Chapter Five

Flexibility Under the Safe Drinking Water Act

A factor that led to the passage of the Safe Drinking Water Act in 1974 was a desire to have all public water systems meet certain health standards. A downside of imposing uniform requirements on drinking water systems, however, is that uniform requirements may cause some localities to take actions that do not make sense for their particular communities--such as testing for chemicals that have not been used in their area or undertaking treatment measures for which the costs far outweigh the benefits.

An important question is whether the SDWA provides sufficient flexibility to adjust requirements in those cases and therefore minimize unjustified costs. Current provisions in the law and the regulations are meant to provide the Environmental Protection Agency and the states with the ability to be flexible with the requirements that they place on communities. In reality, however, many of those provisions are rarely used. Nevertheless, in some cases, the EPA and the states may use the enforcement process to achieve flexibility in dealing with communities.

Provisions in the Law

The federal government and the states share responsibility for enforcing the SDWA. The federal government, through the EPA, has the authority to enforce drinking water standards in states that do not have "primacy." States with primacy take on enforcement responsibility, and the EPA may step in only under special circumstances. To gain primacy, states must obtain approval from the EPA. That approval is granted when states meet certain criteria. States with primacy receive funds to aid them in their oversight capacity. In 1995, $70 million was provided to states for that purpose.

Several provisions in the law are meant to provide the EPA and the states with the ability to be flexible with the requirements that they impose on communities.

- *Variances* are meant to provide some flexibility for dealing with water systems that have exceptionally dirty source water. Variances may be granted to systems that have used the "best technology, treatment techniques, or other means, which the Administrator finds are generally available (taking costs into consideration)" and are still unable to meet the maximum contaminant level defined by the EPA.[1] Before a state may grant a variance, it must find that the variance will not result in "an unreasonable risk to health."[2]

1. Memorandum from Joan Z. Bernstein, General Counsel, Environmental Protection Agency, to Victor J. Kimm, Deputy Assistant Administrator, Office of Drinking Water, May 21, 1979, p. 1.

2. Ibid.

- *Exemptions* may be granted to systems that are unable to meet a maximum contaminant level "due to compelling factors." Those compelling factors may include economic difficulty. Systems may be granted an exemption only if they were already in operation on the effective date of the MCL and if the state determines that the exemption will not result in an "unreasonable risk to health."[3] In addition, states must issue a compliance schedule when they grant an exemption.[4]

- *Waivers* for sampling requirements for specific contaminants may be granted to systems that are deemed to be unlikely to have that contaminant in their source water. States may issue areawide waivers that cover several systems or even all systems in the state. Use waivers may be granted when it is determined that a contaminant was not used, manufactured, or stored in the area. Susceptibility waivers may be granted when the geological conditions, the use of the land, and previous test results indicate that an area is not susceptible to a particular contaminant.

- *Grandfathering* may be used to allow systems to use data that was collected before the time monitoring requirements were in effect to satisfy their initial sampling requirements for a contaminant. Systems that are allowed to use grandfathered data to meet their initial sampling requirements may then begin their sampling requirements with the repeat sampling schedule.[5] Repeat sampling requirements are generally less frequent, and therefore less costly, than initial sampling requirements.

- *Composite sampling* offers a way for small systems (those serving less that 3,300 people) to reduce their monitoring costs by pooling their samples with other systems. States may allow composite sampling for no more than five sampling points. Larger systems may also use composite sampling to pool samples taken from different points in the system.[6]

Actual Use of Provisions for Flexibility

Although variances and exemptions give states the option to offer flexibility to systems in theory, in reality they are not frequently used. No variances and only 15 exemptions were issued between January 1990 and March 1994.[7] Given that approximately 200,000 public water systems are subject to federal regulations, that is a strikingly small number.

Variances and exemptions can be difficult to grant for several reasons.[8] First, it can be costly for a state to set up a program to carry them out. Second, it can be difficult to determine that granting them will not create an "unreasonable risk." Third, variances may be granted only after a technology is already in place. Systems are reluctant to install a technology unless they are sure that it will allow them to meet the required maximum contaminant level. Fourth, economic infeasibility is a criterion under which exemptions may be granted. However, there is no clear agreement on what is considered "affordable." The EPA offers that, "as a rule of thumb, a total annual household water bill becomes unaffordable when it is greater than 2 percent of median household income."[9] It does not indicate, however, what level of median household income should be considered--national, state, county, or other. Finally, states may be reluctant to grant exemptions even when they think they are warranted because they are concerned about the public perception of such an action.

3. Ibid., p. 2.

4. Memorandum from Michael B. Cook, Director, Office of Drinking Water, Environmental Protection Agency, to Regional Water Supply Branch Chiefs, February 20, 1987.

5. Environmental Protection Agency, "Consolidated Rule Summary for the Chemical Phases" (draft, October 1992).

6. Ibid.

7. Information contained in the Environmental Protection Agency's Federal Reporting Data System, August 1994.

8. The reasons discussed in this chapter are based on discussions with EPA staff, representatives of the Association of State Drinking Water Administrators, and state officials.

9. "National Primary Drinking Water Regulations; Final Rule," *Federal Register*, vol. 56, no. 20 (January 30, 1991), pp. 3570-3571.

Although only a small number of exemptions are granted, the EPA and the states often use the enforcement process to accomplish the goals that exemptions were to achieve. As part of the enforcement process, the EPA or a state may set up a compliance agreement with a system that allows it a period of time to comply.

Seven states have approved waiver programs, and 14 states have informal, in-place programs. In addition, 26 states are developing wavier programs but cannot yet grant waivers. Some states expect to reduce testing costs substantially through the use of waivers. For example, Minnesota expects to reduce its monitoring costs by $18 million during the 1993-1995 compliance period--56 percent of what it would expect to spend on the sampling in the absence of a waiver program. It spent $240,000 developing a waiver program and expects to spend approximately $23,000 to operate it each year. Since the state assumes the laboratory costs for water systems, the waiver program will result in significant savings to the state.[10]

Other states that have approved monitoring programs foresee problems in using them effectively. For example, New York State had a monitoring program approved by the EPA in the summer of 1994. Michael Burke, the director of the Bureau of Public Water Supply Protection in New York State, cites a lack of resources as a major impediment in granting waivers. He says that the state has difficulty affording the manpower that an intensive process of collecting data (such as those on chemical use, source protection, soil, and hydrological conditions) requires in order to grant waivers. He also indicates that the systems that are most in need of waivers, primarily small systems, are least likely to be able to undertake that effort themselves.

Although waiver programs are expected to result in significant savings in some states, not all states have them and some important barriers limit their use. Developing the waiver programs takes up limited state resources. Determining what contaminants have been used in an area and examining the susceptibility of water sources can be a very expensive process. States that conduct monitoring tests for water systems are the ones that are most able to benefit from the waiver process. In those cases, the upfront costs that the state incurs to establish a waiver program will result in lower testing costs for the state. If states require the systems themselves to gather the data to justify a waiver, some systems may find it less expensive to conduct the monitoring than to qualify for a waiver.

The EPA believes that most states allow grandfathered data but that such data are successful in lowering systems' costs for only some groups of contaminants. Grandfathered data are available because the EPA either required or encouraged the monitoring of unregulated contaminants in order to obtain occurrence data to be used when those contaminants were regulated. For some groups of contaminants, such as volatile organic compounds, the availability of grandfathered data can greatly reduce the amount of initial sampling that is required. For other groups of contaminants, such as inorganic compounds (IOCs) and synthetic organic compounds, availability of grandfathered data does not generally reduce sampling costs. In the case of IOCs, that failure is because the frequency of initial and repeat sampling requirements is the same.

In the case of SOCs, it is because early monitoring was not required for some of the contaminants that were ultimately regulated. Given the analytic methods for testing, having to test for the subset of contaminants for which grandfathered data are unavailable is not substantially less expensive than testing for the entire group.[11]

Although no data are available on the number of states that allow systems to undertake composite samples, the EPA believes that a significant number of states do not allow it. Some states may be reluctant to allow composite sampling for two reasons. First, they require additional resources to determine when composite sampling has occurred and to ensure that it was done properly. Second, since composite sampling leads to the dilution of samples, it may result in cases in which systems are not required to engage in more frequent monitoring when they have

10. Environmental Protection Agency, *Summaries of Selected State Waiver Programs* (April 1994).

11. Environmental Protection Agency, "Consolidated Rule Summary for the Chemical Phases."

contaminant levels at which such monitoring would otherwise be required.

Restructuring as Another Option to Reduce Costs

In addition to the high average household cost of treating drinking water, some small systems face other problems, including deteriorated physical infrastructure, lack of access to capital, limited customer and rate bases, and limited technical and management capabilities. The combination of those factors creates viability problems for small systems. "Restructuring" is one option that the EPA has advocated for dealing with small systems that cannot afford to comply with SDWA requirements. The EPA uses the term "restructuring" to refer to a variety of operations and ownership changes that systems can adopt to improve their viability. Those options include informal purchasing cooperatives among systems, mutual aid networks, contract operations and maintenance, and wholesale purchase of water, as well as actual consolidation of ownership.[12]

Although the EPA estimates that 50 percent of small systems could benefit from restructuring, numerous barriers can prevent restructuring from taking place. Those barriers include lack of incentives for viable systems to acquire troubled systems, local concerns about loss of control, and in some cases loss of water rights when consolidation occurs.[13] The EPA is urging states to develop viability programs. It would like those programs to contain approaches to prevent new nonviable systems from forming; systematically assess the viability of existing systems; promote restructuring or otherwise provide for improving the effectiveness of systems needing such improvement; and compel restructuring of nonviable, seriously noncompliant systems that are unwilling to take the steps necessary to achieve compliance.[14]

12. Peter E. Shanaghan, "Small Systems and the SDWA Reauthorization," *Journal of the American Water Works Association* (May 1974), p. 56.

13. Ibid.

14. Ibid., p. 57.

Chapter Six

Implications for Providing Cost Estimates Under the Unfunded Mandates Reform Act of 1995

The increasing concern in recent years about the costs that federal requirements impose on state and local governments has led the Congress to pass legislation that will make it harder to enact new unfunded mandates (see Box 3). The Unfunded Mandates Reform Act of 1995 (Public Law 104-4) requires the Congressional Budget Office to estimate the cost of intergovernmental mandates on state and local governments. The Safe Drinking Water Act case study highlights some of the challenges that CBO will face in providing those estimates:

- The law requires CBO to estimate the incremental cost of a mandate--that is, the additional cost that the mandate imposes above and beyond the cost of actions that states and localities are already taking or would undertake on their own before the requirements take effect. It is often difficult, or impossible, to isolate the incremental component of cost.

- The ultimate cost of a mandate is often a function of the specific requirements of the implementing regulations. Those details are not available when CBO is preparing cost estimates, which is the time the legislation is proposed.

- The data available at the time legislation is proposed are often extremely limited. The accuracy of CBO's estimate, therefore, will be limited by the lack of data.

- CBO often has limited time to prepare cost estimates--particularly for amendments and marked-up versions of bills.

As a result of those challenges, CBO's cost estimates will inevitably be imprecise. For example, although CBO's estimate of the cost of the 1986 amendments to the SDWA was based on the best information available from the Environmental Protection Agency and local communities at that time, it is considerably lower than the ultimate cost that current information indicates. CBO estimated that water systems would be required to make between a total of $3.3 billion and $4.6 billion (in 1992 dollars) in capital investments to comply with the amendments' requirements. Based on more recent data, the EPA now estimates that water systems will spend $8.8 billion on capital investments to meet the existing requirements that resulted from the 1986 amendments. Furthermore, an additional $13.8 billion to $20.8 billion could be necessary to meet proposed regulations (in their extended form) that are directly required by the 1986 amendments.[1]

1. This estimate includes a range of $1.6 billion (estimate of the Environmental Protection Agency) to $8.6 billion (estimate of the American Water Works Association) in capital to comply with the radon rule, $1 billion to meet the capital requirements imposed by other radionuclides, and $11.2 billion to meet capital requirements associated with the Disinfectants/Disinfection By-Products Rule. Radionuclides were one of the 83 contaminants that the EPA was specifically required to set standards for under the 1986 amendments. In addition to naming 83 specific contaminants, those amendments directed the EPA to issue regulations for 25 additional contaminants every three years. The Disinfectants/Disinfection By-Products Rule is one of the first group of 25 contaminants that the EPA chose to regulate.

Box 3.
Definitions and Requirements Regarding Intergovernmental Mandates Under the Unfunded Mandates Reform Act of 1995

Definition of an Intergovernmental Mandate

A definition of an intergovernmental mandate may be found in Title I of the Unfunded Mandates Reform Act of 1995. The Congress has not yet provided greater interpretation. The Congressional Budget Office (CBO) has paraphrased the definition below.

An intergovernmental mandate is defined as any provision in legislation, statute, or regulation that (1) would impose an enforceable duty upon state, local, or tribal governments, except when it is a condition of federal assistance or a duty arising from participation in a voluntary federal program; or (2) would reduce or eliminate the amount of authorization of appropriations for federal financial assistance for the purpose of complying with previously imposed duties. Legislation, statutes, or regulations that relate to duties arising from participation in voluntary programs may be considered intergovernmental mandates under a number of circumstances if those provisions were to increase the stringency of conditions of assistance or place caps on or decrease federal funding and if the state, local, or tribal governments lacked authority under the program to amend their financial or programmatic responsibilities to continue providing required services, and if the program is one under which more than $500 million is given to state and local governments under permanent authority.

Legislative Accountability and Reform[1]

Exemptions. The act exempts from the procedural point of order mandates that enforce the constitutional rights of individuals; prohibit discrimination on the basis of race, color, religion, sex, national origin, age, handicap, or disability; require compliance with federal grant-related accounting or auditing procedures; provide for disaster assistance; are necessary for national security or the implementation of treaties; are designated by the President as emergency legislation; or are related to various Social Security programs.

Committee Reports. The act requires any authorizing committee that approves a bill or joint resolution containing a federal mandate to draw attention to the mandate in its report. The report must describe the costs and benefits of the mandate, including direct costs to state, local, and tribal governments, and identify any newly created or existing sources of federal funding that will help pay for the mandate. If the committee intends for an intergovernmental mandate to be partly or entirely unfunded, it must explain why it is appropriate for any of the costs to be borne at the state or local level.

Cost Estimates. The act requires the authorizing committee to submit the bill to CBO for an estimate of a mandate's costs. That estimate must either be included in the committee's report or the committee should insert it into the *Congressional Record.* The CBO cost estimate must be provided for any intergovernmental mandate that would cost $50 million or more in the fiscal year in which it takes effect, or in any of the subsequent four fiscal years. The CBO report must include an estimate of any increased authorization levels in the bill that would help pay for the mandate. If there are such authorizations, CBO must estimate the new budget authority required to comply with the mandate for up to the first 10 years that the mandate is in existence. CBO must submit an explanation if it is unable to estimate the cost. To the

1. The description of the requirements under the Unfunded Mandates Reform Act of 1995 were drawn from the *Congressional Quarterly* (April 15, 1995), pp. 1087-1089.

extent practicable, CBO must also submit cost estimates of mandates in amended legislation.

Requests to CBO. The act requires CBO, at the request of a committee, to study proposed mandates with a significant budgetary impact on state and local governments. The committees can also ask CBO to estimate costs beyond a five-year period and to look at the disproportionate effect a mandate may have on particular regions.

Point of Order. The act allows any member of the House or Senate to raise a point of order against a bill or joint resolution that contains an intergovernmental mandate without a CBO cost estimate, unless that estimate cannot be made. Members can also raise a point of order in either chamber against a bill, joint resolution, amendment, motion, or conference report in which the costs of the intergovernmental mandate are to exceed the $50 million threshold, unless funding was provided to pay fully for the mandate.

Appropriations. The act allows any Member of the House or Senate to raise a point of order against any provision in an appropriation bill, resolution, amendment, or conference report containing an unfunded intergovernmental mandate. Such a point of order would affect only a single provision rather than the entire legislation.

Underfunded Mandates. The act requires federal agencies to determine whether there are sufficient funds to carry out mandates under their jurisdictions. If the funds are insufficient, they must notify the appropriate Congressional authorizing committees within 30 days of the beginning of the fiscal year. The agency can then submit a reestimate, based on consultations with state, local and tribal governments, that the amount appropriated is sufficient to pay for the mandate. Alternatively, it must submit recommendations for implementing a less costly mandate or making the mandate ineffective for the fiscal year. The Congress then has 30 days to consider the recommendations under expedited procedures. If the Congress takes no action within 60 days, the mandate will be abolished. State, local, and tribal governments may continue to comply, voluntarily, with a mandate that has been terminated by the federal government for lack of funds.

Review of Federal Mandates

The act authorizes funds for the Advisory Commission on Intergovernmental Relations to issue various reports on mandates on state and local governments and private business. First, the commission must issue a preliminary report within nine months on the role of federal mandates and the effect on state, local, and tribal governments. The report must make recommendations to the President and the Congress on easing mandates--including terminating impractical, obsolete, or redundant ones--simplifying them, making them more flexible, and temporarily suspending mandates that are not vital but that create fiscal difficulties for state, local, or tribal governments. Second, the commission must complete a study on intergovernmental mandates within 18 months. The study will have to consider the feasibility of measuring both the direct and the indirect costs and benefits of mandates. It will also consider the feasibility of measuring the direct and indirect benefits of federal assistance and tax benefits to state, local, and tribal governments. Finally, the commission must report to the Congress and the President on federal court cases involving intergovernmental mandates. The commission is to submit its first report within four months of the bill's enactment and a subsequent report by March 15 every year.

Measuring the Incremental Cost of a Federal Mandate

As discussed in Chapter 1, measuring the true cost of a federal mandate involves measuring the incremental cost that the mandate imposes on state and local governments. Because many federal mandates are designed to achieve a goal that state and local governments share, many state and local governments would take certain actions toward achieving that goal even without a federal mandate. The incremental cost of the mandate, therefore, is the additional cost that it imposes on state and local governments--above and beyond the expenditures that they would have made in its absence.

In some cases, incremental aspects of cost might be readily identified. For example, if a state or locality already has a requirement in place that is as stringent (or more so) than the proposed federal requirement, then the incremental cost of the federal requirement on that state or locality will frequently be negligible.

Calculating the incremental cost may be considerably more complicated if a state or locality has a requirement that is less stringent than the federal requirement. For example, if a federal mandate specifies a more stringent standard for drinking water than an existing state standard, then calculating the incremental cost will require an understanding of the available technologies for treatment as well as the nature of equipment currently installed in systems. Meeting a more stringent standard could either involve modifying or completely replacing a treatment facility. If a treatment facility is completely replaced, then the incremental cost that it imposes on the community will depend on the remaining life of the facility that it replaces. If the replaced facility is at the end of its useful life, then the incremental cost of the mandate would be the cost of building a new facility that meets the federal standard minus the cost of building a new facility that meets the less stringent state standard. Conversely, if the treatment facility that is replaced is a new one, then the incremental cost of the mandate is the entire cost of building the new facility. Calculating the incremental cost of mandates in that case requires knowledge about the age of the existing stock of treatment systems. That information, however, is often not available.

Finally, calculating the incremental cost ideally entails not only netting out the costs of actions that state and localities are currently undertaking, but also the future actions that they would chose to undertake on their own. For example, as information about the potential risks from drinking water contaminants becomes available through the research that is conducted as part of the process of developing both drinking water legislation and implementing regulations, communities might decide to undertake additional treatment on their own, regardless of federal requirements. Theoretically, CBO would like to deduct the cost of future actions that communities would choose to undertake on their own from the cost of the federal mandate. Predicting those costs, however, is an intractable problem.

Determining the incremental cost of a mandate is extremely difficult. It involves making assumptions about the technological choices that governments will make, the cost of implementing those choices, and possibly the age of the existing stock of equipment. Estimating incremental costs also requires making assumptions about the future actions that states and local governments would have undertaken without federal requirements. Such assumptions will inevitably be arbitrary.

Uncertainty About the Regulations That Will Result from Legislation

CBO cost estimates are made at the time legislation is proposed for enactment. However, legislative language is often broad and lacks the specifics needed to project future costs. Executive branch agencies usually develop those specifics through the regulatory process. For example, when the SDWA was passed in 1974, it did not specify what contaminants to regulate or at what level standards should be set, although it did direct the Administration to do so. The ultimate cost of the SDWA, of course, has hinged on those details. Because of the uncertainty about the

specific regulations that will result from legislation, cost estimates that are made at the legislative stage will be speculative and will usually have to encompass a wide range of possible regulatory alternatives.

In addition to the uncertainty about the specifics of the implementing regulations, both legislation and regulations may be challenged in court. In those cases, important details may not be clarified for a long period of time, making it even more difficult to predict costs.

Limited Data Sources

This study has examined available data on the cost that localities incur to comply with the current final and proposed standards under the SDWA. As is emphasized throughout the study, the data available to calculate that cost are limited. The engineering-based estimates of cost provided by the Environmental Protection Agency and the American Water Works Association rest on numerous assumptions that may ultimately prove to be incorrect. The locally provided cost estimates are based on surveys that are not designed to be representative at the national level, have poor quality control, and in which the respondents may have an incentive to make worst-case assumptions about future costs. Those limitations exist even though the SDWA has been in place for over two decades, many of the regulations have been finalized, the EPA and industry have devoted a great deal of effort and funding to generating cost estimates, and some localities have actually undertaken some of the necessary investments.

When cost estimates are generated at the legislative stage, the limitations on data are much greater. The sources of information used in this study are typically not available: engineering analyses are usually developed only as the specific regulations are formed, and little--if any--information on the costs that municipalities would actually experience may be available from census data or case studies.

The primary source of information for cost estimates developed at the legislative stage is often the views and judgments of federal, state, and local officials or others in the regulated community. Often, a different set of individuals must be contacted for each legislative proposal. In addition, the most informed people in the regulated community may have an interest in the outcome of the legislative debate and may therefore have an incentive to either over- or underestimate costs.

Limited Time

CBO devoted a considerable amount of time and resources to the task of assessing the costs and benefits of the Safe Drinking Water Act in this study. Gathering the appropriate data from a variety of sources, taking steps to assess and improve the quality of the data, and normalizing data obtained from different sources so that estimates may be compared appropriately are very time-consuming tasks.

An additional factor complicates the process of constructing the state and local cost estimates that CBO is required to make under P.L. 104-4: in some cases, the estimates will need to be provided in a very short time period. CBO will try to identify issues early on in the legislative process and in that way maximize the amount of time and effort that it can devote to constructing cost estimates. In spite of those efforts, however, major amendments can be adopted in the final stages of the process, leaving little time to conduct a thorough analysis of their implications.

Although state and local cost estimates can be an important ingredient in a legislative debate, the methodological challenges in estimating the incremental component of state and local costs, the uncertainty about the details of the implementing regulations, the lack of data at the legislative stage, and the short time frame under which those estimates must be produced will limit CBO's ability to provide accurate estimates. As a result of such complicating factors, cost estimates constructed at the legislative stage will be less precise than examinations conducted after the law or regulation is in effect.

Appendix

Method Used to Construct Estimates of Per Capita Local Expenditures on Drinking Water

The Congressional Budget Office calculated average per capita local expenditures on drinking water by dividing Bureau of the Census data on total expenditures by local drinking water systems by an estimate of the population served by municipally owned water systems. The estimate of the population served was based on Census Bureau data on the percentage of households served by public and private community water systems and on information about the percentage of community water systems that are publicly, rather than privately, owned. (The latter information was obtained from the Environmental Protection Agency's Federal Reporting Data Systems.)

Since 1940, the Department of Agriculture's Rural Development Administration (RDA) has provided loans to drinking water systems in rural areas or in cities or towns having populations of 10,000 or less. The department added a grant program in 1966. To reflect only local expenditures, CBO subtracted the value of the subsidies provided through the RDA program from the total expenditures that are reported by the Census Bureau. To calculate the grant equivalent of federal loans, CBO subtracted the net present value of payments that communities were required to make on loans provided by the RDA from the net present value of alternative loan payments that they would have had to make if they had not received RDA loans.

Since 1982, the RDA has provided loans at three different interest rates, depending on the median household income of the community. The highest interest rate is a "market rate" that corresponds to the Bond Buyer's 11-Bond Index. The 11-Bond Index is based on a set of 11 general obligation bonds maturing in 20 years and having a Moody's Investor Service rating of Aa. An "intermediate rate" and a "poverty rate" lie below the market rate. Before 1982, loans were offered at either 4.5 percent or 5 percent, depending on the year. The communities that receive RDA loans will generally not have a sufficient credit rating to receive the market rate indicated by the 11-Bond Index. In addition, RDA loans are generally for 40 years, a longer time period than communities can obtain elsewhere.

The Bond Buyer's Revenue Bond Index was used as an estimate of the alternative rate that communities might have obtained without RDA loans. That index uses 25 bonds maturing in 30 years with Moody's ratings ranging from Baa1 to Aa1. The Revenue Bond Index was thought to represent a conservative assumption about the alternative market rate that communities might expect. That index began in 1979; thus, earlier rates were estimated based on the relationship between the 11-Bond Index and the Revenue Bond Index over the 1979-1993 period. Because the alternative loan would probably be for a shorter period than the RDA loan, it was necessary to make an assumption about the rate at which the borrowing communities discounted future loan payments. For simplicity, CBO assumed that the communities' discount rate was equal to the rate indicated by the Revenue Bond Index. CBO then calculated the grant equivalent of each loan as the net present value of the payments under the alternative loan mi-

nus the net present value of payments under the RDA loan. During the 1957-1968 period, the interest rate charged on loans offered under the RDA exceeded the alternative market interest rate. In those cases, the method described above resulted in a negative grant equivalent. Communities would obviously not accept the RDA loan unless it presented a positive benefit relative to their alternative. Hence, in those cases the grant equivalent was constrained to zero.