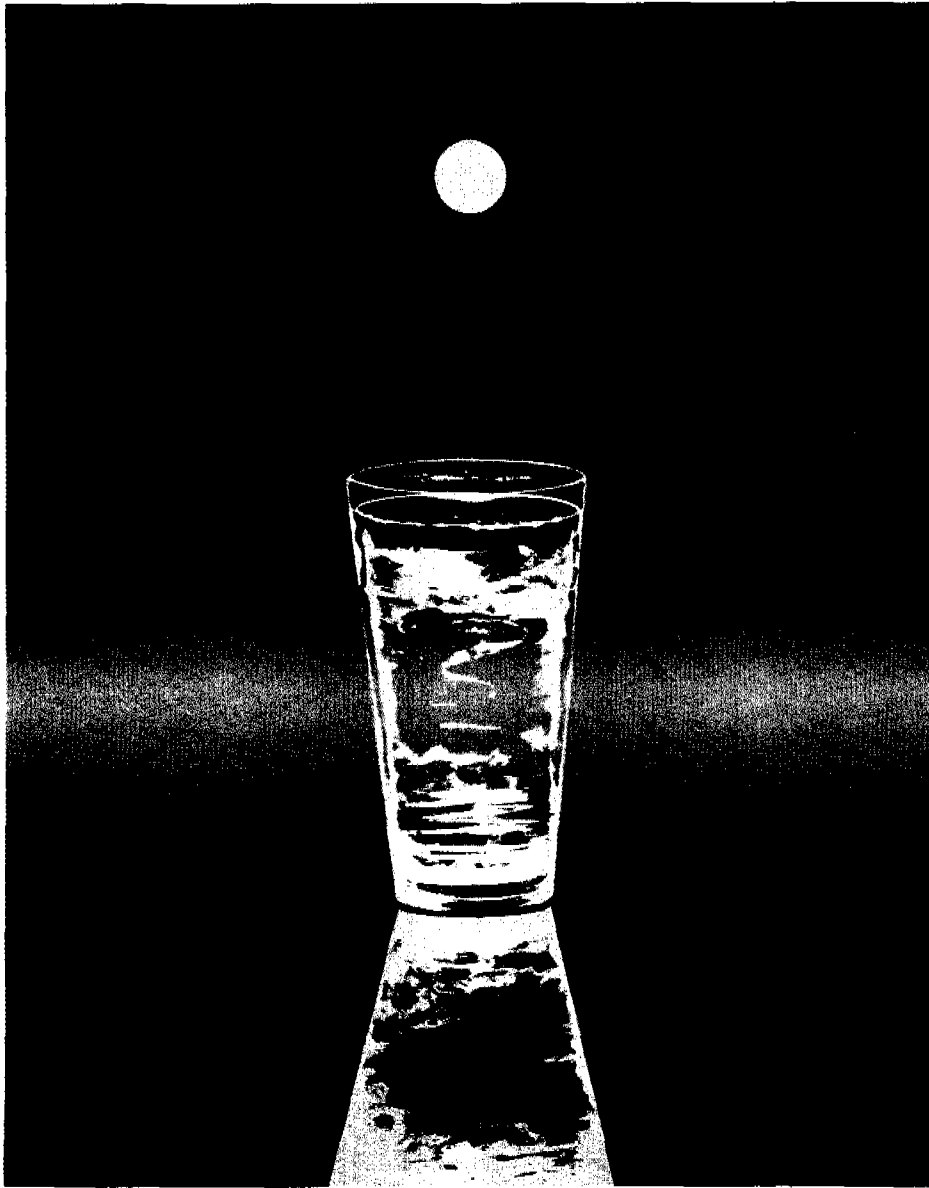


Think Before You Drink



The Failure of the Nation's Drinking Water System to Protect Public Health



NATURAL RESOURCES DEFENSE COUNCIL / SEPTEMBER 1993

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*The Failure of the Nation's Drinking Water
System to Protect Public Health*

ERIK D. OLSON, ESQ.

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About NRDC

NRDC is a non-profit environmental membership organization with more than 170,000 members and contributors nationwide. Since 1970, NRDC scientists and lawyers have been working to protect the world's natural resources and to improve the quality of the human environment. NRDC has offices in New York City, Washington, D.C., San Francisco, Los Angeles, and Honolulu.

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Table of Contents

INTRODUCTION	I
EXECUTIVE SUMMARY	III
Chapter 1: A BRIEF INTRODUCTION TO THE SAFE DRINKING WATER ACT	1
Chapter 2: THE BREAKDOWN IN COMPLIANCE.....	3
MASSIVE VIOLATION OF THE SAFE DRINKING WATER ACT	3
Chapter 3: POOR ENFORCEMENT: A SIGNAL TO WATER UTILITIES	
THAT COMPLIANCE IS OPTIONAL	7
POOR STATE ENFORCEMENT; MODESTLY IMPROVING EPA RECORD.....	8
1993 EPA INSPECTOR GENERAL'S REPORT.....	9
GENERAL ACCOUNTING OFFICE (GAO) DOCUMENTATION OF	
POOR STATE AND EPA ENFORCEMENT	9
OTHER INDEPENDENT INVESTIGATIONS	10
Chapter 4: FAILURE TO INFORM CITIZENS, FAILURE TO REPORT	
VIOLATIONS TO EPA, AND FALSIFICATION OF TEST RESULTS.....	11
UNDER-REPORTING OF VIOLATIONS	11
FALSIFICATION OF DRINKING WATER TEST RESULTS.....	12
FAILURE TO NOTIFY CUSTOMERS OF VIOLATIONS	13
Chapter 5: THE IMPACTS OF DRINKING WATER CONTAMINATION	
ON HEALTH	15
CONTAMINATION OF DRINKING WATER WITH INFECTIOUS	
MICROORGANISMS	15
CHEMICAL CONTAMINATION OF DRINKING WATER	17
Chapter 6: STATE FAILURES AND STATE AND EPA UNDERFUNDING	21
OVERVIEW OF THE SDWA AND ITS REQUIREMENTS FOR	
PRIMACY STATES	21
THE BREAKDOWN IN PRIMACY STATE IMPLEMENTATION OF THE SDWA ...	21
INADEQUATE STATE AND EPA FUNDING FOR DRINKING WATER	23
Chapter 7: AGING, OUTDATED, AND NONVAILABLE DRINKING WATER PLANTS ...	25
Chapter 8: WHAT YOU CAN DO TO PROTECT YOUR DRINKING WATER.....	27
WHAT CITIZENS CAN DO.....	27
WHAT ABOUT BOTTLED WATER OR WATER FILTERS?	28
Chapter 9: PROPOSALS FOR SAFE DRINKING WATER ACT REFORMS.....	31

Table of Contents

ISSUE #1: STATE REVOLVING FUND FOR DRINKING WATER.....	31
ISSUE #2: STATE PRIMACY—FEDERAL BACKSTOP FEE	31
ISSUE #3: STATE PROGRAMS TO ENSURE PUBLIC WATER SYSTEM VIABILITY	33
ISSUE #4: STRENGTHENING AND STREAMLINING ENFORCEMENT.....	34
ISSUE #5: HELPING SMALL SYSTEMS COMPLY.....	35
ISSUE #6: ENSURING ENVIRONMENTAL JUSTICE IN THE DRINKING WATER PROGRAM	35
ISSUE #7: ASSURING THE PUBLIC'S RIGHT TO KNOW ABOUT DRINKING WATER.....	36
ISSUE #8: PROTECTING SOURCES OF DRINKING WATER.....	36
ISSUE #9: PROTECTING WHISTLE BLOWERS	37
ISSUE #10: REDUCING LEAD IN DRINKING WATER	37
Chapter 10: CONCLUSION	39
Notes.....	41

List of Tables and Graphs

Table 1: NUMBER OF DRINKING WATER VIOLATIONS IN 1991-1992.....	3
Table 2: U.S. POPULATION AFFECTED BY DRINKING WATER VIOLATIONS IN 1991-1992.....	4
Table 3: U.S. POPULATION AFFECTED BY CERTAIN MCL VIOLATIONS IN 1991 OR 1992	4
Table 4: STATES THAT REPORTED NO CHEMICAL OR RADIOLOGICAL MONITORING OR REPORTING VIOLATIONS FOR ALL OF 1991-1992	12
Figure 1: POPULATION AFFECTED BY MAXIMUM CONTAMINANT LEVEL VIOLATIONS, BY SIZE OF WATER SYSTEM, IN 1991-1992	5
Figure 2: DRINKING WATER VIOLATION TRENDS.....	6
Figure 3: EPA SPENDING ON ENFORCEMENT	7
Figure 4: VIOLATIONS AND FORMAL ENFORCEMENT ACTIONS—1991-1992	8
Figure 5: WATER SYSTEMS' PERFORMANCE IN ISSUING PUBLIC NOTICES	13
Figure 6: EXAMPLE OF PUBLIC NOTICE	14

Introduction

Every day of our lives, without a second thought, we turn on our water taps to drink, bathe, wash dishes, or clean clothes. Water is an element so fundamental to our lives that we generally take it for granted. We tell ourselves, when it crosses our minds, that in the United States our water is basically safe to drink. We may reassure ourselves that it is only in Third World countries, or perhaps near a few hazardous waste dumps in the United States, that drinking water is hazardous.

But Milwaukee's disease outbreak in early 1993 (which reportedly caused over 370,000 people to become sick), recent contamination incidents in New York City's water causing thousands to boil their water, and the data presented in this report on the degree of drinking water contamination throughout the nation must ring an alarm bell. With the information now available, our trust in the safety of our drinking water supply will and should be shaken. We must think before we drink.

William K. Reilly, Administrator of the Environmental Protection Agency (EPA) under the Bush Administration, and EPA's Science Advisory Board both classified drinking water contamination among the top four public health risks posed by environmental problems.¹ Yet with a few exceptions, such as Milwaukee, drinking water contamination has received relatively little national or local media attention. Few members of the public are aware, for example, that according to the most recent published review of studies of actual cancer cases in the United States, a single class of drinking water contaminants (known as trihalomethanes and their chemical cousins) is associated with *10,700 or more bladder and rectal cancers per year—about thirty cancers per day.*² That is twice as many people as die from fires, and more people than are killed by handguns.

Further, few people are aware of a recent study by the federal Centers for Disease Control and Prevention estimating that 940,000 people become ill each year from consuming contaminated water and that 900 of those people die each year.³ In addition, few know that many other contaminants besides trihalomethanes are found in the drinking water of over one hundred million people. With this lack of knowledge comes complacency, and even a resistance to spending more to protect or clean up water supplies that are perceived to be safe from contamination.

This report reveals the widespread contamination of the United States' drinking water supplies by toxic and cancer-causing chemicals such as lead, trihalomethanes, arsenic, and radioactivity. It shows that millions of peoples' water supplies contain parasites, bacteria, and other microorganisms. And for the first time, it names names—in a 3,500-page appendix summarizing the tens of thousands of water systems that, according to EPA data, broke the drinking water law in 1991 and/or 1992. This report shows that although these tens of thousands of water suppliers are known to be in violation of the Safe Drinking Water Act's health protection rules, in the vast majority of cases (including cases of the most serious violations), timely and appropriate enforcement action is taken by neither the state nor by EPA. Despite recent

One class of drinking water contaminants is associated with 10,700 bladder and rectal cancers yearly. This is twice as many people as are killed in fires and more than are killed by handguns.

efforts by some at EPA to emphasize enforcement, in most places the cop is not on the beat, and violators—often even the most flagrant violators—are evading meaningful enforcement action.

This report also discusses troubling data indicating that some of these contamination problems may affect certain subsets of the public disproportionately. For example, the poor in small communities, as well as Native Americans, appear to have disproportionately high exposure to contaminated water. In addition, AIDS victims, the elderly, pregnant women and their fetuses, young children (especially poor children with an inadequate diet), and infants are put at disproportionate risk by certain contaminants.

Many water suppliers know of contamination problems and yet, in a direct break with their public trust responsibilities and with the law, fail to tell their customers of the problems. Other water suppliers falsify their water test results, potentially threatening the health of the public. Due to a severe lack of investment in the nation's infrastructure, most water supply systems in the United States are aging, and most still rely exclusively upon water treatment technology developed before World War I that fails to remove many dangerous contaminants. Many of the state programs for controlling drinking water problems are in disarray, enfeebled by over a decade of starvation for resources and lack of adequate EPA oversight.

Notwithstanding the clear risks posed by drinking water contamination and the mounting evidence of the government's failure to tackle the problem, within the nation's capital, lobbyists for the water supply industry and representatives of many states and local governments are organizing a major effort to *weaken* the nation's drinking water law. Most water consumers probably would be stunned to learn that part of their water bill is going to support Washington lobbyists who are fighting to weaken drinking water protection—yet that is precisely what is happening.

Some of the very same people who have kept full knowledge of the extent of drinking water contamination from the public are among those who want to weaken the law's protection of the public's health. In complaining about what they call Congress's "unfunded mandates" for local and state governments to protect their water supplies, many of these interests have concentrated their efforts primarily upon weakening public health protections, rather than upon securing adequate funding to implement them. And while it is clear that many of the "mandates" for public health protection are not adequately funded, what is needed is a major infusion of resources into drinking water protection—not a backsliding in the law's protectiveness. In general, the nation's water supplies can be protected and treated, so that they will be pure and essentially free of toxins, at an additional cost that is less than the cost of a can of a soft drink a day per customer.

The Clinton Administration, in a sharp break with past Administrations, has proposed a \$4.6 billion multi-year commitment of federal resources to help cities comply with the drinking water law—but this money is in jeopardy in the budget process. In any event, even if the Clinton Administration's proposal is fully funded, it will not be sufficient to fund all of the existing needs for water supply protection. Before these needs can be met, the public must be informed of the nature of the problem, and the water supply industry, state and local governments, and ultimately the consumers will also have to increase their expenditures to protect public health.

Thus, despite the existence of the 1974 Safe Drinking Water Act and its 1986 strengthening amendments, the nation's drinking water supplies are still at risk. And the public has not been told.

Executive Summary

This report is the result of a two-year investigation into the extent of drinking water contamination in the United States and into the government action—or, more often, inaction—to remedy these problems. NRDC has obtained and analyzed millions of pieces of computerized data and tens of thousands of pages of documents in its investigation of this problem. Most of the information presented in this report on noncompliance with the Safe Drinking Water Act during recent years, including a July 1993 EPA Inspector General's audit of certain drinking water enforcement problems, has never been publicly reported.

The Breakdown in Compliance With the Safe Drinking Water Act

According to EPA's records, in 1991-1992, the nation's water systems committed over 250,000 violations of the Safe Drinking Water Act, affecting more than 100 million Americans. These violations included over 25,000 violations of EPA's fundamental health standards, the Maximum Contaminant Levels (MCLs), affecting over 28 million people. The compliance problems appeared to be most significant for coliform bacteria (an indication that water is contaminated with fecal matter), turbidity (or cloudiness—another indicator of possible microbiological contamination), lead, radioactive contamination, and a family of chemicals known as trihalomethanes (which result primarily from the use of chlorine to disinfect water that has not been treated to remove organic matter).

Under-reporting and Outright Deceit in Reporting Drinking Water Contamination

For reasons discussed in detail in the report, these data probably should be considered *underestimates* of the extent of the noncompliance problem. The General Accounting Office (GAO) and internal EPA documents show clear evidence of under-reporting of violations by water systems and by many states. For example, many states supplied no monitoring data for entire classes of contaminants, and other serious under-reporting has been documented by the GAO. Moreover, according to GAO and a previously undisclosed July 1993 EPA Inspector General's audit, many water suppliers file or are suspected of having filed falsified reports about the level of contamination in their water. Yet neither EPA nor many states have developed effective programs to root out falsification and to prosecute the violators.

The Failure to Enforce

Despite this widespread noncompliance and even outright falsification, EPA's data show a clear pattern of failure to enforce. In the face of over 250,000 violations, states took just over 2,600 formal final enforcement actions, and EPA took about 600; thus, only a tiny percent of the violations were ever subject to penalties. While EPA enforcement numbers have improved somewhat in recent years and some at EPA seek to strengthen EPA enforcement, EPA is hamstrung by lack of drinking water

The Centers for Disease Control estimates that over 900,000 people become sick in the United States every year from contaminated water.

enforcement resources, and there still is a very long way to go in many EPA Regional Offices and in most states before a strong enforcement presence will be felt by the water utilities.

Failure to Notify the Public of Drinking Water Contamination

Although Congress specifically required in the Safe Drinking Water Act that water suppliers notify their customers when their water is contaminated, or when the system has violated EPA rules by failing to test water for contamination, in the majority of cases the water systems do not provide this notice to the public. Even if this notice is purportedly provided, it is often done in a manner calculated to ensure that few if any customers ever actually are informed of or understand the problem. For example, many water systems typically place a notice in the "Legal Notices" section of the newspaper that they have violated the law—in full technical compliance with EPA rules, but in a way that virtually assures the public is never actually made aware of the problem. The lack of effective communication about the drinking water contamination problems has led to unjustified public complacency about the quality and safety of their water supply.

The Health Risks Posed by Poor Enforcement and Inadequate Rules

The public health implications of the drinking water contamination problems are staggering. Many contaminants that are regulated are not adequately controlled under EPA rules because of inadequately protective EPA standards and because of weak or nonexistent enforcement. In addition, many important contaminants, found in over 100 million people's water, are completely unregulated. A few examples will illustrate the extent of the problem:

◆ *Bacteria, viruses, and other pathogens* contaminate the drinking water of tens of millions of Americans. The Centers for Disease Control, in a recent report, found that over 900,000 people become sick in the United States per year from contaminated water. The 1993 Milwaukee disease outbreak alone reportedly affected over 370,000 people. As the Milwaukee disease outbreak and many other cases highlight, AIDS patients, the elderly, young infants, and people that have compromised immune systems are put at greatest risk by these contamination problems, and in many cases have died from drinking water contamination. In addition to the widespread noncompliance with EPA's watershed protection, filtration, and coliform rules noted above, there are major gaps in the EPA drinking water rules for microorganisms (for example, EPA rules do not even require monitoring for the organism that caused the Milwaukee outbreak).

◆ *Trihalomethanes and other disinfection by-products (DBPs)* are formed when chlorine or other similar disinfectants are used to disinfect water that has not been treated to remove organic matter before disinfection. They are found in the drinking water of over 100 million Americans. A recent study by doctors from Harvard and Wisconsin, published in a prestigious journal, found that DBPs may be responsible for 10,700 or more rectal and bladder cancers per year. Another recent massive study of pregnant women and their babies, led by doctors from the Public Health Service, found that certain birth defects are significantly associated with DBPs,

and urged that follow-up studies be conducted as soon as possible. The level of DBPs can be substantially reduced or nearly eliminated through the use of affordable modern treatment technology. Despite the strong evidence that these DBPs pose serious risks, EPA has rules controlling only one class of them (trihalomethanes) and only in large water systems. New rules for DBPs may not be issued until 1996.

✦ *Arsenic* in drinking water poses a major risk of cancer, according to recent studies of people who drink water contaminated with relatively low levels of this widely occurring drinking water contaminant. California state experts found that water containing arsenic *at the level of EPA's current drinking water standard* presents a risk of more than one cancer in every hundred people exposed—10,000 times higher risk than EPA's standard "acceptable" risk of one cancer in one million people. Tens of millions of people in the United States drink water every day from their community water systems that contain arsenic at a level of over 2 ppb (parts per billion)—which presents a very significant cancer risk (about one cancer for every thousand people exposed).

✦ *Lead* contamination of drinking water is widespread and a serious health concern. EPA has found that lead in drinking water is one of the leading sources of lead in the bloodstream, typically contributing 20 percent of total lead exposure for an average person, but far more for some people, particularly bottle-fed infants. Overall, EPA has found that controlling lead-contaminated drinking water could reduce lead exposure for between 130 and nearly 190 million Americans. Lead in drinking water harms millions of children's health, and causes over 560,000 children to exceed the Centers for Disease Control's defined level of concern for blood lead levels. EPA also has found that in men, better control of lead in drinking water could prevent over 680,000 cases of hypertension, 650 strokes, 880 heart attacks, and 670 premature deaths from heart disease every year. However, EPA's lead in drinking water rules allow water systems up to twenty-three years to get the lead out of their water, and exempts most public water systems from lead controls.

✦ *Radioactive contamination* of drinking water, although a little-known problem, affects approximately 50 million Americans, yet most of these contaminants still are not regulated in drinking water. Radioactive contamination of drinking water is well documented as a cause of various forms of cancer, yet EPA's current rules do not control some of the most widespread radioactive contaminants, such as radon. According to EPA data, about 49 million people drink water containing significant levels of radioactive radon, and millions more drink water contaminated with radium, uranium, and other radioactive substances.

Nationwide Breakdown in State Drinking Water Programs

Many state programs for protecting drinking water are in disarray due to inadequate funding, inability or unwillingness to adopt EPA's mandatory drinking water regulations in a timely fashion, and failure to enforce the Safe Drinking Water Act's rules requiring drinking water protection. In addition, most states have failed to adopt the

California state experts found that water containing arsenic at the level of EPA's current drinking water standard presents a risk of more than one cancer in every hundred people exposed.

programs recommended by EPA to prevent drinking water contamination before it occurs through routine, triennial “sanitary surveys” of every public water system.

Decrepit, Outdated, and Decaying Water Supply Infrastructure

The vast majority of the drinking water systems in the United States rely upon drinking water treatment systems developed before World War I. Most surface water systems fail to protect from pollution the watersheds from which they draw their water; hundreds do not filter their water before it is used as some water systems have done since the 1800's. Moreover, advanced water treatment technology, such as membrane filters and granular activated carbon, has been installed in only a relative handful of water systems even though it is clearly economically and technically feasible, particularly for larger systems. Finally, the water mains and service lines in the nation's cities are decaying and millions of Americans are served by lead pipes in their service lines, which contribute to lead-contaminated drinking water. A major effort to invest in the long-neglected water supply infrastructure is needed urgently.

Need for Congress to Strengthen the Safe Drinking Water Act and Resist Efforts to Weaken this Major Public Health Law

The fundamental framework of the Safe Drinking Water Act (SDWA) is sound—it requires EPA to establish national drinking water rules called Maximum Contaminant Levels (MCLs) that are as close to EPA's health goals for safe drinking water as is economically and technically feasible. However, it needs to be strengthened in several areas to make it more protective of public health, and accompanying legislation is needed to help public water systems comply with the Act through economic assistance. In addition, Congress should turn aside the efforts of some members of the water utility industry, as well as some state and local officials, to gut or weaken the Safe Drinking Water Act.

Rather than such weakening amendments, the drinking water law needs to be strengthened to assure protection of the public. The eleven major areas where improved drinking water legislation is needed are:

1. State Revolving Fund for Drinking Water

As proposed by the Clinton Administration and introduced as legislation by Congressmen Waxman and Dingell, the federal government should assist needy local public water systems to come into compliance with the Safe Drinking Water Act. Over 50 billion dollars in federal funds have been spent in the past on cleaning up sewage, but a relative pittance has been spent on cleaning up the water that actually comes out of our taps.

2. Requiring State Programs to Get on their Feet, and Imposing a Federal “Back Stop” Fee in States with Inadequately Funded Programs

Drinking water programs in many states simply are not sufficiently funded to carry out even the most fundamental requirements of the Safe Drinking Water Act, much less to undertake the preventative actions that are needed to avoid drinking water contamination before it happens. Thus, there should be a national requirement that state programs be adequately funded to fully carry out the law. If, after eighteen months, the state has failed to obtain adequate funding, a federal user fee of about a dime per thousand gallons of water should be imposed to pay for the state drinking water program, to be returned to the state if it continues to run a federally approved program.

3. State Programs to Ensure Public Water System Viability

Because of the proliferation of economically weak, generally very small water systems (there are now about 200,000 public water systems in the United States, of which the vast majority are very small), the compliance problems under the Safe Drinking Water Act continue to worsen. There is an urgent need for mandatory programs at the state level to prevent the creation of new nonviable water systems and, over time, to get rid of existing nonviable systems that cannot comply with the Act through consolidation or regionalization of these systems with other systems that can comply or by other means.

4. Strengthening and Streamlining Enforcement

The Safe Drinking Water Act's enforcement provisions are extremely weak and inefficient by comparison to other laws such as the Clean Water Act. The SDWA should be amended to essentially trace the Clean Water Act's more effective and streamlined enforcement provisions to enable EPA and states to better enforce the law. In addition, the SDWA's citizen suit provisions should be modernized to be similar to those of the Clean Water Act and Clean Air Act in allowing citizens to sue for penalties.

5. Helping Small Systems Comply

Special provisions to assist small systems through technical assistance and help with consolidation and regionalization should be adopted to help solve the small systems noncompliance crisis.

6. Assuring Environmental Justice in the Drinking Water Program

The SDWA should be amended to specifically require that drinking water requirements be protective of those who would otherwise be disproportionately affected by drinking water contamination, such as children, infants, the elderly, the poor, and people of color.

7. Assuring the Public's Right to Know About Drinking Water

The law should be amended to strengthen the requirements for public notification and access to information about drinking water contamination.

8. Protecting Sources of Drinking Water

The Act also should be revised to move away from largely "end of the tap" water cleanup and should embody more pollution prevention requirements. For example, the law should strengthen requirements and incentives for watershed protection.

9. Protecting Whistle Blowers

The law should include a stronger provision to protect people such as drinking water utility employees who risk their jobs and personal safety by reporting people (or their employers) who violate the law.

10. Reducing Lead in Drinking Water

The SDWA should be amended to ban lead in plumbing, faucets, and fixtures because the current provisions on lead in these materials are highly ineffective. In addition, while pending litigation brought by NRDC may resolve the legal adequacy of the lead-in-drinking-water rules, if Congress decides to address lead issues, it should adopt the provisions of Congressman Waxman's bill (H.R. 2840, introduced last Congress), which would have substantially strengthened the lead-in-drinking-water rules.

11. Adequate Appropriations for the Drinking Water Implementation and Enforcement, State Grants, and Research Program

The EPA drinking water program, state grants, and drinking water research budget

have been chronically and severely under-funded. Recent budgetary cutbacks in the program, and the Administration's proposed FY 94 operating budget for these programs, will only exacerbate these problems. For example, state grants should be increased to \$100 million per year, EPA's drinking water implementation and enforcement salaries and expenses budget and FTE ceiling must be increased by at least 30 percent, and the budget for drinking water research should be increased by \$35 million.

What Citizens Can Do

Chapter 8 notes that there are five things you can do today to learn about and protect your drinking water:

1. Find out what contaminants are in your drinking water.
2. Contact your Senators and member of Congress, asking them to fight for a stronger Safe Drinking Water Act and Clean Water Act, and to fight efforts to weaken those critical laws. Please send a copy of your letter to NRDC's Drinking Water Project in our Washington, D.C., office.
3. Get involved in local efforts to protect your drinking water. Call your local environmental groups, or the Clean Water Network headquartered at NRDC's Washington, D.C., office (202-783-7800), to learn how to get involved.
4. Find out where your drinking water comes from and what may be threatening it.
5. Take actions in your home to reduce your risk from drinking water contamination. There are several things you can do in your home to reduce your exposure to lead, volatile organic compounds, and other contaminants in drinking water. Chapter 8 lays out some approaches.

The bottom line is that drinking water in the United States is not necessarily safe to drink. The state and federal governments must take the drinking water protection program far more seriously to achieve the goal of making everyone's water safe to drink.

Chapter 1: A Brief Introduction to the Safe Drinking Water Act

The Safe Drinking Water Act (SDWA)¹ was originally passed in 1974, and was significantly updated and strengthened in 1986. The fundamental purpose of the Act is to protect the public from contamination of public water supplies. It establishes a comprehensive national scheme requiring drinking water regulations to be issued by EPA and enforced by states. If a state fails to adopt and enforce the EPA drinking water rules, EPA must enforce the rules in that state.

The law requires all “public water systems” in the United States to comply with federal drinking water standards. The EPA was required under the Act to issue “Maximum Contaminant Levels” or “MCLs”—the maximum allowable amount of a contaminant in drinking water—for approximately 100 contaminants by 1989.⁶ To establish an MCL, EPA must first set a “Maximum Contaminant Level Goal” or MCLG, which is the level of a contaminant that can be safely consumed in drinking water without harming health, with “an adequate margin of safety.” EPA must then set the MCL as close to the MCLG as is feasible, taking costs and available water treatment technology into account. EPA had issued enforceable standards for seventy-eight contaminants as of May, 1993.

In addition, as part of these drinking water rules, EPA issues monitoring and reporting (M/R) rules that require water systems to test their water for contamination and to report the results of those tests to state or federal authorities. These monitoring and reporting rules are critical to assuring that water is safe to drink, for if the water is not tested for contamination and the results are not provided to regulatory authorities, there is no assurance that the water is safe.

Although the statute makes no distinctions among water systems in its requirements—indeed, it requires EPA to regulate *all* public water systems—EPA divides water systems into two overall categories. EPA concentrates the vast majority of its attention upon what it calls “community” water systems, defined as public water systems that serve a year-round population of residents (such as typical city water systems). There are nearly 59,000 community water systems that serve over 245 million Americans. Far less atten-

tion is paid to so-called “noncommunity” water systems, which serve most of their customers only part of the year (such as hospitals, hotels, schools, factories, and resorts). There are nearly 140,000 noncommunity systems serving over 22 million people. Yet most of EPA’s drinking water standards apply only to community systems. Only the coliform, turbidity, and nitrate standards apply to *all* public water systems, including all noncommunity systems. However, some more recent EPA rules do apply to a subset of noncommunity systems with a more stable population base, called “nontransient, noncommunity” systems (of which there are about 24,000 serving 6.2 million people)—such as factories that serve at least twenty-five people at least six months per year.

Chapter 2: The Breakdown in Compliance

Massive Violation of the Safe Drinking Water Act

Public water systems across the country, in every state, are violating the Safe Drinking Water Act—in thousands of cases violating it flagrantly—generally with no meaningful threat of state or federal enforcement action being taken against them. As is shown in Table 1, the number of public water systems in violation of the law in the United States, and the number of violations by those systems, is astounding. Moreover, as Table 2 shows, the number of people affected by these violations is breathtaking.

TABLE 1: NUMBER OF DRINKING WATER VIOLATIONS IN 1991-1992

Total Number of Community and Noncommunity Systems Violating	Percent of Community Water Systems Violating	Number of Maximum Contaminant Level Violations	Number of Monitoring and Reporting Violations	Total Number of Violations*
53,656	43%	25,344	217,515	257,183

*Includes certain violations not categorized as MCL or M/R violations. The data on the number of violations in this report are accurate as of August 1993, the point at which data collection was halted for this report. Since August, in accordance with EPA requirements, states are updating their data to meet a September 1993 update requirement. The appendices to this report (under separate cover) reflect all changes to these data made after August 1993.

Source: Federal Reporting Data System (FRDS) (as of August 1993)

Thus, as Tables 1 and 2 demonstrate, according to EPA's computer records, in 1991-1992 there were over 250,000 violations of the SDWA, affecting more than 123 million Americans. Over 28.8 million people drank water in those years that violated EPA's MCLs, the central health standards of the drinking water program. There were over 217,000 violations of the monitoring and reporting requirements of the Act, affecting 108.7 million people in 1991-1992; about 92 percent of these monitoring and reporting violations are categorized as "major" violations, and just eight percent were "minor."⁷ Thus, the frequently heard argument from water utilities that the noncompliance problems basically are just trivial—such as a late postmark on a monitoring report—can be dismissed as inaccurate.

TABLE 2: U.S. POPULATION AFFECTED BY DRINKING WATER VIOLATIONS IN 1991-1992

Type of System	Population Affected by Maximum Contaminant Level Violations	Population Affected by Monitoring and Reporting Violations	Total Population Affected*
Community	28.8 million	108.7 million	123 million
Noncommunity*	1.4 million	4.9 million	5.6 million

*Total population affected is *not* the sum of those affected by MCL and M/R violations, because some people were affected by both types of violators. The data on the number of violations in this report are accurate as of August 1993, the point at which data collection was halted for this report. Since August, in accordance with EPA requirements, states are updating their data to meet a September 1993 update requirement. The appendices to this report (under separate cover) reflect all changes to these data made after August 1993.

*Includes data only for violations by non-transient noncommunity systems

Source: FRDS (as of August 1993)

The 217,000 reported violations of the requirements to test and report the levels of contaminants in drinking water often mask serious water contamination problems. For example, a review by the EPA Inspector General of compliance files in several states found a pattern of cases in which public water systems that had repeatedly failed to conduct required monitoring actually later turned out to be in violation of the actual MCL.* Thus, it appears, the failure to test often masks a more serious failure to meet the health-based maximum contaminant level.

As Table 3 shows and Appendix D documents in greater detail, the MCL compliance problems appeared to be most significant for coliform bacteria (an indication that water is contaminated with fecal matter), turbidity (cloudiness—another indicator of possible microbiological contamination), nitrate, a family of chemicals known as trihalomethanes (which result primarily from the use of chlorine to disinfect water that has not been treated to remove organic matter), the industrial solvent trichloroethylene, and the radioactive contaminants radium and gross alpha radiation, which come primarily from radioactive groundwater.

TABLE 3: U.S. POPULATION AFFECTED BY CERTAIN MAXIMUM CONTAMINANT LEVEL VIOLATIONS IN 1991 OR 1992

Contaminant	Number of Violations of MCL	Population Affected by MCL Violations in 1991 or 1992*
Coliform Bacteria (old rules)	3,156	>1.9 million
Bacteria and pathogens (new rules)**	17,997	>13.3 million
Turbidity	1,556	>4.2 million
Nitrate	1,090	>382 thousand
Trihalomethanes	66	>1.4 million
Trichloroethylene	191	>501 thousand
Combined Radium	332	>875 thousand
Gross Alpha Radioactivity	327	>469 thousand

*The data on population affected are reported for the year in which the largest number of people were affected, 1991 or 1992. The data in this table are accurate as of August 1993, the point at which data collection was halted for this report. Since August, in accordance with EPA requirements, states are updating their data to meet a September 1993 update requirement. The appendices to this report (under separate cover) reflect all changes to these data made after August 1993.

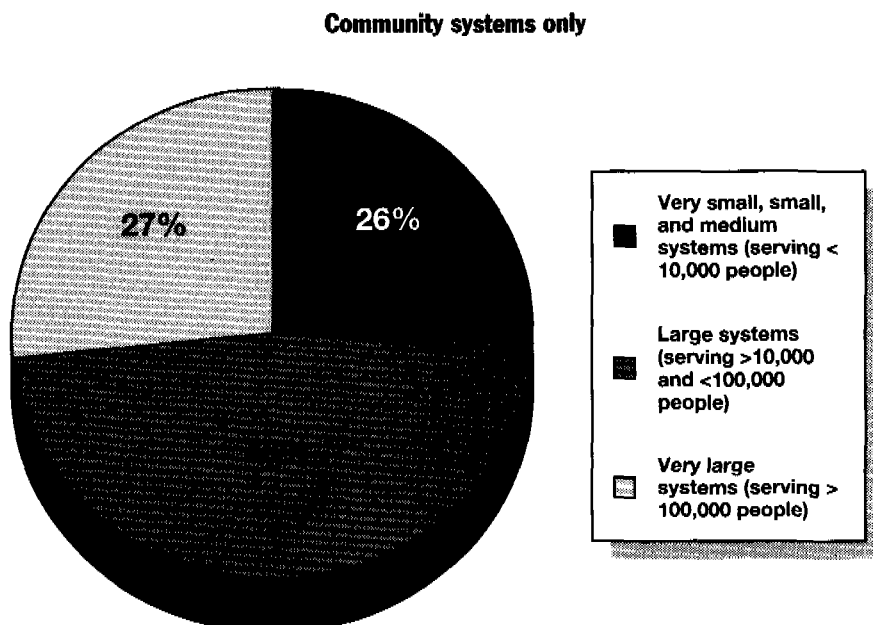
** This includes all substantive violations of the Surface Water Treatment Rule.

Source: FRDS (as of August 1993)

In addition to the large overall number of violators, there are thousands of repeated, chronic, serious noncompliers—what EPA calls “significant noncompliers.” In June 1991, for example, there were 2,645 “Significant Non-Compliers,” or SNCs, and in June 1992, there were 2,586 SNCs, according to EPA data. While the total number of SNCs for microbiological and turbidity violations has decreased slightly since mid-1991, the number of chemical and radiological SNCs has risen.

It is also critical to recognize that, contrary to the rhetoric often heard from some, many large water systems are responsible for substantial violations; serious violations are not the sole domain of small water systems. Indeed, as is clear from Figure 1, in 1991-1992 21.4 million people—the vast majority of the American public that drank water supplied by public water systems confirmed to be contaminated in excess of EPA’s MCL standards—were served by large water systems (those that serve over 10,000 people).

FIGURE 1: POPULATION AFFECTED BY MAXIMUM CONTAMINANT LEVEL VIOLATIONS, BY SIZE OF WATER SYSTEM, IN 1991-1992



Source: FRDS 07(8/93)

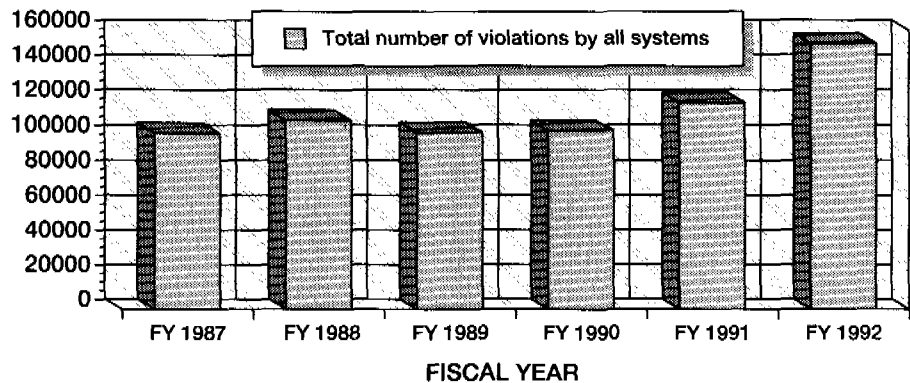
On top of these thousands of violations in 1991-1992, Appendix E provides the most recent EPA list of systems that, according to EPA records, did not meet the June 1993 deadline for compliance with EPA’s surface water treatment rule. That rule required that by the end of June 1993, public water systems that use surface water had to adopt specified measures to adequately protect their watershed from pollution with fecal matter, or they would be required to install filtration systems to remove specific microorganisms that may be in their raw water. Some of the systems listed as having failed to comply with the surface water treatment rule may be subject to an administrative order or other state or EPA enforcement action to require them to come into compliance with the watershed protection of surface water treatment requirements at a later date. Some systems may also derive water from more than one source, and may have violated the surface water treatment rule for one source of water but not for others.

As Figure 2 documents, the nationwide breakdown in compliance apparently has worsened in recent years, in part because of the expansion and strengthening of EPA’s drinking water standards. For example, according to EPA data analyzed by the

National Wildlife Federation (NWF) in *Danger on Tap*, published by NWF in October of 1988, there were about 101,000 violations of the SDWA in Fiscal Year (FY) 1987, affecting about 37 million people. An FY 1988 Update to *Danger on Tap* published by NWF in 1989 found that over 97,000 violations had occurred, affecting about 38 million people. (These FY 1988 data did not include key data for certain states, which was not available, so it appeared that there was no true drop in the number of violations from FY 1987 to FY 1988. Figure 2 updates FY 1988 data.) The FY 1988 update found that about 9,200 MCL violations affected over 12 million people in FY 1988.

In part, the increase in the aggregate number of violations since 1988 can be attributed to the addition of additional and more stringent rules between 1989 and 1991-1992. However, the data also indicate that during this time period, the population affected by certain standards (such as those for microbiological contamination) has risen significantly since 1988, a troubling sign that even the most fundamental requirements of the drinking water law—that water should be essentially free of risky microorganisms—are being widely violated.

FIGURE 2: DRINKING WATER VIOLATION TRENDS



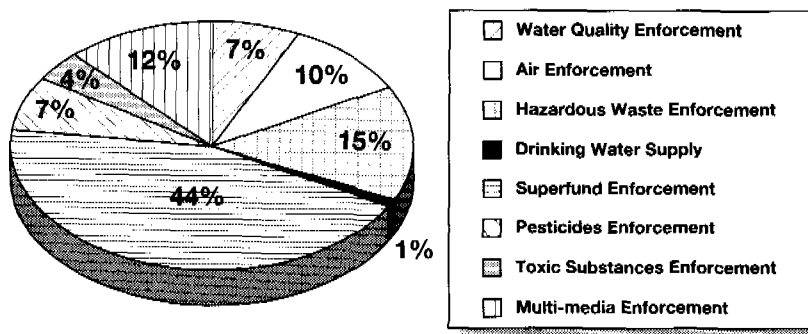
Source: FRDS 9/93

Chapter 3: Poor Enforcement: A Signal to Water Utilities that Compliance is Optional

In the face of this widespread and nationwide breakdown in compliance with the SDWA, and despite the recent best efforts of some at EPA in and certain states to improve drinking water enforcement, in general enforcement has been weak to nonexistent. Despite government protestations that enforcement is an important element of drinking water protection, the poor enforcement record and inadequate resources dedicated to enforcement speak more loudly than words, sending an unmistakable and clear message to violators and potential violators that all too often drinking water compliance is not taken seriously.

Some of the difficulties with EPA enforcement can be laid at the doorstep of the often weak and cumbersome statutory enforcement provisions of the SDWA. However, much of the problem is a lack of resources for enforcement and for data support for enforcement, and in some cases a lack of political will to take a tough enforcement stance, particularly in certain EPA Regional Offices. Figure 3 indicates the serious under-funding of EPA's drinking water enforcement efforts as compared even to EPA's other modest enforcement programs; about one percent of EPA's enforcement budget goes to enforcement of the public water system program.

FIGURE 3: EPA SPENDING ON ENFORCEMENT



Total EPA Enforcement Budget: \$396.8 Million
EPA Public Drinking Water Supply Enforcement: \$4 Million

Source: 1994 EPA Budget Justification

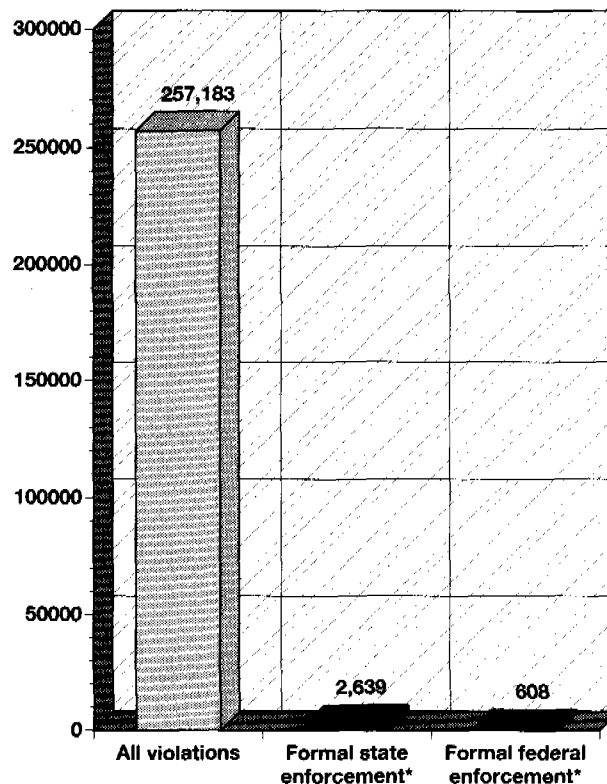
Still, there is a glimmer of hope: EPA management recently placed strong advocates of enforcement into positions of authority in the drinking water program at EPA headquarters. However, these new drinking water managers will have substantial difficulty improving EPA's and states' enforcement practices in light of the need for attitudinal changes at states and in EPA, especially certain EPA Regional Offices, and in light of severe resource constraints and some statutory impediments to efficient EPA enforcement.

Poor State Enforcement Record; Modestly Improving EPA Record

The data indicate clearly the poor enforcement record. For example, as is shown in Figure 4, there were 257,000 violations of the SDWA in 1991-1992, in response to which EPA issued just 519 final administrative orders, took seven emergency actions, referred just four civil cases and four criminal cases to the Justice Department for prosecution, and asked for or obtained administrative penalties in sixty-four cases after issuing an administrative order that was subsequently violated. While this is a modest improvement over the earlier EPA enforcement record—EPA took just fifty enforcement actions in fiscal years 1987 and 129 in 1988—it still represents enforcement against a tiny percentage of violators.

The states' enforcement performance was also extremely weak, with a total of just over 2,600 formal enforcement actions taken in 1991 and 1992 combined. This actually represents a *decrease* in the number of formal state enforcement from previous years; in fiscal 1987 alone there were 2,544 state formal enforcement actions reported, while in fiscal 1988 alone there were 2,321.¹⁰

FIGURE 4: VIOLATIONS AND FORMAL ENFORCEMENT ACTIONS—1991-1992



*"Formal enforcement": defined as final administrative or judicial enforcement actions that are directly enforceable. (See Appendix A for a discussion of "formal enforcement" actions.)

Source: FRDS 19, FRDS 17 (8/93)

Thus, far fewer than one percent of the 257,000 violations were the subject of enforcement actions, and roughly 5 percent of the 53,000 systems known to be in violation saw formal enforcement action brought against them.

1993 EPA Inspector General's Report

A previously unpublicized July 1993 EPA Inspector General's report documents inadequate state and EPA Regional Office enforcement and resistance to taking enforcement actions. A detailed audit of EPA and state enforcement completed by the EPA Inspector General in July 1993, and not previously made public, found that in the EPA Region reviewed (Region I in New England), EPA and the states had simply failed in their enforcement responsibilities:

EPA did not aggressively pursue timely and appropriate enforcement action against small system violators of the SDWA....Some public water systems ... had been in noncompliance for up to ten years before formal enforcement action was taken. When formal enforcement action was taken, it was not timely and appropriate as defined by EPA guidance....Both the [EPA] Region and the states stated that staffing shortages prevented them from taking more actions. Additionally, the [EPA] Region did not believe EPA guidance defining timely and appropriate enforcement action should be applied to all violators, particularly small system violators. Yet continued non-enforceable actions were not successful in bringing these systems back into compliance.¹¹

The Inspector General, manifestly, was frustrated by the EPA Region's continued defense of its failure to enforce the Safe Drinking Water Act, which the EPA Region referred to as amounting to "indiscriminate paper work." The Inspector General responded:

We do not consider administrative orders "indiscriminate paper work." To the contrary, a systematic enforcement program can be far more efficient and effective in eliminating non-compliance. Further, such a program also has a deterrent effect that sends a message that EPA is serious about compliance....We do not understand how the [EPA] Region is protecting public health when it allows systems to violate SDWA standards because enforcement may not be a welcome action by the system owner.¹²

This clear lack of state and EPA Regional office support for drinking water enforcement also has been documented in other EPA Regions and states.

General Accounting Office (GAO) Documentation of Poor State and EPA Enforcement

A detailed 1990 GAO review of EPA and state drinking water enforcement files delivered a discouraging verdict:

Enforcement is neither timely nor appropriate against significant noncompliers. More important, state enforcement actions are often ineffective in returning these violators to compliance. Of particular concern is that many of the significant violators GAO reviewed, some posing serious health risks, have persisted for years. In some of these cases, states took no enforcement action; in others, enforcement action did not bring about compliance or did so only after lengthy delays.¹³

In reviewing state and EPA performance, the GAO investigators found that even where violators had been identified as "Significant Non-Compliers," states took timely and

appropriate enforcement action in just 25 percent of the cases.¹⁴ Thus, the GAO investigators concluded, many violations go on unchecked for years, and states rarely met EPA's enforcement criteria even for the worst violators.

Other Independent Investigations

Several other reviews of various aspects of state and EPA enforcement of drinking water requirements have found that the enforcement of the law is weak and ineffective.

For example, in addition to the July 1993 audit of the Region I drinking water enforcement program, EPA's Inspector General conducted two other audits of drinking water issues. In a 1988 audit of EPA enforcement of the noncommunity water system rules, the Inspector General found widespread noncompliance and virtually no effective state or EPA enforcement response.¹⁵ Another Inspector General's audit of the program, completed in 1990, found that EPA and states were failing to effectively enforce the rules on testing for lead in school drinking water, the lead plumbing ban, and the lead public notification requirements of the SDWA as amended by the Lead Contamination Control Act.¹⁶ Similarly, a Natural Resources Defense Council review of fifty states' enforcement of the lead in school drinking water testing and public notification requirements found widespread noncompliance and virtually no state enforcement.¹⁷

Chapter 4: Failure to Inform Citizens, Failure to Report Violations to EPA, and Falsification of Test Results

In enacting the Safe Drinking Water Act, Congress specifically required that public water systems inform their customers of all violations, in order to let citizens know about these problems and in hopes of creating informed public support for remedying them. Unfortunately, because the water systems, states, and EPA have failed to meaningfully inform the public about the extent of drinking water problems in local communities, this goal has been severely undermined. In addition, it is now clear that despite clear requirements in the law and in EPA regulations, states often are not informing EPA of violations. Most troubling of all is recent mounting evidence that some water systems are falsifying their drinking water test results, generally with impunity.

Under-Reporting of Violations

The data provided in earlier chapters on the number of violations of the SDWA most likely represent understatements of the extent of noncompliance. According to investigations by the General Accounting Office (GAO), the EPA Inspector General, and NRDC's reviews of EPA records and interviews with EPA experts, it is clear that there is serious *under-reporting* of violations, and that some systems are falsifying their test results. Thus, an accurate estimation of the number of violations would likely be significantly higher than the numbers noted above in Chapter 2.¹⁸

According to EPA data summarized in Table 4, in 1991-1992, twenty-six states and territories reported *no* monitoring and reporting violations for chemical and radiological contaminants. Unless compliance in these states is extraordinarily better than that of the other half of the states, which reported tens of thousands of violations of these monitoring and reporting requirements, this suggests a serious and widespread failure by states to report violations of chemical and radiological monitoring requirements to EPA. EPA staff believe that these states, with one or two possible exceptions, in total actually have thousands of violations that are not being reported to EPA.

TABLE 4
STATES THAT REPORTED NO CHEMICAL OR RADIOLOGICAL
MONITORING OR REPORTING VIOLATIONS FOR ALL OF 1991-1992

Region I Maine New Hampshire	Region III Washington, D.C. West Virginia	Region IV Georgia Mississippi
Region V Michigan Minnesota	Region VI Arkansas Louisiana Oklahoma Texas	Region VII Kansas Missouri Nebraska
Region VIII Montana North Dakota Wyoming	Region IX American Samoa Northern Marianas Islands Guam Hawaii Nevada Trust Territories of the Pacific Palau	Region X Idaho

The notion that there is serious under-reporting of violations has been confirmed by GAO and the EPA Inspector General. In a 1990 investigation conducted through thorough file-by-file reviews of drinking water system violations in state and federal files, GAO found that in numerous instances, states were failing to notify EPA of, and therefore EPA's database does not include, many violations of the SDWA known to the states.¹⁹ The GAO investigators noted that while it was possible that there were errors in the EPA database in some cases causing over-reporting, in the vast majority of cases under-reporting of violations predominated.²⁰ A 1988 EPA Inspector General's audit of the noncommunity drinking water program also documented substantial under-reporting of violations by states to EPA.²¹

Thus, it appears clear that EPA, and the public, are not getting a clear or accurate picture of the extent of noncompliance with the Safe Drinking Water Act because of substantial under-reporting of violations known to states but not known to EPA or citizens.

Falsification of Drinking Water Test Results

Perhaps more troubling than state failures to report known violations to EPA are indications that there may be widespread outright falsification of drinking water testing results by public water systems.

The July 1993 EPA Inspector General's Audit of EPA Region I's enforcement program is highly critical of the Regional Office's failure to adequately follow up on examples of possible water system test data falsification. The Inspector General revealed that in 1991, EPA identified "approximately eighty-nine water systems reporting suspicious turbidity or bacteriological test results," but found that the EPA regional office, after an initial investigation of a small subset of these systems, did virtually nothing about the possible falsification of data, other than to tell the states of the possible problem.²² The Inspector General found that the states

did not follow up on the possible falsification of data either, and that EPA said it had higher priorities than to aggressively pursue this issue.²³ A former EPA Region I enforcement official interviewed by NRDC asserts that EPA has adopted a conscious policy in the Region of not aggressively pursuing this issue, and that the few criminal cases that were prosecuted by the Justice Department were initiated by the U.S. Attorney's office when EPA failed to act.

Of course, this apparent falsification problem is not limited to EPA Region I. According to the 1990 GAO investigation of six states' enforcement and violation records across the country, GAO found cases of intentional falsification of drinking water test data. GAO noted that this happens in several ways:

One way for water system operators to ensure the results are within acceptable limits is to take samples from sources that are known to be free of contamination....[O]perators can simply report plausible [turbidity] test results without ever actually testing their water....To falsify microbiological tests, operators can take measures to eliminate any contamination before the sample is tested. For example, boiling or microwaving the sample will kill bacteria, as will rinsing the container with chlorine prior to collection of the sample.²⁴

The GAO investigators cited examples of system operators simply making up turbidity test results and other cases of falsification. While GAO said some state program managers (e.g. Texas and Oklahoma) estimate that 3 to 5 percent of surface water systems falsify data, most states have done little to ferret out falsification and to prosecute violators. In response to GAO's 1990 report EPA Headquarters urged states and regions to take stronger action on falsification, but if the Inspector General's July 1993 audit is any indication of the response to this directive nationally, the states and EPA regional offices have not heeded the call.

Failure to Notify Customers of Violations

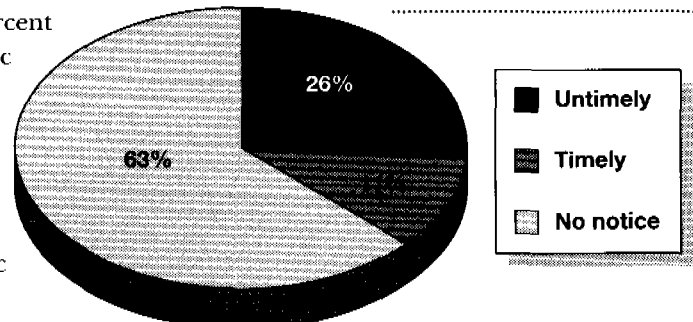
Public Water Systems' Widespread Failure to tell Customers They Are in Violation

One of the critical provisions of the Safe Drinking Water Act is a statutory requirement, now written into EPA regulations, that public water systems that violate the drinking water rules must notify their customers of the violation.²⁵ Congress made it clear that this provision was supposed to spur public pressure to support bringing these systems into compliance with the law, and to enable members of the public to protect themselves and their families from contamination.²⁶ However, it is clear that these public notices in most cases are not being issued, or that when they are (theoretically) issued, they often are provided in a way calculated to virtually assure that the public is never effectively informed of the problem.

A comprehensive June 1992 GAO review of public water system compliance with public notice requirements found widespread noncompliance with these rules, and found that even when notice was given it usually was ineffective. As indicated in Figure 5, water systems issued timely public notice in only 11 percent of the cases; in 26 percent of the cases reviewed untimely public notice was given, and in 63 percent of the cases, no notice was provided to the public at all.²⁷ In 92 percent of the cases where there were monitoring violations, no public notice was provided at all. GAO found that three-quarters of the cases in which timely notice was not given "involved serious long-term health risks" due to MCL violations. There was generally very little EPA or state oversight to assure that public notice was given. Indeed, generally EPA does not even track, in its current computer system, whether public notice was issued.

In 1991, EPA identified approximately eighty-nine water systems reporting suspicious test results, but did virtually nothing about the possibility of falsification.

**FIGURE 5:
WATER SYSTEMS'
PERFORMANCE IN
ISSUING PUBLIC
NOTICES**



Ineffectiveness of Most Public Notice When Given

Even when public notice was issued, GAO found that the notice generally was ineffective at informing the public.²⁸ The most commonly used method of giving public notice is the placement of an advertisement in the Legal Notices section of the local newspaper (see Figure 6). However, very few people actually read these legal notices, and often they are written in a way that fails to accurately convey to the lay person the true nature of the problem.

FIGURE 6: EXAMPLE OF PUBLIC NOTICE

LEGAL NOTICE
 In order to keep our customers informed, and to comply with State and Federal Drinking Water Regulations, Eastside Utility District would like to inform you of a recent violation concerning turbidity levels. Turbidity is a measure of the amount of very fine suspended particles in the water that may give it a cloudy appearance and interfere with proper disinfection. During the period of June 20 - June 30, 1990, Eastside Utility District's water exceeded the maximum allowable limit for turbidity and also the monthly average of 1.0 turbidity units. This violation was caused by an undetermined disturbance in the underground water table which is beyond our control. We are actively pursuing plans for a filtration system which will eliminate this problem. For further information, please contact Eastside Utility District at 892-7890.

The newspaper page also features several other advertisements, including:
 - **GRANTER PERFORMANCE REPORT HEARING**: A notice regarding a public hearing on a grant performance report.
 - **COMPUTER TRAINING**: Advertisements for computer training courses at various schools.
 - **TRAINER MANAGEMENT CREW MANAGER**: A job advertisement for a crew manager.
 - **RELEASE DOCTOR**: A medical advertisement.
 - **INSURER CONNECTIONS**: A form for insurance services.

Source: GAO, DRINKING WATER: CONSUMERS OFTEN NOT WELL-INFORMED OF POTENTIALLY SERIOUS VIOLATIONS (1992)

Indeed, according to GAO, even the EPA suggested language for public notice about certain types of violations is written at the college level and is beyond the grasp of most readers. Thus, it is clear that between the failure of systems to issue notices and the use of methods of notice that meet the letter of the law but that seem calculated to obfuscate the drinking water problem, the public is not being effectively informed about the extent of drinking water contamination in their communities.

Chapter 5: The Impacts of Drinking Water Contamination on Health

The implications for public health of the widespread violations of the Safe Drinking Water Act, and of EPA's failure to adopt effective regulations to control certain unregulated or under-regulated contaminants, are highly significant. Some of the major types of health risks presented by certain contaminants are discussed below.

Contamination of Drinking Water With Infectious Microorganisms

The 1993 Milwaukee disease outbreak alone reportedly affected 370,000 to 430,000 people, and has been linked by some investigators to the deaths of several AIDS patients and at least one cancer patient.²⁹ Recent estimates by the Centers for Disease Control indicate that 940,000 people get sick each year from microbiologically contaminated water, and that as many as 900 may die from such water contamination.³⁰

From 1971 to 1990, Centers for Disease Control experts report, over 140,000 people are documented to have become ill in documented disease outbreaks in the U.S. linked to contaminated drinking water.³¹ However, haphazard reporting and poor ability to detect these outbreaks suggests that this is a substantial understatement of the number of illnesses attributable to such outbreaks; many experts believe that twenty-five or more waterborne illnesses occur for every illness reported.³²

Recent studies indicate that even when disease occurrences do not reach the "epidemic" stage in which scores, hundreds, or thousands of people become ill simultaneously, "endemic" levels of waterborne disease may continually occur, but are never detected because those affected are unaware that their illness is linked to waterborne contamination.

As the Milwaukee disease outbreak and many other cases highlight, AIDS patients, the elderly, young infants, and people who have compromised immune systems (such as some cancer patients undergoing intensive chemotherapy) are put at greatest risk by these contamination problems, and in many cases have died from drinking water contamination.

Appendix E to this report lists the results of a recent internal EPA review indicating that hundreds of water systems that use surface water do not protect their watersheds or filter their water to remove disease-carrying organisms such as those that recently apparently caused a major outbreak of waterborne disease in Milwaukee. The EPA study indicates that the water systems on the list were breaking the law as of June 29, 1993, the last day for water systems using surface water to show that they either filter their water effectively or that they have fully protected their watersheds. Under 1986 amendments to the U.S. Safe Drinking Water Act and EPA's 1989 regulations implementing that law, all surface water systems must make a showing that they filter or meet the criteria for an effective program to protect their watershed from contamination by that date.³³ Some of those water supplies may be able to demonstrate that they need not filter because their watersheds are protected. However, according to EPA's annotations, most of these water systems will not be able to make that showing, and will therefore be in violation of the law; some may be presenting significant risks to their customers.

Many of the water systems on this list may be *more* vulnerable than Milwaukee's to contamination by disease-carrying organisms such as the Milwaukee culprit called *cryptosporidium*. These unfiltered systems listed in EPA's review may be more vulnerable than the Milwaukee water supply, because the Milwaukee supply *is* filtered (although apparently the filter suffered from some type of failure). According to EPA, all of these systems have missed the June 29, 1993 deadline under the law to either fully protect their watershed or to filter their water.

The information in EPA's recent review, taken together with the data showing contamination of surface water supplies with disease-carrying organisms, and the GAO report released in April 1993 indicating serious deficiencies in the nation's system for conducting and following through on sanitary surveys of water systems,³⁴ indicate that significant risks continue to exist for millions of American drinking water consumers. These reviews reinforce the importance of the finding in Chapter 2 above that millions of Americans are consuming drinking water that has violated the EPA Maximum Contaminant Level for bacteria or turbidity (the measurement for water cloudiness that indicates possible microbiological contamination, which apparently was found to be an indicator of the problem in Milwaukee).

EPA regulations currently do not require any monitoring of water supplies for *cryptosporidium*, the Milwaukee disease agent. The only large-scale survey of water supply contamination by disease-carrying organisms such as those apparently responsible for the Milwaukee problem was completed in 1991 by water utility scientists at sixty-six surface water plants in fourteen states and one Canadian province. This study found that 87 percent of raw water samples contained the Milwaukee organism *cryptosporidium*, and 81 percent contained a similar parasite called *giardia*; overall, 97 percent of the samples contained one of these two disease carriers, although some of the organisms may have been "nonviable" and unable to infect people.³⁵ In many cases, as in Milwaukee, these organisms cannot be sufficiently controlled with chlorine disinfection.

While generally, healthy people with normal immune systems escape from such bouts with disease with abdominal cramps, nausea, and diarrhea, individuals with AIDS, other immune system disorders, the elderly, and the very young can be more seriously affected, and in some cases have died from such infections. For example, according to some reports, some AIDS patients have died in Milwaukee as a result of *cryptosporidium* infections. Similarly, in a disease outbreak in Cabool, Missouri, at least three deaths of elderly people were linked to an outbreak caused by drinking water contaminated by *E. coli* bacteria (serotype 0157:H7),³⁶ the same bacteria that apparently caused the recent illnesses in Oregon reportedly linked to "Jack in the Box" hamburgers.

Chemical Contamination of Drinking Water

The contamination of drinking water supplies by infectious microorganisms is only part of the story. There also is mounting evidence of the contamination of the drinking water of tens of millions of Americans by a broad array of organic and inorganic chemicals and radioactive isotopes. Both animal studies and recent human health epidemiological evidence document the ill effects this contamination effects on public health. For example:

1. Trihalomethanes and Other Disinfection By-Products

Over 100 million Americans consume significant levels of trihalomethanes and other byproducts of the chlorination of drinking water. In 1987, the National Academy of Sciences completed a review of this problem and recommended that EPA revise its rules to reduce the allowable levels of these chemicals in drinking water.³⁷

Numerous animal studies, and now about ten epidemiological studies summarized in Appendix F to this report, indicate that these chemicals are associated with certain cancers. A recent article in the prestigious *American Journal of Public Health* by doctors from Harvard and the Medical College of Wisconsin reviewing and aggregating the data from these human epidemiological studies estimated that *10,700 or more rectal and bladder cancers may be caused each year in the U.S. by disinfection byproducts.*³⁸ In addition, a recent human epidemiological study in the respected journal the *American Journal of Epidemiology* found that these chemicals also are significantly associated with pancreatic cancer.³⁹

Another troubling study recently was completed by the U.S. Public Health Service on the possible impacts of DBPs on fetuses. This recent massive two-volume Public Health Service study suggested that these chemicals may be linked to major birth defects such as certain spine and neural disorders, spurring the investigators to urge swift follow-up studies to these troubling findings.⁴⁰

Contrary to the arguments of some, these byproducts of disinfection can be controlled while simultaneously reducing microbiological risks through improved water treatment, such as the physical removal of the "precursors" to disinfection byproducts—the naturally occurring organic materials that are converted to these problematic chemicals when the water is chemically disinfected. The level of DBPs can be substantially reduced or nearly eliminated through the use of modern treatment technology known as "precursor removal" such as granular activated carbon (which is widely used in Europe and has been installed, for example, in Cincinnati, Ohio, at a cost of about \$30 per year per customer), without harming the ability of water systems to disinfect their water. However, only a handful of U.S. water systems use this technology.

Despite the strong evidence that these DBPs pose serious risks, EPA has rules controlling only one class of them (trihalomethanes) and only in large water systems. New rules for DBPs may not be issued until 1996. A recent tentative agreement among interested parties in a "regulatory negotiation" could more strictly regulate these DBPs, but final resolution of the issue will likely take many years.

2. Lead

a. The Health Effects of Lead

Lead poisoning has been determined by the medical community and the Department of Health and Human Services to be the number one environmental threat to children.⁴¹ Research shows adverse health effects from lead at ever lower levels of exposure.⁴²

**Over 85 percent
of the lead
found in the
blood of bottle-
fed infants
may derive
from baby
formula made
with lead-
contaminated
water.**

According to EPA, the adverse effects of lead exposure, even at low exposure levels, include:

Inhibited activity of enzymes involved in red blood cell metabolism....Elevated erythrocyte protoporphyrin (EP) levels, an indication of lead related interference with heme [and blood protein] synthesis....Interference with vitamin D hormone synthesis....Altered electrical brain wave activity....Deficits in IQ and other measures of cognitive function, such as attention span....Slowed peripheral nerve conduction....Deficits in mental indices....Low birth weights and decreased gestational age, factors that may influence early neurological development....Early childhood growth reductions....Small increases in blood pressure have been related to adults with [very low blood lead] levels....⁴³

These and other health effects of lead at low levels have been well documented in the literature.⁴⁴ EPA therefore established a goal of zero lead in drinking water, because “there are no clearly discernable thresholds for some of the non-cancer health effects associated with lead.”⁴⁵

In addition, with the review and concurrence of the Science Advisory Board, EPA concluded that lead is a probable human carcinogen.⁴⁶ Therefore, there is no true “safe” level of lead, reinforcing EPA’s goal of zero lead exposure.

b. The Effects of Lead in Drinking Water

EPA has found that lead in drinking water is one of the leading sources of lead in the bloodstream, typically contributing 20 percent of total lead exposure for an average person.⁴⁷ In some cases a higher percentage comes from drinking water; for example, EPA found that more than 85 percent of the blood lead in bottle-fed infants may derive from drinking baby formula made with lead-contaminated water.⁴⁸ Indeed, recent studies by Harvard University doctors at a lead poisoning clinic in Boston found that the primary source of lead in the bloodstreams of about 15 percent of the lead-poisoned infants treated at the clinic was from lead-tainted drinking water used to make the babies’ formula.⁴⁹

Overall, EPA has found that controlling lead-contaminated drinking water could reduce lead exposure for between 130 and nearly 190 million Americans.⁵⁰ The health effects of this widespread exposure to lead in drinking water appear to be significant. EPA has determined that lead in drinking water harms millions of children’s health, and causes over 560,000 children to exceed the Centers for Disease Control’s defined level of concern for blood lead levels.⁵¹ EPA also has found that in men, better control of lead in drinking water could prevent over 680,000 cases of hypertension, 650 strokes, 880 heart attacks, and 670 premature deaths from heart disease every year.⁵²

c. EPA’s New Lead-in-Drinking-Water Rules

For decades, it has been recognized that lead poses a threat to health when present in drinking water.⁵³ In 1962, the U.S. Public Health Service (PHS) reviewed 1941 standards, and set an essentially voluntary revised standard for lead.⁵⁴ It was the PHS’s 1962 50 ppb lead standard that EPA simply re-promulgated as an enforceable “interim” MCL for lead in 1975.⁵⁵ This 50 ppb standard was widely criticized.⁵⁶

From the day EPA promulgated the 1975 “interim” lead MCL of 50 ppb at the tap, the agency promised to revise that MCL to take into account new information gathered since 1962.⁵⁷ By 1986, Congress was exasperated by EPA’s delays, and mandated revision of the 1975 lead rule and adoption of new or updated rules for 82 other contaminants by 1989.

The final rules, adopted June 7, 1991,⁵⁸ eliminated EPA's long-established (and inadequately protective) MCL of 50 ppb lead in drinking water. Instead, the new rules adopt a complex "treatment technique" that includes no maximum permissible level of lead. Rather than an enforceable MCL for lead, the rules establish an "action level" of 15 ppb—authorized nowhere in the statute—which triggers public water system (PWS) action only if *over 10 percent* of the homes tested⁵⁹ have lead levels in their tap water of over 15 ppb.⁶⁰

If a PWS exceeds the "action level" in 10 percent or more of the tested homes, the PWS is given *six to eight years*, depending upon its size, to implement corrosion control (such as adding baking soda or other corrosion inhibitors to the water).⁶¹ If corrosion control fails after six to eight years to assure that less than 10 percent of the tested homes exceed 15 ppb, then the PWS is given up to *fifteen additional years*—or until after the year 2010—to remove all of the lead pipes in the PWS's distribution system that contribute to the problem.⁶²

There is no binding requirement that the estimated 800 or more PWSs with lead-contaminated source water clean up their water. Instead, if a water system determines it has contaminated source water, it is supposed to recommend treatment of its own water to the primacy agency.⁶³ The primacy agency decides what treatment, if any, to require; there is no automatic treatment rule, no matter how polluted the system's intake water.

Thus, under EPA's new rule, families with small children served by PWSs subject to the rule may in some cases legally be served drinking water contaminated with three, four, or ten times the amount of lead previously prohibited by EPA's 1975 regulations (i.e. 150, 200 or 500 ppb lead)—yet their water system may be in full compliance with EPA's rule presently, for the next ten years, or even forever.⁶⁴ This notwithstanding EPA's concurrent advice that schools with fountains serving water with over 20 ppb lead should take those fountains out of service for the safety of children who might use them.⁶⁵

Moreover, under this rule, thousands of public water systems—those that EPA refers to as "transient noncommunity" systems such as restaurants, motels, and summer camps—are *completely exempted* from protection under the rule, no matter how high the lead levels are in their water. Thus, a tap used by a pregnant woman or child, or by a parent filling a baby bottle at one of these locations, could legally contain unlimited levels of lead contamination.

NRDC has sued EPA because EPA's revised regulations for lead in drinking water fail to adequately protect public health. The rules also are plainly contrary to the Act in three respects.

First, the rules fail to establish a "Maximum Contaminant Level" (MCL) for lead, as required by the unambiguous terms of the SDWA. *Second*, EPA's rule unlawfully provides that the treatment technique it embodies is to be phased in during a period of over two decades. This leisurely compliance schedule is directly in violation of the clear mandate in SDWA that drinking water regulations "shall take effect 18 months after the date of their promulgation," unless the PWS obtains an extension of time under SDWA §§ 1415 and 1416, the variance and exemption provisions of the Act. *Third*, the rule completely exempts from any treatment requirements tens of thousands of public water systems. These PWSs, such as restaurants, motels, and seasonal camps, are completely exempted from the rule, yet high levels of lead in their water may pose significant risks to their customers, particularly infants, children, or pregnant women.

3. Radioactive Drinking Water

Over 49 million Americans drink water every day that is significantly radioactive, most

EPA data indicate that 225 people per year, or 15,750 people over a lifetime, get cancer from radioactive drinking water.

frequently due to radon, radium, and alpha particle emitters.⁶⁶ Most of this contamination occurs because the underground deposits of radioactive rock from which groundwater is pumped contain radioactive deposits such as uranium. EPA has estimated that over 49 million people are put at about a one-in-10,000 cancer risk or greater from radioactive drinking water contamination.⁶⁷

In addition, EPA data indicate that over a lifetime, 15,750 people get cancer from radioactive drinking water (225 per year).⁶⁸

4. Arsenic

Recent human health epidemiological studies indicate that arsenic is a potent human carcinogen. Millions of Americans have no idea that they drink arsenic-contaminated water every day, at levels that pose significant cancer risks. It has been estimated that about 350,000 people may drink water containing over 50 ppb arsenic (the EPA standard), that 2.5 million people may drink water containing over 25 ppb arsenic, and that over 35 million people drink water containing over 2 ppb arsenic.⁶⁹ California state scientists recently completed a study indicating that EPA's current standard for arsenic in drinking water of 50 ppb poses a one-in-100 cancer risk, and that even at 2 ppb, arsenic poses a cancer risk of one cancer per 1,000 people exposed—in the same neighborhood as passive cigarette smoking.⁷⁰

5. Pesticides

Data in Appendix D indicating that certain pesticides are found in thousands of Americans' drinking water is very troubling. Many of these pesticides are probable or possible human carcinogens, and others have other adverse health effects. Indeed, a recent review of pesticide risks in the diets of infants and children by the National Academy of Sciences expressed concern about children's exposure to pesticides via drinking water as well as thorough food consumption.⁷¹ The Academy also noted that children are especially susceptible to pesticides because of their relatively high exposure and sensitivity. In addition, the Academy noted that poor people and minorities may be disproportionately affected by pesticide contamination because of poor nutritional status, higher exposure to certain toxins, and relatively poorer health care.

The occurrence of pesticides in drinking water is increasingly being documented across the country. The U.S. Geological Survey completed a study indicating that in its sampling of water in the Mississippi River basin, over 25 percent of the samples contained levels of a single pesticide—atrazine—that exceeded the EPA Maximum Contaminant Level for that chemical.⁷² Earlier studies by USGS had found that 98 to 100 percent of the 150 streams tested in 1990 contained herbicides.⁷³ Many other pesticides also were found to contaminate this major source of the nation's heartland's drinking water,⁷⁴ yet virtually none of the public water systems in the United States is currently equipped to remove pesticides from its source water. EPA also has found that about one out of ten public water supply wells contains pesticides; EPA infers from these data that nearly 10,000 community drinking water wells and about 446,000 domestic water wells contain pesticides, although most apparently do not exceed EPA's existing MCLs for pesticides.⁷⁵

These and other chemical contamination problems highlight the need for a major national effort to better protect the nation's drinking water supplies.

Chapter 6: State Failures and State and EPA Underfunding

Overview of the SDWA and its Requirements for Primacy States

The Safe Drinking Water Act authorizes states to obtain primary enforcement responsibility (“primacy”) under the Act if they meet several statutory criteria, including the requirement that the state has adopted and is implementing and enforcing drinking water rules “no less stringent” than the federal drinking water rules.⁷⁶ If a state fails to obtain primacy, EPA is required to implement and enforce the drinking water program in that state.

In order to assure that primacy states adopt, implement, and enforce drinking water protection at least as stringent as the EPA drinking water standards, Congress directed EPA to issue regulations prescribing the manner in which a state may apply for primacy and the manner in which EPA is to grant or withdraw primacy.⁷⁷ The Act specifies that before a decision on approval or withdrawal of primacy may become effective, EPA must notify the state of the determination and the reasons for it and must provide an opportunity for a public hearing on the determination.

The Breakdown in Primacy State Implementation of the SDWA

Primacy States’ Failure to Adopt Required Rules

The promise of safe drinking water offered by the SDWA has not been fulfilled. It is true that virtually all eligible states and territories in the nation have obtained EPA-approved primacy for at least part of the PWS program. However, many states have failed to adopt certain key regulations required to be adopted by the 1986 SDWA Amendments, and state enforcement of the Act has, in several states, been virtually nonexistent. Yet EPA has never initiated formal primacy withdrawal proceedings in any state, although it recently has escalated the pressure on some states that are falling behind.

For example, as shown in Appendix G, many states have seriously missed the deadlines for adopting the EPA drinking water regulations mandated by Congress in the 1986 Amendments. Moreover, numerous primacy states that supposedly adopted the

A 1990 GAO report found that even in the most serious, highest-priority cases, certain states had allowed drinking water violations to continue for over four years.

required rules some time ago have failed to obtain EPA primacy approval for the rules, indicating that the states' rules may not be as stringent as EPA's requirements.

EPA reports that "States have expressed reluctance to adopt some of the new SDWA provisions because they do not believe the requirements are necessary or effective."⁷⁸ In some cases, primacy states bluntly have said that they disagree with the law and have no intention of complying with certain of the 1986 SDWA amendments' statutory requirements for primacy states.⁷⁹

It is apparent that many primacy states' drinking water programs are not providing the public health protection regulations required by law, and in some cases have no intention of doing so. In a victory for environmentalists and for the public health, recently the U.S. Court of Appeals for the D.C. Circuit struck down EPA's rules that had relaxed EPA oversight of state primacy programs, ruling these rules illegal.⁸⁰ Despite the problems, and the court's decision, EPA has never formally initiated a single primacy withdrawal proceeding, although it has recently threatened to do so in certain states.

States' Failure to Implement and Enforce the Act

As discussed in Chapters 2 and 3, and documented in numerous studies, enforcement of the Act has, in many primacy states, been almost nonexistent. Moreover, in April 1993, the General Accounting Office (GAO) released a study showing that states are not conducting sanitary surveys every three years as provided in EPA guidance in order to prevent drinking water contamination, due primarily to a lack of resources.⁸¹

An earlier GAO report done in 1990 documented the breakdown in primacy state implementation and enforcement of the SDWA.⁸² GAO found numerous serious flaws in the public health protection of the EPA and primacy states' drinking water programs. For example, GAO found that contrary to law, known "violations are going unreported by [primacy] states to EPA," that some primacy states were unlawfully "suspending or restricting" the application of some EPA rules, and that enforcement by the primacy states studied "was not timely, appropriate, or effective."⁸³ Even with respect to the most serious "significant noncompliers" identified by EPA, GAO found that in the majority of cases, primacy states had allowed violations to continue for over four years; enforcement eventually was taken in only about one-fourth of these most serious, highest-priority cases.⁸⁴ EPA conceded in subsequent Congressional hearings that GAO's findings are essentially accurate.⁸⁵

EPA simply has failed to remedy the primacy states' failure to implement the law. GAO's sobering reviews of the fundamental failure of primacy states to comply with the Act was mirrored by a 1988 study conducted by EPA's Inspector General of EPA's and states' drinking water programs for "noncommunity" water systems (NCWS) under the SDWA.⁸⁶ The Inspector General found that the EPA, primacy states, and public water suppliers were not ensuring that drinking water served by NCWS [noncommunity water systems] to an estimated three million Americans was meeting water quality standards in one EPA region alone.⁸⁷

The Inspector General found numerous unlawful flaws in primacy state programs:

- ✦ States did not assure that systems tested their water as required by the Act.

❖ States did not assure that suppliers “comply with federal regulations when tests revealed that the drinking water was contaminated.”

❖ “States did not initiate enforcement actions against suppliers...as required.”

❖ “Data reported to EPA by the states was erroneous and substantially understated the extent of reportable violations.”⁸⁸

The Inspector General pointed out that “the significance of this program is accentuated by the Centers for Disease Control statistics which show that 45 percent of all disease outbreaks reported nationwide over the last fifteen years were attributed to NCWS.”⁸⁹

Inadequate State and EPA Funding for Drinking Water

The Association of State Drinking Water Administrators has documented a \$150 million shortfall in state resources to carry out the SDWA.⁹⁰ A GAO review of the situation, completed in 1992, confirmed the severe resource shortfall for both state and federal drinking water programs.⁹¹ It is little wonder that EPA and states are struggling to stay afloat.

Chapter 7: Aging, Outdated, and Nonviable Drinking Water Plants

Some forward-looking water suppliers such as Cincinnati, Ohio, have upgraded their water supplies in recognition of the needs of the 21st Century. However, drinking water still is supplied to millions of Americans by aging and outdated water treatment plants that are stretched to their limits by increasing demand and in many cases, poor-quality raw water.

American water suppliers generally are using the same basic water treatment technologies (chlorination and in some cases sedimentation and sand filtration) that have changed little since World War I, when chlorine began to be used for disinfection, and when many water systems began to use sand to filter their water (a technology used in Europe and in some American cities before our Civil War).⁹² In fact, as noted earlier, many surface water supplies still do not even filter their water or protect their watersheds from pollution. While “conventional” treatment now includes the use of alum or other agents and sedimentation to remove particles from the water, some water suppliers do not even use this technology. There are a few industry leaders, but very few water systems in the United States use any advanced treatment technology to upgrade these old conventional techniques in order to remove chemical contamination. In addition, water distribution systems are crumbling, and millions of water service lines are made of lead and must be replaced.

The other major problem with the nation’s drinking water supply infrastructure is that the United States and most states have never had effective controls on the proliferation of small, nonviable drinking water systems serving small populations and unable to afford the staff or needed technologies for drinking water cleanup because they cannot afford to take advantage of the economies of scale. *It is an absurdity that there are 200,000 public water systems in the U.S. today, including about 60,000 community water systems (those that serve year-round residences), a substantial percentage of which are “basket cases” that cannot even meet the most basic microbiological standards.* There is an urgent need for these nonviable and small systems to consolidate with larger systems in order to assure that the quality of the water supplied is adequate. There also is an urgent need for a national mandate to prevent the creation of new nonviable drinking water systems.

Chapter 8: What You Can Do to Protect Your Drinking Water

What Citizens Can Do

There are five things you can do today to learn about and protect your drinking water:

1. Find Out What Contaminants Are in Your Drinking Water

Public water systems generally must test for dozens of contaminants in drinking water. Ask your public water system for: (1) copies of any public notices issued by the system regarding violations that the system has committed over the past few years; (2) copies of the monitoring results for both regulated and unregulated contaminants in the water. Don't let them tell you wouldn't understand the results; you have a right to see them—after all, it is the water you and your family drink and use daily.

It also makes sense for you to test your own water tap at least for lead, which leaches from pipes and faucets; the lead test is relatively inexpensive (about \$15 to \$30) and will give you peace of mind. To find a certified lab to test your water, call the EPA Drinking Water Hotline at (800) 426-4791. You also should pressure your water utility, state regulators, EPA, and elected representatives to clean up your water if it is contaminated. It also is wise to call your state drinking water program (see Appendix J) to check on the accuracy of the information your system is giving you, or to get information your water system won't give you. Beware, however—some states have a tendency to downplay the problems with local water systems.

2. Contact Your Senators and Member of Congress Asking Them to Fight for a Stronger Safe Drinking Water Act and Clean Water Act, and to Fight Efforts to Weaken those Critical Laws

There are major battles brewing over whether to strengthen or weaken the major laws that protect your drinking water. Urge your members of Congress to: (1) support legislation to give water systems funds to clean up drinking water (e.g. Congressmen Waxman and Dingell's bill, H.R. 1701); (2) to support legislation to *strengthen* the current Safe Drinking Water Act and the Clean Water Act; and (3) to oppose special-interest bills that would weaken these laws—for example, Senator

Nickles has introduced a bill (S. 767) that would gut the Safe Drinking Water Act. Urge them also to resist industry attempts to cripple the “polluter pays” requirements in Superfund, which are used to clean up industrial dumps that threaten drinking water. Please send a copy of your letter to NRDC’s Drinking Water Project in our Washington, D.C., office.

3. Get Involved in Local Efforts to Protect Your Drinking Water

Many local and regional environmental groups are actively trying to reduce industrial and other pollution of surface and groundwater. Call your local environmental groups, or the Clean Water Network, headquartered at NRDC’s Washington Office (202-783-7800) to learn how to get involved.

4. Find Out Where Your Drinking Water Comes From and What May be Threatening It

Your public water system (the people who send you your water bills) can tell you what lake, river, or groundwater source your water comes from, and where their water “intake” is located. You may want to visit the “intake” site from which your water is pumped and look around (and upstream) to see whether there are any apparent threats to the water supply. Ask your system for a copy of their watershed protection plan or their wellhead protection plan; if they don’t have one, ask them why they don’t. If they do have one, work with local organizations to assure that it is strong and fully implemented.

5. Take Actions in Your Home to Reduce Your Risk from Drinking Water Contamination

There are several things you can do in your home to reduce your exposure to contaminants in drinking water.

✦ *Lead.* If you suspect lead is a problem in your water, generally if you run your water for a minute or two before drinking the water or using it for baby bottles or for cooking, the levels of lead in the water will go way down. The lead levels decline when water is run because most of the lead in drinking water comes from faucets, or pipes between the water main and your tap, that leach lead into the standing water. *Never* use the water that first comes from the tap for baby bottles or for drinking if you haven’t tested the water to be sure it’s lead-free.

✦ *Easy Ways to Reduce Your Exposure to Chlorination By-Products, Radon, and Other Volatile Compounds in Water.* People are often exposed to the highest levels of many “volatile” contaminants—those that are easily evaporated—by inhaling fumes when they are showering. Examples of these volatile contaminants include certain by-products of water chlorination (found in tens of millions of peoples’ drinking water), radon gas (found in about 50 million peoples’ water) and certain industrial solvents. To reduce the risks from inhaling these chemicals, you can reduce your shower time and assure good ventilation in your bathroom (with a vent fan or open window).

What About Bottled Water or Water Filters?

One of the questions that occurs to many people who hear about drinking water problems is whether they should buy a water filter or bottled water. The bottom line is that it is generally a matter of personal choice. NRDC believes that all tap water should be safe to drink and that therefore bottled water and home filters should be unnecessary—but NRDC recognizes that currently not all tap water is safe.

Unfortunately, the answer to the question of whether or not one is better off buying bottled water or a water filter for the home is not simple. If you know you have contaminated drinking water (for example, if your water system or state has issued a “boil water” order), bottled water may be a good temporary solution. However, even though Americans spend \$2 billion on bottled water every year, bottled water is regulated no more strictly than tap water, and enforcement of bottled water rules is minimal, so there is no overall assurance that bottled water is safer to drink than tap water. In addition, for volatile contaminants, buying bottled water may not help much—since most of your exposure comes from showering. If you decide to buy bottled water, you should ask your bottler for testing data showing the water is not contaminated.

Home filters also are an option, but unless you are simply looking for control of taste and odor, it is wise to find out what contaminants are in your water before you invest in a filter that may or may not remove the particular contaminants of concern.

Home Water Filters

If you are considering buying a water filter for your home, consider the following points:

1. *What’s in My Water that Shouldn’t Be?* The first step before buying a filter is to decide why you want it—do you know of a particular contaminant in the water that worries you? Identify the contaminants in your drinking water (through testing your water or by finding out from other sources what’s in your drinking water). You can buy a filter that simply improves the taste and odor of your water—but it may not remove the toxic contaminants that may be the biggest health concern.

2. *Has the Filter Been Certified by an Independent Organization to Remove the Contaminant(s) of Concern?* Find out whether the filter you are considering buying has been certified by an independent testing organization (such as the National Sanitary Foundation—NSF) to remove the contaminants of concern in your water. Earlier this year, *Consumer Reports Magazine* reviewed water filters for effectiveness.

3. *Should You Get a Filter that Just Treats Certain Tap(s), or One that Treats All of Your Water?* If you have a problem with lead, the faucet itself or pipes and solder near the faucet may be contributing to the lead contamination, so a filter that is installed at the “point of entry” into your home may not help much. On the other hand, if the contaminant of concern is “volatile” (evaporates easily) such as many industrial organic solvents found in water and some by-products of water chlorination, you may get your biggest dose showering and washing dishes or clothes, so a “point of entry” filter that gets rid of the contaminant from the whole house may make plenty of sense.

4. *Are You Going to Take the Time to Maintain the Filter Properly to Assure it Doesn’t Compound the Problem?* Some filters tend to accumulate contaminants or serve as reservoirs for growth of bacteria and other microorganisms if they are not maintained properly (e.g., if the owner fails to change the filter cartridge as often as required). In some cases, this buildup can

reach the point of “breakthrough,” where a potentially large dose of accumulated contaminants is released into the water, or the filter essentially stops working. Thus, filter owners must be careful to maintain their filters or their water could end up worse than it was before.

Bottled Water

Those thinking about buying bottled water may want to consider the following points:

1. Is This Bottled Water Any Cleaner than Your Tap Water? If you are paying the typical \$1 to \$3 per gallon for bottled water, that’s about 1,000 or more times what you are probably paying for tap water. Is it any safer to drink? The answer is not always clear. If you *know* you have a tap water contamination problem (such as chemical or bacterial contamination), bottled water may be your only short-term solution.

However, the Food and Drug Administration, which is supposed to regulate bottled water, considers this program a relatively low priority and puts few resources into testing or enforcement. Studies have shown that *some* bottled water contains unsafe levels of certain contaminants. Moreover, often water bottlers simply take water from a public water system and bottle it, sometimes after filtering it to remove taste, odors, or contamination. You may want to write to the water bottler, or call your state health department (call EPA’s Drinking Water Hotline for the number), to find out whether the bottled water has been tested, and if so, what’s in it. Distillation or filtration of water removes some contaminants—but may not remove others. If your bottled water is no better than tap water, why buy it—unless you prefer its taste?

2. Will Using Bottled Water Reduce Your Exposure to the Contaminants in Your Tap Water? Switching to bottled water when you have nitrate or bacterial contamination in your tap water may make a lot of sense. However, some contaminants, such as the volatile chemicals discussed earlier, actually are the biggest problem when you shower or wash dishes or laundry. Using bottled water may do little to reduce your exposure to these chemicals.

Chapter 9: Proposals for Safe Drinking Water Act Reforms

In order to resolve many of the problems discussed in this report, reform of the Safe Drinking Water Act is needed. A set of (not necessarily exclusive) proposals for such reforms are suggested below.

Issue #1: State Revolving Fund for Drinking Water

A revolving loan fund for projects that will help needy PWSs comply with the requirements of the SDWA should be created, as proposed by the Clinton Administration. Such a fund would not only help struggling communities to pay for their drinking water protection, but also would create badly needed jobs in these communities.

The top priority of this fund should be paying for the consolidation of systems that are having difficulty or will have difficulty complying with the Act's requirements. Only if a system shows that it cannot come into compliance by consolidating or restructuring should a loan be available to upgrade the system. A set-aside for small systems should be included. Zero- or reduced-interest loans should be provided to very needy systems. Any system receiving federal funds should be required to establish a program to assure that drinking water is affordable for low-income customers; loan repayment stretch-outs or reduced interest should be provided to pay for such programs where they cannot be paid for with a modest contribution from the customer base of 1.5 percent of the system's total billing.

Issue #2: State Primacy—Federal Backstop Fee

1. Primacy States Provided Up to Eighteen Months to Establish Their Own Funding Programs

Each state should be provided with up to eighteen months to establish its own financing mechanism, which could be based upon user fees, permit fees, chemical use taxes, or any other mechanism the state desires, so long as a *dedicated permanent fund for drinking water protection activities* is established, which meets the fiscal needs of the state to carry out the following functions:

State Funding for Drinking Water Program. The funding scheme must provide adequate income to assure that the state primacy program will: (a) meet the primacy requirements of the SDWA; (b) pay for the state's program to prevent the creation of new, nonviable public water systems, and identify and eliminate or resolve problems with existing nonviable systems; and (c) be adequate to pay for sanitary surveys and other critical components of the state's drinking water program. Periodic sanitary surveys of all PWSs in accordance with EPA guidelines should be a requirement to obtain and maintain primacy.

Funding to Assure that All Public Water Systems Offer "Life Line" Rates to Low-Income Customers. A state program also should be established to assure that to the extent feasible, residential customers with incomes below 150 percent of the federal poverty line will pay a lifeline rate of a maximum of 2 percent of their income on drinking water. The primacy state would be given flexibility in how to achieve this goal. For example, the state could require all large systems simply to establish such a program and could make provision of state revolving fund (SRF) financial assistance to any system contingent upon establishment of such an affordability program. Stretch-outs in loan repayment schedules or interest rate adjustments could be offered to assist water systems in carrying this out. Residential customers could be notified of this program by their water system; if they identified themselves and filed a short form demonstrating their qualification, the water system could bill them for no greater than 2 percent of their income for the previous year. Alternatively, the state could create a pot of funds to be directly accessed by PWSs for reimbursement for lost revenues due to establishment of lifeline rates.

2. Federal User Fee on Water Automatically Put Into Place if No State Financing Program Has Been Approved by EPA

A federal user fee on water to pay for the primacy program, modeled on the Clean Air Act fee and estimated at about 8 to 15 cents per 1000 gallons, would be imposed to carry out the functions listed immediately above if: (a) the Governor of the State requests the imposition of the fee (in which case the funds would be collected and provided to the primacy program in the form of a dedicated fund for the primacy program); or, (b) a primacy state does not get EPA approval within eighteen months of a state program to provide adequate funds to fulfill the functions listed in A and B above; or, (c) EPA approval of the state's primacy or funding program is revoked. The federal fee would be collected by the PWS and sent to the federal government, which would then return all of those funds (minus federal administration costs of up to 15 percent) to the state for implementation of the primacy program. If the state does not have primacy, the federal user fee would be imposed immediately and would go to a dedicated federal fund for EPA to implement the program in that state. If the state has primacy but has not adopted all of the programs listed immediately above, the federal user fee would still be collected to the extent necessary for EPA to implement those parts of the program not picked up by the state.

Residential customers with incomes of less than 150 percent of the federal poverty level could file with their water system for exemption from the federal water user fee.

Issue #3: State Programs to Ensure Public Water System Viability

State Viability Programs as a Condition of Primacy

In order to receive and maintain primacy under section 1413 of the SDWA, each state should within eighteen months develop and successfully implement an EPA-approved program to:

- (a) ensure the long-term viability of all new drinking water systems; and
- (b) provide for the appropriate regionalization and/or consolidation of existing nonviable systems.

An approvable program may be administered, in part, by state agencies other than those directly responsible for Safe Drinking Water Act implementation, but any program which provides for split responsibilities must incorporate effective means of communication and coordination with the state agency directly responsible for drinking water quality regulation.

Issue #4: Strengthening and Streamlining Enforcement

The SDWA's enforcement authorities are unduly cumbersome, and should be made similar to the Clean Water Act's (CWA) enforcement authorities, which also apply to municipal governments. In addition, certain parts of the SDWA's enforcement provisions need to be strengthened or clarified to assure that EPA and states have the necessary flexible tools to ensure compliance. It must be clarified that federal facilities are fully covered by all enforcement provisions. Specific reforms in enforcement that are needed include:

- (a) *Streamlining Administrative Order Authority.* EPA should be authorized to issue Administrative Orders in a streamlined fashion similar to that of the CWA. EPA should be authorized to impose penalties in final administrative orders issued after issuance of a proposed order and an opportunity for a hearing. EPA should not have to first issue a notice of violation and then an administrative order without penalties before imposing administrative penalties, as it now must do under the SDWA.
- (b) *Clarifying EPA and State Authority to Order Consolidation, Restructuring, and Hookup Moratoria, and to Put Chronically Violating PWSs into Receivership.* It should be made clear that EPA may, in appropriate circumstances, issue an administrative order or commence a civil action to require a PWS that violates the SDWA to consolidate or restructure so that it can comply, and that EPA may impose a moratorium on new hookups to a noncomplying PWS. In addition, EPA should be authorized to put a PWS that is in chronic non-compliance into receivership through a civil action. Primacy states should also be required to have these authorities as well as administrative penalties.
- (c) *Clarifying EPA's Authority to Enforce State Drinking Water Decisions and Requirements.* EPA should have the clear authority to directly enforce primacy state program rules and requirements without further federal action, such as decisions on state filtration or similar issues.
- (d) *Raising the Penalty Caps for Administrative Orders.* The penalty levels authorized by the SDWA should be made consistent with the Clean Water Act's administrative penalties.

(e) *Strengthening EPA's Ability to Obtain Information and Conduct Inspections.* EPA's information gathering and inspection authorities under the SDWA must be brought into line with other environmental statutes such as section 308 of the CWA. For example, EPA should have clear authority to require a PWS or underground injection well operator to monitor or submit information, and the drinking water program needs clear authority to issue subpoenas. EPA also should be able to conduct inspections on presentation of credentials, as is provided for under other major environmental laws.

(f) *Strengthening and Clarifying EPA's Emergency Authorities.* The requirement that EPA find that state or local authorities "have not acted to protect the health of persons" before EPA acts in an emergency delays urgently needed EPA actions, insults states, and is hard for EPA to find; it should be eliminated. The cap of \$5,000 per day in penalties should be increased to be in line with the CWA. In addition, as in Superfund, there should be a prohibition on pre-enforcement review of EPA emergency orders, to avoid delays in addressing emergencies covered by this provision.

(g) *Providing Criminal Authority for Knowing and Negligent Violations, Knowing Endangerment, and Making False Statements, in Line With the Provisions of the CWA.* The SDWA's enforcement authorities are far weaker than the CWA and other environmental statutes, and should track the CWA's criminal authorities for false statements, knowing violations, knowing endangerment, and negligent violations.

(h) *Making the SDWA Citizen Suit Provision Work.* To our knowledge, no citizen suit has ever been prosecuted against a public water system in the history of the SDWA. This is in large part because unlike some other environmental statutes, such as the CWA, the SDWA citizen suit provision does not provide for penalties against the violator. In addition, the law should be fixed, as the Clean Air Act recently was, to make it clear that a violation that is either ongoing *or* has occurred repeatedly in the past may be the subject of a citizen suit—so the citizen need not prove, as some courts have required under other laws, that the violation is occurring on the day the suit is filed—a showing often very difficult to make.

(i) *"Traffic Ticket" Authority for Minor Violations.* EPA should be authorized to issue on-the-spot "traffic ticket"-type penalties for minor violations, with a cap of \$2,000 per violation for minor violations. These would replace the formalized and burdensome administrative order proceedings for more serious violations.

(j) *PWS Suits to Require Polluters to Pay for Monitoring and Water Treatment Costs.* A PWS should be authorized to file a civil action against any polluter who has caused contamination of its raw water with a contaminant regulated under the Act, and that has led to an exceedence of the MCL, triggered a treatment technique requirement, or prevented the system from obtaining a monitoring waiver. The PWS should be authorized to recover the costs of monitoring, and, if applicable, of treating its water or shifting to an alternate water supply in order to achieve compliance with the standard.

(k) *Making the Lead Bans Enforceable.* The relevant enforcement authorities under the Act must be amended to apply to the lead plumbing ban and to the Lead Contamination Control Act provisions that amend the SDWA.

Issue #5: Helping Small Systems Comply

NRDC has proposed several reforms that would help small systems comply with the Act, including:

- (1) Providing funds for small systems to consolidate and restructure, or, if that is impossible, to pay for upgrading their facilities (see state revolving fund section);
- (2) Requiring states to develop programs to assure long-term viability of all systems, particularly smaller, struggling systems having difficulty complying (see section on state programs to ensure PWS viability);
- (3) Providing EPA and states the authority to order consolidation, restructuring, and the ability to put abandoned or “basket case” systems into receivership (see streamlining and strengthening enforcement section).

In addition, there is a need to assure that small-system operators are given the training and technical assistance they need to come into compliance. Therefore, the SDWA should provide that all operators of public water systems be certified and trained by the primacy program in accordance with EPA guidelines, including small-system operators. It is absurd that drivers must be licensed and show their driving proficiency in all states, but that all public water system operators do not face a similar requirement in all states.

Small-system technical assistance, training, and a certification program, tailored to system size, should be required as a part of all primacy programs. Up to 2 percent of the state’s revolving fund should be available for such small system activities.

Issue #6: Ensuring Environmental Justice in the Drinking Water Program

In developing and establishing Maximum Contaminant Level Goals (MCLGs) under the SDWA, EPA should explicitly be required to establish the MCLG at a level that will protect not just the average American, but the most sensitive and most highly exposed subpopulations. Thus, for example, in setting an MCLG for an industrial chemical, EPA should be required to consider that some people (such as children or pregnant women) may be especially sensitive to the chemical’s effects, and that others (such as low-income people or people in communities near industrial facilities) may be exposed on a multi-media basis to high levels of that chemical and many others simultaneously. Thus, the margin of safety required under the Act in setting MCLGs should specifically include consideration of the disproportionate exposures and vulnerability of some subpopulations of the public.

In establishing the enforceable rules, EPA should be required specifically to find that the standard will protect such subpopulations to the maximum extent feasible, as that term is defined in the Act. Similarly, in evaluating whether a proposed variance or exemption may be issued under the Act, the primacy program and EPA should

explicitly be required to evaluate impacts upon highly exposed or highly vulnerable subpopulations.

In addition, in the state programs to protect sources of drinking water through pollution prevention activities such as watershed protection and wellhead protection, the state should specifically be required to show that its programs are protective of all subpopulations of the public, and that their programs are implemented in a manner to redress disproportionate impacts on certain groups, such as the economically disadvantaged and communities of color. These programs should also address, as part of area-wide watershed protection and groundwater source protection, those private sources of drinking water that may be threatened by contamination as well, which often are disproportionately found in communities of color and in economically disadvantaged communities.

Finally, primacy programs and EPA should be required to show that in distributing state revolving fund monies and other assistance under the Act, the effect of the distribution is not discriminatory with respect to race or ethnicity.

Issue #7: Assuring the Public's Right to Know About Drinking Water

It should be made clear that a public water system's failure to provide information on drinking water quality upon written request is a violation of the SDWA. The SDWA regulations state that certain records required to be kept under the Act must be made available to the public. However, the rules are not clear and many public water systems refuse or fail to provide information to their customers or to other members of the public on the actual levels of contaminants in their water, the results of sanitary surveys, or other similar information.

This is a direct violation of the principle that the public has a right to know what is in its drinking water and what the known threats are to its quality. Any failure to provide, upon written request, information on the results of drinking water quality monitoring, or other information on a public water system such as a sanitary survey, emergency drinking water plan, or other record that may reflect upon the system's drinking water quality that is required to be developed or kept under the SDWA, should be made a clear violation of the SDWA. This violation should be enforceable as any other SDWA violation is, in a citizen suit, or in an enforcement action by states or EPA. Costs of searching and copying the records should be limited to reasonable fees under EPA rules, and the option of the citizen simply going to the PWS and reviewing the records without paying for copying should be provided.

Finally, the Act should provide as part of the public notice requirements that each PWS send an annual report to its customers and the primacy agency noting any violations that occurred during the last year. These annual reports would be issued *in addition to* the public notices already required (for example, the mandatory immediate notices of violations that may pose short-term health risks). The annual report should be made on a simple and short standard form provided by EPA that explains the public health implications in clear and objective language for laypersons. The report should be certified by the system operator, and made available upon request to any member of the public.

Issue #8: Protecting Sources of Drinking Water

As part of the primacy program, states should be required to develop a comprehensive plan to prevent the contamination of drinking water, establishing the roles and

responsibilities of state and local governments for prevention, priorities, and prevention rules or other mechanisms, as well as data management and public participation procedures. The purpose of these provisions would be to get EPA to emphasize pollution prevention measures more, rather than end-of-the pipe treatment as the basic remedy of choice. These programs should, at a minimum, include local pollution prevention plans for all public water systems, developed on a state-established priority basis, for protecting watersheds and groundwater used for drinking water. The plans could be developed on a basin-wide or area-wide basis, or on a system-by-system basis. They should build upon and strengthen existing wellhead protection and watershed protection plans.

In addition, EPA should be required to review and assure that all of its programs (e.g., the Clean Water Act, the Resource Conservation and Recovery Act, Superfund, the Federal Insecticide, Fungicide and Rodenticide Act, the Toxic Substances Control Act, and programs under other authorities) incorporate source control and pollution prevention mechanisms to assure protection of drinking water sources. Up to 5 percent of the state revolving fund should be available to states for these preventative programs. Incentives to establish and implement these programs should be included, but no relaxation of MCLs should be authorized merely due to their adoption.

As noted in the section on environmental justice, these programs should be shown to be protective of all subpopulations of the public, including economically disadvantaged communities and communities of color. The area-wide and local plans should seek to offer as comprehensive a plan as possible, to protect both the PWSs of concern and surface or groundwater used for drinking water by private water users such as home wells.

Finally, as noted above in the enforcement section, PWSs should be authorized to file a civil action against any person who has caused contamination of their water system to recover the costs of monitoring and cleaning up their source water.

Issue #9: Protecting Whistle Blowers

The SDWA's whistle-blower protection provision dates to 1974 and is cumbersome and largely ineffective. It should be amended to be more effective, in line with the Energy Policy Act's whistle-blower protection provision that was enacted into law last year.

Issue #10: Reducing Lead in Drinking Water

The current ban on plumbing containing over 8 percent lead is largely ineffective. Alternatives to conventional old-generation plumbing are now available that will not contribute more than a few parts per billion, and in some cases less than one part per billion, of lead to drinking water. The SDWA should be amended to require EPA to ban all plumbing that leaches lead at greater than a few ppb, or less to the extent feasible.

In addition, the lead ban and Lead Contamination Control Act provisions must be made directly enforceable under the general enforcement provisions of the SDWA.

Finally, the lead rule, which is currently the subject of a challenge in the U.S. Court of Appeals for the D.C. Circuit, is fundamentally flawed. We are ready to allow this case to take its course in the courts and to be resolved by the judiciary.

However, if Congress chooses to take up this issue, we would support amendments to the Act similar to Congressman Waxman's bill of last Congress, embodying an overhaul of the lead rule which would clarify that EPA must substantially reduce the amount of time allowed for compliance, require the issuance of an MCL for water delivered to consumers, and assure that no PWS customer is exposed to levels of lead in excess of the EPA MCL. We would vigorously oppose any amendments that would seek to redefine where PWS's have control over their pipes and where they do not.

Chapter 10: Conclusion

As this report has sought to show, drinking water in the United States is not yet safe for everyone to drink. Some progress has been made, yet the promise of the 1974 Safe Drinking Water Act has not yet been fulfilled. However, with recent managerial changes in EPA's drinking water program, greater support from EPA's senior management, the White House, Congress, and a better informed public, it is NRDC's hope that more progress will be made towards achieving water that everyone can drink—without thinking twice.

End Notes

- 1 Reilly, W. K., "Aiming Before We Shoot: The Quiet Revolution in Environmental Policy" (Address delivered Sept. 26, 1990), citing EPA Science Advisory Board, UNFINISHED BUSINESS (1987).
- 2 Morris, R.D. et al., "Chlorination, Chlorination By-Products, and Cancer: A Meta-Analysis," AMERICAN JOURNAL OF PUBLIC HEALTH, vol. 82, no. 7, pp. 955-963 (1992).
- 3 Rose, J., "Waterborne Pathogens: Assessing Health Risks," HEALTH & ENVIRONMENT DIGEST, Vol. 7, No. 3, pp. 1-6 (June, 1993).
- 4 42 U.S.C. § 300f et seq.
- 5 The term "public water system" is defined in the Act as a water system that provides piped water for human consumption to at least 25 people or 15 service connections. SDWA § 1401(1).
- 6 If a contaminant cannot feasibly be measured in drinking water, EPA may then issue a "treatment technique" for the contaminant—which specifies a particular technology that must be used (or its equivalent) to rid the water of the contaminant. For example, Congress believed in passing the law that it might be infeasible to measure the level of viruses in drinking water. EPA has issued treatment techniques for filtering surface water supplies to control some microorganisms in water, and for certain chemical contaminants such as acrylamide and lead (although NRDC has challenged EPA's failure to issue an MCL for lead). Throughout this report, however, for the sake of simplicity, we refer to all violations of substantive treatment technique requirements and actual MCL violations jointly as "MCL violations."
- 7 A "major" violation occurs when no samples are taken or no results are reported during a compliance period, or, in the case of coliform rules, when at least 90 percent of the required samples are not taken or reported during a monitoring period.
- 8 EPA Inspector General, "Report of Audit E1HW7-03-0171-81928: Non-Community Water System Program," pp. 10, 12, 13, and 30 (1988).
- 9 National Wildlife Federation, DANGER ON TAP, p. 16 (1988) and National Wildlife Federation, DANGER ON TAP: FY 1988 UPDATE, at 8 (1989).
- 10 *Ibid.*
- 11 EPA Inspector General, "Audit Report of Region I's Enforcement of the Safe Drinking Water Act (SDWA)," Audit # E1HWC3-01-0023-3100291, p. iii (July 30, 1993).
- 12 *Ibid.*, p. 9.
- 13 GAO, DRINKING WATER: COMPLIANCE PROBLEMS UNDERMINE EPA PROGRAM AS NEW CHALLENGES EMERGE, p. 3 (1990).
- 14 *Ibid.* at 35.
- 15 EPA Inspector General, "Report of Audit E1HW7-03-0171-81928: Non-Community Water System Program," pp. 10, 12, 13, and 30 (1988).
- 16 EPA Inspector General, "Audit Report E1HWF9-03-0316-0100508: Report of Audit of Lead in Drinking Water Program," (September 28, 1990).
- 17 NRDC, LEAD CONTAMINATION CONTROL ACT: A STUDY IN NON-COMPLIANCE (1991).
- 18 Clearly, it is possible that there are some "false positives" where systems are reported to be in violation but are not. For example, some states have started using automated compliance determinations, in which a computer determines whether there is a violation based upon a report sent (or not sent) to the state by the water system or by a lab. Such systems, or human error, could result in incorrect attribution of a violation to a system that had not violated the law. However, there is little evidence that there is widespread over-reporting of violations. To the contrary, the weight of GAO, Inspector General, and other investigations appears to suggest that under-reporting of violations is common.
- 19 GAO, DRINKING WATER: COMPLIANCE PROBLEMS UNDERMINE EPA PROGRAM AS NEW CHALLENGES EMERGE, pp. 26-28 (1990). (Hereinafter "GAO, DRINKING WATER COMPLIANCE PROBLEMS.")
- 20 *Ibid.* at 26-27.
- 21 EPA Inspector General, "Report of Audit E1HW7-03-0171-81928: Non-Community Water System Program," pp. 12, 13, 17, 34, 38, 39, 41-42 (1988).
- 22 EPA Inspector General, "Audit Report of Region I's Enforcement of the Safe Drinking Water Act (SDWA)," Audit # E1HWC3-01-0023-3100291, p. 29 (July 30, 1993).
- 23 *Ibid.* at 29.
- 24 GAO, DRINKING WATER COMPLIANCE PROBLEMS, *supra*, p. 21.
- 25 42 U.S.C. § 300g-3(c)(1).
- 26 H.R. Rep. No. 1185, 93rd Cong., 2d Sess., reprinted in U.S. Code Cong. & Admin. N., at 6476-77.
- 27 GAO, DRINKING WATER: CONSUMERS OFTEN NOT WELL-INFORMED OF POTENTIALLY SERIOUS VIOLATIONS, pp. 17-20 (June 1992).
- 28 *Ibid.* at 30-37.
- 29 Personal communication with Kathy Fessler, Milwaukee Health Department, September 1993.
- 30 Rose, J., "Waterborne Pathogens," *supra*.
- 31 Herwart, B.L., et al., "Outbreaks of Waterborne

- Disease in the U.S.: 1989-90" JAWWA (April, 1992) p.129; Levine, W.C., Stephenson, WT, and Craun, G., "Waterborne Disease Outbreaks, 1986-1988," MORTALITY AND MORBIDITY WEEKLY REPORT, Vol. 39, No. ss-1 (March, 1990); Craun, G., "Surface Water Supplies and Health" JOURNAL OF THE AMERICAN WATER WORKS ASSOCIATION (JAWWA) (February 1988) p.40.
- 32 U.S. EPA, Surface Water Treatment Proposed Rule, preamble, 52 Fed. Reg. 42181, 183 (1987).
- 33 40 C.F.R. Section 141.70 *et seq.*
- 34 GAO, DRINKING WATER: KEY QUALITY ASSURANCE PROGRAM IN FLAWED AND UNDERFUNDED (April 1993).
- 35 LeChevallier, M.W., Norton, W.D., and R.G. Lcc, "Occurrence of *Giardia* and *Cryptosporidium* in Surface Water Supplies," APPLIED AND ENVIRONMENTAL MICROBIOLOGY, Vol. 57, No. 9, pp. 2610-2616 (September 1991).
- 36 Geldreich, E. *et al.*, USEPA, SUMMARY REPORT: INVESTIGATION OF THE CAROL, MISSOURI OUTBREAK FOR A WATER SUPPLY CONNECTION (undated).
- 37 NAS, NRC, DRINKING WATER AND HEALTH, Vol. 7 (1987)
- 38 Morris, R.D., *et al.*, "Chlorination, Chlorination By-Products, and Cancer: A Meta-Analysis," AMERICAN JOURNAL OF PUBLIC HEALTH, vol. 82, no. 7, pp. 955-963 (1992).
- 39 Ijsselmuiden, C.B., *et al.*, "Cancer of the Pancreas and Drinking Water: A Population-Based Case-Control Study in Washington County, Maryland," AMERICAN JOURNAL OF EPIDEMIOLOGY, vol. 136, no. 7, pp. 836-842 (1992).
- 40 Bove, F. J., *et al.*, PUBLIC DRINKING WATER CONTAMINATION AND BIRTHWEIGHT, FETAL DEATHS, AND BIRTH DEFECTS (U.S. Public Health Service and N.J. Dept. of Health (1992); Bove, F. J., *et al.*, PUBLIC DRINKING WATER CONTAMINATION AND BIRTHWEIGHT AND SELECTED BIRTH DEFECTS (U.S. Public Health Service and N.J. Dept. of Health (1992).
- 41 HHS's major 1988 report on lead concluded that "childhood lead poisoning is recognized as a major public health problem.... [T]he American Academy of Pediatrics notes that lead poisoning is still a significant toxicological hazard for young children in the United States." HHS, Agency for Toxic Substances and Disease Registry, THE NATURE AND EXTENT OF LEAD POISONING IN CHILDREN IN THE UNITED STATES: A REPORT TO CONGRESS at 2 (hereafter, "HHS, CHILDHOOD LEAD POISONING").
- 42 As HHS's detailed review of the literature, concluded: a growing number of investigators have examined the effects of exposure to low levels of lead on young children. The history of research in this field shows a progressive decline in the lowest exposure levels at which adverse health effects can be reliably detected. Thus, despite some progress in reducing the average level of lead exposure in the country, it is increasingly apparent that the scope of the childhood lead poisoning problem has been, and continues to be, much greater than was previously realized. HHS, CHILDHOOD LEAD POISONING, at 1.
- 43 56 Fed. Reg. at 26467-68 (June 7, 1991)
- 44 *See, e.g.*, HHS, CHILDHOOD LEAD POISONING; Levin, R. "Summary of Recent Epidemiological Studies on Lead Exposure," (October 17, 1988) and attachments; EPA, REDUCING LEAD IN DRINKING WATER: A BENEFIT ANALYSIS, (December, 1986).
- 45 56 Fed. Reg. at 26467-68 (June 7, 1991).
- 46 *Id.* at 26470.
- 47 EPA, FACT SHEET: NATIONAL PRIMARY DRINKING WATER REGULATIONS FOR LEAD AND COPPER, attachment at 3 (May 1991). (Hereafter, "EPA, FACT SHEET.")
- 48 56 Fed. Reg. 26460, 26470 (June 7, 1991).
- 49 Shannon, M.W., and Graef, J.W., "Lead Intoxication in Infancy," PEDIATRICS, vol. 89, No. 1, pp. 87-90 (Jan. 1992); Shannon, M.W., and Graef, J., "Hazard of Lead in Infant Formula," NEW ENGLAND J. OF MEDICINE, Vol. 326, no.2, p. 137 (Jan. 9, 1992).
- 50 *See*, EPA, FINAL REGULATORY IMPACT ANALYSIS OF NATIONAL PRIMARY DRINKING WATER REGULATIONS FOR LEAD AND COPPER, at 1-6 and 5-35, (April, 1991), (hereafter, "EPA, FINAL RIA."); and EPA, FACT SHEET, at 3 (May 1991). In 1986, before certain new data became available, EPA had published what it described as possibly a "low estimate" that 42 million Americans may be exposed to lead at levels above 20 ppb in their drinking water, the then-proposed MCL. EPA, REDUCING LEAD IN DRINKING WATER: A BENEFIT ANALYSIS, at 1-8 (Dec. 1986).
- 51 *See*, EPA, FACT SHEET, at 3 (560,000 children would be brought below 10 ug/dl blood lead by lead in drinking water controls); *see also*, FINAL RIA at 5-38 to 5-44 (millions of children would show IQ improvement if lead in drinking water is better controlled, less than one IQ point on average, but in some cases far more).
- 52 EPA, FINAL RIA, at 5-38. Due to a lack of adequate quantitative data, EPA did not estimate the

number of women whose blood pressure or hearts were affected by lead contamination of their drinking water, nor did the agency attempt quantify major health effects to children such as impaired growth and hearing, behavioral changes, impaired heme synthesis, kidney ailments, and cancer. However, such impacts are likely to occur due to lead-polluted drinking water. These estimates also do not include a quantification of the major health effects on adults such as metabolic changes, enzyme inhibition, cancer, immune system effects, and other effects which EPA believes may occur but could not quantify. *Id.*, at 5-42.

53 Since 1941, the U.S. Surgeon General, in coordination with public health officials and water utility representatives, had established (unenforceable) limits on the concentration of lead in drinking water. SAFE DRINKING WATER: HEARINGS BEFORE THE SUBCOMMITTEE ON PUBLIC HEALTH AND THE ENVIRONMENT OF THE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE, HOUSE OF REPRESENTATIVES, Serial No. 92-24, 92nd Cong., 1st Sess. at 612 (1971) (Testimony of Leonard Dworsky, Cornell University, and attachments).

54 *Id.* at 572 (reprinting, PUBLIC HEALTH SERVICE DRINKING WATER STANDARDS, REVISED 1962, at 43.) PHS noted that "exposure to even relatively small quantities [of lead] may result in serious illness or even death" and that lead is a "cumulative poison." PHS also pointed out that "a principal source of lead in municipal drinking waters is lead pipe and goose-necks in house services and plumbing systems." *Id.* at 574; PHS, DRINKING WATER STANDARDS at 45. Therefore, the PHS stated that drinking

water "should not be excessively corrosive to the water supply system," and established a standard of 50 ppb lead, to be monitored "semiannually" unless there was evidence available that greater frequency of monitoring is needed due to local conditions. *Id.* at 535-366, PHS STANDARDS at 6-7. The standards provided that monitoring was to be conducted in source water in accordance with standard methods, unless the concentration of a substance is "expected to increase in processing and distribution...." *Id.* at 535. The standards also provided that monitoring was to be conducted in source water in accordance with standard methods, unless the concentration of a substance is "expected to increase in processing and distribution...." *Id.* at 535.

55 40 Fed. Reg. 59575 (1975).

56 For example, in two comprehensive reports on drinking water and health, the first in 1977, the second in 1982, the National Academy of Sciences reviewed the lead in drinking water problem, and concluded that EPA's standard should be lowered to protect fetuses and young growing children. National Academy of Sciences, National Research Council, DRINKING WATER AND HEALTH, Volume 1, at 260-61 (1977); National Academy of Sciences, National Research Council, DRINKING WATER AND HEALTH, Volume 4, at 179-83 (1982); National Academy of Sciences, National Research Council, DRINKING WATER AND HEALTH, Volume 5, (1984).

57 See 40 Fed. Reg. 59575 (1975). In 1983, the Agency solicited comments on the lead MCL and possible revisions to it, see 48 Fed. Reg. 45502 (Oct. 5, 1983). In 1985, EPA proposed a Recommended MCL (RMCL—renamed MCLG, under the 1986 Amendments to SDWA § 1412) for lead, and

in an advanced notice of proposed rulemaking discussed various regulatory options for lead. 50 Fed. Reg. 46936 (November 13, 1985).

58 56 Fed. Reg. 26460.

59 PWSs are supposed to test high-risk homes, to the extent their records allow them to target such homes.

60 40 C.F.R. § 141.80(c) and 141.81.

61 A PWS serving 50,000 people or more that does not already optimize corrosion control generally will be required to implement corrosion control irrespective of whether it exceeds the action level in 10 percent of the homes it tests. See §141.81

62 *Id.* § 141.84.

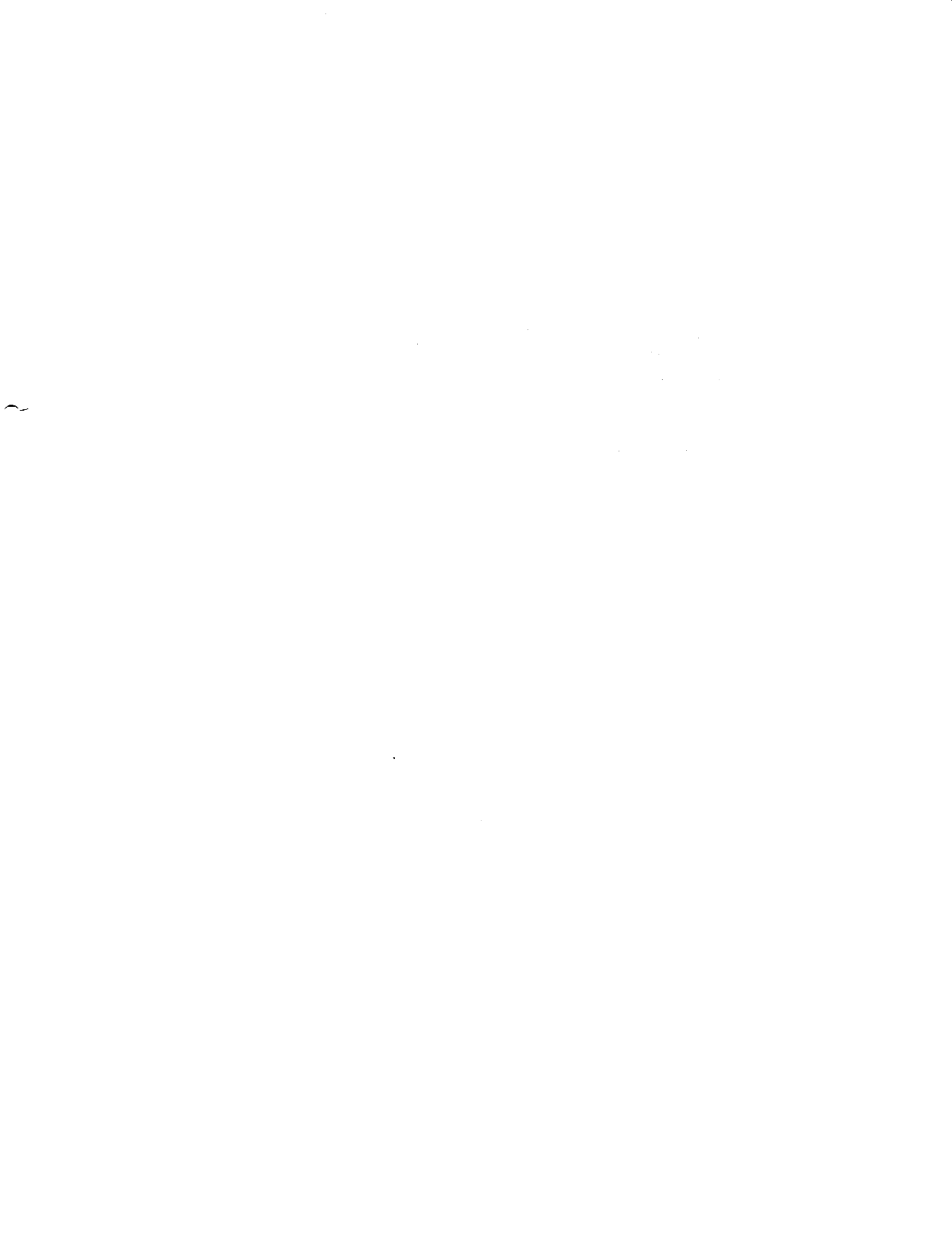
63 *Id.* § 141.83.

64 This is because the family could live in a pocket of a community with lead-contaminated water (due, for example, to old lead service lines and goose-necks), yet if less than 10 percent of the tested homes served by their system exceed the action level, their PWS would not be required to take action. On the other hand, even if the system did exceed the action level in over 10 percent of the homes, the family may live in a home served by a lead service line and their PWS may not be required to replace their line for twenty or more years—if ever. Similarly, the family may be unlucky enough to be served by one of the hundreds of water systems that has lead-polluted source water, and their PWS may not be required to treat its water under the rule (since there is no binding national requirement for such treatment, no matter how high the lead levels in their water).

65 See 56 Fed. Reg. at 26479.

66 U.S. EPA, ADDENDUM TO: THE OCCURRENCE AND EXPOSURE ASSESSMENTS FOR RADON, RADIUM 226, RADIUM 228,

- URANIUM, AND GROSS ALPHA PARTICLE ACTIVITY IN PUBLIC DRINKING WATER SUPPLIES (Sept. 30, 1992).
- 67 See PROPOSED RADIONUCLIDE RULES, 56 Fed. Reg. at 33067, 33076, 33082 (1991); Comments of the Natural Resources Defense Council, *et al.*, on EPA's Proposed NPDWRs for Radionuclides (Nov. 1991).
- 68 See EPA, REGULATORY IMPACT ANALYSIS OF PROPOSED NATIONAL PRIMARY DRINKING WATER REGULATION FOR RADIONUCLIDES, p. 5-4 (1991); see also EPA, UNCERTAINTY ANALYSIS OF RISKS ASSOCIATED WITH EXPOSURE TO RADON IN DRINKING WATER (Draft, 1993) (slightly revising radon risk estimates). The lifetime number of cancers is derived by multiplying the annual predicted cancer incidence by 70 years. Earlier estimates by an expert now working for water utilities were that "the lifetime number of premature deaths due to waterborne radon in the U.S. is estimated to lie between 5,000 and 125,000, with a best estimate of 25,000." Crawford-Brown, "Cancer Fatalities From Waterborne Radon (Rn-222)," *RISK ANALYSIS*, v. 11, no. 1, pp. 135-143 (1991).
- 69 Smith, A. H., *et al.*, "Cancer Risks from Arsenic in Drinking Water," *ENVIRONMENTAL HEALTH PERSPECTIVES*, v. 97, pp. 259-267 (1992); personal communications with Al Havinga, EPA Office of Drinking Water, 1992.
- 70 Joseph P. Brown, *et al.*, Univ. of California at Berkeley and California EPA, review of Arsenic in Drinking Water Studies, referenced in *SCIENCE NEWS*, April 1992, p. 253.
- 71 NAS, NRC, PESTICIDES IN THE DIETS OF INFANTS AND CHILDREN (1993).
- 72 USGS, DISTRIBUTION OF SELECTED HERBICIDES AND NITRATE IN THE MISSISSIPPI RIVER AND ITS MAJOR TRIBUTARIES, APRIL THROUGH JUNE, 1991, USGS Water Resources Investigations Report 91-4163 (1991).
- 73 *Ibid.*; USGS Press Release, "Spring Sampling Finds Herbicides Throughout the Mississippi River and Tributaries," November 20, 1991.
- 74 *Ibid.*
- 75 U.S. EPA, NATIONAL SURVEY OF PESTICIDES IN DRINKING WATER WELLS: PHASE I REPORT (1990).
- 76 See SDWA § 1413, 42 U.S.C. § 300g-2.
- 77 SDWA § 1413(b)(1), 42 U.S.C. § 300g-2(b)(1).
- 78 *NWF v. EPA*, Record Doc. No. 1-3 at 10, JA at 14.
- 79 EPA reports that Alaska, for example, contends that "mandatory disinfection is unnecessary in some states." *NWF v. EPA* Record Doc. No. 1-10 at 23, JA at 99. Montana says "I do not believe we will be willing to establish regulations which: 1. we are not convinced are justifiable in terms of public health protection vs. cost and, 2. which we know we will be unable to enforce." *Id.* Record Doc. No. 3-30 at 2, JA at 119B.
- 80 NATIONAL WILDLIFE FEDERATION *v.* EPA, 980 F.2d 765 (D.C. Cir. 1992) (litigated by NRDC).
- 81 GAO, DRINKING WATER: KEY QUALITY ASSURANCE PROGRAM IS FLAWED AND UNDERFUNDED (April 1993).
- 82 GAO, DRINKING WATER: COMPLIANCE PROBLEMS UNDERMINE EPA PROGRAM AS NEW CHALLENGES EMERGE, GAO/RCED-90-127 (dated June 1990).
- 83 *Id.* at 3-5.
- 84 *Id.* at 4-5.
- 85 Statement and Testimony of Lajuana Wilcher, EPA Assistant Administrator for Water, at Hearings on Problems in the Environmental Protection Agency's Drinking Water Program, House Environment, Energy, and Natural Resources Subcommittee, Committee on Government Operations, pages 104-133, 101 Cong., 2d Sess., August 3, 1990.
- 86 NCWS are PWSs not used by towns but rather by such establishments as restaurants, motels, schools, factories, and campgrounds with their own source of water.
- 87 EPA Inspector General, REPORT OF AUDIT ON THE NON-COMMUNITY WATER SYSTEM PROGRAM, at 2, Audit No. E1HW7-03-0171-81928 (September 26, 1988). The Inspector General's report reviewed activities in EPA Region III (comprising the District of Columbia, Pennsylvania, Maryland, Virginia, and West Virginia). While the Inspector General's review was limited to EPA's Region III, the Agency's water office agreed that this Region was a proper "surrogate" for the program nationally, as its "program is not substantially different than that of any other Region's program." Response to Audit Report by Rebecca W. Hanmer, Acting Assistant Administrator for Water, USEPA, reprinted in *id.*, at 46.
- 88 *Id.* at 2-3.
- 89 *Id.* at 3.
- 90 Association of State Drinking Water Administrators, STATE COSTS OF IMPLEMENTING THE 1986 SAFE DRINKING WATER ACT AMENDMENTS (1989).
- 91 GAO, DRINKING WATER: WIDENING GAP BETWEEN NEEDS AND AVAILABLE RESOURCES THREATENS VITAL EPA PROGRAM (July 1992).
- 92 For a history of drinking water treatment, see, for example, Abel Wolman, *WATER, HEALTH AND SOCIETY* (Indiana U. Press).





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