

National State Auditors Association

Joint Performance Audit

WATER QUALITY

August 2001

State of Tennessee Comptroller of the Treasury, Division of State Audit
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STATE OF TENNESSEE
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John G. Morgan
Comptroller

August 3, 2001

Mr. Ron Jones, President
National State Auditors Association
State of Alabama
Chief Examiner of Public Accounts
50 North Ripley St.
Montgomery, AL 36130-2101

Dear Mr. Jones:

Transmitted herewith is the joint report compiling the results of the NSAA Joint Audit on Water Quality. For this project, twelve states—Arkansas, Colorado, Georgia, Hawaii, Iowa, Kentucky, Louisiana, Maryland, Michigan, Montana, Oregon, and Tennessee—conducted performance audits of water quality programs within their states. Tennessee coordinated the planning and information sharing during the audit and compiled the joint report.

We are grateful to have had the opportunity to serve as the lead state on this important project, and we appreciate the assistance and cooperation of all of the other participating states.

Sincerely,

John G. Morgan
Comptroller of the Treasury

JGM/nle
00-023j

Audit Highlights

National State Auditors Association

Joint Performance Audit

Water Quality

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Audit Objectives

The National State Auditors Association chose water quality as the topic for its 2000 joint performance audit project. Polluted water impacts one's health, the environment in which one lives, and one's quality of life. While great strides have been made in protecting and rehabilitating water sources, maintaining safe drinking water and surface water remains a constant challenge.

Twelve state audit organizations participated in the joint audit: Arkansas, Colorado, Georgia, Hawaii, Iowa, Kentucky, Louisiana, Maryland, Michigan, Montana, Oregon, and Tennessee. This report is a summary of the audit work relating to the three objectives listed below. Not all states covered each objective, while others covered additional areas. The three joint objectives selected were

1. to determine whether state regulatory programs meet or exceed minimum Environmental Protection Agency (EPA) standards for drinking water and surface water;
2. to determine whether states have an effective monitoring program for drinking water and surface water; and
3. to determine whether states apply corrective actions effectively.

CONCLUSIONS

Standards

Participating states found that, generally, their state standards met or exceeded EPA standards. For drinking water, the EPA National Primary Drinking Water Regulations are legally enforceable standards that apply to public water systems. Primary standards protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in public water systems. In regards to surface water, the EPA has established criteria for acceptable levels of pollutants detected in surface waters based upon the designation (drinking, agricultural, industrial, and recreational) of each water supply.

Monitoring

Surface Water

Monitoring for compliance with water quality standards has proven to be a constant challenge. Auditors who reviewed their states' policies for surface water monitoring found that those policies met EPA standards.

Problems found included the following:

Self Monitoring and Reporting. States found their regulatory departments were monitoring nonmajor facilities only as resources allowed, not reviewing minor facilities self-monitoring reports, not verifying self-reported data from permitted dischargers, and inadequately reviewing and

tracking discharge monitoring reports submitted by permit holders.

Total Maximum Daily Loads. Five states reported on their state's problems in developing the Total Maximum Daily Loads (TMDLs) required by the Environmental Protection Agency. A TMDL is the maximum amount of a pollutant that a water body can assimilate and still meet water quality standards for its designated use. The five states' progress ranged from coming close to meeting their goals to having no agency or the EPA developing the TMDLs.

Permitting. States issue permits under the National Pollutant Discharge Elimination System to regulate the amount and kind of pollutants discharged into water bodies. One state (Louisiana) found that permitted facilities were not inspected as required.

Permit Backlog. Several states found that major and minor permits were backlogged. A permit is considered backlogged when a renewal application has been received but the permit review process has not been completed by the permit's expiration date. One state (Colorado) suggested that the frequency with which permits are renewed should be driven by risk factors rather than just the passage of time.

Data Management and Information Systems. Some states' information systems contained inaccurate information on the results (and possible violations) listed on discharge monitoring reports.

Qualifications of Laboratories and Operators. States noted problems in tracking certifications of laboratories and operators. In addition, Louisiana noted in-house laboratories are not accredited.

Planning and Coordination. Colorado suggested that better coordination could improve water monitoring. The use of volunteer groups for sampling could allow the division to expand its resource base to accomplish more work without significant additional cost.

Drinking Water

Most states found their state's policies for monitoring met minimum standards set by the EPA. However, Oregon found the state's testing requirements for volatile and synthetic organic chemicals were less stringent than those set by the EPA.

Problems found in the monitoring process included the following:

Oversight of Local Agencies. Michigan found problems with its state department's oversight of local health departments which oversee non-community drinking water systems. State department staff did not complete many of the required on-site evaluations of these local agencies.

Drinking Water Revolving Fund. Two states suggested improvements in this loan program so it can better help public water systems. The purpose of the fund is to help public water systems finance the cost of water systems infrastructure needed to achieve or maintain compliance with the federal Safe Drinking Water Act. The EPA provides federal grants to the states. In addition, Louisiana found that the creation of its fund as a separate entity causes fragmentation.

Consistency. Several states found consistency of monitoring of water systems to be a problem. For example, in one state, inconsistencies in monitoring by regional offices led to differences in the frequency of and areas reviewed in sanitary surveys. In another state, the department's decentralization led to inconsistent instructions to water systems regarding required reports, water plant information, and water testing documentation.

Water Sampling Data. Water systems must sample the water periodically for various contaminants. Many states rely on self-reported data, and some audit reports noted concerns about the reliability of this data. States also found problems with water systems that did not collect all required samples or water divisions that did not review sampling data.

Sanitary Surveys. Several states found that all sanitary surveys were not conducted and survey deficiencies were not always followed up. These surveys are periodically conducted of all public water systems to assess the reliability of the system to provide safe drinking water to the public. These surveys are among the most important tools states can use to help ensure water system compliance with drinking water requirements and are an essential element of a state's drinking water program.

Information Systems. Several states reported some type of problem with the information systems used by their staff: from problems with data entry resulting in discrepancies between paper and electronic files and between state and federal databases to the use of multiple databases that pose potential uniformity and consistency problems. Federal regulations require states with primary enforcement authority to maintain records on each public water system for their compliance with applicable provisions of state regulations.

Operator and Laboratory Qualifications. Several states noted problem areas in the operator certification or laboratory accreditation programs. For example, a drinking water program needs a complete list of operators with their corresponding continuing education credits to ensure operators are properly certified. Also, information needed to identify instances where samples were taken by uncertified persons was not available in a program's information system. Further, Louisiana noted that its laboratory accreditation programs could be duplicative.

Emergency Preparedness. Most states that reviewed emergency preparedness found few problems. However, Michigan noted that several community water system files did not have emergency contingency plans.

Corrective Action

Surface Water Enforcement

Several states found problems in the enforcement process, including untimely enforcement action, lack of follow-up of long-term compliance schedules, not enforcing monetary penalties,

inconsistent penalty structure, and poor record keeping and case tracking. In addition, two states found no action taken for some violations.

Drinking Water Enforcement

The joint audit addressed the following areas: corrective actions and penalties; significant non-compliers (violators who pose the greatest risk to public health); public notice requirements; and maximum contaminant level, monitoring, and reporting violations. Problems in these areas included departments not taking timely enforcement action, not identifying maximum contaminant level violations, and not ensuring water systems report test results. Also, some states found that water system customers were not always notified of violations.

Nonpoint Source Pollution

The objectives for the joint audit on nonpoint source pollution (NPS) were limited to determining whether the state had a program for monitoring NPS. Most states that addressed this objective found that policies and procedures exist for regulating NPS, but did not evaluate the implementation of the policies. However, Kentucky, which focused in depth on NPS, found serious problems in the permitting of animal feeding operations, improper sewage disposal, monitoring of coal mining permits, and abandoned underground mine mapping. Also, one state (Tennessee) suggested that a ranking system be used when awarding federal grant funds to ensure the most needy areas get the funds. Further, Colorado recommended that its Water Pollution Control Revolving Fund loans be used to address nonpoint source pollution.

**National State Auditors Association
Joint Performance Audit
Water Quality**

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NSAA Joint Performance Audit Water Quality

INTRODUCTION

PURPOSE OF THE NSAA JOINT AUDIT

The National State Auditors Association (NSAA) chose water quality as the topic for its 2000 joint audit project. Polluted water impacts one's health, the environment in which one lives, and one's quality of life. While great strides have been made in protecting and rehabilitating water sources, maintaining safe drinking water and surface water remains a constant challenge.

BACKGROUND INFORMATION ON DRINKING WATER AND SURFACE WATER

Drinking Water

Drinking water is vulnerable to a wide range of contaminants from agricultural, industrial, urban, and residential land uses, as well as natural causes. Acute health effects can result from short-term exposure to a contaminant, usually in large doses. Reactions such as nausea, lung irritation, skin rash, dizziness, or even death, can result almost immediately. Chronic health effects can result from long-term exposure to a contaminant, usually in smaller doses. Reactions such as birth defects, cancer, organ damage, damage to the immune system, or disorders to the nervous system can take many years to fully develop.

The Safe Drinking Water Act (SDWA) of 1974 is the main federal law that ensures the quality of the nation's drinking water. It requires the federal Environmental Protection Agency (EPA) to set national drinking water standards to protect against health risks and ensure consistent quality of the nation's water supply. The act was amended in 1996 to emphasize sound science and risk-based standard setting, small water supply system flexibility and technical assistance, community-empowered source water assessment and protection, public right-to-know, and water system infrastructure assistance through a multi-billion-dollar state revolving loan fund. When combined with protecting ground and surface water under the Clean Water Act, SDWA standards are critical to ensuring safe drinking water. These standards are part of a "multiple barrier" approach, which includes assessing and protecting drinking water sources; protecting wells and collection systems; making sure water is treated by qualified operators; ensuring the integrity of distribution systems; and making information available to the public on the quality of their drinking water. The National Primary Drinking Water Regulations set standards for chemical, microbiological, radiological, and physical contaminants that are known or anticipated to occur in public water systems and can adversely affect public health.

Specific standards set by the National Primary Drinking Water Regulations apply to all public water systems (those with at least 15 service connections or regularly serving at least 25 people for at least 60 days of the year) and include enforceable maximum contaminant levels and treatment techniques. A maximum contaminant level is the highest permissible level of a contaminant in drinking water. Treatment techniques are specified by the EPA for certain contaminants whose concentrations in drinking water cannot be measured by economically or technologically feasible analytical methods. The national standards include testing requirements for treated water to ensure standards are achieved. The EPA has set standards for 90 chemical, microbiological, radiological, and physical contaminants in drinking water.

The responsibility for ensuring safe public drinking water is divided among the EPA, states, and public water systems. The SDWA gives the EPA authority to delegate primary responsibility (primacy) for enforcing drinking water regulations to states that meet specific requirements. All states except Wyoming have assumed primacy.

With EPA's oversight, states with primacy adopt and implement drinking water regulations that are no less stringent than the National Primary Drinking Water Regulations set by the EPA. Primacy states must also adopt, implement, and maintain a formal enforcement program to ensure that violations of state regulations are promptly addressed and that public health is protected. In addition, states are required to establish and maintain records and reports regarding their regulatory and enforcement activities.

Surface Water

The Clean Water Act (CWA), enacted in 1972, is the primary federal law that protects the nation's waters, including lakes, rivers, aquifers, and coastal areas. The act's primary objectives are to restore and maintain the integrity of the nation's waters, translating into two fundamental national goals: (1) to eliminate the discharge of pollutants into the nation's waters, and (2) to achieve water quality levels that are fishable and swimmable. The act provides a comprehensive framework of standards, technical tools, and financial assistance to address the many causes of pollution and poor water quality, including municipal and industrial wastewater discharges, polluted runoff from urban and rural areas, and habitat destruction. Some of the provisions of the act include requiring major industries to meet performance standards to ensure pollution control, charging states and tribes with setting specific water quality criteria appropriate for their waters and developing pollution control programs to meet them, providing funding to states and communities to help them meet their clean water infrastructure needs, and protecting valuable wetlands and other aquatic habitats through a permitting process that ensures development and other activities are conducted in an environmentally sound manner. The EPA credits the Clean Water Act with improving a great deal of the nation's waters to include swimmable and fishable uses, reducing annual wetlands losses dramatically, cutting the amount of soil lost to agricultural runoff by a billion tons annually, and increasing the number of people in the United States served by modern wastewater treatment facilities.

In accordance with CWA, as amended, the EPA has established criteria for acceptable levels of pollutants detected in surface waters based upon the designation (drinking, agricultural, industrial,

and recreational) of each water supply. These criteria are not established in law by the federal government but are suggested by the EPA as acceptable levels. The EPA considers the variance of water contaminants throughout the country and the amount of state resources available in establishing procedures to be used by the states in determining water quality standards for the various designations of surface water.

The Clean Water Act requires that states compile two lists that describe the known conditions of their water bodies. The 305(b) report describes the status of water quality for each of the state's waterbodies. This report is issued to the Environmental Protection Agency (EPA) every two years and covers the previous two years as required under the Clean Water Act in order to report the status of the nation's waters to Congress. The EPA has published guidelines for developing this report. Included in these guidelines are criteria for rating water quality. Other 305(b) report goals included in this report are as follows:

- Assess the general water quality conditions of rivers, streams, lakes and wetlands;
- Identify the causes of water pollution and the sources of pollutants;
- Specify waters which have been found to pose human health risks due to elevated bacteria levels or contaminants of fish; and
- Highlight areas of improved water quality.

In addition, the report lists each water body in the state, its designated use or uses, whether or not the water body is impacted by pollution, the cause of that pollution in the form of pollutants or pollution, and the known or possible sources of pollutants or pollution.

In general, waters with less than or equal to 10% exceedence of a standard are considered as meeting the standard, waters with greater than 10% and less than or equal to 25% exceedence of a standard are considered moderately impaired, and waters with greater than 25% exceedence of a standard are considered severely impaired. The EPA takes the report provided by each state and summarizes the reports into a national water quality summary. The 305(b) report is used in part to determine the amount of EPA funds to be provided to each state.

The 303(d) report is a listing of waterbodies for which existing pollution controls are not stringent enough to attain and maintain water quality standards. The 303(d) list is issued every two years and covers the previous two years. The 303(d) list is a subset of the 305(b) report. The EPA reviews the state 303(d) lists and approves the lists. Once the list has been approved, Total Maximum Daily Loads (TMDLs) are supposed to be developed for each waterbody listed in the 303(d) list. Waters listed on the 303(d) list are considered a priority for water quality improvement efforts, including regulatory approaches such as permit issuance, and efforts to control pollution sources that have historically been exempted from regulation such as certain agricultural and forestry practices.

OBJECTIVES OF THE AUDIT

For the 2000 National State Auditors Association's joint audit project, audit organizations in 12 states chose to participate: Arkansas, Colorado, Georgia, Hawaii, Iowa, Kentucky, Louisiana, Maryland, Michigan, Montana, Oregon, and Tennessee. Auditors from ten states met in Nashville, Tennessee, in January 2000 to determine the audit objectives and to draft the audit program. The three joint objectives selected were

- 1.to determine whether state regulatory programs meet or exceed minimum EPA standards for drinking water and surface water;
- 2.to determine whether states have an effective monitoring program for drinking water and surface water; and
- 3.to determine whether states apply corrective actions effectively.

States were allowed to modify the audit program and the above objectives, if desired, to better address issues relevant to their states. Some states covered additional areas. For example, Hawaii assessed the state's use of the Drinking Water Treatment Revolving Fund; Louisiana reviewed the fragmentation of the state's water quality programs; and Colorado focused mainly on discharge permitting, nonpoint source activities, and financial assistance programs. Kentucky focused on animal feeding operations, improper sewage disposal, and acid mine drainage. Oregon determined whether the drinking water program was conducting sanitary surveys of public water systems in a timely manner and whether public water systems report all positive sample results to the state. This report is a summary of the audit work and focuses primarily on that work relating to the three joint objectives.

SCOPE AND METHODOLOGY

In general, the audit covered the calendar years 1997 through 1999. Arkansas, Colorado, Georgia, Hawaii, and Maryland released reports in 2000, while the remaining states completed their reports in 2001. The audit work reported herein was conducted in accordance with generally accepted government auditing standards. The methods used included:

1. reviews of state and federal laws and rules, state policies and procedures, files and database information on water systems, wastewater dischargers, and certified operators,
2. reviews of information systems for the drinking water and surface water programs, state reports submitted to the EPA, program reports and records, complaint files, federal audits and national research reports, and data on other states' programs;
3. interviews with program staff, local and federal officials, and stakeholders;
4. site visits to regional offices, laboratories, nonpoint source pollution projects, water system operators, and wastewater dischargers; and
5. observations of staff activities, including water sampling techniques and chain of custody procedures.

CONCLUSIONS AND RECOMMENDATIONS

OBJECTIVE 1

DO INDIVIDUAL STATE REGULATORY PROGRAMS MEET OR EXCEED MINIMUM UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA) STANDARDS FOR DRINKING WATER AND SURFACE WATER?

The EPA National Primary Drinking Water Regulations are legally enforceable standards that apply to public water systems. Primary standards protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in public water systems.

In regards to surface water, the EPA has established criteria for acceptable levels of pollutants detected in surface waters based upon the designation (drinking, agricultural, industrial, and recreational) of each water supply. The EPA considers the variance of water contaminants throughout the country and the amount of state resources available in establishing procedures to be used by the states in determining water quality standards for the various designations of surface water.

Of the seven states (**Arkansas, Colorado, Iowa, Louisiana, Maryland, Oregon, and Tennessee**) that specifically commented on both surface water and primary drinking water standards, all found that their state standards met or exceeded the EPA standards. **Georgia, Hawaii, Michigan, and Montana** focused solely on drinking water. Georgia, Hawaii, and Michigan have implemented and enforced state programs of regulations that meet or exceed national drinking water standards. Montana state law requires that standards may not be more stringent than comparable federal regulations or guidelines.

OBJECTIVE 2
DO INDIVIDUAL STATES HAVE AN EFFECTIVE MONITORING PROGRAM
FOR SURFACE WATER AND DRINKING WATER?

Surface Water Quality Monitoring

Of the six states (**Arkansas, Colorado, Iowa, Maryland, Oregon, and Tennessee**) that specifically commented on their state's policy for surface water monitoring standards, all found that their state met minimum standards set by EPA.

Monitoring for compliance with water quality standards has proven to be a constant challenge. This joint audit focused on the following areas: self-monitoring and reporting, Total Maximum Daily Loads (TMDL), permitting, permit backlogs, data management and information systems, nonpoint source pollution, and qualifications. Other areas addressed include the Water Pollution Control Revolving Fund and planning and coordination between different groups.

Self-Monitoring and Reporting

In **Arkansas**, the National Pollutant Discharge Elimination System (NPDES) permitted dischargers are self-monitored and report to the Department of Environmental Quality through the use of periodic Discharge Monitoring Reports (DMRs). Self-monitoring and reporting parameters are established on a permit-by-permit basis. The DMRs are reviewed for filing compliance, and if reports are five days late, an administrator notifies the delinquent facility of the tardiness of its report. A computer-generated Error Report is produced for each administrator, identifying facilities with unreported data. No exceptions of this review process were identified during the review of submitted DMRs.

In **Iowa**, a weakness in the Department of Natural Resources' system is that nonmajor facilities are monitored only as resources permit. It was also noted that samples from point source dischargers are tested and results are reported by certified labs; however, the permit holder selects the samples tested. The department also selects a sample to be tested at least once a year. In conclusion, the department does not have any controls in place to ensure proper selection of samples by point source dischargers.

In **Louisiana**, the Department of Environmental Quality does not appear to be reviewing minor facilities' self-monitoring reports to ensure that they are in compliance with permit limits. Auditors reviewed 42 minor facilities' permit files and found that these facilities were required to submit 715 monitoring reports in 1998 and 1999. These facilities did not submit 153 (21%) of the required reports. For major permits, the department reviews the reports for completeness and enters the data into the national Permit Compliance System (PCS) database. The computer then

analyzes the data and determines whether effluent violations exist. Neither state law nor the EPA requires that the department review self-reported monitoring data. The EPA recommends, but does not require, that states input self-monitoring data from minor facilities into the PCS. This system is a national EPA database where states enter permit limits and enforcement and monitoring data on major facilities. The EPA encourages states to enter this same data on minor facilities as resources allow.

In **Oregon**, there were no instances identified where the Department of Environmental Quality did not accept self-reported monitoring data. However, if something looked incorrect during a quick review of the Discharge Monitoring Report (DMR), an inspector may look at the report more closely or request additional information. Reviewers were unable to identify policies/procedures developed by the department to ensure self-reported data is verified for accuracy and timeliness. According to department officials, verification of self-reported data is limited by time and staffing levels and is the responsibility of the permitted facility. Failure to verify self-reported data increases the risk that inaccurate or falsified data will not be prevented or detected. The system of controls intended to ensure that self-reported data is accurate and timely was reviewed. Interviews with department program coordinators and regional staff indicate that the state accepts self-reported data at face value. Only if a violation is observed, a complaint is made, or reported data appears to be questionable, will an inspector question the report and/or launch an investigation. Inaccuracies and corrections are the responsibility of the permitted facility.

In **Oregon**, most permits require the permit holder to submit DMRs on a monthly basis, but some are required to report less frequently depending on the permit. Most reports are submitted timely, some are late, and some are not submitted at all. Reports are reviewed by department inspectors; however, the review varies depending on an inspector's familiarity with the file and past compliance. There is no formal policy in place to note that a review has been conducted. In addition, there is no standard system to track when DMRs are submitted or reviewed. According to inspectors, the Source Information System (SIS) database is not used primarily because the system was not practical or user friendly. In addition to the problems with the database itself, there is also a training problem with department personnel. Some staff were entering incorrect information to the database. Some permit inspectors have developed their own tracking systems or keep a manual log.

In **Tennessee**, the National Pollutant Discharge Elimination System (NPDES) permit holders report their own discharge monitoring data to the Division of Water Pollution Control at frequencies stated in their discharge permits. The frequency is determined by the volume and types of pollutants discharged and varies by permit. Larger permit holders do much of their analyses on site and report directly to the division, while smaller permit holders generally send effluent samples to contract labs for analysis and then report the results to the division. The department stated that there is nothing to prevent permit holders from submitting false information. However, there are quality assurance measures conducted by the division and EPA to discourage it. In addition, staff look for certain clues that might indicate that a lab has a problem or may be misrepresenting results, such as very consistent results, frequent outliers, or bad data.

Recommendations

- **Louisiana** recommended that the Department of Environmental Quality should at least spot check self-monitoring data for minor facilities. Also, the department should begin entering more permit limits on minor facilities into the Permit Compliance System (PCS) when resources allow. The department could also implement a priority system for reviewing self-monitoring data for facilities that are consistently out of compliance. The department should implement electronic submission of discharge monitoring reports which may result in a more efficient review of self-monitoring data.
- **Tennessee** recommended that the Division of Water Pollution Control examine controls over self-reported data to ensure that controls are sufficient to discourage false reporting and to catch inaccurate reporting by permit holders. All division staff who review monitoring data should be trained in how to recognize questionable test results.

Total Maximum Daily Loads (TMDLs)

Five states reported on their state's progress in developing Total Maximum Daily Loads (TMDLs). A Total Maximum Daily Load (TMDL) is the maximum amount of a pollutant (such as nitrogen) that a water body can assimilate and still meet water quality standards for its designated use (such as fishing and swimming) and is essential for improving the quality of polluted water bodies. Without an established TMDL for each identified pollutant, existing wastewater discharge permits may be allowing permit holders to discharge excessive amounts of pollutants into the state's water bodies, including rivers, lakes, and streams. The TMDL is determined by a study which (1) quantifies the amount of a pollutant in a stream, (2) identifies the sources of the pollutant, and (3) recommends regulatory or other actions that may be needed in order to clean up the stream. These actions could involve reducing the amounts of pollutants being discharged under the National Pollutant Discharge Elimination System (NPDES) permits or requiring installation of other control measures. The EPA is ultimately responsible for TMDL development under the federal Clean Water Act. Various lawsuits across the nation relating to the slow development of TMDLs could require the EPA to take action.

In **Arkansas**, the Department of Environmental Quality has been indirectly involved in a lawsuit filed against the EPA regarding the development of TMDLs. The lawsuit was settled in summer 2000 with the agreement that TMDLs would be calculated on all Arkansas streams. However, it is still unclear how much of this work will be done by the department and how much will be done by the EPA.

In **Iowa**, neither the Department of Natural Resources nor the EPA is developing TMDLs as required by the Clean Water Act. The EPA Region 7 is currently involved in a lawsuit aimed at requiring the EPA to develop TMDLs for Iowa's 303(d) waters. The department is not a party to the lawsuit.

In **Maryland**, the Department of the Environment has made minimal progress in establishing TMDLs for 196 polluted water bodies, as required by the Federal Clean Water Act of 1972. The department has identified, in the aggregate, 367 pollutants in the aforementioned 196 water bodies and, as of June 30, 2000, had established TMDLs for only 11 of the identified pollutants.

In 1987, **Oregon** and the EPA entered into a consent decree where it was agreed that if the state failed to follow a specified plan for development of TMDLs, the EPA would take action no later than 90 days following Oregon's inaction. In 1997, the EPA was again taken to court to force TMDL development. The U.S. District Court agreed with the EPA that the Memorandum of Agreement the Department of Environmental Quality negotiated with the plaintiffs would now be the substance of a revised consent decree. The department must determine TMDLs for 1,168 state water body segments but has completed TMDLs for only 73 segments.

Tennessee did not meet its goal for developing TMDLs for calendar year 2000. However, its planning process and the rotating watershed approach to monitoring has prepared the Division of Water Pollution Control for both TMDL development and permit issuance. The rotating watershed approach enables the division to designate watersheds (a watershed is the land area that drains into a stream) to be placed in one of five groups, with activities in each group of watersheds scheduled according to the five-year cycle. Each group includes watersheds in all geographic areas of the state so that monitoring activities are not concentrated in any one area in any given year.

Recommendation

- **Maryland** recommended that the Department of Environment continue its efforts to establish Total Maximum Daily Loads (TMDLs), particularly with respect to pollutants designated as high priority.

Permitting

States issue permits under the National Pollutant Discharge Elimination System to regulate the amount and kind of pollutants discharged into water bodies. One state found that many permitted facilities were not inspected.

In **Louisiana**, 34% of major and significant minor facilities were not inspected by the Department of Environmental Quality from fiscal year 1996 to 1998. In addition, 10% of minor facilities may never have been inspected by the department between 1990 to 1999.

The **Arkansas** Department of Environmental Quality has quality control procedures in place which include annual inspections of National Pollutant Discharge Elimination System (NPDES) major facilities (facilities discharging more than one million gallons per day). These on-site inspections include a review of monitoring procedures and lab facilities. Additionally, the department established a quality control target of inspecting NPDES minor facilities (facilities

discharging less than one million gallons per day) once every three years. The EPA does not require these inspections.

In **Oregon**, permit writers in the Northwest Region indicated that some basic standards were consistent from permit to permit. Industrial permit standards are generally consistent within industry category. For all permits, the system of reporting is basically consistent, but the reported parameters frequently vary.

Recommendations

- **Arkansas** recommended that in continuing to maintain high quality control standards, the Department of Environmental Quality continue to strive to meet its target of inspecting minor facilities at least once every three years.
- **Louisiana** recommended that the Department of Environmental Quality ensure that its inspectors conduct all inspections at the frequency required by its policies and procedures.

Permit Backlog

A permit is considered backlogged when a renewal application has been received but the permit review process has not been completed by the permit's expiration date. Untimely reissuance of permits may result in facilities operating under outdated or less than stringent standards.

Colorado found that 45% of the major permits and 36% of the minor permits were backlogged in December 1999. The state's Water Quality Control Division attributed the backlog to loss of staff and to growth in the state, which increases the number of permits needed. The audit found little evidence of water quality deterioration or increased noncompliance of discharge limits associated with the backlog. The division has made significant efforts to address the permit backlog, but it still will not meet the EPA's deadlines and will not, according to its own plan, have eliminated the backlog until at least 2005. The division's goal is to reduce the backlog to 10% by December 2005. The division has begun using contract resources to perform some functions related to permitting. However, this practice should be expanded. Increased use of contract work would allow the division to eliminate the backlog sooner and direct resources to other functions without making a permanent commitment to additional staffing.

The division believes the frequency with which permits are updated and renewed should be driven by risk factors rather than simply by the passage of time. The division is moving to a watershed approach to water quality management that would support this sort of permitting strategy. Adjustments to policies and procedures would be needed, such as ensuring ongoing communication between the Assessment and Permits Units so that permit drafters would be kept up to date on any standards changes and updating the division's data systems to efficiently identify permits affected by changes such as the establishment of new standards.

Currently, the five-year expiration date triggers a process that includes a complete review and redevelopment of the permit. The division does not automatically renew any permit or rank applications based on criteria such as type of facility, location of discharge, quality of water in the receiving water body, or other factors. Some states have developed systems to rank permits to determine the amount of work needed to update or renew them. Federal law prohibits the division from allowing permits to extend beyond five years without risking the loss of its permitting delegation from the EPA. However, the division could propose changes to the state law to remove this limitation and make policy and procedural changes that would result in a permitting approach that is more risk-based.

Louisiana found that 54% of major permits and 10% of minor permits had expired. After five years, a facility must reapply to the Department of Environmental Quality to renew its permit. However, if a facility submits the application at least 180 days before the permit expiration date, state regulations allow the facility to continue operating under the expired permit conditions until the department can reissue the permit. According to the department, the backlog was the result of receiving primacy for the National Pollutant Discharge Elimination permit program from the EPA in 1996. The department had to revise all major permits and begin issuing minor permits under EPA guidelines.

Tennessee's permit backlog has been above 10%. In June 2000, the backlog for major facilities was 23% and for minor facilities was 13%. A lack of experienced permit writers, other staffing inadequacies, and inadequate resources all appear to have contributed to the backlog. However, the backlog for major facilities had dropped to 10% by January 2001, and the EPA had provided training to the permit writers.

Recommendations

- **Colorado** recommended that the Water Quality Control Division may want to expand the use of contractors to assist in reducing the permit backlog. The division has the ability to use the EPA's contractor to outsource permit-related work in the future. In addition, the division should implement an approach for renewing permits that includes evaluating permits to determine the amount of work required for renewal, establishing a streamlined process for permit renewal, and continuing to move toward a permitting process that bases renewals on changing circumstances and needs. The division should propose changes to the five-year duration requirement from the statutes and establish permit lengths in regulations. In addition, steps should be taken to streamline the permit amendment process. The division should expand its workload tracking effort in the Permits Unit to include greater detail on all significant unit functions including issuance of permit amendments, groundwater permits, and certifications.
- **Tennessee** recommended that the Division of Water Pollution Control ensure that it has the resources it needs to prevent the backlog from exceeding 10%.

Data Management/Information Systems

Several states found data in information systems used to track permitted dischargers was inaccurate.

A review of **Arkansas'** information system for its surface water program revealed discrepancies between database-generated reports and the original source data contained in discharge monitoring reports (DMRs). Specifically, problems were found with the reporting of late filings of DMRs and in the count of violations reported on DMRs.

In **Colorado**, all data (water sample analysis) and routine reports are submitted to the Water Quality Control Division by the permitted water dischargers in hard copy, which must then be entered into the Permits Compliance System (PCS) by staff. Other states that use or are trying electronic reporting have noted that, in addition to reducing the need for staff to process and enter data from hard copy reports, electronic reporting has improved the quality of their data (e.g., fewer data entry errors).

Maryland's deficiencies in the EPA's Permit Compliance System (PCS) hindered the Department of Environment's efforts to identify National Pollutant Discharge Elimination System (NPDES) permit reporting violations by wastewater dischargers. Reporting violations are the result of a wastewater discharger's failure to either conduct or report required tests. The PCS contains automated edit checks that identify wastewater discharger reporting violations. However, department personnel advised the auditors that the reporting violation listings generated by the PCS contain numerous entries that do not represent actual reporting violations and as a result, the listings are not reliable and are not used by the department to identify reporting violations.

Oregon reported that the databases maintained by the department contain incomplete and inaccurate information. The Department of Environmental Quality maintains 13 databases related to the Water Quality (WQ) program. The Source Information System (SIS) is designed to track WQ permit information. However, several department Information Systems officials, program coordinators, and regional inspectors/compliance officers indicated that the data is inaccurate and not up-to-date. During the auditors' review of self-reported data, they found numerous records dated 1901 in one database, which is an indication that the application is not Y2K compliant or that other problems exist. According to the WQ information systems manager, the system was designed without adequate edit checks or field requirements to reduce the risk of data entry errors and inconsistencies. Overall, reviewers were unable to identify satisfactory controls to ensure the accuracy or completeness of data within the department's WQ computerized applications.

The department does not maintain the Permit Compliance System (PCS) database; EPA staff performs all maintenance for Oregon. The EPA does not have access to department staff and information; thus, data entered into PCS may not be accurate or up-to-date. Interviews indicate that databases maintained by the department also contain incomplete and inaccurate information.

In **Tennessee**, water quality monitoring data collected for purposes other than enforcement is collected by the Division of Water Pollution Control in addition to various other agencies and

entered into a database housed at the central office by data entry staff. The division accepts water quality data from any group or organization that EPA accepts as having data gathering capabilities. Up until December 31, 1998, data arriving at the central office from state labs and other sources was entered directly into the EPA's STORET (Water Quality Storage and Retrieval System) database, which originated in 1995. A new STORET database was supposed to go on-line on January 1, 1999, but as of November 2000, the new system was still not able to accept state-entered data. Currently, the division stores this data on an in-house Access database. The new STORET database is an Oracle-based system that will automatically digitize water quality data on a Geographic Information System (GIS). Division management reports that data will take more time to enter on the new system, and will require more information to be entered manually. Management indicated that they are working on automating data entry from labs, so that once it is entered at the labs, it will go automatically to the STORET database, where it will be available to the public.

The division's procedures for sampling contain specific guidelines regarding sample collection methods, quality assurance/quality control procedures, chain of custody requirements, and a description of legal ramifications of sampling. Also, the EPA performs an annual review of the state division's monitoring program, and feedback from the EPA about these reviews has consisted mainly of staffing concerns.

Recommendations

- **Arkansas** recommended that the Department of Environment Quality develop both automated (review of software programming, routine software testing) and manual (sampling, proofing) procedures to prevent and detect discrepancies in the department's information system.
- **Colorado** recommended that the Water Quality Control Division pursue the establishment of an electronic self-reporting system that would allow permitted water dischargers to report their monitoring information via electronic means. To do this, the division should work with permitted facilities to determine their capabilities and needs as well as use other states as models and resources.
- **Maryland** recommended that the Department of Environment, in conjunction with the Environment Protection Agency, identify and correct the Permit Compliance System (PCS) so that the reporting violations are correctly identified. In the interim, the department should use the manual log to ensure that it has received all discharge monitoring reports.
- **Tennessee** recommended that the Division of Pollution Control ensure that direct data entry into the Water Quality Storage and Retrieval System (STORET) and automated entry of lab results do not compromise quality control/quality assurance measures. In addition, the division should develop and implement new procedures to ensure the quality and integrity of water quality data.

Qualifications

Problems in tracking laboratory qualifications and certified operators and concerns about in-house labs were noted by several states.

In **Arkansas**, all commercial labs that operate in the state must obtain an annual Department of Environmental Quality certification. When inspections are conducted at the labs, the inspector reviews quality control techniques, lab equipment operation, and the qualifications of the individuals who are working in the lab. However, the state lab certification inspector does not track current lab certifications for expiration.

In **Iowa**, labs and operators performing tests on samples from point source dischargers are required to be tested. Controls in place surrounding the testing and certification of the labs and operators are in place and operate effectively. However, some of the major facilities have in-house labs/operators that are employees of the facility being tested; therefore, the independence of the operator cannot be relied upon.

In **Louisiana**, the Department of Environmental Quality does not accredit in-house laboratories. The department's Laboratory Accreditation Program accredits commercial laboratories that submit samples from permitted facilities that prove compliance with water discharge permits. Laboratory accreditation staff currently inspects these laboratories every three years to ensure that all methodologies are approved and followed. However, Louisiana code only applies to accreditation of commercial laboratories. Therefore, noncommercial laboratories, such as the in-house laboratories at Exxon and other large facilities, are not accredited by the department. There are about 1,000 of these in-house laboratories. Because the department is not accrediting these laboratories, it is not ensuring that data from the facilities that produce large amounts of waste in the state are accurate. In addition, some data submitted from these laboratories may be less reliable than data submitted from accredited labs.

In **Oregon**, the Department of Environmental Quality laboratory located on the campus of Portland State University performs ambient water quality monitoring. The department's laboratory program maintains a network of 156 ambient water quality monitoring stations at various sites around the state to collect samples of surface water from rivers, streams, and lakes. In Oregon, lab staff collects and analyzes all samples in accordance with established EPA or approved alternate procedures. The lab does not rely on self-reported data based on permitted activities or independent laboratories.

The controls implemented by the department appear to be adequate to ensure operators obtain and maintain certification and continuing professional education (CPE). However, the database used to track operators and cross-reference to treatment plants in which they work is not up-to-date.

Recommendations

- **Arkansas** recommended that a listing of labs currently certified by Arkansas be maintained and updated continuously to facilitate confirmation of current lab certification during field inspections.

- **Louisiana** recommended that the legislature may wish to amend state statutes to also include accreditation of noncommercial laboratories. This would help ensure that data submitted from these laboratories are more reliable and accurate. Without accurate data, it may be impossible for the Department of Environmental Quality to determine if these facilities are in violation of their water discharge permits.

Planning and Coordination

Some states participating in the joint audit were concerned about planning and coordination between different governmental entities because some states have multiple oversight agencies.

In **Colorado**, the Water Quality Control Division and others have taken a step to improve water-monitoring coordination in Colorado. In 1998, the division, along with Colorado State University and the U.S. Geological Survey, initiated a statewide Water Quality Monitoring Council. The Council consists of representatives from approximately 80 organizations including local, state, and federal agencies; environmental groups; private industry; higher education; and citizen initiative groups. Goals of the council include 1) providing strategic direction for a statewide water quality monitoring network; 2) promoting the development of collaborative and cost-effective watershed-based monitoring strategies; and 3) promoting the use of quality assurance procedures and protocols related to sample collection, analytical methods, assessment, and data management. For example, collecting water samples for regulatory decisions is a technical and time-consuming task for the division's Monitoring Unit. Expanding efforts to share information with other agencies that collect and test water consistent with division operations has the potential to provide efficiencies and cost savings for all participants. In addition, the use of volunteer groups for sampling allows the division to expand its resource base to accomplish more work without significant additional cost. It is estimated that the average cost of collecting and analyzing a water sample is about \$535. If a volunteer group collects water samples that are then tested by the division, it is estimated that about \$300 per sample could be saved in staff time and travel costs. Currently, there are no formal agreements to routinely share water-sampling results with other agencies.

In **Louisiana**, the programs that are designed to protect water quality are housed in five different state departments. Because these programs are in separate departments, some water quality functions within these departments may not formally coordinate related water quality responsibilities. This lack of formal coordination and communication may result in fragmentation. For instance, both the Office of Public Health (in the Department of Health and Hospitals) and the Department of Environmental Quality have laboratory accreditation programs which are in the process of becoming accredited by the same national accrediting entity. Both laboratory programs accredit laboratories for environmental purposes. Because both departments may accredit the same laboratories, these two programs could be combined under one administrative entity to reduce costs to the state.

In **Oregon**, the Department of Environmental Quality (DEQ) has working relationships with the Forestry and Agriculture Departments, but state regulations have established that the DEQ is

responsible for coordinating efforts aimed at protecting and improving groundwater quality in the state. These departments manage and can address nonpoint source pollution (NPS). While the DEQ is delegated by EPA to administer the National Pollutant Discharge Elimination System (NPDES) program, a memorandum of understanding was negotiated with the Department of Agriculture to oversee confined animal feed lots. DEQ is responsible for establishing standards for surface water within forested areas but coordinates with the Department of Forestry to protect water quality while still managing commercial forest activity.

Recommendations

- **Colorado** recommended that the Water Quality Control Division expand its efforts to share water quality sampling activities and information with other organizations. In addition, the division should work with the Denver Water Department to establish an agreement to share water sampling in a manner acceptable to both agencies, and based on the success of this effort, pursue future agreements with other entities. The division should also expand efforts to use volunteer resources to collect samples, particularly for use in activities that do not directly result in standards setting, permitting, or Total Maximum Daily Loads (TMDL) development.

Water Pollution Control Revolving Fund

The 1987 amendments to the federal Clean Water Act created a new program for funding construction of publicly owned water treatment works. The program replaced the existing Federal Construction Grant Program with a revolving loan fund.

Colorado found that interim construction inspections conducted on Water Pollution Control Revolving Fund projects provide little value. Interim inspections were consistently made on a quarterly basis, in addition to initial and final inspections, even in cases when minor deficiencies were noted in the initial inspection. Reportedly, the value of these inspections appears limited, in part because the entity that will be operating the facility is ultimately held responsible by the Water Quality Control Division for the effectiveness of the system and the ability to meet effluent standards.

Recommendations

- **Colorado** recommended that the Water Quality Control Division reduce the number and frequency of construction inspections on Water Pollution Control Revolving Fund projects by implementing a risk-based approach to conducting interim inspections. Using a risk-assessment approach to reduce the number of interim construction inspections would allow for scarce engineering resources to be applied to other priorities without increasing the likelihood of problems during construction of a facility.

Drinking Water Quality Monitoring

Conducting required monitoring is critical to ensure problems are detected. This joint audit focused on the following areas: Oversight of local agencies, Drinking Water Revolving Loan Fund, consistency, water sampling data, sanitary surveys, information systems, operator and lab qualifications, and emergency preparedness.

Of the nine states (**Arkansas, Colorado, Georgia, Hawaii, Iowa, Louisiana, Maryland, Michigan, and Tennessee**) that specifically commented on their state's policy for drinking water monitoring standards, all found that their state met minimum standards set by EPA.

In **Oregon**, the state's testing requirements for volatile and synthetic organic chemicals for drinking water are less stringent than those set by the EPA. Oregon allows for less frequent testing. As a result, some Oregon water systems may not have a sufficient number of tests completed to clearly indicate users' level of exposure to regulated substances.

Recommendations

- **Oregon** recommended that the Department of Human Services Health Division implement federal standards for volatile and synthetic organic chemical testing frequency. The division should adopt and enforce the federal testing frequency requirements in the current compliance period.

Oversight of Local Agencies

In **Michigan**, the Drinking Water and Radiological Protection Division has adopted a risk-based monitoring process for overseeing activities of local health departments, which requires division field staff to perform on-site evaluations of each health department based on a health department action plan developed in December 1997. The action plan permits field staff to reduce on-site visits for any health department that is in significant compliance with contract provisions after a history of two years' compliance with the minimum program requirements. Local health departments in compliance may complete and submit a self-evaluation for two years following two consecutive years of on-site evaluations with full compliance with minimum program requirements. The division did not comply with its evaluation action plan. Twelve health departments did not receive an on-site evaluation and did not complete a self-evaluation in 1998. Six of the 12 did not receive an on-site evaluation or complete a self-evaluation in 1999. Two of the six were out of compliance with at least one minimum requirement in 1997. Failure to monitor for proper program implementation is a serious internal control weakness that could jeopardize the health of users of these non-community drinking water suppliers.

Recommendations

- **Michigan** recommended that the Drinking Water and Radiological Protection Division improve its oversight of the non-community drinking water program by implementing existing program monitoring requirements.

Drinking Water Revolving Loan Fund

Three states suggested improvements in the implementation of this loan program so it can better help public water systems. The Drinking Water Revolving Loan Fund, created by the 1996 amendments to the federal Safe Drinking Water Act, provides federal grants from the EPA to the states. The purpose of the fund is to help public water systems finance the costs of water system infrastructure needed to achieve or maintain compliance with the Safe Drinking Water Act.

Colorado noted that the privately owned public water systems, such as mobile home parks and restaurants, are not eligible under state law to receive loans from the Drinking Water Revolving Loan fund. Of the 2,000 public drinking water systems in Colorado, over 1,400 are owned by either private or nonprofit entities. According to Water Quality Control Division staff, privately owned systems are more likely to be in need of improvement or have compliance-related problems than publicly-owned systems. The EPA is supportive of such loans because the fund should be used as a tool to assist all drinking water systems in complying with rules and standards.

Hawaii found that its Drinking Water Treatment Revolving Loan Fund had not been used to its full potential. As of June 2000, only one loan had been made from the fund, which was established in 1997.

Louisiana found that its creation of the Drinking Water Revolving Loan Fund Program as a separate entity causes fragmentation. The 1996 amendments to the Safe Drinking Water Program authorized the states to set up this fund to provide loans to water systems that need improvements in order to meet federal standards. The Office of Public Health set this program up in the Environmental Health division but as a separate program from the Safe Drinking Water Program in Engineering Services even though they share staff, funds, and responsibilities.

Recommendations

- **Colorado** recommended that the Water Quality Control Division work with the Colorado Water Resources and Power Development Authority to seek change to state law to allow moneys in the Drinking Water Revolving Fund to be loaned to privately owned public drinking water systems for compliance or capacity development projects.
- **Hawaii** recommended that the Department of Health work with public water systems with high priority projects to ensure they will be ready to apply for assistance from the revolving loan fund.

- **Louisiana** recommended that the Drinking Water Revolving Loan Fund Program and the Safe Drinking Water Program should be combined into one program. In addition, the legislature may wish to consider whether water programs could be consolidated into fewer departments.

Consistency

Several states found consistency of monitoring to be a high-risk area. For example, inconsistencies in monitoring by regional offices led to differences in the frequency of sanitary surveys and the areas reviewed in a sanitary survey.

Georgia noted communication and coordination problems between the Drinking Water Compliance Program and the regional offices. Examples of the communication/coordination problems included differences on how often the regional offices thought sanitary surveys were required and on perceived reporting requirements for regional offices. One regional office was doing some sanitary surveys more often than required and one office targeted “problem” systems for surveys and randomly selected others for review.

In **Louisiana**, the current organizational structure of the Safe Drinking Water Program within the Office of Public Health does not allow the Central Office administrative control over the entire program. This lack of control leads to inconsistent application of regulations and monitoring activities in the district and regional offices, in addition to difficulties in tracking funding. The central office has not produced a standard operating procedures (SOPs) guide for the regional/district offices. The lack of SOPs can further contribute to the inconsistent implementation of monitoring activities from region to region.

Montana’s ongoing problems with staff turnover, new rule interpretations, and the use of consultants increases its risk of monitoring inconsistencies. Other concerns noted inconsistencies in the forms used, report format, and areas reviewed for sanitary surveys.

Michigan’s Drinking Water and Radiological Protection Division has established a policy manual for the non-community drinking water program, and several resource documents and manuals are used in the community drinking water program. However, these materials have not been formally adopted by the division. The Department of Environmental Quality has decentralized the community drinking water program. Employees are assigned to eight field locations throughout the state. As a result, eight managers are making independent decisions on how to implement the community drinking water program, which has led to inconsistent instructions to drinking water supply systems regarding contents of required reports, plant information, and water testing documentation. The department has contracted with 43 local health departments to administer the non-community drinking water program. With the decentralization of the community drinking water program and the implementation of the non-community drinking water program by the health departments, it is critical that the division develop a comprehensive written policies and procedures manual to provide for the consistent implementation of federal and state laws, rules, policies, and procedures relating to the community and non-community drinking water programs.

The lack of such a manual can impact the effectiveness and efficiency of program operations and hinder the consistency of program practices between the field offices and the central office, in addition to contributing to different interpretations of state and federal program requirements.

In **Tennessee**, each community public water system has a monitoring program established detailing the sampling requirements along with any waivers that have been granted. Monitoring requirements are based on the type of system, treatment, water source, populations served, pipe materials, and whether a system had previously detected a particular contaminant or is vulnerable to a contaminant. Using these criteria, systems are addressed the same way no matter where they are located in the state.

Recommendations

- **Georgia** recommended that the Environmental Protection Division's Drinking Water Compliance Program improve the level of communication and coordination that exists between it and the Regional Office personnel by providing more guidance on the duties they expect to be performed and the frequency with which they expect these duties to be performed. In addition, the program should also take an active role in monitoring the drinking water related activities of the regions.
- **Louisiana** recommended that the Office of Public Health should implement a centralized structure with regional and district staff reporting directly to the Central Office. If the office is not restructured, best management practices among districts should be considered. A standard policies and procedures manual for the district and regional offices should be developed to help promote standardization.
- **Montana** recommended that the Department of Environmental Quality standardize agency position descriptions to address classification/pay inequities between engineering positions. In addition, the department may need to develop rules and a work plan to identify Montana Environmental Policy Act (MEPA) documentation needed to address staff inconsistencies. Rule development may also be needed.
- **Michigan** recommended that the Drinking Water and Radiological Protection Division formally adopt its written policies and procedures manual for the community and non-community drinking water programs.

Water Sampling Data

Water systems staff must sample the water periodically for various contaminants. Many states rely on self-reported data, and some audit reports noted concerns about the reliability of this data. States also found that required samples were not always collected and that water divisions did not review sampling data.

In **Arkansas**, the Department of Health restricts the amount of self-reported data. Only nine of the state's public water systems are allowed to submit self-reported data. All others submit their water samples directly to the department's laboratory for testing. To ensure that submitted water samples are properly collected and are representative of the water quality in the water systems, the division collects unannounced samples from each system, on a random basis, so that each system is sampled about once every three years. In order to verify self-reported data, the water systems that report the data are required to submit monthly, for quality assurance purposes, the greater of six water samples or 10% of the required water samples to be tested by the department's in-house lab.

In **Colorado** all data (water sample analysis) and routine reports are submitted to the state by the public water systems in hard copy, which must then be entered into the Drinking Water Information Management System by staff. The estimated cost of this process is about \$7,000 per year. Reportedly, other states that use or are trying electronic reporting have noted that, in addition to reducing the need for staff to process and enter data from hard copy reports, electronic reporting has improved the quality of the data (e.g., fewer data entry errors).

Georgia's drinking water program performs no verification of self-reported data. Currently, employees of the various water systems throughout the state are responsible for drawing and submitting water samples for testing, and no verification activities are performed to ensure that the systems are submitting water samples that actually came from their systems.

Hawaii found that its Department of Health generally met monitoring requirements for public water systems. All chemical monitoring requirements were met for the 29 systems in the sample; however, one system did not collect the required number of monthly coliform (microbiological) samples. However, the auditors noted that the chain of custody of the water samples was not consistently documented. Chain of custody forms are used to record whenever samples are collected, transferred, stored, analyzed, or destroyed and are used to trace the possession of the sample from its collection to analysis. Information was often missing from the chain of custody forms or the chain of custody was not properly documented on the form.

Louisiana found inconsistencies with the number of routine and repeat samples collected among the districts during a file review. Also, it was impossible for the auditors to determine if the correct routine and repeat samples were collected for some public water systems that use non-state laboratories. The federal Primary Drinking Water Guidelines require a certain number of routine samples to be collected monthly, depending upon the population served by the water system. The guidelines also require a certain number of repeat samples to be collected depending on the number of samples that test positive for total coliform and the total number of routine samples collected. The guidelines also state that the public water systems are ultimately responsible for the collection of the samples; however, in Louisiana, the majority of samples are collected by state sanitarians. In addition, the state does not require water systems to pay for any sampling or monitoring costs. The state conducts all inspections, tests, etc. As a result of their inability to charge fees to the water systems for services provided that the systems are responsible for conducting, the Safe Drinking Water Program must rely on funding from the state's General Fund.

In **Maryland**, policies and procedures were in place to effectively monitor drinking water quality for community and nontransient water systems. However, the Department of the Environment did not actively oversee the activities of the local health departments that had been delegated the responsibility to monitor transient water systems, which serve establishments such as restaurants. For example, the department received the results of drinking water tests conducted at transient water systems but did not review the test results to ensure that tests were being conducted at the proper intervals.

Montana has no formal procedures for systematically verifying self-reported data. However, current controls include a comprehensive system of operator certification, the required use of certified labs, and occasionally collecting independent samples. Independent sampling is generally conducted to address identified concerns/noncompliance.

In **Oregon**, all public water systems essentially self-report their laboratory results. Laboratories, independent from the water systems, must report to the system operators, who are then responsible for submitting original laboratory report copies to the division. However, there were critical weaknesses in the state's water quality reporting requirements. Water system operators must test their water for chemical and bacterial contaminants routinely and report the results to the Oregon Department of Human Services Health Division. There were some cases in which a laboratory provided test results to a system operator, but the operator did not report the test results to the division. The division's effectiveness could be enhanced if the law was amended to require laboratories to report test results directly to the division and water system operators. In addition, there were instances in which water systems had a positive sample but did not report the result to the division. One weakness noted is that the division relies on self-reported data and does not independently verify results. Therefore it would be possible for a water system to submit test results that were actually obtained from a different water source.

Tennessee's drinking water program is set up as a self-monitoring program. Water suppliers are required to take certain samples at a scheduled frequency and report the results to the state. All analysis is required to be performed by a state-certified laboratory except for those parameters for which the state grants the supplier approval to perform the analysis. Laboratory officials enter field sample data information on a form and forward this information to the Division of Water Supply to be keyed in by the division's staff. The staff runs data verification or error reports that reject discrepancies. Other data verification reports check for violations on chemicals with enforceable Maximum Contaminant Levels (MCLs) and for detection limit violations on chemicals without an MCL but which the federal government wants to track. If a discrepancy or violation is identified by these error reports, the division contacts the Department of Environment and Conservation's Environmental Assistance Center, lab, or water supplier to verify information. A review of error reports for January through July 2000 showed 5% of the reports had errors.

Based on a review of most recent audit reports by the Department of Health and the EPA and interviews with these officials, there do not appear to be any major concerns about sampling controls, quality assurance, self-reported data, or flow of sample data information from local labs to the division. Officials also indicated that the samples collected and the sample analysis

information that is reported by the laboratories to the division are accurate and consistent. Officials also indicated that Tennessee's Laboratory Certification Program requires adequate controls to prevent laboratories from falsifying and/or altering test results from the samples.

Recommendations

- **Colorado** recommended that the Water Quality Control Division pursue the establishment of an electronic self-reporting system that would allow drinking water systems to report their monitoring information via electronic means. To do this, the division should work with the water systems to determine their capabilities and needs as well as use other states as models and resources.
- **Georgia** recommended that the Environmental Protection Division's Drinking Water Compliance Program consider having personnel randomly sample and test the water of regulated systems to verify that the systems are submitting water for testing that is actually from their systems.
- **Hawaii** recommended that the Department of Health review all chain of custody reports to verify that drinking water samples are properly documented and, as needed, provide training in proper chain of custody procedures and documentation.
- **Louisiana** recommended that the Office of Public Health district and regional staff should ensure that the correct numbers of samples are collected. In addition, this office should issue monitoring violations to those public water systems that do not collect correct samples and provide necessary training to the parish sanitarians in sample collection techniques. The legislature should consider repealing state statutes which prohibit this office from charging public water systems a fee for regulatory activities.
- **Maryland** recommended that the Department of the Environment implement procedures to ensure that the local health departments are properly monitoring transient water systems. In addition, the department should periodically verify that the required tests are taken at proper intervals.
- **Montana** recommended that the Department of Environmental Quality review related compliance and complaint information prior to site visits.
- **Oregon** recommended that the Legislative Assembly consider amending state statutes to require laboratories to report public water system test results directly to both the division and water system operators. The Oregon Department of Human Services Health Division needs complete and timely water quality data to ensure that appropriate action is taken if contamination is found.

Sanitary Surveys

Several states found that all sanitary surveys were not conducted and survey deficiencies were not always followed up. These surveys are periodically conducted of all public water systems to

assess the reliability of the system to provide safe drinking water to the public. A sanitary survey consists of an on-site assessment of all water system components including the water source, the treatment process, equipment, operation, and maintenance of the water supply system. Federal regulations require states with primary enforcement authority to have a systematic program for conducting sanitary surveys on public water systems. These surveys are among the most important tools states can use to help ensure water system compliance with drinking water requirements and are an essential element of a state's drinking water program.

The **Hawaii** sanitary survey program had been inactive from about 1992 to 1997. Since 1997, the program has appeared to make a good faith effort to complete surveys of all systems. However, Hawaii found that the program's follow-up of survey findings was uneven and that the program did not have standard follow-up procedures.

In **Louisiana**, 47% or almost half of the water systems sampled had only one sanitary survey conducted in the past five to ten years when they should have had at least three conducted. According to the workplan submitted by the Office of Public Health to the EPA, sanitary surveys must be conducted annually for surface water systems and once every three years for groundwater systems. The EPA attributed the reason for the delinquencies to staff vacancies and an overly ambitious goal. Without the sanitary surveys, the state is only monitoring the output of the water systems, not the processes themselves. By not monitoring the processes, the state could be missing an opportunity to ensure the quality of the drinking water supplied to the users of the water system. The audit report also noted that most of the districts sampled do not conduct formal follow-up for sanitary survey violations. Without follow-up to the surveys or enforcement action, systems have no incentive to correct violations noted on the sanitary survey.

While the Department of the Environment in **Maryland** had conducted required on-site assessments (sanitary surveys) of community and non-transient water systems, it did not monitor the efforts of the local health departments in completing initial surveys of all transient water systems. In addition, the department did not always maintain documentation that public water systems had corrected deficiencies identified during such surveys.

In **Michigan**, the Drinking Water and Radiological Protection Division has not established a comprehensive oversight and compliance review program to help ensure that water suppliers are in compliance with program requirements. Based on a review of nine community drinking water supply systems, it was noted that neither the division nor water supply system files contained sufficient documentation to ensure that the water suppliers were in compliance with program standards. Four files, including the largest water system in the state, did not contain a sanitary survey. The division was unaware that district office staff had not properly documented or completed sanitary surveys.

In addition, local health departments did not complete surveys for all non-community drinking water suppliers. Based on a review of a random sample of 11 local health departments, 22 of 246 sanitary surveys (9%) were not completed as required at 7 of the 11 health departments. The health departments did not have documentation that they followed-up deficiencies noted in 88 of the 224 surveys (9%) at 10 of the 11 health departments. Sanitary surveys for non-community

drinking water suppliers were not always completed in a timely manner, and serious deficiencies were not followed up on a timely basis.

In **Montana**, the Department of Environmental Quality committed to doing 75 sanitary surveys, requiring local governments to complete 200 with an additional 100 to be completed by private consultants. Due to problems with staff and local staff turnover, the department fell short of its target for community systems surveys. For fiscal year 2000, the department plans to have new staff hired and a new contractor who will be required to complete 470 surveys in a 12-month period.

In **Oregon**, sanitary survey inspections are not conducted as required. As of February 2000, 102 of the 746 community water systems (13.7%) had received one in the past five years. According to program managers, the Department of Human Services Health Division's goal is to comply with the law and conduct a sanitary survey every five years. In order to address the backlog, the division recently began paying county health departments to conduct the sanitary surveys.

Recommendations

- **Hawaii** recommended that the Department of Health develop a systematic program for follow-up on sanitary survey recommendations.
- **Louisiana** recommended that the Office of Public Health should continue striving to meet the sanitary survey goals in the EPA workplan. The Office of Public Health should begin issuing enforcement actions for failure to correct significant deficiencies identified by sanitary surveys and implement a policy that requires follow-up when sanitary surveys show significant deficiencies.
- **Maryland** recommended that the Department of the Environment identify those transient water systems for which an initial sanitary survey has not been received, and require the local health departments to complete them. In addition, Maryland recommended that the department monitor to ensure that the local health departments complete subsequent sanitary surveys as required. Finally, the department should document corrective actions taken by public water systems as a result of deficiencies identified during sanitary surveys.
- **Michigan** recommended that the Drinking Water and Radiological Protection Division ensure that district office files contain sufficient documentation to support substantial compliance with program requirements for the 1,450 community drinking water supply systems. The division could use a file cover sheet or checklist outlining minimum documentation standards, dates they were achieved, and evidence of supervisory review.

In addition, the division should increase its oversight of the local health departments to help ensure that sanitary surveys are completed timely and that serious deficiencies are followed up on a timely basis. The division should monitor health departments to help ensure that the follow-up of sanitary surveys is a top priority and health departments identify which survey deficiencies are considered serious.

- **Oregon** recommended that the Department of Human Services Health Division continue working with counties to complete sanitary surveys. The division should evaluate whether this effort is effective in addressing the backlog of systems needing surveys and, if necessary, develop another approach to effectively meet the sanitary survey requirements.

Information Systems

Federal regulations require states with primary enforcement authority to maintain records on each public water system for compliance with applicable provisions of state regulations. Almost all states reported some type of problem with the information systems used by their staff: from problems with data entry resulting in discrepancies between paper and electronic files and between state and federal databases to the use of multiple databases that pose potential uniformity and consistency problems.

The **Arkansas** Department of Health's drinking water program uses more than one database, thereby increasing the risk of data not being entered or retained uniformly in each system. The department is currently on course to modernize data retention with EPA-approved software that will manage a database network.

Georgia found problems with data maintained in files and records. There were also discrepancies between the hard copies on file and the state database and between the state database and the federal database.

Hawaii found the drinking water program's computerized data management was fragmented and inefficient. The drinking water data was maintained in a variety of stand-alone databases that contained the same data. Maintaining data in multiple databases duplicates efforts. For example, positive water testing results could be manually entered into as many as three separate databases. In spite of the fragmentation, the Hawaii auditors found the data in the central databases was generally accurate.

Iowa found that the results of monitoring cannot be transferred to the Safe Drinking Water Information System (SDWIS)/federal data system effectively. Errors in transferring data from the state's SDWIS to the federal SDWIS cause reporting errors and additional staff time to work with the EPA to manually correct the errors. Some of the data is not transferred, which can cause an item to be reported as a Significant Non-Complier (SNC) when it is in compliance.

Louisiana found that the level of accuracy of the computer data, primarily with the sanitary survey data, varied by district. In one district, the date of the most recent sanitary survey was inaccurate for all the water systems in the sample. The accuracy of the other districts ranged from 69% to 84%. It was also noted that the Safe Drinking Water Program's computer database was often inaccurate for enforcement and violation data. For example, in 1999, 23 of the 36 administrative orders (64%) issued were not entered into the computer. One of the reasons for

the inaccuracy of the administrative order data is that the Enforcement Unit in the central office cannot enter enforcement actions into the database.

In **Maryland**, water sampler information (name and certification number) recorded on the drinking water testing reports received by the Department of the Environment is to be entered into the Public Drinking Water Information System (PDWIS), which performs an automated comparison of the water sampler information entered against a database of certified water samplers. However, information needed to perform this comparison and to identify instances where uncertified persons took samples was not always available or entered into the system.

The **Michigan** Drinking Water and Radiological Protection Division had not developed an effective method to report activities and results of the non-community drinking water program. As a result, local health departments reported significant problems with the automated data management system. Also, the EPA has criticized the division's lack of effort to develop an effective data management and reporting system. The data management system used by the division and local health departments is in need of significant improvements to provide for efficient reporting of existing program requirements as well as additional data monitoring requirements that will be required by EPA's drinking water program. Seventeen of the 35 health departments (49%) that responded to survey questions regarding the existing data management system reported that the Department of Environmental Quality did not provide sufficient data collection and transfer systems. Other comments from local health departments indicated ongoing problems with implementation, undependable upgrades, unreliability, work duplication to ensure accuracy of data, and frequent loss of data during data downloads and system updates. The absence of a user-friendly data management and reporting system results in both the department and local health department staff spending their time attempting to resolve system problems.

Montana has had ongoing problems with data transfers and inaccuracies, which have created significant problems with the EPA's compliance data. Incompatibilities between state and federal systems have not been clearly defined and researched. Three different systems also exist—state permitting and compliance, Department of Environmental Quality enforcement tracking, and EPA compliance reporting.

In **Oregon**, according to the Department of Human Services' Health Division officials, the current database is limited in the functions that can be performed. Specifically, compliance determination for chemical tests is not automated, and the division cannot track a public notice issued by a water system that has been issued a violation. Program administrators also indicated that the division's database does not automatically match laboratories' results to division approvals. Laboratory test results are reviewed manually. The division is able to receive some data (about 30% of coliform results) electronically directly from laboratories, thus eliminating the risk of the division staff entering incorrect data. The current database system does not allow chemical results to be received electronically.

The division randomly selects results for a number of water systems and verifies that laboratories have received the appropriate division approvals. Overall, the division's current database system is limited in the functions that can be performed. Because a large amount of the data must be

entered manually, the likelihood for data entry errors increases. The division is scheduled to implement a new database system from the EPA in late 2001, which will allow the division to calculate all types of violations and may allow for improved monitoring.

In **Tennessee** the Division of Water Supply uses multiple databases to maintain its drinking water data. The staff manipulates the data maintained in the different database files to obtain the needed information for reports. These databases are not easily linked and are not user friendly. Some of the capabilities will change once Tennessee has its version of the federal Safe Drinking Water Information System (SDWIS) operating, which should be by the summer of 2001. Division management believes the current system is good because there are no limits (as found in “off the shelf” systems) to what information can be maintained in the databases. When an off-the-shelf system is used, the user must alter operations to fit the system. According to division management, this will be the case when SDWIS goes on-line in Tennessee.

In 1994 and 1999, the EPA conducted data verifications to detect discrepancies between the public water systems data maintained by the division and the data reported to the EPA’s Federal Reporting Data System (FRDS) to ensure that the division was determining compliance in accordance with federal regulations. The EPA has found only a very small percentage of discrepancies. However, EPA noted isolated examples where information was not reflected in either the Tennessee data system or the federal system.

Recommendations

- **Arkansas** recommended that the Department of Health continue its efforts to meld the various databases into one system.
- **Georgia** recommended that the Environmental Protection Division Drinking Water Compliance Program continue its efforts to improve its data systems. Improvements are needed in the accuracy of data maintained in the division’s files and records, in data maintained in the division’s state database, and in data provided by the division to the Environmental Protection Agency.
- **Hawaii** recommended that the Department of Health should expedite its decision of either adopting an EPA-developed information system or implementing an alternative integrated information system.
- **Louisiana** recommended that the Office of Public Health’s Enforcement Unit should be given access to the database by the Central Office in order to enter enforcement codes for actions it initiates.
- **Maryland** recommended that the Department of the Environment ensure that the sampler name and certification number are reported by the laboratory that analyzed the sample and that this information is entered into the Public Drinking Water Information System (PDWIS) for all drinking water samples collected.

- **Michigan** recommended that the Drinking Water and Radiological Protection Division develop an effective method to report activities and results of the non-community drinking water program.
- **Oregon** recommended that the Department of Human Services determine which monitoring requirements could be automated.

Operator and Lab Qualifications

The EPA requires states to have systems in place to ensure that public water systems employ operators with a predetermined level of certification based upon the population served by the system and the source of water used by the system. Operators must first pass a certifying exam. Other requirements include education, work experience, and continuing education. The EPA also requires that states establish programs to ensure that laboratories have the technical capability to analyze water samples for contaminants. Several states noted areas where the operator certification or laboratory accreditation programs could be improved.

In **Arkansas**, a review of public water system operator certification program files revealed that a complete listing of certified operators and their corresponding continuing education credits is not maintained to serve as a reference for staff members in confirming whether or not operators submitting required reports to the Department of Health are properly certified. This lack of controls has allowed the possibility that a water system could operate without a certified operator.

Hawaii found that its Board of Certification of Operating Personnel in Water Treatment Plants strictly enforced certification requirements, including education, work experience, and continuing education requirements.

Louisiana auditors determined that the lab accreditation programs in the Department of Environmental Quality and the Office of Public Health might be duplicative. Both have laboratory accreditation programs that accredit or certify laboratories that submit monitoring data to the departments for analysis. Both laboratory accreditation programs are in some stage of becoming accredited by the same national accrediting entity called National Environmental Laboratory Accreditation Program (NELAP). According to staff at both agencies, the two programs are different because they are governed by separate laws, the Safe Drinking Water Act and the federal Clean Water Act, respectively. Reportedly, neither NELAP nor EPA requires two separate laboratory accreditation programs. According to a NELAP official, nothing in the federal laws prevents one program from overseeing both types of accreditation. Having one Laboratory Accreditation Program could reduce overhead and administrative costs to the state. In addition, laboratories would only have to go through one agency for both accreditations, the National Environmental Laboratory Accreditation Program would only have to accredit one body, and the EPA would only have to review one program.

In **Maryland**, the Department of the Environment had not established sufficient procedures to ensure that the individuals who collected drinking water samples for laboratory analysis were

properly certified. The certification of drinking water samplers helps to ensure reliability of samples collected for laboratory analysis and is required by Code of Maryland Regulations.

Michigan's Department of Environmental Quality and the American Water Works Association (AWWA) offer continuing education classes to certified operators of drinking water plants. Department employees routinely teach classes and contribute significant staffing and financial resources to operate this training program. AWWA collects all fees for these training programs and has not reimbursed the department for costs for staff time to prepare for or teach classes, for postage and printing costs of the training catalogue, and for related staff time to process applications for these training classes. The department has not entered into a contractual agreement outlining duties and responsibilities of the respective parties and has not attempted to recover its costs of operating this training program. The department and AWWA have operated this program on a cooperative basis for years without any consideration that the state should recover its program costs. Recovery of the cost of staff time used on training programs could provide funding to improve monitoring for compliance with significant program requirements.

In regard to laboratory certification in Michigan, the Drinking Water and Radiological Protection Division's drinking water laboratory program achieved continuing certification as an EPA-certified drinking water laboratory. This certification indicates that the program is being operated under high standards and maintains an effective quality control system.

In **Montana**, the Department of Environmental Quality has an extensive tracking system in place for operator and laboratory qualification requirements.

In **Oregon**, the State Public Health Laboratory, a part of the Department of Human Services Health Division, is responsible for certifying and approving laboratories to test drinking water. The division appeared to adequately ensure that water quality analysis was completed by laboratories that the division had certified to conduct analysis in the state. However, the division could improve its monitoring of test results to ensure that analysis is completed under appropriate division approvals. Six of 77 water systems reviewed had samples analyzed for chemical contaminants by a laboratory that did not have the division's approval to perform the tests and 15 had samples analyzed by a division-approved laboratory, but used unapproved analytical methods. Sixteen of the 77 systems reviewed were tested by the laboratory that the division identified as using unapproved methods. Although all systems should have been retested, 14 either did not receive any retesting, or the tests performed were incomplete. The division did not have an automated follow-up process for determining whether required retests were being performed.

In **Tennessee**, the Department of Environment and Conservation's Division of Water Supply appears to maintain valid and current certification information on laboratories conducting water tests. The Tennessee Laboratory Certification Program was established to evaluate laboratories to determine technical capability to analyze for contaminants. The EPA approved the program in March 1999. Guidelines require that the designation of Department Laboratory Certification Officers will be from those experienced professional staff members assigned to the Bureau of Laboratory Services, which is the Department of Health's Division of Laboratory Services. The

department's Operator Certification Program for public water systems appears to adequately ensure that all water systems operators maintain valid certification and qualifications.

The EPA proposed guidelines for the Certification and Recertification of the Operators of Community and Nontransient Noncommunity Public Water Systems. Final guidelines were published February 5, 1999, as required by the Safe Drinking Water Act Amendments of 1996. These guidelines provide states with the minimum standards for the development, implementation, and enforcement of operator certification programs for public water systems. State Operator Certification programs were to be in full compliance with EPA guidelines by February 5, 2001. States that failed to comply would lose 20% of their Drinking Water Revolving Grant funds provided by the EPA.

Recommendations

- **Arkansas** recommended that the Department of Health continue its efforts to enter all operator data into the new database to strengthen its confirmation process and ensure that each facility is functioning with a properly certified operator.
- **Hawaii** recommended that the Director of the Department of Health, in cooperation with the Board of Certification of Operating Personnel in Water Treatment Plants, should continue to ensure that all water treatment plant operators are appropriately certified.
- **Maryland** recommended that the Department of the Environment establish procedures to ensure that only certified individuals collect drinking water samples for laboratory analysis.
- **Michigan** recommended that the Department of Environmental Quality enter into a contractual agreement with the American Water Works Association (AWWA) which addresses disposition of training program revenue.
- **Oregon** recommended that the Department of Human Services develop a process for monitoring test results to ensure that laboratories conducted the analysis in accordance with state rules. In addition, the department should develop a process to ensure that all retests are conducted properly.

Emergency Preparedness

In **Arkansas**, the Department of Health's regulations require that each public water system have an emergency plan. The department's monitoring of the adequacy of the emergency plan for each system is minimal. During scheduled field inspections, the inspector may informally ask about emergency preparedness, but no formal review is performed.

In **Iowa**, the Department of Natural Resources does not have set policies and procedures for monitoring local governments' emergency preparedness as it relates to water quality issues. The department responds to individual requests for assistance on a case-by-case basis. The

Emergency Management Division within the Iowa Department of Safety monitors local governments for emergency preparedness. The local governments prepare and submit contingency plans for a number of different types of disasters. One of the required sections of their plans is entitled the “Multi-hazard” section, which includes water quality issues. The Department of Natural Resources’ role is to provide technical assistance to both the local governments and staff of the Emergency Management Division.

In **Michigan**, five system files out of nine community water system files did not contain emergency contingency plans. Water suppliers must prepare a contingency plan that lists well information, emergency numbers, and procedures for emergencies. Failure to require water systems to prepare contingency plans could compromise the safety of the water systems.

In **Oregon**, the Department of Human Services Health Division is a regulatory agency, not an emergency responder. Division officials often consult with other agencies when water emergencies occur. The division’s Drinking Water Program has an emergency response plan. Counties also are required to have emergency plans, which are reviewed during the division’s triennial county review. In addition, a program staff person maintains an emergency preparedness binder that contains an inventory of water systems, contaminant sources, contact phone numbers, and basic safety precautions.

In **Tennessee**, there are no regulations that require public water systems to update their emergency plans. Emergency plans are checked against current situations when sanitary surveys are conducted at water system plants.

Recommendations

- **Arkansas** recommended that the Department of Health perform formal reviews of the adequacy of local emergency plans.
- **Michigan** recommended that the Drinking Water and Radiological Protection Division ensure that district office files contain sufficient documentation to support that they are in substantial compliance with program requirements for its 1,450 community drinking water supply systems.

OBJECTIVE 3
DO INDIVIDUAL STATES APPLY CORRECTIVE ACTIONS EFFECTIVELY?

Surface Water Enforcement/Corrective Actions

Several states found problems in the enforcement process including untimely enforcement action, inconsistent penalty structure, and poor record keeping and case tracking. Also, one state addressed enforcement cooperation among state agencies.

In **Arkansas**, the current formal enforcement structure allows for inconsistencies in the initiation of the formal enforcement process and the levying of fines. Even though the Department of Environmental Quality has developed a worksheet for determining fines, the worksheet is often not used, and the fines are actually levied based upon broad guidelines applied on a case-by-case basis. In addition, municipal permit holders were penalized less than industrial permit holders during the 1999 calendar year. Department personnel state that financial penalties are not an effective violation deterrent for municipally-owned facilities.

The Arkansas report also noted that during the examination of 30 formal enforcement actions opened during calendar year 1999, it was often necessary for enforcement actions to have schedules of compliance that extend two or more years into the future. Although the state has developed a system for tracking adherence to these long-term, phased-in compliance schedules, two instances were noted in which the violator was behind in completing the scheduled requirements, and no backup documentation was located indicating that any follow-up activities had occurred.

In **Iowa**, prior to formal penalties, the Department of Natural Resources sends out formal warnings to remind the violator to follow the approved action plan or face penalties if actions are not being taken to return the violator back to compliance. Department officials indicated that the penalty structure is an effective deterrent to noncompliance. There have been very few violators that did not take corrective action in a timely manner after imposition of a penalty. The only other enforcement method available to the department is referral of the facility to the Attorney General's Office. This occurs rarely and is done if the penalties are not effective. Violations were reviewed and there were no instances identified where steps taken by the department were not proper. Correction action was taken on all violations reviewed for calendar years 1997 – 1999. Iowa auditors tested the department's monitoring and enforcement actions for impaired waterways and did not identify any instances where the department failed to appropriately modify monitoring or enforcement actions for repeat offenders.

Louisiana found no evidence of enforcement actions against minor facilities for 373 violations out of a total of 675 in calendar years 1998 and 1999. Inspection discrepancies for some minor and major facilities did not result in enforcement action. In addition, enforcement actions did not always deter 35% of minor and 46% of major facilities from committing subsequent violations.

The Department of Environmental Quality took over a year to issue some enforcement actions after violations occurred. State law allows enforcement actions to be abandoned if the department does not take steps to obtain final enforcement action after two years. Therefore, lengthy enforcement cases may potentially benefit facilities who can have their orders abandoned after two years if the department has not followed up on formal enforcement actions.

The department often voids or amends enforcement actions, some due to its untimely actions. The department had to void 143 actions out of 580 (about 25%) in 1998 and 1999. According to department staff, the department may have to void an action when it determines that no action is warranted because of insufficient evidence or lack of jurisdiction. In addition, the department's untimely enforcement and issuance of permits can also result in amending or rescinding enforcement orders. For example, the department cited a facility for discharging stormwater without authorization through a permit. However, the facility had submitted its permit application seven years earlier.

Also, the department has not collected 47% of penalties assessed for water violations in 1998 and 1999. According to the department, the reason that some of these penalties are still uncollected is that in some cases, the penalty has been appealed and the department is still waiting on a decision.

The department's beneficial environmental projects need criteria. Beneficial environmental projects allow companies that have committed environmental violations to opt to perform environmental projects in lieu of or in addition to paying penalties. Department rules specify the categories of projects that may be approved. However one of the categories is "other," which may lead to projects serving special or political interests. Some companies paid less for the beneficial environmental project than the original penalty. In addition, the department does not require companies to submit notification of satisfactory project completion.

Maryland found that the Department of Environment's enforcement actions against wastewater dischargers were inadequate. Specifically, the department did not take any action against wastewater dischargers that failed to report violations of National Pollutant Discharge Elimination System (NPDES) permit limits in a timely manner. Furthermore, the department did not maintain documentation supporting its decision to forego enforcement action regarding violations that were reported.

The department did not always enforce the corrective action and monetary penalty provisions of consent orders. Consent orders are agreements entered into between the department and the wastewater discharger and are the primary enforcement tool used by the department when a discharger has significantly violated NPDES permit limits.

Oregon found that the EPA reports on the state's water quality indicate that, generally, the Department of Environmental Quality met the monitoring and reporting goals of the Clean Water Act; however, the most recent report indicates that the department does not consistently follow departmental or EPA policy related to timely enforcement actions and does not keep and report accurate data. There were also concerns about the differences over criminal penalties between the two agencies.

Tennessee found that in the Division of Water Pollution Control, reviews of enforcement files revealed record-keeping problems; central office files were not always updated as cases progressed. The resolution of cases was not included in case files and several files did not contain all required documentation. These problems could result in the inability to properly track enforcement actions by the central office; cases “falling through the cracks” without adequate, timely enforcement action or follow-up; documents having to be sent from the Environmental Assistance Centers to the central office multiple times; and difficulty for citizens and other stakeholders in determining how an enforcement case was resolved.

Division management reported that they had finished rebuilding their enforcement database in June 2000 but that it only included cases opened since 1997. Some of the older cases had been entered, but not all. Unlike the old database, the new database is capable of tracking cases from the Notice of Violation stage to final resolution, whether the resolution consists of payment of penalties or compliance with terms of an order. Prior to the database being rebuilt, the paper files were not always adequately maintained because of staff shortages (there was only one employee in the enforcement section) and turnover. In addition, the database was not considered adequate to track cases.

Tennessee also addressed enforcement cooperation with other state agencies. In this state, the Department of Environment and Conservation (TDEC) works with the Department of Agriculture and the Tennessee Wildlife Resources Agency (TWRA) to prevent and control water quality problems. Although the Department of Agriculture has no enforcement authority, its Water Resources Division has a Memorandum of Understanding with TDEC’s Division of Water Pollution Control regarding agricultural nonpoint source pollution. The agreement states that in the case of a serious pollution problem, the Water Resources Division will try to work out a voluntary solution by informing landowners of their rights, providing technical assistance, and advising them of available funding to help correct their problem. If a voluntary solution cannot be worked out, Division of Water Pollution Control staff make a visual inspection and conduct sampling at the site, which could lead to the division taking enforcement action against the violator.

For enforcement cases in which a fish kill has occurred, the TWRA’s Environmental Services Division conducts the damage assessment and places a dollar value on the damage to be included as a portion of civil penalties assessed in commissioner’s orders. This amount is subtracted from penalties collected by TDEC and credited to TWRA. Another area of cooperation is in Natural Resource Damage Assessments under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which looks at long-term damage assessments caused by contamination over a long period of time. Under this program, any damage penalties assessed must be used to restore the damaged resource. Another area of enforcement cooperation between TWRA and TDEC has to do with the fact that TWRA has its own law in the criminal code that makes polluting the waters of the state a Class A misdemeanor.

Recommendations

- **Arkansas** recommended that while professional judgement should remain a key element of the enforcement process, the Department of Environmental Quality should develop a more

uniform penalty structure that provides for the initiation of formal enforcement and the levying of fines based upon predetermined guidelines and equitable formulas. In addition, the agency should consider developing an alternative enforcement strategy that more effectively addresses violations by municipal permit holders.

Arkansas also recommended that the department institute monthly review procedures of compliance schedules to ensure that formal enforcement actions are being complied with and that case managers are properly documenting all department follow-up performed in connection with long-term enforcement actions.

- **Louisiana** recommended that the Department of Environmental Quality develop a policy that requires facilities to formally respond to discrepancies found during inspections. It should also update the Enforcement Management System document to reflect this policy. The department should track facilities with poor compliance records more closely. In addition, the department should issue enforcement actions as close to when violations occur as possible.

The department should develop additional requirements for beneficial environmental projects, including requiring that facilities submit actual costs of the project and ensuring that the project costs at least as much as the original penalty amount. In addition, the department should inspect the projects once they are complete to verify satisfactory completion or have project beneficiaries submit a letter certifying that projects are completed and satisfactory.

- **Maryland** recommended that the Department of Environment take the necessary action to ensure that wastewater dischargers report permit-limit violations in a timely manner. In addition, it was also recommended that the department maintain documentation supporting enforcement decisions regarding wastewater dischargers that violate National Pollutant Discharge Elimination System (NPDES) permit requirements. The department should also enforce corrective action and monetary penalty provisions of consent orders.
- **Tennessee** recommended that to ensure that cases do not fall through the cracks, the Division of Water Pollution Control should review all enforcement case files. Staff should examine the files for proper documentation of the enforcement process including follow-up procedures, whether milestones contained in compliance schedules were met, and whether civil penalties were collected. In addition, the division may wish to consider including a memo in each case file noting how the case was resolved, whether by compliance with orders, payment of penalties, submission of reports, etc.

Drinking Water Enforcement/Corrective Actions

The joint audit addressed the following areas: corrective actions and penalties; Significant Non-compliers; public notice requirements; and maximum contaminant level, monitoring, and reporting violations. Problems in these areas included departments not taking timely enforcement action, not identifying maximum contaminant level violations, and not ensuring water systems report test

results. Also, some states found that water system customers were not always notified of violations.

Adequate enforcement requires that a state have policies and guidelines for taking corrective action and take action when violations are found or reported. In **Arkansas**, the Department of Health's formal enforcement structure is designed for the specific purpose of returning violators to compliance prior to formal penalties. Penalties are often suspended if the public water system remains compliant for at least 12 months following the penalty assessment. The steady decrease in formal enforcement actions demonstrates the effectiveness of the department's enforcement strategy and reflects the success of the penalty suspension option in bringing violators into compliance. In the review of enforcement actions, there was no inconsistency in the application of enforcement procedures between public and private entities or between various regions of the state.

In **Maryland**, the department did not ensure that consistent, timely enforcement actions were taken to correct drinking water violations, particularly with respect to systems monitored by the local health departments. It is believed that the department's failure to establish written policies specifying progressive corrective action and enforcement activities required in response to drinking water violations contributed to these deficiencies.

In Maryland, state law is not consistent with the EPA's drinking water regulations requiring states to have administrative authority to assess penalties against public water systems serving 10,000 individuals or less. Although most drinking water violations occur in these systems, the state does not have administrative penalty authority over them.

Montana reported that the department has taken steps to strengthen enforcement by developing formal program compliance guidelines and establishing a separate Enforcement Division. Although the EPA has noted ongoing concerns with penalty calculations and reductions, other measures taken by the Department of Environmental Quality provide program corrective action. For example, Montana used administrative penalties prior to their use in most states, which created a stronger regulatory environment that has been used to send a message to public water suppliers that compliance is needed. As new policies and guidelines are put in place, corrective action should become more effective.

Oregon found instances when the Department of Human Services Health Division did not issue written violation notices. In some cases, the division did not investigate violations to ensure that corrective action had been taken. Specifically, of the 12 systems reporting excess contaminants, 3 did not receive a written notice of violation; and of the 24 systems not reporting test results, the division did not issue a written notice to 22. However, 11 of the 12 systems took corrective action to resolve the problem, while 21 of the 24 did not.

Recommendations

- **Maryland** recommended that for public drinking water systems monitored either by the department or the local health departments, the department ensure that there is a consistent,

timely application of corrective actions and enforcement activities relating to drinking water violations. Maryland also recommended that the department establish written policies specifying the progressive corrective actions and enforcement activities that are required in response to drinking water violations. The department should continue its efforts to make state law consistent with EPA regulations regarding administrative authority to assess penalties against systems serving 10,000 individuals or less.

- **Montana** recommended that the Department of Environmental Quality implement a process for supervision of licensing and compliance staff to ensure consistency and follow-up on identified system noncompliance. In addition, the department should establish standardized permitting/licensing procedures as well as develop standardized compliance procedures.
- **Oregon** recommended that the Department of Human Services Health Division follow state rules by issuing written notices when violations are found. Documentation and justification should be provided when there are any exceptions to rules.

Significant Non-Compliers (SNCs)

Significant Non-Compliers (SNCs) are violators who pose the greatest risk to health. They comprise the top tier of violators and are generally the highest priority for enforcement actions.

In **Georgia**, less than 5% of the public water systems in Georgia were listed as SNCs by the Environmental Protection Agency (EPA) for calendar year 1999. Most of these systems were listed as SNCs because of reporting/monitoring violations rather than sustained high levels of contaminants in drinking water.

Hawaii found that the public water system supervision program took appropriate action against SNCs, but that the action was not always timely. The program did not meet the EPA's timeliness criteria for 8 of the 12 SNCs reviewed. (The criteria requires an enforcement action to be issued within six months of a violation.) Timely and appropriate actions do not guarantee that systems will return to compliance by deadlines. Hawaii found many instances where water systems failed to meet interim and final compliance deadlines established in administrative orders. Many delays were beyond the systems' control, and the program approved extensions to the compliance schedules. However, reasons for other delays were not clearly documented in the enforcement files.

In **Iowa**, for SNCs, the Department of Natural Resources requires additional testing be performed on a more frequent basis and applies more stringent enforcement actions without giving the SNC a chance to correct the deficiency. Iowa tested a sample of the 1999 SNCs, and there were no instances identified where steps taken by the department did not follow federal guidelines.

In **Michigan**, the auditors determined that the primary method of gaining compliance of non-community drinking water suppliers is through the cooperation between the local health departments and the suppliers. County officials and commissioners have opposed the use of

enforcement measures and assessment of fines against water suppliers who are local businesspersons and constituents. As a result of the local health departments' reluctance to take timely enforcement action and failure of the division to require health departments to take timely and appropriate enforcement action against water suppliers who are not in compliance with drinking water standards, the EPA has identified 1,026 (9.5%) of the approximately 10,800 non-community drinking water suppliers in the state as being in "significant noncompliance" with federal and state requirements. A list of SNCs was given to the health departments by the division with instructions to make the follow-up of SNCs a top priority.

In **Montana**, there were 47 facilities on the EPA's SNCs list for 1999. Interviews with both EPA and Department of Environmental Quality staff indicated that this figure is misleading. Staff turnover and low state agency pay have been cited as problems in getting this area corrected.

According to the Department of Human Services Health Division management, most **Oregon** SNCs are classified as such because of reporting violations. This was confirmed when ten SNC systems were selected for review and eight of the ten were classified as SNCs because of reporting violations. Files for seven of the ten showed that violations had not been corrected in the time allowed, but the division had not taken enforcement action. For two of the systems, there was no evidence that the division had contacted the system operator about the violations. Ultimately the state is required to identify and report SNCs to the EPA and make efforts to return these systems to compliance.

Recommendations

- **Georgia** recommended that the Environmental Protection Division continue developing mechanisms to help prevent future violations of the Safe Drinking Water Act and thus future Significant Non-Compliers. In addition, the department might also encourage expansion of the Small System Peer Review Program. Under this program, a water system can request a Peer Review by volunteer inspectors trained by the EPA and Georgia's department to review the system and provide confidential written communications. Stronger enforcement penalties taken against systems with repetitive problems might be another method of encouraging small, problem-prone systems to correct their problems or consolidate with larger systems.
- **Hawaii** recommended that the Department of Health should exercise greater vigilance in bringing SNCs back into compliance by ensuring that the Safe Drinking Water Branch initiates enforcement action in a more timely manner with the assistance of the attorney general's office. It should also routinely remind systems on compliance schedules to submit status reports and exercise its penalty powers on systems that exhibit a lack of commitment to resolving noncompliance.
- **Michigan** recommended that the Drinking Water and Radiological Protection Division take appropriate steps to ensure that the local health departments take timely action to address non-community drinking water suppliers who repeatedly fail to monitor or comply with significant program requirements.

- **Oregon** recommended that the Department of Human Services Health Division should follow agreements with the EPA for monitoring water systems classified as SNCs. The division should ensure that enforcement action is taken with SNCs that have not achieved compliance requirements.

Public Notice

The federal Safe Drinking Water Act recognizes that since everyone drinks water, everyone has a right to know what is in it. Therefore, all public water systems must quickly notify consumers when there is a serious problem with water quality.

In **Hawaii**, the Department of Health has ensured that Hawaii consumers are informed of safe drinking water violations; therefore, public notification is appropriate and timely.

Louisiana auditors found that 53% of the MCL (maximum contaminant level) violations identified by the Office of Public Health in audit sample did not result in the public water systems sending verification of the public notification to the Office of Public Health. (An MCL is the highest level of a contaminant that is allowed in drinking water.) Federal Primary Drinking Water Guidelines require public water systems to notify the public when they have an MCL violation. According to staff, the only way that a public water system would be cited for failure to issue public notification is if it received an administrative order for another violation and the failure was noted during a file review.

In **Maryland**, the Department of Environment was not always properly notifying public water systems of drinking water monitoring violations. Additionally, the department had not established procedures to ensure that the public was notified of health-based violations (such as by posting notices in conspicuous places within the area served by the system). A health-based violation occurs, for example, when a drinking water maximum contaminant level has been exceeded. Monitoring violations are the result of a water system's failure to either conduct or report required tests of drinking water. According to the department's records, a total of 310 health-based and 192 monitoring violations occurred during calendar year 1999.

According to **Oregon's** rules, if test results show excess levels of nitrate or nitrite, a system operator is required to collect and test one additional sample within 24 hours after being notified of the results. Systems unable to comply with the 24-hour sampling requirement must immediately notify their users and collect one additional sample within two weeks. Three systems exceeded limits for nitrate, and did not resample within 24 hours, but there was no evidence that their users had been notified.

State rules require the owner or operator of a public water system found to have excess levels of contaminants to notify persons served by the system. Files were reviewed for 12 water systems that had reported excess contaminants and received a violation notice. Files for four of the systems did not contain evidence that a public notice was provided to the users of the system. Three of the four systems had excess levels of contaminants considered to pose an acute risk to

human health. Of the 24 water systems reviewed that received a reporting violation, there was no evidence in the division's files that any provided public notices to the users of those systems.

In **Tennessee**, some files reviewed lacked evidence of public notification. Monitoring, reporting, and maximum contaminant levels (MCLs) violations require that the water system notify the people served by the system of the violation. A review of the files maintained by the department for 30 water systems with violations in calendar year 1999 (out of a total of 309) showed that in 13 cases (43%) there was no evidence of public notice in the files. Without public notification, water system customers may not get information they need to determine how well their system is operating and any potential health effects caused by a violation.

Recommendations

- **Hawaii** recommended that the Department of Health continue to ensure that the public remains informed of all safe drinking water violations.
- **Louisiana** recommended that the Office of Public Health should take enforcement actions against water systems that fail to issue public notification.
- **Maryland** recommended that the Department of Environment notify the public water systems of monitoring violations in a timely manner. Additionally, they recommended that the department establish procedures to ensure that the water systems properly post public notifications of health-based violations.
- **Oregon** recommended that the Department of Human Services Health Division require system operators to submit documentation of all public notices. The division should follow up with water systems that do not submit evidence.
- **Tennessee** recommended that the Division of Water Supply should ensure that the public is notified of monitoring, reporting, and maximum contaminant levels (MCLs) violations, as required by state rules.

Maximum Contaminant Level (MCLs) and Reporting Violations

Some states found that water systems did not always report the results of their monitoring, including results that indicated maximum contaminant level violations. Water system operators must routinely test their water for chemical and bacterial contaminants and report the results to a regulatory body. Maximum Contaminant Levels (MCLs) are the highest level of a contaminant that the EPA allows in drinking water. MCLs ensure that drinking water does not pose either a short-term or long-term health risk.

In **Louisiana**, 24% of total coliform maximum contaminant level (MCL) violations identified from routine water samples from the auditors' sample were not identified as violations by the Office of Public Health staff. Because 24% of violations were not identified, they were never

entered into the computer database for consideration against the escalation policy, the water systems were never told to issue public notification, and the public was never informed about the violations.

Michigan's Drinking Water and Radiological Protection Division contracts with 43 local health departments to implement the non-community drinking water program. A primary responsibility of the health departments is to ensure that the approximately 10,800 non-community water suppliers complete periodic testing as required by federal and state laws and rules. Each instance of a water supplier failing to complete a water test must be reported to the state as a monitoring violation and included in the federal reporting system. This system provides information to the public on water suppliers who may be providing water that does not meet minimum health safety standards. Monitoring and MCL violations were reviewed at 11 (26%) of the 43 local health departments. All 11 health departments failed to report some monitoring violations. Of the 246 water suppliers reviewed, 76 (31%) had at least one monitoring violation. Failure to report a monitoring violation was identified as a major concern of the EPA during a 1997 audit of Michigan's Drinking Water Supply Program. Numerous test results received by the state water laboratory exceeded the maximum time limit of 30 hours for coliform bacteria testing established by the EPA. Holding these types of samples in excess of 30 hours is likely to have a negative impact on the ability of the bacteria to survive and is therefore a monitoring violation if another valid sample is not submitted before the end of the reporting period. Five health departments (45%) did not either report a total of five MCL violations in the federal reporting system or document that the samples had been invalidated as required by the *Non-community Public Water Supply Manual*. Also, three health departments did not comply with minimum program requirements by either requiring water suppliers to follow safety precautions for contaminated water supplies (sign posted and use of alternate water supply) or requesting the invalidation of samples in accordance with division procedures.

The absence of contract provisions mandating timely and appropriate progressive disciplinary actions and the absence of written policies and procedures for handling significant noncompliance contributed to the local health departments not taking timely and appropriate progressive disciplinary actions against water suppliers in significant noncompliance with program requirements. The lack of an effective system to ensure that MCL violations are properly recorded and followed up is a serious weakness in internal controls over the program which could result in the state's loss of primacy.

In **Georgia**, federal data indicated that about 27% of Georgia's systems had significant reporting violations during fiscal year 1997, compared to a national average of 17%. (More recent data was not available.) The Department of Natural Resources' Environmental Protection Division personnel noted that comparisons to national averages might be misleading because some states may not accurately report their violations (which could result in underreporting of violations in national averages).

Oregon found that of the 100 water systems reviewed (6 of which were not subject to chemical testing and reporting requirements at the time of review), 15% of the systems failed to report lead and copper test results; 12% did not report initial inorganic chemical test results; 13% reported

incomplete chemical test results; and 29% reported chemical results after the due date. Ten out of 100 systems reported a coliform test result more than 10 days after the due date. In addition, 10 out of the 14 systems that tested positive for coliform did not report initial results within 24 hours, as required; and 8 of the 10 did not complete a repeat test as required. Reporting violations were not issued to any of the above water systems for failure to comply. Nine of the 12 water systems reviewed that had received violations for exceeding allowable contaminant limits had not reported initial positive results to the division within 24 hours, as required. Water systems that have not completed or reported required tests may be subjecting users to unhealthy levels of respective contaminants. In addition, without enforcement actions to motivate water system operators to report on time, the division may continue to receive late laboratory results.

Recommendations

- **Georgia** recommended that the Environmental Protection Division improve its compliance with federal reporting standards.
- **Louisiana** recommended that the Office of Public Health staff should review sample analysis results carefully to determine if a Maximum Contaminant Level (MCL) violation has occurred and to ensure that all violations receive an enforcement action.
- **Michigan** recommended that the Drinking Water and Radiological Protection Division develop an effective oversight system to ensure that the local health departments are posting monitoring violations and MCLs violations to the federal reporting system. In addition, the division should take appropriate steps to ensure that the local health departments take timely action to address non-community drinking water suppliers who repeatedly fail to monitor or comply with significant program requirements.
- **Oregon** recommended that the Department of Human Services Health Division determine whether monitoring requirements can be automated to ensure that the system identifies all violators. The division should consider developing electronic forms for laboratories and water systems to use in reporting. Finally, the division should more actively enforce water sample reporting requirements. Violations should be issued to water systems that fail to report within required time periods, fail to report complete results, or fail to report tests entirely.

NONPOINT SOURCE POLLUTION

Rainfall or snowmelt moving over and through the ground, carrying away natural and man-made pollutants and depositing them into lakes, rivers, and wetlands causes nonpoint source pollution (NPS). Pollutants can include excess fertilizers and pesticides applied on agricultural and residential areas; metals from abandoned mining sites; and oil, grease, and chemicals from urban runoff. The federal Clean Water Act does not establish regulatory tools to deal with NPS pollution, mainly because it is difficult to blame any one person, property owner, or company. The objectives for the joint audit on nonpoint source pollution were limited to determining whether the state had a program (including policies and procedures) for monitoring nonpoint source pollution. Most of the states that completed these objectives found few problems. However, Kentucky focused in depth on nonpoint source pollution and found serious problems. Its audit objective was to determine whether Kentucky's efforts are effective to detect and prevent water pollution resulting from animal feeding operations, improper sewage disposal, and mining operations. Kentucky's conclusions and recommendations are discussed at the end of this section.

The **Arkansas** Department of Environmental Quality makes an effort to control nonpoint source pollution (NPS) through preventive programs including the State Permitting Program, which permits all industries producing waste that may potentially cause surface water contamination. The Soil and Water Conservation Commission spearheads the state's effort in educating the public and industries on NPS prevention and has instituted recommendations for "best-management" practices to be used by agricultural and industrial entities to decrease the amount of NPS in the state.

In **Colorado**, there appears to be a need to expand the Water Pollution Control Revolving Fund loans to individuals and private entities to increase beneficial uses of these moneys for nonpoint source pollution (NPS). Currently, state statutes do not allow the Colorado Water Resources and Power Development Authority to make loans available to non-governmental entities. However, the federal Clean Water Act does allow these funds to be loaned out to private entities to address NPS. The EPA provides funding to the state to address NPS through the NPS Management Program and/or the Energy and Mineral Impact Assistance Program. These projects include mining remediation activities, agricultural runoff projects, and information and education projects directed at specific industry areas and broader urban runoff issues. In addition, there are NPS funds that can be targeted to address division priorities, specifically mining remediation projects.

Colorado recommended that the Water Quality Control Division work with the Colorado Water Resources and Power Development Authority to seek changes in state statutes to allow loans to private entities from the Water Pollution Control Revolving Fund for nonpoint source activities. Allowing loans to be made to private entities would greatly benefit the agricultural industry in the state, including both crop and livestock farmers. In addition, the division should actively encourage the use of Energy and Mineral Impact Assistance Program funds to accomplish more abandoned mine nonpoint source remediation projects.

In **Iowa**, the Department of Natural Resources has a program in place to monitor for nonpoint source pollution. However, there are no formalized policies or procedures in place because the uniqueness of each situation prevents a standard approach from being practical.

In **Louisiana**, one of the most common sources of water impairments is agriculture nonpoint source pollution (NPS). Agricultural activities that cause NPS include confined animal facilities, grazing, plowing, pesticide spraying, irrigation, fertilizing, planting, and harvesting. The Department of Environmental Quality is the lead agency for implementing Louisiana's Nonpoint Source Management Program. Since agriculture is a major contributor to NPS, the Department of Agriculture and Forestry (DAF) works with 43 local soil and water conservation districts to implement best management practices and educational projects. These districts include both DAF and U.S. Department of Agriculture personnel. According to DAF documents, DAF has implemented 216 BMPs designed to reduce soil erosion and improve irrigation and water quality.

In **Oregon**, the Department of Environmental Quality includes nonpoint source pollution in the National Pollutant Discharge Elimination System (NPDES)/Water Pollution Control Facilities (WPCF) permitted activities primarily under stormwater permits. Under federal regulations, the permits center on best management practices as opposed to placing limits on specified pollutants. Monitoring and reporting may vary depending on the type of permit issued.

The awarding of NPS funds in **Tennessee** without any competitive or ranking process could prevent the most needy areas from getting grant funds. Tennessee does not have a formal ranking system because it has generally had enough funds to meet everyone's needs. However, the state plans to develop a competitive system. Other states have a ranking process for awarding funds based on cost, impact, and projected effectiveness.

Kentucky's Conclusions on Nonpoint Source Pollution

During Kentucky's planning for the joint audit, it became apparent that water pollution related to nonpoint sources constituted the greatest threat to water quality in rural areas. In light of this impact, the Office of Auditor of Public Accounts focused on nonpoint source pollution, an area that has not traditionally been examined. Kentucky's performance audit uncovered serious problems with oversight, interagency communication, and compliance with federal and state regulations.

In the past, water pollution control strategies addressed pollution that entered the nation's waters at distinct points. Known as "point source" pollution, this is the type of pollution the federal government and individual states have targeted. However, the Environmental Protection Agency (EPA) considers nonpoint source pollution a large source of the nation's water quality problems. Nonpoint source pollution comes from diffused, diluted sources of pollution that result from a variety of human activity. For example, Kentucky's Division of Water reported that 91% of Kentucky's impaired waters are polluted as a result of nonpoint source pollution.

Kentucky focused its audit work on determining whether the Commonwealth's efforts to detect and prevent nonpoint source pollution are effective. Specifically, the auditors examined the permitting of animal feeding operations, preventing improper sewage disposal, and averting acid drainage from mining operations. Based on the extent of problems found by Kentucky auditors,

other state auditors may wish to consider reviewing their states' efforts to prevent and control nonpoint source pollution. The following is an overview of the conclusions in the Kentucky report.

Permitting of Animal Feeding Operations

Animal feeding operations pose a risk to water quality because of the large amounts of animal manure and wastewater generated. Runoff and spills from ruptured or poorly constructed waste lagoons or waste storage structures result in water contamination. Excessive rainfall also causes spills that result in water pollution. Kentucky auditors found that few federal Kentucky Pollutant Discharge Elimination System (KPDES) permits have been issued to concentrated animal feeding operations as required by the EPA. CAFOs, with high numbers of confined animals, and other smaller Animal Feeding Operations (AFOs) generate large amounts of animal manure and wastewater that threaten Kentucky's water quality. CAFOs are required to be regulated as point sources by the federal Clean Water Act. However, they have not historically been subject to permitting under the KPDES, which is required by the EPA. Under the alternative permitting system used by Kentucky, over 50% of the Commonwealth's CAFOs and AFOs operate without permits. However, the Division of Water is moving toward federally compliant permitting with the promulgation of emergency regulations in response to a recent push from the EPA. As of July 1, 2001, three federal Kentucky Pollutant Discharge Elimination System permits for CAFOs have been issued.

Furthermore, the Division of Water's (DOW) regulations only require a permit for AFOs and CAFOs that use liquid waste handling systems. As a result, 75% of all CAFOs and 49% of AFOs operate without a permit. For example, only two poultry feeding operations have permits. Almost all poultry feeding operations use dry waste handling systems scraping waste out of barns and storing it or removing it from the premises to be used as crop fertilizer. Based on estimates from DOW, poultry CAFOs in Kentucky generate more than 180 million pounds of poultry litter annually. Without an adequate process, DOW cannot be sure that CAFOs and AFOs are disposing of their dry waste properly, and that the Commonwealth's surface and groundwater are protected. Other states have perceived the importance of permitting poultry feeding operations, even though they do not use liquid waste handling systems. For example, Tennessee, has received recent approval from the EPA to permit poultry feeding operations that do not use liquid waste handling systems.

Kentucky also reported that DOW's method of identifying sites that should be permitted is inadequate. Historically, division officials have relied on complaints to identify sites which should be permitted. The permitting process has also relied upon voluntary compliance. Operators may voluntarily request permitting in order to receive funding to implement best practices.

Integrators

The report also noted that some integrators avoid CAFO status by relocating animal units to different sites. Integrators are companies who own the animals and contract with the farmer for the operation. By transporting animals to an AFO at an alternate site, integrators can avoid liability and the operations do not have to meet the permanent litter storage or setback requirements. As a solution to this problem, the EPA is in the process of proposing regulations

that would either lower the number of animal units to qualify as a CAFO or develop a three-tiered permitting process. The EPA is also recommending that certain “dry manure handling poultry operations” be designated as CAFOs. Another option for states concerned about operators breaking up CAFOs into smaller AFOs is to adopt watershed permits. A state could adopt a watershed permit that requires operators to seek permits for any AFOs located in the watershed.

Water Quality Plans

Kentucky has no mechanism to ensure that operators are developing required plans and carrying out best management practices (BMPs). Each agriculture operation located on 10 or more acres is required to develop and implement an individual agriculture water quality plan that addresses the prevention of water pollution. Operations on fewer than 10 acres must develop a “groundwater protection plan.” These plans should discuss the BMPs designed to provide protection against groundwater pollution. BMPs are guidelines recommended to use in controlling nonpoint source pollution in land-based activities such as agriculture, mining, construction, and forestry.

Straight Pipes and Faulty Sewage Systems

Discharges of fecal coliform from straight pipes and faulty sewage systems threaten Kentucky waters. However, the number and location of straight pipes and faulty sewage systems that discharge pollution into the Commonwealth’s surface and ground waters are not known. Many communities and homes in the Commonwealth use straight pipes or faulty sewage systems. Tough, rocky soil and hilly terrain make sewage systems expensive and difficult to construct. Defective sewage systems contribute to the pollution found in streams and rivers. In Kentucky, 104 of 196 impaired streams (53%) contain pathogens relating to fecal coliform. Much of this pollution comes from straight pipe and faulty sewage system discharges. Although various entities attempt to monitor and mitigate the effects of straight pipe discharges and faulty sewage systems, there is no statewide effort to locate and document improper sewage disposal.

Coal Mining and Reclamation Permits

Kentucky found that its DOW does not sufficiently monitor compliance with KPDES permits issued for coal mining and reclamation operations. According to a Memorandum of Understanding (MOU) between DOW and the Department for Surface Mining Reclamation and Enforcement (DSMRE), the division issues KPDES permits but is not primarily responsible for the monitoring and testing of permittees (operators). Although the MOU delegates this responsibility to DSMRE, monitoring and testing information is not always communicated to DOW. In addition, there are no established procedures in place to ensure that DSMRE informs DOW when acid mine drainage has been detected through its monitoring and testing procedures. As a result, DOW is not taking the proper steps to ensure that mining operations do not threaten water quality.

Abandoned Underground Mine Mapping

No state agency is singularly responsible for identifying and mapping abandoned underground mines. While the Department of Mine and Minerals (DMM) and DSMRE are beginning to scan existing maps and locate abandoned underground mine shafts, they are encountering statutory or other obstacles, which have limited their success. For example, Kentucky officials believe that Commonwealth law precludes the use of money from the state's Abandoned Mine Reclamation Fund to locate, scan, and computerize all abandoned underground mine locations. Developing a system to locate and identify all of the underground abandoned mines in the Commonwealth could help agencies determine the source of acid mine drainage. Such a system could also identify unstable conditions affecting coal slurry impoundments as well as private and commercial land development. Acid mine drainage from abandoned mines is one of the main coalmine pollutants in Kentucky. It kills aquatic wildlife and vegetation, eats away concrete and metal structures, raises water treatment costs, and turns the color of stream banks to bright orange and red.

Complaint Tracking

The Kentucky Department for Environmental Protection's Notifications and Complaints System has improved its complaint tracking and investigation process. The majority of the closed complaints reviewed were investigated in a timely manner. The time from receiving the complaint to the investigation was 10 days or less. Also, the majority of the complainants were satisfied with the results. However, some areas could be improved: apprising complainants about the status of their complaints; conducting follow-up inspections; making the system easier for inspectors to use; providing a toll-free number for the public to use to make complaints; and ensuring accessibility to other environmental departments that are asked to respond to complaints applicable to their areas.

Performance Indicators

The Division of Water does not develop and track measurable objectives and performance indicators related to its budget. The division's most recent budget request contained performance measures stating the number of CAFOs inspected and number of AFOs inspected for groundwater protection plans. However, the division's branch officers who are responsible for permitting, inspecting, and developing groundwater protection plans were not aware of these performance measures.

The Kentucky report made several agency recommendations, which are summarized as follows:

- The Division of Water (DOW) should enforce two regulations related to the permitting of CAFOs; seek to amend regulations to ensure that all animal feeding operations go through the same type of permitting process; regularly investigate all AFOs and CAFOs to ensure compliance with state and federal regulations; consider developing KPDES permits that apply to middle-tiered operations; and consider permitting watersheds.
- The Natural Resources and Environmental Protection Cabinet and the Cabinet for Health Services should develop an action plan to target straight pipes.

- DOW and the Department for Surface Mining Reclamation and Enforcement (DSMRE) should work together to ensure that KPDES monitoring and testing results are communicated to DOW and work together to develop a database to store KPDES monitoring and testing results.
- DSMRE should report to DOW any acid mine drainage identified through testing or monitoring.
- DSMRE, the Division of Abandoned Mine Lands, and the Division of Mines and Minerals should work together to locate, scan, and computerize underground abandoned mine locations in the Commonwealth.
- The Department for Environmental Protection should improve administrative procedures related to investigations, institute a toll-free number for residents to call related to environmental complaints, and link its internal planning to the budgetary process.

Kentucky also suggested that its General Assembly should consider

- requiring agriculture operators to certify water quality plans;
- funding an inventory of straight pipes and abandoned mines;
- preventing the transfer of property until a sewage management disclosure has been made;
- creating a state-funded program to ensure the most cost effective and appropriate wastewater systems are installed throughout the Commonwealth;
- determining whether mine maps should be included as part of the Kentucky Open Records Act; and
- reviewing statute to determine whether the Division of Abandoned Mine Lands can use money from the Abandoned Mine Reclamation Fund to locate, scan, and computerize abandoned underground mine locations.

Appendix 1

Glossary of Environmental Terms

303(d) List — List of impaired water bodies in the state. Developed pursuant to section 303(d) of the Clean Water Act.

Classification — Designation of water quality intended to protect all existing uses of state waters, and any additional uses for which waters are suitable or intended to become suitable.

Clean Water Act — Federal legislation that regulates surface water quality.

Community Water System — A public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

Drinking Water Revolving Fund (DWRF) — Low-interest loan program that assists governmental agencies in constructing drinking water facilities to meet public health requirements.

Discharge Monitoring Report (DMR) — The monthly analysis of discharged waters required for each NPDES permit holder. Each DMR is custom tailored for each individually issued NPDES permit.

Effluent — Wastewater discharged to waters of the state.

Major NPDES permit holder — Permitted facilities discharging one million gallons of water or more a day.

Maximum Contaminant Level (MCL) — The maximum level of a specific contaminant that is allowed in drinking water. MCLs are enforceable standards.

National Pollutant Discharge Elimination System (NPDES) — The EPA's permit program to regulate the quantity and quality of the direct discharge of pollutants into surface water. The EPA allows individual states to administer this program themselves with continued EPA oversight. Currently, all states except Wyoming administer their own NPDES Permit Program.

Non-Community Water System — A public water system that is not a community water system, but that serves not fewer than 25 individuals on an average daily basis for not less than 60 days per year. Non-community water supply systems are classified as either non-transient (e.g., large employers, schools, and daycare centers) or transient systems (e.g., small motels, restaurants, and campgrounds) where people do not remain for long periods of time.

Nonpoint source — Pollution whose discharge into receiving water cannot be traced to its point of origin. Pollution from a nonpoint source typically results from dispersed origins such as abandoned mining waste sites, agricultural operations, and stormwater runoff in urban areas.

Point source — Pollution whose discharge into receiving waters can be traced to its point of origin, such as a factory or wastewater facility.

Public Water System — Any water system that provides water to at least 25 people for at least 60 days annually.

Safe Drinking Water Act — Federal legislation that regulates drinking water.

Safe Drinking Water Information System (SDWIS) — The EPA's drinking water data collection system.

Standards — Numeric values that are intended to maintain water quality at a level sufficient to protect classified uses of that stream or river segment.

Surface Water— The water that systems pump and treat from sources open to the atmosphere, such as rivers, lakes, and reservoirs.

Total Maximum Daily Load (TMDL) The maximum amount of a contaminant that a water body can carry and still meet water quality standards.

Wastewater — Liquid waste resulting from commercial, municipal, private, or industrial processes. This includes, but is not limited to, cooling and condensing waters, sanitary sewage, industrial waste, and contaminated rainwater runoff.

Water body — Any contiguous body of water identified by a state. A water body can be a stream, a river, a segment of a stream or river, a lake, a bay, a series of bays, or a watershed.

Watershed — Geographic region designated by natural drainage areas.

Appendix 2

Drinking Water Contaminants and Related Health Effects (as of October 2000)

Contaminants	Potential Health Effects	Potential Sources of Contamination
Inorganic Chemicals		
Antimony	Increase in blood cholesterol	Petroleum refineries, fire retardants, ceramics, electronics, solder
Arsenic	Skin damage, circulatory system problems, cancer risk	Semiconductor manufacturing, petroleum refineries, wood preservatives, herbicides, natural deposits
Asbestos	Benign intestinal polyps	Asbestos cement in water mains, natural deposits
Barium	Increase in blood pressure	Drilling wastes, metal refineries, natural deposits
Beryllium	Intestinal lesions	Metal refineries and coal burning factories, electrical, aerospace and defense industries
Cadmium	Kidney damage	Galvanized pipes, natural deposits, metal refineries, batteries, paint
Chromium	Allergic dermatitis	Steel and pulp mills, natural deposits
Copper	Gastrointestinal distress, liver or kidney damage	Household plumbing systems, natural deposits, wood preservatives
Cyanide	Nerve damage, thyroid problems	Steel/metal, plastic and fertilizer factories
Fluoride	Bone disease, mottled teeth in children	Water additive, natural deposits, fertilizer and aluminum factories
Lead	Delayed physical or mental development in children, kidney problems and high blood pressure in adults	Household plumbing systems, natural deposits
Inorganic Mercury	Kidney damage	Natural deposits, refineries/factories, landfills, cropland
Nitrate	“Blue Baby Syndrome” ⁽¹⁾	Fertilizer use, septic tanks, sewage, natural deposits
Nitrite	“Blue Baby Syndrome” ⁽¹⁾	Fertilizer use, septic tanks, sewage, natural deposits
Selenium	Hair or fingernail loss, circulatory problems	Petroleum refineries, natural deposits, mines
Thallium	Hair loss, changes in blood, kidney, intestine or liver problems	Ore processing sites, electronic, glass, and pharmaceutical companies
Organic Chemicals		
Acrylamide	Nervous system or blood problems, cancer risk	Water additive during sewage and wastewater treatment
Alachlor	Eye, liver, kidney or spleen problems, anemia, cancer risk	Herbicide used on row crops
Atrazine	Cardiovascular system problems, reproductive difficulties	Herbicide used on row crops
Benzene	Anemia, decrease in blood platelets, cancer risk	Factories, gas storage tanks, landfills
Benzo(a)pyrene	Reproductive difficulties, cancer risk	Linings of water storage tanks and distribution lines
Carbofuran	Blood or nervous system problems, reproductive difficulties	Soil fumigant used on rice and alfalfa

Appendix 2

Drinking Water Contaminants and Related Health Effects (as of October 2000)

Contaminants	Potential Health Effects	Potential Sources of Contamination
Carbon tetrachloride	Liver problems, cancer risk	Chemical plants and other industrial activities
Chlordane	Liver or nervous system damage, cancer risk	Banned termiticide
Chlorobenzene	Liver or kidney problems	Chemical and agricultural chemical factories
2,4-D	Kidney, liver or adrenal gland problems	Herbicide used on row crops
Dalapon	Minor kidney changes	Herbicide used on rights of way
1,2-Dibromo-3-chloropropane	Reproductive difficulties, cancer risk	Soil fumigant used on soybeans, cotton, pineapples and orchards
o-Dichlorobenzene	Liver, kidney or circulatory system problems	Industrial chemical factories
p-Dichlorobenzene	Anemia, liver, kidney or spleen damage, changes in blood	Industrial chemical factories
1,2-Dichloroethane	Cancer risk	Industrial chemical factories
1-1-Dichloroethylene	Liver problems	Industrial chemical factories
cis-1, 2-Dichloroethylene	Liver problems	Industrial chemical factories
trans-1,2-Dichloroethylene	Liver problems	Industrial chemical factories
Dichloromethane	Liver problems, cancer risk	Pharmaceutical and chemical factories
1-2-Dichloropropane	Cancer risk	Industrial chemical factories
Di(2-ethylhexyl)adipate	General toxic effects or reproductive difficulties	PVC plumbing systems, chemical factories
Di(2-ethylhexyl)phthalate	Reproductive difficulties, liver problems, cancer risk	Rubber and chemical factories
Dinoseb	Reproductive difficulties	Herbicide used on soybeans and vegetables
Dioxin (2,3,7,8-TCDD)	Reproductive difficulties, cancer risk	Waste incineration and other combustion, chemical factories
Diquat	Cataracts	Herbicide use
Endothall	Stomach and intestinal problems	Herbicide use
Endrin	Nervous system effects	Banned insecticide
Epichlorohydrin	Stomach problems, reproductive difficulties, cancer risk	Industrial chemical factories, water additive during treatment process
Ethylbenzene	Liver or kidney problems	Petroleum refineries
Ethylene dibromide	Stomach problems, reproductive difficulties, cancer risk	Petroleum refineries
Glyphosate	Kidney problems, reproductive difficulties	Herbicide use
Heptachlor	Liver damage, cancer risk	Banned termiticide
Heptachlor epoxide	Liver damage, cancer risk	Breakdown of heptachlor
Hexachlorobenzene	Liver or kidney problems, reproductive difficulties, cancer risk	Metal refineries, agricultural chemical factories

Appendix 2

Drinking Water Contaminants and Related Health Effects (as of October 2000)

Contaminants	Potential Health Effects	Potential Sources of Contamination
Hexachlorocyclopentadiene	Kidney or stomach problems	Chemical factories
Lindane	Liver or kidney problems	Insecticide used on cattle, lumber and gardens
Methoxychlor	Reproductive difficulties	Insecticide used on fruits, vegetables, alfalfa and livestock
Oxamyl (Vydate)	Slight nervous system effects	Insecticide used on apples, potatoes and tomatoes
Polychlorinated biphenyls (PCBs)	Skin changes, thymus gland problems, immune deficiencies, reproductive and nervous system difficulties, cancer risk	Landfills, waste chemicals
Pentachlorophenol	Liver or kidney problems, cancer risk	Wood preserving factories
Picloram	Liver problems	Herbicide
Simazine	Blood problems	Herbicide
Styrene	Liver, kidney and circulatory problems	Rubber and plastic factories, landfills
Tetrachloroethylene	Liver problems, cancer risk	Factories, dry cleaners
Toluene	Nervous system, kidney or liver problems	Petroleum factories
Total Trihalomethanes (TTHMs)	Liver, kidney or nervous system problems, cancer risk	Byproduct of drinking water disinfection
Toxaphene	Kidney, liver or thyroid problems, cancer risk	Insecticide used on cattle and cotton
2,4,5-TP (Silvex)	Liver problems	Banned herbicide
1,2,4-Trichlorobenzene	Changes in adrenal glands	Textile finishing factories
1,1,1-Trichloroethane	Liver, nervous system or circulatory problems	Metal degreasing sites and other factories
1,1,2-Trichloroethane	Liver, kidney or immune system problems	Industrial chemical factories
Trichloroethylene	Liver problems, cancer risk	Petroleum refineries
Vinyl Chloride	Cancer risk	PVC pipes, plastic factories
Xylenes	Nervous system damage	Petroleum and chemical factories
Radionuclides		
Beta particles and photon emitters	Cancer risk	Natural and man-made deposits
Gross alpha particle activity	Cancer risk	Natural deposits
Radium 226 and Radium 228	Cancer risk	Natural deposits
Microorganisms		
Giardia lamblia	Gastroenteric disease	Human and animal fecal waste
Heterotrophic plate count	Indicator of how effective water treatment is at controlling microorganisms	Not applicable

Appendix 2

Drinking Water Contaminants and Related Health Effects (as of October 2000)

Contaminants	Potential Health Effects	Potential Sources of Contamination
Legionella	Legionnaire's disease	Found naturally in water but multiplies in heating systems
Total Coliforms	Indicator that other potentially harmful bacteria (that can cause gastrointestinal diseases) may be present	Human and animal fecal waste
Turbidity	No health effects but it can interfere with disinfection and provide a medium for microbial growth.	Soil runoff
Viruses	Gastroenteric disease	Human and animal fecal waste

(1) "Blue Baby Syndrome" is a condition in which a child turns blue due to lack of oxygen.

SOURCE: Environmental Protection Agency Drinking Water Standards

Appendix 3

Suggested Reading

U.S. Environmental Protection Agency

1996 “Report to Congress on National Water Quality Inventory”

1997 “National Public Water System Annual Compliance Report”

“Drinking Water Infrastructure Needs Survey,” First Report to Congress, January 1997

“Ground Water Quality in the United States: Report Findings” (1998)

“Safe Drinking Water Act, Section 1429: Ground Water Report to Congress” (1999)

“Proactive Approach Would Improve EPA’s Water Quality Standards Program” (2000)

U. S. General Accounting Office

“Drinking Water: Compliance Problems Undermine EPA Problems as New Challenges Emerge” (1990)

“Water Pollution: Serious Problems Confront Emerging Municipal Sludge Management Program” (1990)

“Water Pollution: Stronger Efforts Needed by EPA to Control Toxic Water Pollution” (1991)

“Water Pollution: Observations on Compliance and Enforcement Activities Under the Clean Water Act” (1991)

“Water Pollution: State Revolving Funds Insufficient to Meet Wastewater Treatment Needs” (1992)

“Drinking Water: Key Quality Assurance Program Is Flawed and Underfunded” (1993)

“Drinking Water: Combination of Strategies Needed to Bring Program Costs in Line With Resources” (1994)

“Water Pollution: EPA Needs to Set Priorities for Water Quality Criteria Issues” (1994)

“Water Pollution: Information on the Use of Alternative Wastewater Treatment Systems” (1994)

“Water Transfers: More Efficient Water Use Possible, If Problems Are Addressed” (1994)

“Drinking Water: Safe Drinking Water Act Reauthorization Issues” (1995)

“Hazardous Waste: Compliance With Groundwater Monitoring Requirements at Land Disposal Facilities” (1995)

“Animal Agriculture: Information on Waste Management and Water Quality Issues” (1995)

“Water Pollution: Differences Among the States in Issuing Permits Limiting the Discharge of Pollutants” (1996)

“Water Pollution: Many Violations Have Not Received Appropriate Enforcement Attention” (1996)

“Water Quality: A Catalog of Related Federal Programs” (1996)

“Clean Water Act: State Revolving Fund Loans to Improve Water Quality” (1996)

“Drinking Water: Information on the Quality of Water Found at Community Water Systems and Private Wells” (1997)

“Environmental Protection: EPA’s and States’ Efforts to Focus State Enforcement Programs on Results” (May 1998)

“Drinking Water: Some Households Rely on Untreated Water From Irrigation Systems” (1998)

“Safe Drinking Water Act, Progress and Future Challenges in Implementing the 1996 Amendments” (1999)

“Water Quality: Federal Role in Addressing--and Contributing to--Nonpoint Source Pollution” (1999)

“Drinking Water: Better Planning Needed to Link Needs and Resources” (1999)

“Water Quality: Identification and Remediation of Polluted Waters Impeded by Data Gaps” (2000)

“Water Quality: Key EPA and State Decisions Limited by Inconsistent and Incomplete Data” (2000)

“Environmental Protection: Collaborative EPA-State Effort Needed to Improve Performance Partnership System” (2000)

“Clean Water Act: Proposed Revisions to EPA Regulations to Clean Up Polluted Waters” (2000)

“Drinking Water: Spending Constraints Could Affect States’ Ability to Meet Increasing Program Requirements” (2000)

“Environmental Protection: More Consistency Needed Among EPA Regions in Approach to Enforcement” (2000)

Congressional Budget Office

“Water Use Conflicts in the West: Implications of Reforming the Bureau of Reclamation’s Water Supply Policies” (1997)

“Federalism and Environmental Protection: Case Studies for Drinking Water and Ground-Level Ozone” (1997)

Audit Reports

<u>State</u>	<u>Year</u>	<u>Title</u>
Arizona	1993	<i>Department of Environment Quality, Office of Water Quality</i>
	1998	<i>Underground Storage Tank Program</i>
	1999	<i>Department of Water Resources</i>
California	1998	<i>Lahontan Regional Water Quality Control Board</i>
	1998	<i>Drinking Water and Contamination of Groundwater by Gasoline Components and Additives</i>
Colorado	1994	<i>Water Programs (limited scope)</i>
Florida	1994	<i>Water Resources Management Program administered by Department of Environmental Protection and Water Management Districts</i>
	1995	<i>Surface Water Improvement Program (follow-ups in 1997 and 1998)</i>
	1997	<i>Reuse of Reclaimed Water</i>
	1997	<i>Water Resources Management Program and Consumptive Use Permitting Program</i>
	1997	<i>Economic Components of State Water Policy</i>
1999	<i>Progress Report on Florida Water Policy</i>	
Kansas City	1992	<i>Water and Pollution Control Department Review of Controls Over Storeroom Inventories</i>
	1993	<i>Water and Pollution Control Department Backflow Prevention Program</i>
Kansas	1997	<i>Department of Health and Environment Efforts to Protect Water from Pollution Caused by CAFO</i>

Montana	1998	<i>Permitting and Compliance Division, Department of Environmental Quality</i>
South Carolina	1994	<i>Department of Health and Environment Controls Implementation of SDWA</i>
Texas	1996	<i>Natural Resource Conservation Commission's Oversight of Water Districts and Utilities</i>
Utah	1995	<i>Water Loan Program</i>
Virginia	1997	<i>Department of Environmental Quality</i>
Wisconsin	1992	<i>Nonpoint Source Water Pollution Abatement Program</i>

Appendix 4

List of Participating States' Reports

Participating states' reports that were used to compile this joint audit report can be found at the following websites or mailing addresses.

Arkansas—*Drinking and Surface Water Quality*

<http://www.legaudit.state.ar.us/auditmain.html>

Colorado—*Water Quality Control Division Performance Audit*

http://www.state.co.us/gov_dir/audit_dir/2001perf/1270.pdf

Georgia—*Public Water Systems' Drinking Water Quality*

<http://www2.state.ga.us/Departments/AUDIT/pao/drinking%20water.pdf>

Hawaii—*Audit of the Department of Health's Oversight of Public Water Systems*

Office of the Auditor

465 S. King St. Room 500

Honolulu, HI 96813-2917

(808) 587-0800

A brief overview of the report can be found at <http://www.state.hi.us/auditor/>

Iowa—Contact Annette Campbell

Office of Auditor of State

State Capitol Building

Room 111

1007 East Grand Avenue

Des Moines, IA 50319-0001

(515) 281-5834

or info@auditor.state.ia.us

Kentucky—*Kentucky's Management of Nonpoint Source Water Pollution*

<http://www.kyauditor.net>

Louisiana—*Water Quality in Louisiana*

<http://www.lla.state.la.us/perform/waterqua.pdf>

Maryland—*Water Quality – State Monitoring, Enforcement and Regulatory Efforts Related to Drinking Water and Point Source Pollution*

<http://www.ola.state.md.us/reportfiles/performance/2001/WaterQty.PDF>

Michigan—*Public Drinking Water Supply Program, Department of Environmental Quality*

<http://www.state.mi.us/audgen/comprpt/docs/r7612099.pdf>

Montana—"NSAA Joint Audit on Water Quality"
Montana Legislative Auditor
Angie Grove, Performance Audit Manager
Rm 160, State Capitol
P.O. Box 201705
Helena, MT 59620-1705
(406) 444-3122
or LAD@state.mt.us

Oregon—*Drinking Water Program, Department of Human Services, Oregon Health Division*
<http://www.sos.state.or.us/audits/summary/2001/2001-03.pdf>

Oregon—*Surface Water Quality Program Information Report*
Office of the Secretary of State
Audits Division
255 Capitol Street NE Suite 500
Salem, OR 97310
(503) 986-2255

Tennessee—*Water Quality*
<http://www.comptroller.state.tn.us/sa/reports/pa00023.pdf>