. Furthermore, our analysis of 200 surveys revealed that the documentation of surveys is often incomplete and that deficiencies are sometimes not treated consistently.

Key Elements of Systems Are Sometimes Not Evaluated

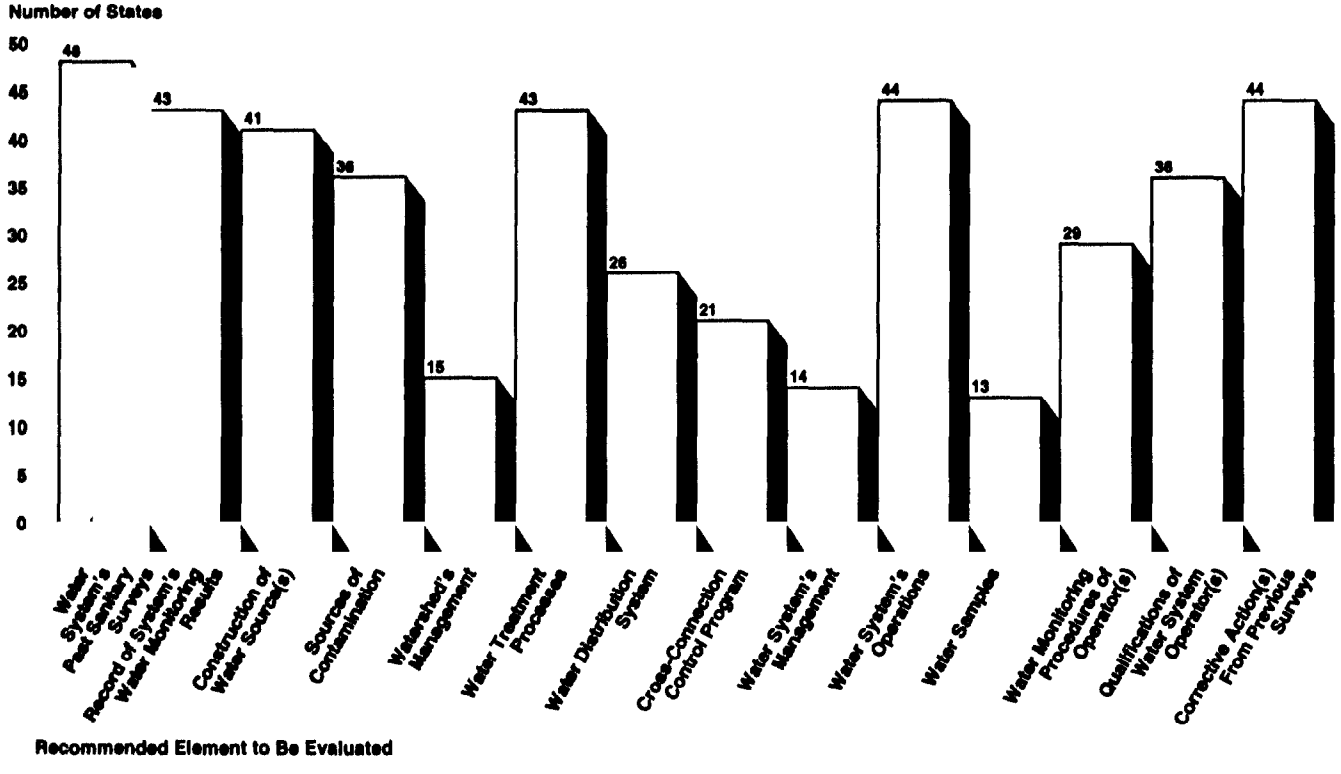
According to EPA's guidance, a sanitary survey should provide a comprehensive, accurate record of a water system's components, an assessment of the system's adequacy and operating conditions, and a

determination as to whether previously noted deficiencies have been corrected. To accomplish this, EPA recommends that a comprehensive survey evaluate all of a water system's components and procedures—ranging from those used to protect a water source from contamination to those used to maintain the structural integrity of the entire treatment and distribution system. EPA's guidance also recommends that a comprehensive survey include an evaluation of the system's management and the qualifications of the system's operator(s).

In some cases, there may be legitimate reasons for omitting certain elements from a sanitary survey—perhaps because of the type of water source, the design of a particular system, or the type of treatment performed. According to EPA's sanitary survey course coordinator, however, evaluations of the water distribution system, the cross-connection control program, the qualifications of the operator(s), and most of the other recommended elements are virtually always warranted.

Nevertheless, the type of thorough sanitary survey recommended by EPA frequently does not occur. In response to our nationwide questionnaire, state drinking water officials in 45 of the 48 states conducting Class I sanitary surveys reported that their surveys typically do not evaluate one or more of the water system's components and operations that EPA recommends be evaluated. Moreover, as figure 2.1 illustrates, many key elements are often omitted from states' sanitary surveys despite guidance from EPA recommending that they be included virtually all the time.

Figure 2.1: States Reporting They "Always or Almost Always" Include a Recommended Element in Their Sanitary Surveys



Surveys in some states were particularly limited. For example, Utah responded that it "always or almost always" evaluates only 3 of the 14 items that EPA recommends be evaluated in a sanitary survey. Some of the areas that the state reported are not "always or almost always" evaluated during a Class I survey are the water system's operations, the cross-connection control program, and the qualifications of the operator(s).

Resource limitations help to explain why many states are unable to undertake the type of comprehensive examination of water systems that EPA recommends. In addition, several state drinking water officials provided other explanations as to why their states do not evaluate specific components and operations during a survey. Officials in Colorado, for example, reported that the state cannot check water distribution systems because it has no authority to evaluate anything beyond the treatment

plant. Tennessee officials reported that the state cannot evaluate the watershed's management because the state does not have a watershed management program. The failure or inability of states to evaluate during a sanitary survey all of the applicable components and operations of a water system increases the risk that problems may not be detected and corrected before water quality is affected.

Results of the Sanitary Surveys Reviewed Were Often Poorly Documented

While EPA's regulations do not specify how sanitary surveys are to be documented, the agency's guidance states that—in addition to a formal report—field notes, diagrams, and completed inspection forms are critical to the sanitary survey process. According to EPA's sanitary survey course coordinator, unless sanitary surveys are properly documented, future inspectors will be unable to follow up on previously identified problems and system operators will be less likely to follow inspectors' recommendations. Our analysis of 50 randomly selected fiscal year 1991 sanitary surveys in each of the four states we visited disclosed that the documentation of what sanitary surveys entailed and what they disclosed about water systems' adequacy and condition was often incomplete.

We found that in three of the four states—Illinois, New Hampshire, and Tennessee—inspectors do write formal reports and use inspection forms to document the findings and recommendations of sanitary surveys, but the information contained in these reports and forms varies considerably. In Illinois and New Hampshire, sanitary survey inspectors generally write a report and complete a checklist or form to document and report on their evaluation of a water system's components and operations. Several of the survey documents in our sample also included a hand-drawn diagram of the water system and, in Illinois, photographs of the water system. In these two states, the sanitary survey documents often covered many of a water system's components and operations regardless of whether or not a deficiency was noted. In Tennessee, inspectors write a report and use a rating form to document the results of a sanitary survey. A small number of survey reports also included a checklist on which inspectors wrote comments concerning the condition and functioning of a water system's components or processes. However, the sanitary survey reports in Tennessee usually covered only those components and operations found to be deficient.

While the type of documentation in Illinois, New Hampshire, and Tennessee was generally consistent throughout the state, the quality of the information that was contained in this documentation was not. Many of

the documents we reviewed in each state contained incomplete or missing entries or nondescriptive language that made it difficult to assess a water system's components and processes. In New Hampshire, for example, inspection personnel use form letters containing standard language to formally document deficiencies and notify owners and operators about them. According to EPA's sanitary survey course coordinator, however, form letters are suitable only for systems with minor problems, while a more substantial and descriptive explanation is needed when a system is determined to have a significant problem that could affect human health. Additionally, our review disclosed that in the two states that use regional field offices to conduct sanitary surveys—Illinois and Tennessee—the quality and quantity of documentation varied from one regional office to another. In Illinois, for example, some of the state's regional offices provide written documentation of their evaluation of previous sanitary surveys' recommendations and use inspection forms to document their evaluation of all of a system's components and operations, while other regional offices do not.

Documentation was particularly incomplete in Montana, which relies on the qualifications of inspectors to adequately perform surveys and does not require specific documentation of the surveys performed or detailed reports of the surveys' results. We found that the reports prepared by county inspectors frequently consisted of a simple statement, such as, "The system looks OK." Only 30 percent of the surveys disclosed deficiencies. In contrast, in Illinois, New Hampshire, and Tennessee, where documentation was considerably more complete, 97 percent of the sanitary surveys in our sample disclosed deficiencies.

This large disparity raises questions about the accuracy and completeness of Montana's documentation, and about the reliability of the conclusions of inspectors' final reports. Moreover, in one case we reviewed, the state's file contained evidence calling into question the favorable conclusion in the sanitary survey report. Although the county inspector reported in a May 29, 1991, survey of a water system serving a trailer court that "everything looks OK," the results of bacteriological testing of water samples taken on June 10, 1991, showed the water system violated the standard for the allowable level of total coliform bacteria. Following this violation, the state advised the system operator to (1) check the chlorinator and repair or replace it if necessary, (2) obtain a new test kit to measure the chlorine residual because the existing test kit was not working, and (3) take and record daily tests of chlorine residuals. While the May 1991 survey noted that a new chlorination system had been

installed in 1987, the survey report did not indicate whether either the chlorinator or the chlorine residual test kit had been checked for proper operation.

Inadequate documentation of sanitary surveys can limit their usefulness. According to EPA's sanitary survey training course manual, "Field notes, diagrams, and completed inspection forms are critical to the sanitary survey process. The judicious use of the form will a) provide uniformity of inspections, b) ensure completeness of the inspection, c) facilitate record-keeping, and d) allow follow-up inspection by another inspector." Major functions of the survey report, according to the manual, are to provide water system owners and operators with formal notification of deficiencies and to motivate them to take corrective actions. Furthermore, according to the manual, the most important functions of the report are "to provide a hard record for future inspecting parties and to provide much needed information during emergency situations or when technical assistance is needed."

Deficiencies Found in the Sanitary Surveys Reviewed Were Not Evaluated Consistently

While EPA's guidance provides inspection criteria for determining whether or not a water system has a deficiency, the agency does not provide guidance on how to assess the significance of a deficiency. We found that in the absence of this additional guidance, federal and state drinking water officials cannot ensure that (1) deficiencies are evaluated consistently and (2) all regulated water systems are treated equally.

In our review of 200 sanitary surveys, we found that different inspectors sometimes treated the same deficiency differently. For example, in New Hampshire, at two different water systems, inspectors observed that storage tank vents needed screens to keep out birds and insects. But one inspector rated this deficiency as "significant," and the second inspector did not.[2] The difference in the rating is important because significant deficiencies require the water system owner to notify the state about the corrections made. Other deficiencies require no such response, and corrections are not checked until the next scheduled survey.

New Hampshire's program manager informed us that in response to concerns over inconsistent interpretation, the state recently published a list of 12 significant health risks that can be identified during a sanitary survey. This list is incorporated into the state's computerized sanitary

[2]According to state drinking water officials, a deficiency is considered to be "significant" if it can directly affect the system's water quality or can reduce the system's reliability or ability to deliver water to customers.

survey report and eliminates much of the chance for inspectors to interpret deficiencies differently.

According to drinking water officials in the states we visited, some degree of inconsistency in how water systems' deficiencies are interpreted and reported should be expected since inspectors must rely on their knowledge and experience. However, as we point out below, inconsistency in evaluations may well be exacerbated by a high turnover among staff and inadequate training of state inspection personnel.

Inadequate Training of Inspectors May Contribute to Sanitary Surveys' Flaws

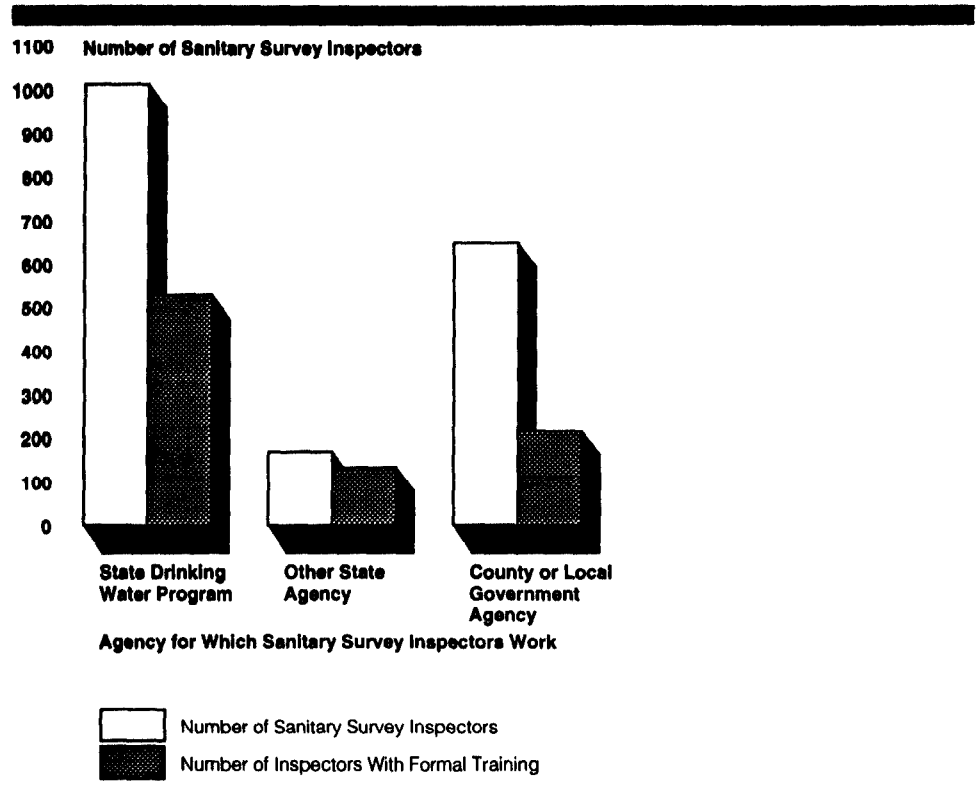
Inadequate training may help to explain some of the problems affecting sanitary surveys. Drinking water officials at all levels generally agree that inspectors, regardless of their experience or educational background, all need to be trained in how to properly conduct a sanitary survey. However, EPA has not established any requirements that states should follow for training inspectors. Perhaps more significant, responses to our nationwide questionnaire showed that over half of the sanitary survey inspectors nationwide lack any formal training.

Most states offer some type of training for their sanitary survey inspectors despite the absence of federal requirements. Forty-eight states reported that they use a combination of EPA-sponsored training programs, state-developed training, and programs offered by a variety of other organizations, such as local chapters of the American Water Works Association and the Association of State Drinking Water Administrators. Only 12 states, however, actually require formal training for their inspectors. In the remaining states, such training is optional or is simply not available.[3] When we asked how many of their inspectors have actually received training, states reported that only 48 percent of the sanitary survey inspectors nationwide have attended formal training programs or courses.

Figure 2.2 provides a breakdown of the number of inspectors that have received formal training.

[3]Hawaii and Maine reported that none of these types of training programs is available there. Hawaii reported that its inspectors do not receive any training, while Maine indicated that it does not have the personnel or funds for training.

Figure 2.2: Training Level of the State, County, and Local Government Inspectors Conducting Sanitary Surveys



According to the coordinator of EPA's sanitary survey training course, the course has been conducted around the country about 40 times over the past few years. He added that while the course has not been held in every state, he feels sure that at least one inspector has been trained in approximately 43 states.

According to drinking water officials in the four states we visited, the training course is not always available at a time, place, or cost that accommodates the high rates of staff turnover or the tight financial constraints of many state drinking water programs. The coordinator of the EPA course acknowledged that many states have to wait until EPA's course either comes to them or a neighboring state before they can afford to send their inspectors to training.

Drinking water officials in the four states we visited reported that they rely primarily on on-the-job training, using experienced sanitary survey inspectors to train new inspectors. Similarly, program managers in

20 other states responded to our nationwide questionnaire that resource constraints and the lack of training courses available from EPA have forced them to use on-the-job training as the primary method for training their inspection personnel.

We believe an overreliance on on-the-job training will inevitably take its toll on the quality of both inspectors and inspections. With less than half of the sanitary survey inspectors nationwide having received formal training, it is likely that a significant number of inspectors have been trained by others who may never have received any type of formal training themselves. Indeed, according to the coordinator of the EPA course, there is a 50-percent chance that a new inspector could be trained by an untrained inspector. We believe that unless the personnel conducting on-the-job training programs are themselves fully qualified and properly trained, there is little assurance that inspectors are capable of detecting and reporting on the deficiencies that may exist in public water systems.

EPA Places Limited Emphasis on Sanitary Surveys

While drinking water officials at all levels agree on the importance of sanitary surveys in ensuring the capability of a water system to produce and deliver safe drinking water, EPA has done little to ensure that sanitary survey programs are consistently implemented in all states. Drinking water officials in the four states we visited reported that they had very little interaction with EPA representatives concerning the frequency, thoroughness, and documentation of the sanitary surveys conducted within their state. Rather, state officials told us that the only information exchanged between states and EPA concerns the number of sanitary surveys that the states conducted during a specified period of time.

EPA's Overall Strategy for the Drinking Water Program De-Emphasizes Sanitary Surveys

The nearly unanimous expressions of support for sanitary surveys as a quality assurance tool can be reconciled with the relatively low priority given them only when one sees them in the context of the crisis affecting the overall drinking water program today. As we explained in our previously cited July 1992 report, EPA recently adopted a strategy formally acknowledging that states will not be able to fulfill all of their key responsibilities, at least over the next several years. EPA's strategy therefore sets "short-term" priorities in the drinking water program to focus limited resources on high-priority activities, those deemed most important in protecting public health. States are to build resources over the next 5 years, after which they are expected to fully implement the program.

One effect of EPA's strategy was to downplay the role of sanitary surveys. While the agency's guidance recommends that sanitary surveys be conducted at least every 3 years, the new strategy only says that states must "maintain some capability to perform sanitary surveys" and that states may meet this requirement by maintaining "a small number of individuals with the technical expertise needed to respond to emergencies and perform a limited number of sanitary surveys."

Our July 1992 report noted that because states are faced with a huge and growing shortage of resources to implement the drinking water program, it was understandable that EPA drinking water officials would attempt to establish priorities among elements of the program. However, we reported that the strategy essentially sidesteps the problem of the shortage of resources, explaining that (1) the strategy effectively postpones the implementation of some new requirements by the smallest water systems, which typically have the most difficulty complying with drinking water requirements; (2) states will be unable to accomplish even the highest-priority items under the strategy; and (3) the strategy assumes with little basis that the states will be able to resolve their financial dilemmas at the end of the 5-year period. Given EPA's own determination that protecting drinking water should be one of the agency's most critical environmental responsibilities, we recommended that EPA and the Congress reexamine the drinking water program's funding, rather than compromise vital elements of the program and its overall integrity.

Importantly, our report also took issue with EPA's assertion that all of the key activities of the program would still receive "Priority 1" attention, citing sanitary surveys in particular. As the report pointed out, sanitary surveys are a quality assurance tool that has "traditionally formed the backbone of state drinking water programs," and they are "one of the most effective tools that states can use to help ensure compliance and correct problems before they become serious."

In the absence of regulations specifying what states must do during sanitary surveys or how often states must conduct them, EPA has granted states considerable latitude in developing and implementing their survey programs. Even though drinking water officials agree on the importance of sanitary surveys, this latitude helps to explain the wide variation in the frequency and comprehensiveness of states' sanitary surveys. Since there are no minimum requirements, it is understandable that states tend to curtail sanitary survey activities during periods of limited resources in order to focus efforts on other aspects of the drinking water program for

which EPA has established specific requirements. Indeed, drinking water officials in two of the states we visited expressed the view that from the states' perspective, it makes more sense to emphasize the activities subject to greater attention and oversight by EPA than to emphasize sanitary surveys.

Conclusions

Despite strong agreement that sanitary surveys are one of the most valuable tools in ensuring the quality of drinking water, we found substantial evidence that states vary in both the frequency and comprehensiveness of the surveys they conduct. The frequency with which states conduct sanitary surveys ranges from quarterly to once in 10 years. Importantly, 23 states have reduced the frequency of surveys since 1988 because of financial constraints, a downward trend that is expected to continue.

When sanitary surveys are conducted, (1) some key components or operations of water systems are regularly not evaluated in many states, (2) documentation is sometimes incomplete, and (3) the results of the surveys are sometimes interpreted inconsistently from one surveyor to another. In such situations, the surveys' effectiveness in ensuring that water systems can deliver safe drinking water is limited. Systems' deficiencies that could have been detected during a comprehensive survey may not be found until after water quality is affected and the root cause(s) investigated. By that time, however, consumers may already have ingested contaminated water.

These problems are attributable to a number of causes, including (1) a lack of detailed requirements governing both the frequency of surveys as well as the manner in which they should be conducted, documented, and interpreted; (2) insufficient training of inspectors; and (3) insufficient attention given by federal and state program managers to sanitary surveys. As we have reported on several occasions in the past, however, an important underlying problem is the significant funding shortage undermining the integrity of the entire drinking water program. This shortfall has contributed profoundly to the problems affecting state sanitary survey programs, and its resolution will need to be part of any effective solution.

Recommendations

To improve the effectiveness of sanitary surveys, we recommend that the Administrator, EPA, take the following steps:

- Work with states to establish minimum requirements governing the frequency of sanitary surveys, as well as the manner in which they should be conducted and documented. These requirements should be set in a manner that considers states' resource constraints, but reflects the survey elements essential to ensure that water systems are capable of delivering safe drinking water to consumers.
- Assist states in developing criteria to guide inspectors in interpreting the results of surveys and in identifying appropriate actions to be taken when specific types of deficiencies are detected.
- Augment the agency's efforts to provide formal sanitary survey training to states' inspectors.

Sanitary Surveys Reveal Significant Problems With Water Systems

While most public water systems appear to be delivering safe drinking water to consumers, many systems have deficiencies that could affect the quality of drinking water. Smaller systems are in the greatest need of major improvements. Some larger systems, however, also need to upgrade their operations to ensure that they can continue to provide safe drinking water.

Though sanitary surveys offer great potential in helping drinking water officials detect problems before they threaten public health, detecting problems alone does not ensure they will be corrected; follow-up is essential to ensure that the recommendations arising from sanitary surveys are implemented. Nevertheless, three of the four states we reviewed in detail lack effective mechanisms to ensure that water system owners and operators correct the deficiencies disclosed. In New Hampshire, which recently implemented systematic follow-up procedures, the state's program manager told us that he has seen a dramatic improvement in the correction of deficiencies.

Small Water Systems Are in Worse Condition Than Larger Systems

States responded to our questionnaire that most medium-sized and large public water systems under their jurisdiction are in generally good condition, while smaller systems need to make major improvements. Our review of sanitary survey reports on 200 community water systems in four states tended to confirm these results.

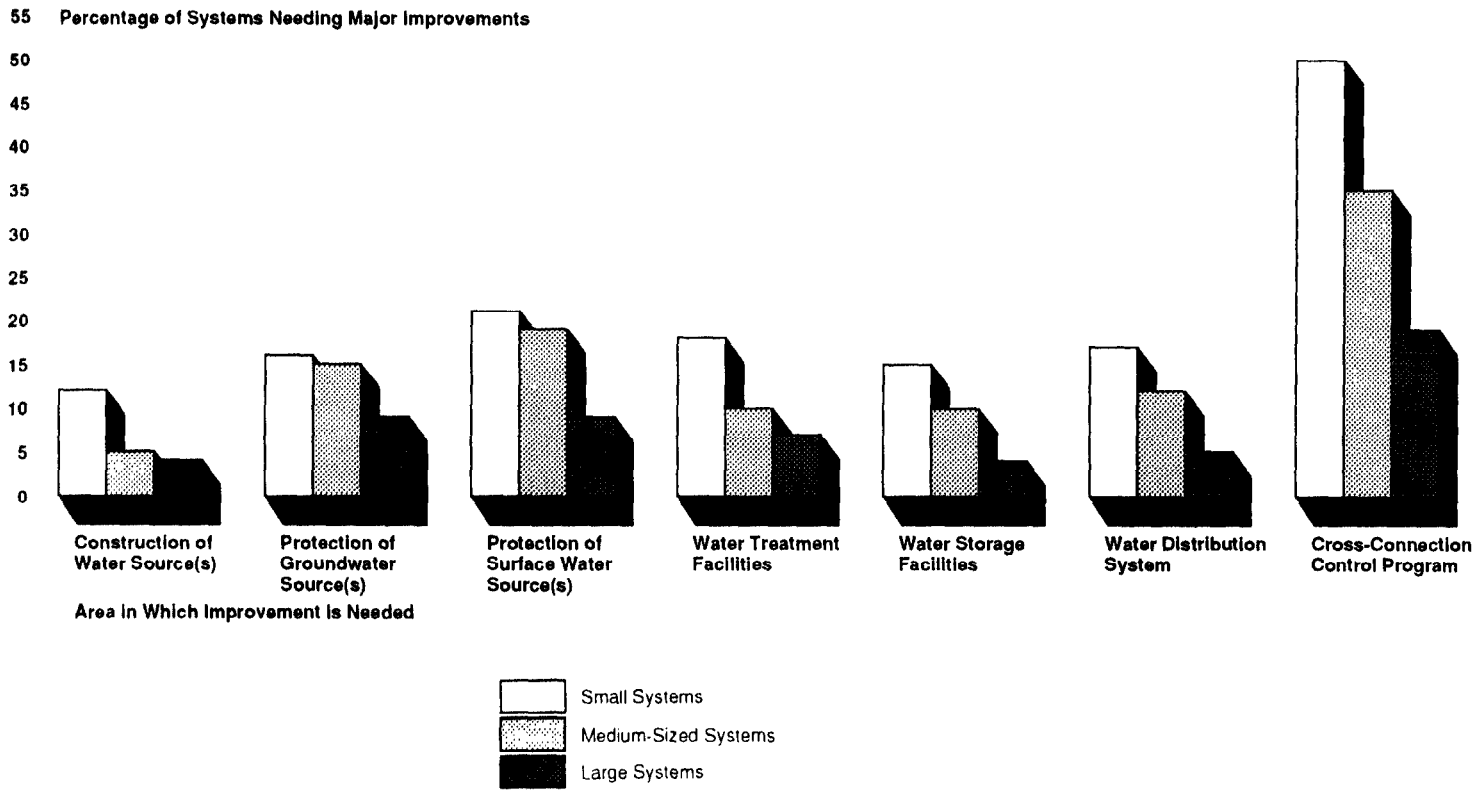
National Data Indicate Frequent Problems at Small Systems

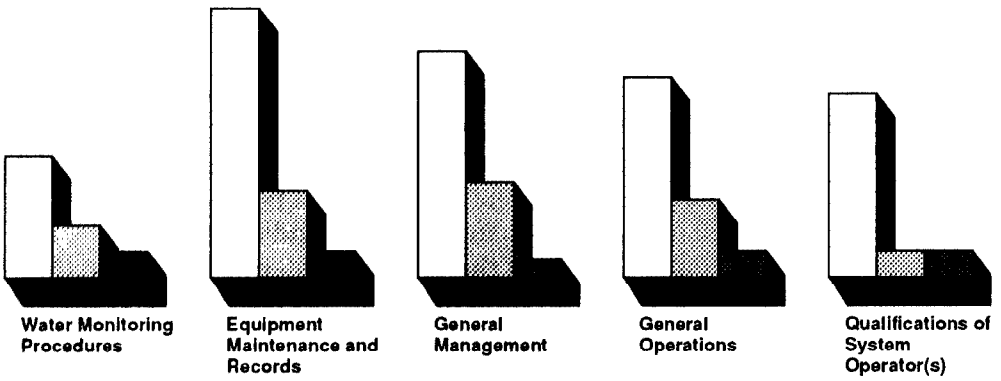
Our questionnaire asked states to assess the overall adequacy of the operations and condition of public water systems under their jurisdiction. For each of 12 different elements, we asked states to estimate the percentage of small, medium-sized, and large water systems that are adequate, in need of minor improvements, or in need of major improvements. States responding to these questions[1] generally reported that small water systems need more improvements than medium-sized or large systems.

Figure 3.1 shows the average percentage of small, medium-sized, and large systems nationwide that states estimated to need major improvements in each of the 12 areas evaluated.

[1]Our analysis was based on the responses received for each question. Five states reported they were unable to respond to any of the questions, while two others were able to respond to only some of the questions. Additionally, nine states reported that some of the elements we asked about were not applicable for one or more categories of water systems in their jurisdiction. For example, states in which all small water systems rely on groundwater indicated that our question about the "protection of surface water sources" was not applicable for small systems.

Figure 3.1: States' Estimates of the Percentage of Water Systems Needing Major Improvements





Note: For the purpose of our questionnaire, we asked states to consider small water systems as those serving 3,300 or fewer persons, medium-sized systems as those serving from 3,301 to 10,000 persons, and large systems as those serving more than 10,000 persons.

Sanitary Surveys Also Disclose Problems at Small Systems

The questionnaire responses were confirmed by our analysis of the 200 sanitary surveys in Illinois, Montana, New Hampshire, and Tennessee. In total, 161 of the 200 reports disclosed one or more deficiencies. While these deficiencies primarily involved problems with systems' operations and maintenance, 60 involved problems with water systems' infrastructures. Small systems accounted for 56 of the 60 deficiencies in systems' infrastructures.

Inadequate water sources or the failure to protect existing water sources from potential contamination were cited in 28 of the surveys we reviewed.

The surveys reported wellfields subject to flooding; well casings that terminated too close to the ground to prevent the infiltration of surface water; and sewers, septic systems, and other potential sources of contamination located near wells.

A Montana case we examined illustrates the consequences that can arise from a problem with the water source. About 100 residents of a subdivision have suffered serious water shortages since the construction of its water system in the early 1970s, and periodically the water from this system has become contaminated. Although identifying specific sources of contamination is difficult, a 1989 sanitary survey of this system identified one of the three wells in this system as a potential source of the contamination. This well is located within 30 feet of an old hand-dug well containing surface water drainage that was observed to recede as water was pumped from the public well. The survey report noted that dead animals had been fished out of the hand-dug well; and thus it was a possible source of contamination of the drinking water supply. Upon the recommendation of the state, the hand-dug well was filled in. Problems with contamination continued, however. Currently, this system is under an administrative compliance order to continuously disinfect its drinking water, and the water system owners are working to obtain funding to develop a new well to alleviate a chronic shortage of water.

Deficiencies associated with water distribution systems were cited in 23 of the sanitary surveys we reviewed. Such deficiencies generally involved inadequate water storage capacity, undersized or inadequate water mains, and designs that did not allow for periodically flushing the distribution pipes to remove contaminants.

New Hampshire, for example, requires all community water systems to have a 200-foot protective radius within which no buildings, septic tanks, leaching fields, or oil or other hazardous materials may be located or stored. Of the 50 community water systems we reviewed in New Hampshire, 12 violated this requirement. In one case, an auto repair shop was located 60 feet from the community water system's well. In another case, the state had approved one location for a well, but the water system owner relocated the well to a place from which the required 200-foot radius extended beyond the owner's property line and thus was unprotected. In such a case, New Hampshire does not normally force water system owners to correct the violation unless water quality is affected.

Problems Identified in the Sanitary Surveys Reviewed Often Went Uncorrected

For sanitary surveys to be effective in ensuring that public water systems can provide safe drinking water, the deficiencies disclosed must be followed up on to ensure that timely corrections are made. From our review of 200 sanitary surveys, however, it appears that procedures for following up on deficiencies are a weak link in state sanitary survey programs.

Of the 161 surveys we examined in which deficiencies were cited, about 60 percent contained deficiencies that were also cited in previous sanitary surveys. As shown in table 3.1, failing to correct deficiencies is not unique to small systems.

Table 3.1: Water Systems With Deficiencies Repeated in Four-State Sample of 200 Sanitary Surveys, by Size of System

	Small	Medium-sized	Large	Total
Number of systems in sample with deficiencies reported in 1991 survey	129	20	12	**161**
Number of systems with deficiencies in 1991 survey that were repeated from earlier surveys	82	12	5	**99**

Drinking water program officials in the states we visited told us that because of limited resources, they are generally able to follow up on only the most serious deficiencies disclosed during sanitary surveys—those deficiencies actually causing a problem with water quality—to determine whether corrections have been made. Deficiencies that may affect water quality in the future are given a lower priority.

As noted in chapter 2, officials performing sanitary surveys in Illinois, New Hampshire, and Tennessee routinely provide public water system owners and/or operators with written reports of a survey's results, including details on any deficiencies noted. The officials also normally require the water system officials to report back to the state on their plans to correct the deficiencies. The effectiveness of these procedures in getting deficiencies corrected, however, has been limited.

In a New Hampshire case, for example, sanitary surveys of a water system for a mobile home park that were performed in February 1991 and July 1988 noted nearly identical deficiencies. These deficiencies included (1) an inability to separately sample the water of the two wells in this system in order to monitor water quality and isolate problems; (2) flooding of the pump house; (3) the susceptibility of the wells to contamination from storm water because of poor grading; and (4) the failure to maintain

a 200-foot protective radius around the wells, free of buildings, septic tanks, leaching fields, or other potential sources of contamination. Although both the 1988 and 1991 survey reports required the system owner to respond to the state within 45 days to indicate the steps taken or proposed to remedy the deficiencies, the system owner did not respond, nor did the state follow up when a response was not received.

The New Hampshire drinking water program manager told us that, historically, the program focused its limited resources on completing sanitary surveys, rather than on following up on deficiencies to ensure corrections. However, recognizing the futility of performing surveys showing the same deficiencies time after time, New Hampshire recently implemented a computer tracking system of deficiencies. Under this system, public water systems that do not respond after deficiencies are cited in survey reports are automatically identified for follow-up actions that can include administrative orders, administrative fines ranging from $300 to $5,000, or referral to the state attorney general's office for litigation. According to the New Hampshire drinking water program manager, the experience with this new system thus far has shown water system operators that the state is serious about following up on deficiencies, and, as a result, water systems' efforts to correct deficiencies have dramatically improved.

In Montana, a state in which inspectors do not routinely prepare a written report of a sanitary survey's results, deficiencies disclosed during the survey are generally discussed with the water system officials at the conclusion of the survey. Unless the deficiencies are considered serious, follow-up to determine whether corrections have been made usually awaits the next scheduled survey. Follow-up on deficiencies considered serious, however, does not await the next survey. We noted, in our sample of sanitary surveys, several cases in which water systems had been referred to enforcement officials for legal action in an attempt to force water system officials to make the necessary improvements.

Even enforcement action, however, does not always result in the timely resolution of deficiencies. In one such case, residents served by a community water system for a trailer court in Montana were advised in January 1991 to boil their water before use because of chronic bacteriological contamination and deficiencies that made the system's water sources prone to continued contamination. After the "boil order" was issued, the system owner stopped submitting required monthly water samples for bacteriological testing. The state initiated enforcement action

in January 1992. Subsequently, the system owner resumed submitting monthly samples but did not act to correct any of the deficiencies cited. Because of the water system's continued noncompliance and general lack of good-faith efforts to meet standards, this case was turned over to the enforcement section of the state's Water Quality Bureau for legal action. In September 1992, the state issued an administrative compliance order to the system owner, requiring him to adhere to regulations for sampling and monitoring the drinking water, make the necessary improvements to the system to correct the deficiencies, and designate a certified operator to be in charge of the system.

In commenting on this case, the Chief of Montana's Water Quality Bureau wrote, "I wish we could claim this situation was an isolated incident in Montana. Unfortunately, the truth is that many users of small public water supplies are served by substandard systems or by systems that are not monitored as required and therefore have public health threats which remain undetected." The Chief noted that "severe resource limitations and an overwhelming workload" have hampered the state's ability to follow up on detected problems and to protect public health by enforcing monitoring and treatment requirements at public water systems.

Drinking water officials in the states we visited told us, understandably, that they are focusing their limited resources on the elements of the drinking water program that are mandated—and monitored—by EPA. As we noted in chapter 2, while EPA's regulations require states with primacy to have sanitary survey programs, the regulations do not specify what states must do during the surveys, how often states must conduct them, or what actions states must take when deficiencies are disclosed. The officials reported that since EPA's monitoring of sanitary surveys is largely confined to counting the number of sanitary surveys completed, states give limited attention to ensuring that deficiencies identified in surveys are pursued unless a threat to public health is apparent. The explanation by a drinking water official in Arizona, where sanitary surveys are performed by the same field personnel who inspect wastewater treatment plants, was typical: The state's limited number of field staff are generally too busy working on the activities that are required by law—and hence monitored more actively by EPA—to follow up on deficiencies identified in sanitary surveys.

Conclusions

Sanitary surveys are an integral and essential component of state programs to ensure that public water systems are capable of delivering

safe drinking water to consumers. For sanitary surveys to achieve their purpose, however, the deficiencies detected need to be corrected. While some water system officials readily make whatever corrections are necessary, others do not.

The four states we reviewed in detail generally have limited their follow-up to the more serious cases in which the quality of drinking water actually deteriorated and a threat to public health was apparent. Although this approach is understandable in light of their severe resource constraints, it undermines one of the key purposes of a sanitary survey program—to identify and correct problems before they become larger problems affecting water quality. New Hampshire's recent actions to set up a computerized system for tracking deficiencies to enable routine follow-up with water systems that do not comply with requirements may be a positive and cost-effective approach for addressing this problem.

As we pointed out in chapter 2, however, the significant shortfall in funding that undermines the entire drinking water program will undoubtedly affect the ability of EPA and the states to address the serious problems with sanitary surveys. Accordingly, as stated in our July 1992 report, we believe that efforts to address that shortfall will need to be part of any realistic solution to the problems identified in this chapter.

Recommendations

In order to improve the effectiveness of sanitary surveys in protecting drinking water quality, we recommend that the Administrator, EPA, do the following:

- Help states to develop and implement procedures to ensure that deficiencies detected during sanitary surveys are corrected on a timely basis. This assistance could include identifying states with effective follow-up systems and helping other states set up similar systems.
- Ensure that, as part of their oversight responsibilities, EPA headquarters and regional staff monitor the effectiveness of states' follow-up.

Major Contributors to This Report

Resources, Community, and Economic Development Division, Washington, D.C.	Peter F. Guerrero, Associate Director, (202) 512-6501 Steven L. Elstein, Assistant Director Gregory A. Kosarin, Assignment Manager Kelly S. Ervin, Staff Social Science Analyst
Boston Regional Office	Ellen M. Crocker, Regional Management Representative Gerald L. Laudermilk, Evaluator-in-Charge Arthur T. Merriam Jr., Staff Evaluator Maureen T. Driscoll, Staff Evaluator

The first copy of each GAO report and testimony is free. Additional copies are $2 each. Orders should be sent to the following address, accompanied by a check or money order made out to the Superintendent of Documents, when necessary. Orders for 100 or more copies to be mailed to a single address are discounted 25 percent.

Orders by mail:

U.S. General Accounting Office
P.O. Box 6015
Gaithersburg, MD 20884-6015

or visit:

Room 1000
700 4th St. NW (corner of 4th and G Sts. NW)
U.S. General Accounting Office
Washington, DC

Orders may also be placed by calling (202) 512-6000
or by using fax number (301) 258-4066.

PRINTED ON RECYCLED PAPER

United States
General Accounting Office
Washington, D.C. 20548

Official Business
Penalty for Private Use $300

First-Class Mail
Postage & Fees Paid
GAO
Permit No. G100