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Reauthorization of the Safe Drinking Water Act and The Viability of Rural Public Water Systems*

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Introduction

The provision of safe, high-quality drinking water at affordable prices is crucial in maintaining the quality of life in all communities. Industrial, commercial, residential, and recreational uses of land require a dependable supply of drinking water to be viable. This resource dependency is particularly dramatic in rural areas since many communities not only seek to maintain the existing quality of life, but frequently pursue economic growth as a means towards higher incomes and full employment.

The ability of rural communities to provide safe and affordable drinking water is determined in part by the existing quality of supplies. As ground and surface water become contaminated, both health risks and treatment costs rise. To reduce the risks posed by water pollution, a complex legislative framework has developed in Arizona to promote prevention, to regulate potentially polluting activities, and to require remediation when water supplies have been negligently contaminated (Pima Association of Governments, Report, 1994). As a result, the implementation and enforcement of

surface water and aquifer protection legislation have become principal determinants of the quality of water that rural water systems have at their disposal. As pollution risks are efficiently controlled, the integrity of water supplies is bolstered, and the viability of rural water systems is enhanced.

Given the quality of water supplies, the ability of rural communities to provide safe and affordable drinking water is then determined by cost-effective treatment and delivery to consumers. Treatment and delivery, in turn, are largely the concern of public water systems, defined as systems which serve piped water to at least 15 service connections or regularly serve an average of at least 25 people each day at least 60 days per year (United States Environmental Protection Agency, 1993). The Safe Drinking Water Act (SDWA) and its amendments regulate public water systems. Under the SDWA, rules have been promulgated establishing drinking water standards for contaminants, treatment techniques, sampling regimens, record keeping procedures, and public notification protocols when SDWA requirements have been violated.

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The net impact of implementing and enforcing the SDWA has been to simultaneously decrease health risks posed by drinking contaminated water while dramatically increasing the cost of treatment and delivery. Compliance costs have been particularly burdensome for small systems. The Environmental Protection Agency (EPA) has estimated that compliance across all systems will cost \$1.4 billion annually with many systems having to install new equipment. The adverse impact of these costs on small-system viability is evidenced by the fact that 70% of recent SDWA violations have been by small systems (GAO Report) and by forecasts that new requirements will exacerbate compliance problems for these systems still further.

In September 1993, EPA submitted to Congress its "Administration Recommendations for Safe Drinking Water Act Reauthorization," EPA Office of Ground Water and Drinking Water, including ten major recommendations for revisions to the SDWA. Action on the recommendations was deferred to the 104th Congress. For rural communities, it is clear that congressional decisions on reauthorization will dramatically impact not only the current viability of small public water systems but also the future plausibility of establishing new systems as needed.

In the following sections, the SDWA is described and the recent experience of Eastern Pima County with the act is depicted. Next the SDWA Reauthorization is discussed, followed by an identification of issues and needs posed by its potential implementation, particularly as it applies to rural areas dependent upon small public water systems.

Overview of the Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) was enacted by Congress in 1974 and amended as recently as 1986. The purpose of the Act is to ensure that drinking water supplied to the public is safe, that is, free from contaminants that could adversely affect human health. The Environmental Protection Agency (EPA) is the federal agency which has the responsibility for promulgating regulations to carry out the provisions of the Act. In particular, EPA is required to set standards and to identify treatment techniques for contaminants, and to establish requirements for monitoring water quality and for ensuring the proper operation and maintenance of water systems (Fennemore Craig). Water suppliers are responsible for making sure that the water meets

EPA standards and for complying with established monitoring, operation, and maintenance protocols. However, it is important to note that the SDWA does not provide funding to support mandated treatment activities.

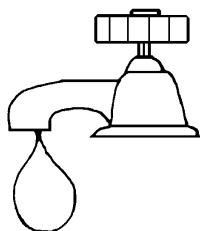
In Arizona, primary enforcement responsibility for the SDWA is with the state through the Department of Environmental Quality (ADEQ). The EPA plays an oversight role providing guidance, technical assistance, and some financing. While the state has been delegated "primacy," actual enforcement relies heavily upon community water systems demonstrating compliance through periodic sampling and testing requirements. In the unlikely event that state enforcement is inadequate, emergency federal enforcement provisions are available to the EPA in the form of issuing orders for public notification of SDWA violations, mandating clean-up, requiring the use of an alternative supply, and/or imposing daily fines.

There are three major types of requirements in the SDWA: 1) sampling and reporting, 2) record keeping, and 3) public notification (U.S. EPA, 1993). Each supplier of water must collect samples from the water system, take them to a certified laboratory for analysis, and send the results to DEQ. The laboratory results, name of the person who collected the samples, dates and locations of sampling points, steps taken to correct problems, sanitary survey reports, and other information must be kept on file by the water supplier. Finally, any time there is a violation of a requirement, the public must be notified.

A significant advantage in the state assuming enforcement "primacy" is that some degree of flexibility can be exercised by DEQ in implementing the Act. For example, some requirements can be made stricter, such as requiring operator certification or minimum design standards. On the other hand, variances and exemptions can be issued from some of the requirements for systems that are having major technical or financial problems associated with compliance.

There are two types of drinking water standards which apply to all public water systems in Arizona: primary and secondary. Primary standards are health based and enforceable. Secondary standards are based on the aesthetic quality of the water and are non-enforceable guidelines. In the case of primary standards, maximum contaminant levels (MCL's) are concentrations which are judged to be associated with acceptable health risks given cost and

technology constraints. For chemicals which are believed to cause cancer, the goal is to set MCL's as close to zero as is technically and economically feasible. For contaminants which are difficult or costly to measure, treatment techniques are required in lieu of specifying an MCL. Secondary MCL's have been established as guidelines associated with



the aesthetic quality of water, such as taste, odor or color, and are not enforceable.

Underlying any discussion or evaluation of the SDWA is an inescapable tension between capturing the documented health benefits associated with drinking safe water and bearing the significant costs of precaution. Monitoring turbidity, bacteria, total chloroform, lead and copper, radionuclides, as well as inorganic, synthetic organic, volatile organic and chlorinated organic chemicals can help reduce a wide array of health risks, varying from gastroenteric infections, to liver and kidney damage, to several types of cancer. Unfortunately, the additional costs imposed by monitoring, sampling, treatment, and record keeping are substantial, and for many small water systems particularly burdensome.

The Eastern Pima County SDWA Experience

The legislative intent of the SDWA is to insure that drinking water poses minimal risks to public health. The EPA is charged with implementing the intent of the Act and does so in two steps. First, "safe" drinking water is defined during the process of setting MCL standards and establishing treatment techniques. That is, drinking water which is in compliance with MCL standards and treatment requirements is judged to be safe for public health purposes. Second, protocols for sampling, record-keeping, and public notification have been established to promote the compliance of public water systems with EPA treatment and MCL safety standards. A brief description of these protocols follows.

In general, sampling requirements are detailed and complex, but the overall intent is to tailor sampling procedures to the type of containment being analyzed. The requirements address the types of analyses to be performed, the frequency of sampling, the location within the water system where sampling must occur, preservation techniques, transportation precautions, and laboratory certification. Some public water systems (e.g. small water

systems, such as systems serving less than 3,300 people, or transient, non-community systems, such as systems serving hotels or restaurants) may receive variances or exemptions to these requirements.

In addition to sampling activities, public water systems are required to keep records on several aspects of sampling, including chemical analyses, MCL violations, enforcement actions, and sanitary surveys. Upon analysis of a constituent, a certified laboratory must report the results to ADEQ within 3 working days. If the analysis shows an MCL violation, then reporting must be within 24 hours of the completion of the analysis. All systems, regardless of distinguishing factors, are responsible for reporting all chemical analysis results, violations, and public notices to ADEQ.

In the event of a violation, public notification takes numerous forms, such as hand delivery, electronic media, continuous posting and direct mail, in order to insure that affected individuals will be adequately informed. Notification procedures are described for each type of compliance violation. Two categories of violations are distinguished: tier 1 and 2. Tier 1 violations pose serious and direct risks to human health either through chronic (non-acute) or brief (acute) exposures. Exceeding an MCL or violating treatment technique requirements are examples of Tier 1 violations. Tier 2 violations are less directly threatening to human health and generally violate SDWA specifications on a procedural basis. Examples include, a failure to monitor the water supply or to follow prescribed sampling and analysis methods. In general, public notices must include a discussion of the violation; the potential for adverse effects; the population at risk such as children or pregnant women, the steps taken to correct the problem; and recommended precautions.

ADEQ and the State's Primacy Role

The drinking water program was designed so that the day-to-day responsibility to carry out the program would be delegated to approved state governmental agencies while the EPA provided guidance, assistance and limited funding. The state of Arizona has been granted primacy through ADEQ and therefore accepts the obligation to monitor and enforce EPA requirements pertaining to SDWA. To assess compliance, ADEQ has established rules and procedures which address the production, treatment, distribution and testing of public water systems.

The determination of compliance unfolds through an inventory and analysis of each system. A key component is the sanitary survey, an on-site review of the system's water source, facilities, equipment, and operation and maintenance, performed approximately every five years. Upon inspection, a compliance status of 1, 2, or 3 is determined. A system operating under full compliance with the SDWA will earn a rating of one.

A compliance status of two indicates that a system is in substantial compliance with the act's provisions and is considered to pose only moderate risks to public health. Operational and maintenance procedures are most often the cause of violations, however, sampling procedures are also potential candidates. Examples of level two violations include inadequate site clean-up, lack of proper fencing and security, susceptibility of system to freezing, or user complaints. The issuance of an administrative order is the generally accepted practice for redressing "substantial-compliance" violations.

A compliance designation of three denotes a system in non-compliance. Systems in non-compliance may have exceeded an MCL, failed to properly implement treatment requirements, ignored operation and maintenance procedures, or simply failed to sample the water. Examples of an operational and maintenance violation that would result in a rating of three include failing to install a pressure gauge, failing to chlorinate when necessary, or not having the well site graded properly. Initially, correction of a violation is addressed through an administrative order. If the system fails to comply, the order may proceed to full closure of the system.

SDWA Compliance in Eastern Pima County

Recent compliance of small public water systems with respect to the SDWA was analyzed. Data was collected from ADEQ and reflects the compliance status of public water systems as recorded in their most recent system survey prior to 1994. Not included in the analysis are small systems dependent upon surface water. In narrowing the focus to groundwater, only 6 systems in Pima County were eliminated. Similarly, compliance of large public water systems (e.g. Tucson Water) was not included.

Only eighteen of the 238 systems evaluated were awarded full compliance with the SDWA while substantial compliance was granted to an additional 98 systems. The remaining 165 systems were classified as being in non-compliance with the SDWA.

The probability of a public water system being in compliance or substantial compliance with SDWA regulations does not appear to vary systematically with system size. ADEQ (1994) defines systems of medium size as serving between 3,301 and 50,000 individuals, with small systems serving less than 3,300. In this survey of recent compliance performance, forty-six percent of the medium systems were discovered to be in non-compliance while 51.5% of the small systems were classified similarly.

Approximately 95% of public water systems in Eastern Pima County are classified as small. Of the small systems, 49.5% were in compliance or substantial compliance with the Act. In 5 cases, comprising slightly more than 2% of the small systems, water quality failed to meet MCL standards, thus potentially posing serious risks to human health. The remaining 112 non-compliant systems were in violation of SDWA regulations in ways unrelated to MCL and treatment technique requirements. Specifically, the systems failed to comply through improper operator certification (64.3%), inappropriate sampling procedures (57.1%), unsuitable operation and maintenance (17.8%), or some combination of the above (34.8%). For these systems, failure to fully comply with the SDWA may not reflect increased health risks as much as an inability or unwillingness to bear the financial burdens associated with EPA protocols.

SDWA Cost Implications for Small Public Water Systems

The 1986 amendments to the SDWA mandated a dramatic increase in the number of drinking water contaminants to be regulated. The potential economic impact of this regulatory expansion was recently assessed by ADEQ (1994). For small systems, ADEQ projects that investment costs could be substantial when treatment becomes necessary. For example, the capital cost of treating inorganic contaminants is estimated to vary between \$61,000 and \$135,000 per system. While these potential costs are high, the likelihood that they would actually be incurred is low since groundwater quality is good to excellent over most of the Tucson Basin (PAG, Draft Report 1994).

While additional capital costs may be avoided by small systems in Pima County, the same cannot be said of sampling costs. The 1986 amendments called for regulating an additional 66 con-

taminants by 1989 and for further expanding the number of MCLs by 25 every year thereafter. The sampling costs associated with this regulatory expansion are likely to become progressively burdensome if small systems are to comply.

Recent evidence documents that a significant number of small public water systems are already in non-compliance with the SDWA. As new regulations are promulgated and enforced, systems can choose to partially comply, merge with other systems, borrow required investment funds, charge higher prices to consumers, some combination of the above, or shut down. The relative desirability of these alternatives will be greatly affected by the specification of the SDWA reauthorization bill currently being debated in Congress.

Reauthorization of the Safe Drinking Water Act

In the 1993 version of the reauthorization, EPA submitted to Congress an extensive list of proposed revisions to the SDWA (Trager, et al., 1994). The original reauthorization bill, sponsored by Senator Max Baucus, included many of the recommendations proposed by the EPA, but failed to gain bipartisan support due to a failure to address the MCL standard-setting process. A second bill was subsequently introduced requiring increased risk/benefit analysis in standard setting, but was opposed by the EPA on the grounds that the mandated analysis would unrealistically delay the issuance of regulations. Recently a flurry of bills and amendments have been introduced designed to address EPA and public water system concerns, each enjoying some degree of support. Ultimately, successful legislation will have to marry a variety of concerns. Particularly prominent among these concerns is the task of safeguarding public health while limiting the financial burden imposed by unfunded federal mandates.

Several of EPA's recommendations have general applicability across public water systems regardless of size. For example, EPA wants to maintain and strengthen state primacy, a position strongly supported by ADEQ. In addition the recommendations call for mandatory state programs to protect ground water and surface water supplies, and for mandatory minimum operator certification program criteria to apply to all water systems, including small systems. Programs to protect water supplies have been in existence for many years in

Arizona, and have been substantially revised and updated since 1986. Similarly, operator certification programs are already operational. In these regards, Arizona has acted proactively in an attempt to strengthen the state's ability to provide affordable, safe drinking water.

Of direct concern to small public water systems are the following EPA recommendations:

- Establishing (and adequately funding) a Drinking Water State Revolving Fund to provide low-interest loans to help water systems meet the costs of SDWA compliance;
- Requiring state-implemented programs to assess the viability of existing small systems and to prevent the formation of new, nonviable systems while restructuring and/or consolidating nonviable, noncompliant small systems;
- Establishing a less expensive "best available technology" that small systems could use to comply with the SDWA, if they would not otherwise be able to achieve compliance through restructuring; and
- Allowing for longer compliance deadlines for making drinking water standards effective, moving from 18 months after EPA promulgation to 60 months.

Noticeably absent from the list of EPA recommendations are suggestions for revising the standard-setting process itself. Between 1974 and 1986, EPA issued rules regulating 23 drinking water contaminants. The 1986 SDWA amendments required EPA to establish national drinking water standards or treatment techniques for 83 contaminants by 1989, and for 25 additional contaminants every three years thereafter. Critics of the program argue that this regulatory expansion places a disproportionate burden on small public water systems in rural areas by failing to account for local health-risk impacts and budgetary realities. That is, failure to base drinking water standards on a site specific, risk-benefit basis runs the risk of burdening drinking water programs to the point of collapse.

Future Outlook

Supporters of strict SDWA regulations are quick to argue that evisceration of the program is likely to be "penny wise, but pound foolish," since

the high price of water treatment is more than justified by the cost savings associated with the prevention of disease. For example, the EPA estimates that the Surface Water Treatment Rule alone helps avoid 90,000 cases annually of acute gastroenteritis, and that the Lead and Copper Rule can reasonably be expected to reduce exposure to 140 million people, including 18 million children, to unsafe levels of lead in their blood (GAO Report).

Unfortunately, many small systems do not comply with SDWA standards or monitoring requirements due to disproportionate costs. Similarly, according to the EPA, the primary reason for state drinking water non-compliance is resource scarcity, as reflected in prohibitive costs to implement new regulations, competition with other state programs for scarce financial resources, legislative priorities, and state budget shortfalls.

In recognition of both health and cost concerns, Arizona will be participating in an EPA national survey of drinking water systems this fall (Water Resources Research Center, 1994). The objective of the study is to determine the investment needed to be made in the nation's drinking water systems to supply safe water and comply with current and future federal regulations. Assisted by ADEQ, EPA will survey public water systems across the country, both large and small, to develop computer models to project drinking water systems capital investment needs. There appears to be consensus in the regulated community that an appraisal of investment needs is a crucial first step in building a workable program to safeguard public drinking water in light of budgetary realities. From EPA's perspective, the survey initiative is part of a general redirection effort with respect to the safe drinking water program (McGuire, 1995). A comprehensive plan (announced in late December, 1994) is being developed over the next 5 to 8 months in which the agency intends to emphasize shifting resources away from low risk to high risk regulations, and expanding the use of regulatory negotiation among affected parties in implementing costly treatment rules. While a great deal of uncertainty remains about the net impact of the water system survey, EPA's redirection program, and reauthorization debates in Congress, one effect on consumers of drinking water in rural areas is inescapable. As consumers demand higher quality water, and stricter drinking water standards are implemented, public water systems will be forced to charge higher prices, prices which reflect the full real cost of supply.

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Editor's Note

After a brief hiatus, Community Development Issues is back. I hope you find this issue on the Safe Drinking Water Act informative. Our next issue will be out by early May and will focus on Youth at Risk and economic development.

Sincerely,

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