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Institutional Framework for Rural Water Supply in North Carolina, South Carolina, and Virginia

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ABSTRACT

Water supply systems in rural areas and small communities of the United States have a disproportionate share of problems with quantity and quality of water supply. In addition, because of the higher costs of system development in low-population areas and the generally lower income of the population served, these water systems confront special economic and financial problems. This report analyzes the institutional framework of rural water supply development and operation and determines whether existing institutions adequately recognize and address the unique problems experienced by water systems in rural areas.

The institutional framework is divided into three parts for analysis. First, a variety of organizational arrangements for provision of water supply are described and their strengths and weaknesses considered. Second, programs for technical and financial assistance from federal and state governments, including a comparative evaluation of the programs within the three states, are analyzed. Third, federal and state regulatory mechanisms applicable to water supply operations are analyzed with special concern for the impact of such regulation on small systems.

Although substantial portions of the analysis apply to other areas, special emphasis is placed on the states of North Carolina, South Carolina, and Virginia. Analysis of the laws and administrative programs of these states through case studies illustrates the actual operational experiences of rural suppliers in these areas.

Key Words: Water Supply, Institutional Constraints, Virginia, North Carolina, South Carolina, Financing, Administrative Regulation, Drinking Water, Rural Areas, Water Supply Development, Planning, Water Quality, Governmental Interrelations

LIST OF ABBREVIATIONS

ARC	Appalachian Regional Commission
ARDA	Appalachian Regional Development Act of 1965
CAA	Community Action Agency
CDBG	Community Development Block Grant
CFRDA	Consolidated Farm and Rural Development Act of 1961
CHS	Commission for Health Services
COG	Council of Government
CWC	Cassatt Water Company
CWF	Clean Water Fund
DCA	Division of Community Assistance
DEM	Division of Environmental Management
DHCD	Department of Housing and Community Development
DHEC	Department of Health and Environmental Control
DHR	Department of Health Resources
DHS	Division of Health Services
DNRCD	Department of National Resources and Community Development
DOC	U.S. Department of Commerce
DWP	Demonstration Water Project
EDA	Economic Development Administration
EPA	U.S. Environmental Protection Agency
FmHA	Farmers Home Administration
FUSD	Fork Union Sanitary District
HA	Housing Act of 1949
HCDA	Housing and Community Development Act of 1974
HUD	U.S. Department of Housing and Urban Development
LCG	Local Government Commission
LPWCDIA	Local Public Works Capital Development and Investment Act of 1976

MACAA	Monticello Area Community Action Agency
MCL	maximum contaminant level
MGD	million gallons per day
NCCWBA	North Carolina Clean Water Bond Act of 1977
NCRWSPA	North Carolina Regional Water Supply Planning Act of 1971
NCUC	North Carolina Utilities Commission
NDWP	National Demonstration Water Project
NIPDWR	National Interim Primary Drinking Water Regulations
NWWA	National Water Well Association
OEO	Office of Equal Opportunity
PCPSA	Pulaski County Public Service Authority
PDC	Planning District Commission
PSC	Public Service Commission
PWEDA	Public Works and Economic Development Act of 1965
RH	Rural Housing
SCC	State Corporation Commission
SDWA	Safe Drinking Water Act
SMSA	standard metropolitan statistical area
TAP	Total Action Against Poverty
USDA	U.S. Department of Agriculture
VWP	Virginia Water Project
WBWSA	Wythe-Bland Water and Sewer Authority

INTRODUCTION

I. Overview of Rural Water Supply

Most citizens of the United States have access to a safe and dependable water supply at a relatively modest cost. Health statistics are a testimonial to the success of the water supply industry. Only 35 reported disease outbreaks during 1960-1970 were caused by inadequate public water systems;[1] these outbreaks caused 40,000 cases of disease, 90 percent of which occurred in 4 of the outbreaks. In recent years small concentrations of potentially hazardous substances in drinking water at some locations have raised concerns, but a safe water supply is still generally taken for granted by a large percentage of the population.

Although water supply conditions in the United States predominantly are good on the basis of nationwide averages, the distribution of problems is not uniform among the population; an important factor in this distribution is the type of water supply system involved. Because of concentration of population in urban areas, most citizens of the United States receive water from relatively large water systems, but rural areas depend to a much greater extent on individual supplies and small systems. It was reported in 1970 that 17 percent of the nation's population was served by individual supplies.[2] The rural water survey[3] conducted for the U.S. Environmental Protection Agency (EPA) pursuant to the Safe Drinking Water Act (SDWA)[4] and published in 1983 reported that approximately 40 percent of the 21,974,000 households in rural areas (defined to include communities of less than 2,500 population and other rural areas) were served by individual systems. An additional 10 percent of these rural households were served by small systems with 2-14 connections, with the remaining 50 percent served by community systems having 15 or more connections.[5] Many small systems exist in this latter category. Of the 61,500 community water systems (those systems serving a year-round resident population of 25 or more persons or having 15 or more service connections) in the United States, 95 percent have individual service populations of 10,000 or less, 86 percent serve less than 2,500 persons each, and 63.5 percent serve a population of less than 500 each.[6] Although the

total population served by these small systems is relatively small, the large number of such systems is a significant factor in the structure of the water supply industry.

Because of the special characteristics of individual water systems and small multi-connection systems prevalent in rural areas, such areas experience a disproportionate share of water supply problems. The latest and most comprehensive assessment of rural water supply conditions is the EPA rural water survey. The survey assessed water quality conditions through a sampling program which focused on a wide range of quality indicators, including all the contaminants for which EPA has established primary maximum contaminant levels (MCL). (Primary MCL's are established under SDWA for those contaminants that produce health risks.) Although the sampling program used in the survey did not conform to all of EPA's procedures for determining an official violation of a primary MCL (for example, pretesting to verify suspected MCL violations was not performed), the results of the survey indicate significant water quality problems in rural areas. According to the survey, approximately 64 percent of rural households have water supplies with concentrations of at least one contaminant for which EPA has established a primary MCL (with the exception of turbidity) in excess of the EPA standard. Thirty percent of such households are in excess of EPA standards for 2 or more of the contaminants regulated by primary MCL's. The survey found that households in standard metropolitan statistical areas (SMSA) (and therefore urbanized) and those in larger communities tended to have the best overall water quality because of the higher proportion of households served by community water systems having 15 or more connections. Households served by systems with 2-14 connections had the poorest quality, even when compared with households served by individual systems.[7]

Regarding water quantity, the EPA survey found that few rural households experience shortages of domestic water, but some problems do exist. Among households reporting inadequate quantity of supply, a major cause of the problem is the deterioration or inadequate construction of physical facilities. Problems of inadequate quantity are more frequently experienced by those served by small systems with 2-14 connections than by those with individual systems. Households served by this small-

system category also experience more frequent interruptions of service than do households served by individual systems or larger community systems.[8]

Economic and financial problems figure strongly in the rural water supply situation. Rural water systems often are confronted with two difficulties: (1) low per-capita income of the service population and (2) higher costs for system development and operation.[9] Higher costs primarily result from the low-population density of rural areas. The greater distance between dwellings increases the amount of water distribution line and imposes greater operating costs. In addition, the small size of such systems prevents the scale economies associated with larger operations. After surveying 34,632 public water systems nationwide, EPA compared costs of water supply according to size of the service population and showed that residents of small communities generally pay more for water supply[10] (see *Tables 1* and *2).* Further evidence of this disparity in costs is indicated by data in EPA's 1983 rural water survey showing median household monthly costs per thousand gallons of water used to be $1.08 within SMSA's and $1.62 outside SMSA's.[11]

II. Institutional Framework Affecting Rural Water Supply

Public water supply operations are carried out within a complex institutional framework that affects all aspects of operation. Water supply service typically is provided by local or regional governments or by private companies. State law generally specifies a variety of individual institutional arrangements for provision of water supply. Inherent in each arrangement are limitations on such basic factors as financing and service boundaries.

Although water supply generally is viewed as a local responsibility, the federal government and state governments have established assistance programs that are a significant part of the institutional framework. Because of their concern with public health and other aspects of welfare, federal and state governments also regulate water suppliers. Regulation may extend to various aspects of operations and to water rate determination, especially in the case of private supply operations.

Since most of the citizens of the United States receive water from a relatively small number of large municipal water supply systems, the institutional framework may be oriented to this type of system and may not recognize the special characteristics of the rural water supply situation. Institutional deficiencies that may affect rural suppliers are especially significant since water supply problems are relatively widespread in rural areas.

III. Scope and Organization of Study

This report results from an analysis of the institutional aspects of rural water supply development and operation. It describes the institutional framework affecting rural water supply operations in North Carolina, South Carolina, and Virginia. Although substantial portions of the analysis are applicable to other areas, the specific laws and programs of these states are investigated in detail. Case studies illustrate actual operational experiences of rural suppliers within the institutional frameworks of the three states.

The major sections of the report analyze the three components of the institutional framework: (1) organizational arrangements for provision of water supply, (2) programs for technical and financial assistance from federal and state governments, and (3) regulatory mechanisms directed toward water supply operations. Analyses of these components of the institutional framework are followed by the case studies and a concluding section that discusses some of the unresolved issues of rural water supply.

IV. Footnotes

1. G. Craun and L. McCabe, "Review of the Causes of Waterborne Disease," *Journal of the American Waterworks Association,* Vol. 65, No. 1, pp. 74-78 (Jan. 1973).

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3. J. Francis, B. Brower, W. Graham, O. Larson III, J. McCaull, and H. Vigorita, "National Statistical Assessment of Rural Water Conditions—Executive Summary" (1983).

4. Safe Drinking Water Act of 1974, 42 *U.S.C.A.,* sec. 300f *et seq.* (1980).

5. Francis, *supra* n. 3 at p. 5.

6. "EPA's Interim Final Policy for Compliance of Small Public Drinking Water Supply Systems," *Environment Reporter: Current Developments,* pp. 291-94 (June 20, 1980).

7. Francis, *supra* n. 3 at pp. 6-9.

8. *Id.* pp. 10-11.

9. M. Blase, W. Gottman, and G. McNabb, "Public Water Supply Districts: Evaluation of a New Institution," *Land Economics,* Vol. 48, No. 3, pp. 273-76 (Aug. 1972).

10. U.S. Environmental Protection Agency, "Water Supply/Wastewater Treatment Coordination Study, "Washington, D.C., pp. 300-301 (draft report 1979).

11. Francis, *supra* n. 3 at p. 12.

INSTITUTIONAL ARRANGEMENTS FOR PROVISION OF PUBLIC WATER SUPPLY

North Carolina, South Carolina, and Virginia all have enacted enabling legislation that authorizes several public organizations to provide water supply service. Included are general-purpose units of local government and a variety of special-purpose governmental organizations. Water supply also is provided by private companies and organizations in the three states.

I. North Carolina

The following entities are authorized to provide water supply service in North Carolina:

1. Municipal and county governments,
2. County water and sewer districts,
3. County service districts,
4. Metropolitan water districts,
5. Sanitary districts,
6. Water and sewer authorities,
7. Private water companies and cooperative associations.

A. Municipal and County Governments

Municipalities and counties possess general authority to provide water supply service. An incorporated municipality has the power to "acquire, construct, enlarge, improve, maintain, own, and operate" a water supply and distribution system.[1] Any county in North Carolina also may operate a water system. The county government may establish charges for its services; finance the system through grant, debt, or tax levy; and promulgate ordinances to regulate the system.[2]

Both municipalities and counties may issue general obligation

bonds to finance water systems under authority of the Local Government Bond Act.[3] For water systems, voter approval is not required for issuance unless the amount exceeds 2/3 of the sum by which the total county or city debt was reduced the previous year. For example, if debt were reduced by $90,000 in 1980, an additional $60,000 of general obligation bonds could be issued in 1981 without a voter referendum. In addition, municipalities and counties may issue revenue bonds without a public referendum, as authorized by the Local Government Revenue Bond Act.[4]

To issue either type of bond, a local government must gain the approval of the Local Government Commission (LCG), a state regulatory agency. LCG bases its decision on the current and past financial status of the local government, the marketability of the issue, and the ability of the locality to bear the extra taxes in the case of general obligation bonds. For revenue bonds, approval depends upon the probability that receipts will meet the outstanding indebtedness attributable to the bond issue.

Two or more local political subdivisions may create a joint agency to plan, develop, operate, and maintain a public enterprise such as a water system.[5] The applicable jurisdictions may confer any powers necessary, including the power to hold title to real estate, to the joint agency. Appropriations from the member governments finance the agency.

B. County Water and Sewer Districts

After a public hearing, a county board of commissioners may create a county water and sewer district by resolution upon the following findings:[6]

1. There is a demonstrable need for providing in the district water services, or sewer services, or both;

2. The residents of all the territory to be included in the district will benefit from the district's creation; and

3. It is economically feasible to provide the proposed service or services in the district without unreasonable or burdensome annual tax levies. . . .

The territory within the corporate limits of a city or town cannot be included in the district unless the city or town government gives approval by resolution.

The created district is regarded as a corporate political body, governed by the board of commissioners of the county in which the district is established.[7] The governing body has the power to exercise eminent domain; to issue revenue and general obligation bonds for the provision of water systems; to levy property taxes within the district; to finance the operation and maintenance of the district's water system; or to finance debt service on general obligation bonds issued by the district.[8]

The district's governing body also is authorized to make special assessments against benefited property within the district for financing the costs of "constructing, reconstructing, extending, or otherwise building or improving water systems. . . ."[9] It has the power to enter into contracts and to establish, revise, and collect rates for the services furnished by the water system.[10]

C. County Service Districts

The county board of commissioners may define within a county any number of service districts, whose primary purpose is to provide more intensive services in certain areas than are provided countywide, including a "water supply and distribution system."[11] The district is created by resolution and governed by the county government.

To support the additional services provided, the county government may levy within the district taxes greater than those applicable in other areas of the county.[12] Extending the district requires a petition signed by 100 percent of the real property owners within the proposed annexation area.[13] Two or more districts may consolidate to provide more efficient service.

The county has authority to issue general obligation bonds to finance district services. If proceeds from the issue will provide services only within the district, a concurrent majority vote in both the district and county is required.[14]

D. Metropolitan Water Districts

Any two or more cities, towns, incorporated villages, sanitary districts, water districts, other political subdivisions, or unincorporated areas within a county can petition the county board of commissioners to create a metropolitan water district.[15] However, a metropolitan water district can exist only within a single county. If an unincorporated area is to be included, a petition first must be submitted by at least 15 percent of the voters in the area.

Upon district creation, the county board of commissioners must appoint a district board of three members, and the government of each jurisdiction involved must each appoint one member.[16] The district, after having been petitioned, may add more political subdivisions or unincorporated areas.

A metropolitan water district is an independent, corporate political body. Its powers include issuing both general obligation and revenue bonds and imposing taxes on property within the district.[17]

E. Sanitary Districts

A sanitary district may be created for the purpose of ". . . preserving and promoting the public health and welfare. . . ."[18] Boundaries are established without regard to county, township, or municipal boundaries, but no municipal corporation, in whole or in part, can be included within the boundaries of a district unless the municipality's governing body consents.

For district creation, 51 percent or more of the property owners within the proposed district must petition the board of commissioners in the county that contains the largest portion of the district's land area.[19] The county board(s), in conjunction with the Commission for Health Services (CHS) decide(s) whether the district should be created. Upon creation, a sanitary district becomes an independent, corporate political body, and the county commissioners elect a sanitary district board to serve as the district's governing body.[20]

F. Water and Sewer Authorities

The governing bodies of two or more cities, counties, towns, incorporated villages, sanitary districts, or any other type of incorporated political subdivision may signify their desire to form a water and sewer authority by resolution.[21] Once created, an authority is an independent public body with a governing board; the number of board members elected is left to the discretion of the respective local governments.[22] Authorities have the power to set and collect fees for service and to issue revenue bonds.[23]

G. Private Water Companies and Cooperative Associations

Water supply in North Carolina also is provided by private companies and organizations. Although the size of private water suppliers varies considerably, a significant proportion of such suppliers serves relatively small numbers of customers. Private suppliers generally are subject to regulation both by the Division of Health Services (DHS) of the Department of Human Resources (DHR) and by the North Carolina Utilities Commission (NCUC), while public suppliers are subject to health-related regulation but not to regulation as utility operations. These regulatory programs are discussed later in this report.

Water supply also may be provided by a private organization known as a cooperative association, formed when five or more persons express their mutual agreement[24] by signing written articles of incorporation and describing the terms and conditions of the stock that will be issued.[25] In essence, the cooperative is a private, incorporated company that is regulated by the NCUC as are other private water suppliers.

Table 3 summarizes the characteristics of the major entities that provide water supply in North Carolina.

II. South Carolina

Institutional entities for provision of water supply in South Carolina include the following:

1. Municipal and county governments,

2. Special-purpose districts,

3. Rural community water districts,

4. Private water companies and nonprofit corporations.

A. Municipal and County Governments

Any city or incorporated town in South Carolina is authorized to own and operate waterworks.[26] This authority applies both inside and outside jurisdictional boundaries, with limits established by the particular municipal charter or ordinance. The power of eminent domain is applicable to waterworks development.[27] The board of commissioners of public works for the city or town is empowered to manage the water system. If the town does not have a public works department, this power is vested in the town council. The town council or local public works department establishes rates and charges, which are exempt from South Carolina Public Service Commission (PSC) regulation.[28]

The government of each county in South Carolina is empowered to acquire, construct, improve, enlarge, operate, and maintain water supply facilities to serve within the county.[29] The county cannot provide service within the jurisdiction of any water supply district or municipality without first acquiring its consent. A county is authorized to establish rates and charges for the system and is not subject to control by the PSC.[30] General obligation bonds can be issued by the county government to finance any development and construction costs pertinent to a water supply system.[31] City or town councils also may issue general obligation and revenue bonds to finance the development or operation of their systems.[32]

B. Special-Purpose Districts

Special-purpose districts (or public service districts) may be established to provide central water supply service to unincorporated areas in South Carolina.[33] The process for creation requires that a majority of resident landowners, or those individuals who own more than half of the acreage within the proposed district, sign a petition and submit it to the clerk(s) of the court in the county or counties in which the district is to be

located.[34] After the county court(s) has approved the petition, the eligible voters residing within the proposed district must vote whether to create the district and develop the water system; this referendum is held by the county government(s). At the same election, the voters must elect three commissioners to serve as the district board,[35] which is regarded as a corporate political body.[36] Upon approval by the county government(s), taxes necessary to meet any legitimate expense may be imposed upon all assessable property within the district.[37]

Both the county (or counties) in which a special-purpose district is located and the district board of commissioners have the authority to issue bonds for financing water system construction. With county government approval, the district's board of commissioners is authorized to issue general obligation bonds for any improvements required.[38] Bonds are issued by the district's board of commissioners on behalf of the public service district and are first subject to approval by the county government.[39]

C. Rural Community Water Districts

A rural community water district may be established as a corporate political body with boundaries that may extend across county lines. To initiate the process of district creation, at least 25 real property owners residing within proposed district boundaries must submit a petition to the county government(s) involved.[40] Within 60 days after the petition is received, the county government(s) must hold an election. If the majority of voters within the proposed district favors creation of the district, it becomes immediately effective.

Upon recommendation from the county government(s), the Governor of South Carolina must appoint five district residents to serve as the district board.[41] Rural community water districts are expressly exempt from PSC regulation;[42] rate setting is entirely a board decision. A rural community water district board can issue revenue bonds but has no authority to levy taxes.[43]

D. Private Water Companies and Nonprofit Corporations

Private water companies operated for profit also exist in South Carolina. As in North Carolina, such companies are subject to

regulation of both health and public utility aspects of operations. This regulation is considered in a later section of this report.

Nonprofit corporations also provide water supply and disposal service in South Carolina. Such a corporation can be organized by three or more citizens who must subscribe and file articles of incorporation with the South Carolina Secretary of State.[44] The article is simply a two-page document with 13 questions. Costs are $10 for filing and approval, $10 each year for filing and annual report, and $5 for any desired amendment, plus any attorney's fees. If the service area of officers and/or trustees is to be changed, the articles must be amended by resolution of the board of directors.[45] These nonprofit organizations are subject to taxation but not to PSC regulation.[46]

The South Carolina Farmers Home Administration (FmHA) office proposed the need for this type organization to the General Assembly, which in 1968 enacted the legislative authorization. FmHA supported the nonprofit corporation because it could be inexpensively and easily created and because, by the nature of the institutional arrangement, citizen participation would be substantial.[47] To date, 33 such corporations have been created.

Table 4 summarizes the characteristics of the major entities that provide water supply service in South Carolina.

III. Virginia

Public water supply in Virginia can be provided through the following institutional arrangements:

1. Municipal and county governments,
2. Sanitary districts,
3. Public facility districts,
4. Service districts,
5. Water authorities,

6. Private water companies.

A. Municipal and County Governments

The basic mechanism for providing public water supply in Virginia traditionally has been general-purpose units of local government. Specific authority for such services as water supply is contained in enabling legislation and, in the case of municipalities, in individual charters. Since charter provisions vary among municipalities, authority related to water supply and other governmental operations also varies to some extent.

State enabling legislation provides that the governing bodies of counties and municipalities have authority to ". . . acquire or otherwise obtain control of or establish, maintain, operate, extend and enlarge waterworks . . . within or without the limits of the county, city, or town. . . ."[48] When water is provided through this authority, the water supplier is not a legal entity distinct from the county or municipality itself. This aspect of waterworks operations can be significant for such issues as financing since local governments have greater fund-raising capabilities than have other water supply entities. Counties and municipalities can levy taxes[49] as well as issue general obligation and revenue bonds, subject to prescribed limitations.[50] They also can levy assessments on abutting property owners for special benefits that result from local improvements such as the construction of water lines.[51]

Generally, a local government provides water supply services for its citizens, but broader service is possible. Subject to specific limitations, such service can be provided outside jurisdictional boundaries.[52] Any two or more counties and municipalities can enter into contracts for joint construction and management of water supply projects.[53]

B. Sanitary Districts

Legislation creating sanitary districts provides a mechanism for a county or city to supply water and other specified public services within designated districts inside the county or city's political boundaries.[54] Sanitary districts are created by the state's circuit courts upon petition of 50 qualified voters (50 percent of the

qualified voters if the proposed district contains fewer than 100 qualified voters).[55] The court makes its decision after a public hearing on the proposed district's establishment.[56] The enabling legislation provides that property not be included in a district if the court is of the opinion that it will not benefit by inclusion.[57] A portion of a town's total land area can be included in a district with the approval of the governing body of the town and the other political subdivision involved.[58] Under specified conditions by order of the circuit court, the boundaries of existing sanitary districts can be modified, a district can be abolished, or separate districts can be merged.[59] Operation of a sanitary district is the responsibility of the county or city where the sanitary district is located and does not require an independent managerial entity. All powers associated with district operations are vested in the governing body of such county or city.[60] These powers include the levying of an annual tax on property within the district to cover costs associated with the district.[61] Other sources of funds include fees charged for services[62] and bonds (subject to specified restrictions).[63]

Usual procedures for creation of sanitary districts do not apply to counties having an "urban county form of government," a form generally available to counties with populations of more than 90,000.[64] However, enabling legislation for the urban county form of government requires that a county adopting such a form be divided into 5 to 11 districts for electoral and other purposes.[65] These districts serve as sanitary districts.[66]

C. Public Facility Districts

Public facility districts are similar to sanitary districts because they also offer a mechanism for providing water supply and other public services on a special-district basis within a political subdivision. Such services are provided by the political subdivision and not by a separate governmental entity. Enabling legislation for public facility districts generally does not apply to the state's political subdivisions; rather, such legislation only applies to certain counties[67] and cities.[68]

D. Service Districts

The Virginia Area Development Act[69] provides for creation of

service districts within the boundaries of planning districts. Planning district boundaries originally were established by the Division of State Planning and Community Affairs, which has since been abolished.[70] The planning districts were created to promote the ". . . orderly and efficient development of the physical, social and economic elements of the district by planning, and encouraging and assisting governmental subdivisions to plan for the future."[71] Powers of each planning district are vested in a planning district commission (PDC).[72]

Planning districts generally are not authorized to implement plans and policies or to furnish governmental services,[73] but two special exceptions, one of which encompasses limited water supply functions, have been created by the General Assembly. Functions authorized for the Cumberland Plateau Planning District include operation of a tanker-truck water supply system for communities experiencing drought and water shortage and assistance with taking pipelines underneath roadways. This authority is contingent upon ratification by the political subdivisions included in the planning district.[74]

In contrast to the planning districts, service districts are intended to provide an institutional mechanism for provision of public services. The creation of a service district is initiated upon request to the PDC by the governing bodies of two or more of the district's members. The commission then formulates a plan for the district that must include "two or more governmental subdivisions embracing the majority of the population within the planning district and all the governmental subdivisions which are parties to the planning district commission."[75] The plan must specify such factors as boundaries, services to be performed (potentially to include water supply), and other necessary operational details.[76] If the proposed plan is approved by the governmental subdivisions in the service district, it is subjected to a referendum for approval.[77] If the plan is approved by a majority of the voters of each governmental subdivision within the proposed district, a service district commission is formed, made up of elected members and members appointed from the membership of the governing bodies of the governmental units within the district.[78] Upon creation, a service district assumes all functions previously exercised by the PDC.[79]

Several sources of operational funds are authorized for service districts. Provision is made for state financial support of the planning function.[80] A service district can make an annual assessment upon each governmental subdivision within the district, up to the limit established in the district plan.[81] Districts are authorized to issue bonds payable from their various revenues, including assessments against member governmental subdivisions.[82] A service district also is authorized to charge fees for services.[83]

E. Water Authorities

The Virginia Water and Sewer Authorities Act[84] provides for creation of special authorities for provision of water supply, sewage disposal, garbage or refuse collection and disposal, or any combination of such services. With the exception that the word "authority" must appear as part of the name of such entities,[85] no standard name is prescribed.

Such authorities may be created by ordinance or resolution of the governing body of any individual political subdivision or by the governing bodies of two or more political subdivisions. Under certain conditions, approval of the necessary ordinance or resolution requires voter approval in a special referendum.[86] Provision also is made for citizens to initiate proceedings for creation of such an authority if the governing body of a political subdivision has not initiated them.[87] Final creation requires that, after local approval, the State Corporation Commission (SCC) find that the authority is organized according to law and that estimated costs and rates for services are fair and equitable.[88]

An authority so-created is an independent corporate body whose powers are exercised by a board of at least five members, including at least one member from each participating political subdivision. The method of selecting board members is specified in the ordinance or resolution creating the authority.[89] Sources of funds for operating an authority include fees for services[90] and issuance of revenue bonds.[91] Any political subdivision that is a member of an authority is authorized to "lend, advance, or give money to such authority."[92]

An authority has an initial corporate existence of 50 years which can be extended by resolutions of the political subdivisions that are members at the time of extension.[93] Although a member of an existing authority has the general right to withdraw its membership, "no political subdivision shall be permitted to withdraw from any authority after any obligation has been incurred by the authority."[94] After complying with legislative provisions regarding its obligations, an authority can be dissolved through the concurrence of all its members.[95]

F. Private Water Companies

As in North Carolina and South Carolina, water supply service in Virginia also can be provided as a private business activity. When the number of customers served meets jurisdictional limits, such companies are subject to regulation by the Virginia Department of Health, as are public water suppliers. But unlike public suppliers, private water companies also are subject to regulation by the SCC. Regulation of water supply activities is considered in a later section of this report.

Table 5 summarizes the characteristics of the major institutional arrangements for provision of water supply in Virginia.

IV. Comparative Analysis of Institutional Arrangements for Provision of Public Water Supply

The institutional arrangements for provision of water supply in North Carolina, South Carolina, and Virginia fall into four categories:

1. County and municipal governments,
2. Special-purpose governmental entities,
3. Private, nonprofit corporations, and
4. Private, profit-making corporations.

These organizations differ in their capabilities and their inherent suitability for water supply provision.

A. County and Municipal Governments

Counties and municipal governments traditionally provide water supply and other public services. A chief advantage of this institutional arrangement is that it views the public service function as its prime concern, whereas some other water suppliers view such service as a secondary concern. General-purpose governmental entities also have advantages in managing and financing water supply service. Water system management is enhanced by public works programs, which can combine different public works activities and achieve economies of scale that may be unattainable by a small water supply operation. Counties and municipalities enjoy considerable flexibility in financing water supply systems. Funding sources include taxes, general obligation and revenue bonds, and service fees. Local governments generally are eligible for state and federal financial aid. However, managerial and financial capabilities vary greatly among individual units of local government. In many rural areas, the potential for the local government to plan, finance, and manage water supply operations is limited.

B. Special-Purpose Governmental Entities

Special-district governmental entities vary considerably in form and in their strengths and weaknesses for providing water supply. One of the important variables affecting such capabilities is the relationship between the special-district and general-purpose local governments, which may range from the special district's control by the local government to the district's operating independence. In counties and municipalities with control and management responsibilities, the general institutional structure does not differ significantly from that of counties and municipalities that themselves provide water supply, except that service is provided within limited areas rather than throughout the political subdivision. Basic differences do exist, however, in districts that operate independently of the county or municipality.

Independent districts have both advantages and disadvantages. Their boundaries can be established to conform to appropriate service areas, whether within the boundaries of a single locality or, at least in some cases, including all or parts of two or more

localities.

But weaknesses can arise from the form of district management. Typically, independent districts are managed by an appointed or elected board. A potential disadvantage of boards is that political appointments can weaken managerial capabilities. Even with a qualified board, special districts may encounter management problems because the districts are separated from county and municipal public works departments and because they have more limited funding relative to local governments. Special districts, especially those with appointed boards, tend to be insulated from contact with citizens, so citizen input and involvement can be inadequate.

Related to the extent of citizen involvement is the requirement of a referendum for creating the special district. Such a requirement increases citizen awareness and participation and assures a broad base of citizen support to establish such a district. However, the relative ease with which districts needing only the approval of local governments can be created may encourage greater use of this method and possibly result in minimal citizen awareness and support.

C. Private, Nonprofit Corporations

Citizens' cooperatives in the form of private, nonprofit corporations provide an alternative to governmental water supply that continues to place primary emphasis on public service. These entities generally are based on substantial citizen interest. Typically, they are controlled by a board of directors whose members receive water supply service from the system, an arrangement with an inherent incentive for effective water system development and management. Basic weaknesses of such organizations are associated with their small size and accompanying funding limitations. Nonprofit corporations are eligible for certain kinds of financial aid but excluded from others.

D. Private, Profit-Making Corporations

Private, profit-making corporations that engage in provision of water supply often exist because alternative institutional

arrangements are not available. They are subject to problems distinct from those of other approaches. In many instances, private, profit-making corporations are not in business for water supply purposes alone. But residential and commercial development companies and trailer park owners must provide a water supply for their establishments if an existing public system is not accessible. Since water system operation and management is not their primary interest, such companies may neglect these private systems, thus subjecting them to operational problems and deterioration. These water systems generally are financed through the original arrangements made for the entire development project, and any additional repairs or upgrading also must be financed privately since private, for-profit corporations are not eligible for federal or state financial assistance. Although this institutional arrangement sees much use, it exhibits basic deficiencies as a water supply mechanism.

V. Footnotes

1. *N.C. Gen. Stat.,* sec. 54-111 *et seq.* (1975) at sec. 160A-311 and 160A-312.
2. *N.C. Gen. Stat.,* sec. 153A-274 *et seq.* (1978) at sec. 153A-274.
3. Local Government Bond Act, *N.C. Gen. Stat.,* sec. 159-43 *et seq.* (1976) at sec. 159-43.
4. Local Government Revenue Bond Act, *N.C. Gen. Stat.,* sec. 159-81 *et seq.* (1976) at sec. 159-80.
5. *N.C. Gen. Stat.,* sec. 160A-460 *et seq.* (1976) at sec. 160A-460.
6. *N.C. Gen. Stat.,* sec. 162A-86 *et seq.* (Supp. 1979) at sec. 162A-87.
7. *Id.* sec. 162A-89.
8. *Id.* sec. 162A-89.1, -90, -91.
9. *Id.* sec. 162A-02.
10. *Id.* sec. 162A-88.
11. County Service District Act of 1973, *N.C. Gen. Stat.,* sec. 153A-30 *et seq.* (1978) at sec. 153A-301.
12. *Id.* sec. 153A-302.
13. *Id.* sec. 153A-303.

14. *Id.* sec. 153A-308.

15. Metropolitan Water Districts Act, *N.C. Gen. Stat.,* sec. 162A-31 *et seq.* (1976 and Supp. 1979) at sec. 162A-33.

16. *Id.* sec. 162A-34.

17. *Id.* sec. 162A-36.

18. *N.C. Gen. Stat.,* sec. 130-123 *et seq.* (1974) at sec. 130-123.

19. *Id.* sec. 130-124.

20. *Id.* sec. 130-144.

21. North Carolina Water and Sewer Authorities Act, *N.C. Gen. Stat.,* sec. 162A-1 *et seq.* (1976 and Supp. 1979) at sec. 162A-3.

22. *Id.* sec. 162A-5, -6.

23. *Id.*

24. *N.C. Gen. Stat.,* sec. 54-111 *et seq.* (1975) at sec. 54-111.

25. *Id.* sec. 54-113.

26. *S.C. Code,* sec. 5-31-10 (1977) at sec. 5-31-610.

27. *Id.* sec. 5-31-430.

28. *S.C. Code,* sec. 6-31-10 *et seq.* (1977) at sec. 6-31-400.

29. *S.C. Code,* sec. 44-55-1410 *et seq.* (1977) at sec. 6-31-400.

30. *S.C. Code,* sec. 6-31-10 *et seq.* (1977) at sec. 6-31-400.

31. County Bond Act, *S.C. Code,* sec. 4-15-10 *et seq.* (1977) at sec. 4-15-30.

32. *S.C. Code,* sec. 6-31-10 *et seq.* (1977) at sec. 6-21-190.

33. *S.C. Code,* sec. 6-11-10 *et seq.* (1977 and Supp. 1979) at sec. 6-11-10.

34. *Id.* sec. 6-11-20.

35. *Id.* sec. 6-11-60.

36. *Id.* sec. 6-11-100.

37. *Id.* sec. 6-11-270.

38. *Id.* sec. 6-11-420.

39. *Id.* sec. 6-11-500.

40. *S.C. Code,* sec. 6-13-10 *et seq.* (1977) at sec. 6-13-20.

41. *Id.* sec. 6-13-30.

42. *Id.* sec. 6-13-60.

43. *Id.* sec. 6-13-50.

44. *S.C. Code,* sec. 33-35-10 *et seq.* (1977 and Supp. 1979) at sec. 33-35-50.

45. *Id.* sec. 33-35-60.

46. *Id.* sec. 33-35-100.

47. Personal communication from E. Pittman, Loan Officer, Farmers Home Administration, South Carolina State Office, Columbia, S.C. to K. Patrizi (Sept. 23, 1980).

48. *Va. Code Ann.,* sec. 15.1-292 (1981).

49. Powers of localities to levy taxes are contained in *Va. Code Ann.,* sec. 58-839 *et seq.* (1974 and Supp. 1983).

50. Powers of localities with respect to bonding are contained in the Public Finance Act, *Va. Code Ann.,* sec. 15.1-170 *et seq.* (1981 and Supp. 1983).

51. *Va. Code Ann.,* sec. 15.1-239 (1981).

52. *Id.* secs. 15.1-334 (1981), 15.1-302 (1981), 15.1-341 (1981), 15.1-875 (1981), 15.1-456 (Supp. 1983).

53. *Id.* sec. 15.1-21 (1981).

54. *Id.* sec. 21-112.22 *et seq.* (1983).

55. *Id.* sec. 21-112.22.

56. *Id.* sec. 21-114.

57. *Id.* sec. 21-115.

58. *Id.* sec. 21-113.

59. *Id.* secs. 21-116.1 to 21-117.1.

60. *Id.* sec. 21-118.

61. *Id.* sec. 21-118(6).

62. *Id.* sec. 21-118(5).

63. *Id.* secs. 21-122 to 21-138.

64. *Id.* sec. 15.1-722 *et seq.* (1981 and Supp. 1983).

65. *Id.* sec. 15.1-787 (1981).

66. *Id.* sec. 15.1-791.

67. *Id.* sec. 21-427 (1983).

68. *Id.* sec. 21-427.1.

69. Virginia Area Development Act, *Va. Code Ann.,* sec. 15.1-1400 *et seq.* (1981 and Supp. 1983).

70. *Va. Acts of Assembly,* ch. 760 (1976).

71. Virginia Area Development Act, *supra* n. 69 at *sec.* 15.1-1405(a) (1981).

72. *Id.* sec. 15.1-1404.

73. *Id.* sec. 15.1-1405(a).

74. *Id.* sec. 15.1-1405(b1).

75. *Id.* sec. 15.1-1421.

76. *Id.* sec. 15.1-1422.

77. *Id.* sec. 15.1-1425.

78. *Id.* secs. 15.1-1426, 15.1-1427.

79. *Id.* sec. 15.1-1432.

80. *Id.* sec. 15.1-1433.

81. *Id.* sec. 15.1-1436.

82. *Id.* sec. 15.1-1438.

83. *Id.* sec. 15.1-1437.

84. Virginia Water and Sewer Authorities Act, *Va. Code Ann.,* sec. 15.1-1239 *et seq.* (1981 and Supp. 1983).

85. *Id.* sec. 15.1-1241 (1981).

86. *Id.* sec. 15.1-1244.

87. *Id.* sec. 15.1-1244.1.

88. *Id.* sec. 15.1-1246 (Supp. 1983).

89. *Id.* sec. 15.1-1249 (1981).

90. *Id.* sec. 15.1-1249 (1981).

91. *Id.* sec. 15.1-1250(g).

92. *Id.* sec. 15.1-1250(h1).

93. *Id.* sec. 15.1-1250(a).

94. *Id.* sec. 15.1-1248 (1981).

95. *Id.* sec. 15.1-1269.1 (Supp. 1983).

INSTITUTIONAL MECHANISMS FOR ASSISTANCE TO WATER SUPPLIERS

Although provision of water supply generally is a function of municipalities, counties, and other local entities, federal and state governments contribute to these operations through financial and/or technical assistance. The federal government operates several assistance programs and has been the principal provider of outside funding for rural water supply purposes. To a lesser extent, the states have provided assistance for water supply needs. North Carolina and South Carolina are more active in this area than is Virginia.

I. Federal Assistance Programs Applicable to Rural Water Supply

Federal agencies that administer rural water supply assistance programs include FmHA, an agency of the U.S. Department of Agriculture (USDA); the U.S. Department of Housing and Urban Development (HUD); the Economic Development Administration (EDA), an agency of the U.S. Department of Commerce (DOC); EPA and the Appalachian Regional Commission (ARC). The programs of these agencies and the authorizing legislation are displayed in *Table 6,* and each is discussed below.

A. U.S. Department of Agriculture—Farmers Home Administration

Rural Housing Loans and Grants:

1. Program Description: The Housing Act of 1949[1] (HA) authorizes the Secretary of Agriculture (Secretary) to extend, through the FmHA, financial assistance (loans and grants) to farm owners and rural residents to "construct, repair, alter, or improve their dwelling. . . ."[2] The primary objective is to provide low-income rural residents with a safe and sanitary place to live. Moderate-income families also are eligible, but preference is given to those of low income. Under the program, a rural area is defined as any town, city, village, or place not associated with an urban area. It must have a population of less than 10,000 and be rural in character. The population limit can be extended to 20,000 if the area (1) is not within an SMSA and (2) has a serious lack of mortgage credit.

HA specifically provides for the issuance of loans and/or grants for the repair and/or improvement of rural dwellings. The Secretary is authorized to provide FmHA grants, loans, or combined grant-loans to cover the cost of, among other improvements, ". . . providing a convenient and sanitary water supply. . . ."[3] Grants are not to exceed $5,000 per household, and no loan or combination grant-loan can exceed $7,500 per household. The loan repayment period is 10 years. The interest rate charged depends on the income level of the applicant and usually ranges between 1 and 12 percent. Interest payments may be waived entirely for loan recipients under extreme financial hardship. Among low-income rural residents who qualify for assistance, preference is given first to war veterans and families of deceased servicemen and then to the elderly or handicapped.[4]

Financial assistance under HA is provided through two subprograms: section 502 rural housing (RH) loans and section 504 RH loans and grants.

a. Section 502 Rural Housing Loans: To be eligible for an RH loan under the section 502 program, a person must be (1) an individual without an adequate home in a rural area or (2) a farm owner without decent, safe, or sanitary housing.[5] An important additional requirement is that he must lack sufficient financial resources to provide for his needed housing and facilities after provision is made for living expenses and taxes. The family or person also must be of low or moderate income and have the legal capacity to enter into a loan contract.

One purpose of the RH loan program is to enable the recipient to ". . . buy, build, rehabilitate, improve, or relocate a dwelling and provide related facilities, . . ."[6] including an adequate and safe water supply.[7] Construction of individual domestic water wells and payment of connection fees for central systems are covered under the program. Any home repaired with RH funds must be structurally and functionally sound. RH loans also may be used to refinance debts and other RH loans.

b. Section 504 Rural Housing Loans and Grants: Another program, referred to as section 504 RH loans and grants, is provided for those who do not qualify for section 502 RH loans.[8] Section 504

financial assistance may be used for a variety of purposes, including the construction and installation of domestic water wells and the payment of connection fees for central system customers.[9]

To be eligible for section 504 loans, an individual must own and occupy a deficient dwelling located in a rural area and must not qualify for a section 502 RH loan. An individual who is 62 years of age or older and is able to repay only a part of the section 504 loan may qualify for a combination loan and grant. A grant alone may be obtained by an individual 62 years of age or older who is unable to make any loan repayments whatsoever.

2. Summary and Analysis: This FmHA program, based on both section 502 and section 504 of HA, is the current mainline federal effort to supply low- and moderate-income rural residents with financial assistance for developing individual water supplies and for paying public water system connection fees.

In general, these programs have been helpful for installing individual wells and for financing connection fees for potential customers of centralized rural water systems. However, grants are available only to persons 62 years of age or older; those outside this category can receive loans only. In some instances, the 10-year loan repayment period has burdened very low-income recipients because of the size of monthly repayment installments.[10]

Table 7 lists Virginia, North Carolina, and South Carolina's fiscal year 1980 appropriations for both the section 502 and section 504 RH programs. The level of appropriations for section 504 RH grants indicates that if full grants ($5,000) were awarded, there would be sufficient funds for 104 recipients in Virginia, 42 recipients in North Carolina, and 112 recipients in South Carolina.

Water and Wastewater Disposal Loans and Grants:

1. Program Description: The Consolidated Farm and Rural Development Act of 1961[11] (CFRDA) authorizes the Secretary of Agriculture to issue water and waste facility loans and grants to certain agencies in rural areas. Pursuant to this authority, the FmHA operates the Water and Waste Disposal Loans and Grants Program for rural areas. For CFRDA purposes, a rural area is a

community of less than 10,000 persons or other association of rural residents. Grant and loan funds may be used for the installation and improvement of domestic water and waste facilities. Such facilities include the "development, storage, treatment, purification, and distribution of water."[12] Funds also may be used to purchase or rent equipment needed for the proper utilization of such facilities, the acquisition of land and rights needed for the project, and legal or planning service fees. Grants and loans cannot be used to pay for operation and maintenance expenses, the purchase of fire equipment and facilities, the purchase of already existing systems, or the refinancing of existing indebtedness.

County FmHA offices serve as contact points for all applicants, but applications are processed by district offices. In evaluating an individual application, the district director must determine that the service area was properly defined to avoid the possibility of discrimination through gerrymandering.[13] The director also must authenticate the number of assured water system customers before he can issue a loan that will be secured by user fees.[14]

This program is viewed by FmHA primarily as a loan program. In fact, all applications to FmHA are for loans only; direct applications for grants are not possible. The need for grants is determined by FmHA through review of loan applications. Regulations provide that grants be used for serving the most needy communities, thus reducing user costs in such communities to a reasonable level.[15] User costs include fees, charges, or taxes that are attributable to the project. The need for a grant and amount of the grant (a maximum of 75 percent of project development cost) are determined by application of one of two concepts: the "1-percent rule" or the "similar-communities rule." FmHA district offices determine which one to employ, apparently without formal rules to guide them.

The 1-percent rule attempts to define a reasonable water bill in relation to an area's median income. Under this approach, grants are provided whenever the average water bill exceeds a predetermined percentage of average income. Then a grant is established in an amount necessary to reduce the average water bill to such a percentage. The following percentages apply:[16]

1. 0.75 percent when the median income is under $6,000 per year;

2. 1.00 percent when the median income is $6,000 to $10,000 per year;

3. 1.25 percent when the median income is greater than $10,000 per year.

The similar-communities rule is defined as ". . . that [rate] which is not less than existing prevailing rates in communities being served by an established system constructed at similar cost per user and having similar economic conditions."[17] An exception to this rule may be granted by the FmHA national office under the conditions that a similar community does not exist or that the rates of such a community appear to be too high. However, the median income within the applicant's potential service area must be less than $4,000 per year in such cases.

FmHA is directed to rank both applicants and projects by priority.[18] For applicant-priority listings, public bodies are first, with quasi-public or other-than-public organizations next. To be eligible, all recipients must operate on a not-for-profit basis. If operating on a not-for-profit basis, applicants organized under general profit corporation laws are eligible. The highest priority is given to communities with a population of less than 5,500, especially if their existing water supply system requires immediate attention because of a sudden, unexpected deterioration in water quality. For project-priority listings, FmHA gives first consideration to projects needing improvements to comply with the SDWA of 1974.[19] Also of high priority are projects that will extend existing facilities to provide service to more residents or projects that involve the merging of two or more smaller facilities to increase efficiency.

The 1980 and 1981 fiscal year national appropriations and the 1980 allocations for Virginia, North Carolina, and South Carolina are displayed in *Table 8.* The 1981 appropriations average $2 million per state in available grant funds and $8 million per state in available loan funds. In comparison to the previous 1980 average of $6 million per state in available grant funds and $10.4 million

per state in loans, the 1981 totals are a substantial reduction.

2. Summary and Analysis: This FmHA assistance program is currently the major federal effort to supply funds for rural community water supply facilities. Although FmHA assists both water supply and wastewater systems, funds have been more readily available to water supply projects than to wastewater disposal projects because EPA construction grants are available for wastewater treatment works and disposal systems.[20] From 1937 to 1979, FmHA issued 15,931 loans totaling $5.6 billion, $3.8 billion (68 percent) of which went to water supply projects. From 1966 through 1979, FmHA awarded 7,223 grants ($1.6 billion); $1.1 billion or approximately 69 percent went to water supply projects.[21] Presently, and for the past 5 fiscal years, the demand for funds has exceeded those available.[22]

The preceding funding data illustrate that the FmHA program emphasizes loans rather than grants, as opposed to urban-oriented assistance programs (for example, HUD's block grant program discussed in the next section of this report), which emphasize grants. This distinction can be interpreted as a pervasive form of federal policy discrimination against rural areas.

The procedures and criteria used by FmHA to select projects for financial assistance can be questioned. The absence of comprehensive guidelines for evaluating applicants on a competitive basis may result in failure to provide assistance where it is most needed. It has been reported that a rule of "first-come, first-served" appears to apply in certain cases, an approach likely to result in somewhat arbitrary decisions in relation to need.[23] An alternative project selection system recommended by a study group is presented in Appendix A.

The lack of a uniform approach also poses a potential problem for determining the grant/loan ratio awarded to successful applicants. Application of agency criteria varies among FmHA offices. Certain offices may favor the 1-percent rule while others may favor the similar-communities rule. Still others may apply both rules, using one as a check on the other. Under the similar-communities rule, the determination of a similar community, and therefore a reasonable rate, is left entirely to the discretion of the

particular FmHA office. This discretion and variation in practice can produce a substantial lack of uniformity among FmHA offices and increase the possibility of arbitrary decisions.[24] Appendix B presents an alternative that has been proposed for grant-rate determination.

Use of the reasonable user-fee approach by FmHA has been criticized on several other grounds.[25] Since it relies on median family incomes, it has been seen as regressive for those with incomes below the median level. Criticism of this approach also has been directed toward the possible lack of adequate attention devoted to selecting least-cost project alternatives. Once a reasonable user fee is established, the incentive for a community to find a lower cost alternative is lost since reducing the cost would reduce the grant. Finally, establishment of a reasonable user fee has been seen as an unreasonable restriction on joint funding involving other agencies because FmHA would likely reduce or withdraw its grant support if other funds were committed to a project such that user fees were reduced below the predetermined reasonable level. Of course, this policy ensures the broadest distribution of FmHA funds, an important factor since funding requests typically exceed available funds.

Adequacy of staffing—both size and composition—in certain FmHA offices appears to be a significant problem. Some FmHA offices may not have staffs of adequate size for effective program implementation. Nationwide, a larger staff and more loan officers were employed in 1946 than are employed now,[26] even though this program and other FmHA programs are now more extensive and appropriations over five times larger than they were in 1946. Presently, the Virginia FmHA office staff comprises the state director, one loan assistant, and a part-time clerk. Paperwork is almost unmanageable.[27] This staffing problem is not nearly as acute in North Carolina or South Carolina as it is in Virginia. A potential problem in staff composition is that the traditional agricultural background required may result in deficiencies concerning evaluation of proposals for water supply projects.[28]

B. U.S. Department of Housing and Urban Development—Community Development Block Grant Program

Introduction: The Housing and Community Development Act of 1974[29] (HCDA) was established to promote the development of viable urban communities and a suitable living environment for low- and moderate-income persons. This objective includes eliminating hazards to health, safety, and public welfare, along with a more rational utilization of land and other resources. HCDA consolidated a complex system of HUD programs into a more manageable system of federal aid. In doing so, it eliminated the public facility loan and grant program, which funded community water and sewer projects, as authorized by the Housing and Development Act of 1965.[30] The consolidated system under HCDA is the Community Development Block Grant (CDBG) program. Funds from this program may be used for a wide variety of community development needs, including public water systems.

Administration of the CDBG program is divided between the federal government and state governments. HUD administers the program in metropolitan areas, which receive 80 percent of program appropriations (aside from funds reserved for specified purposes).[31] The states may request approval to administer the program in nonmetropolitan areas, the component previously known as HUD's Small Cities Program. Approval for a particular state is based on an annual submission to HUD of certification that it will engage in related planning, provide technical assistance to localities, provide from state funds a 10-percent matching contribution, and consult with local governments regarding the program.[32] Although an approved state must comply with the objectives and requirements of HCDA, considerable flexibility exists for operation of the CDBG program.[33] North Carolina, South Carolina, and Virginia all have assumed administrative responsibilities. The program of each is considered below.

North Carolina: The nonmetropolitan portion of the CDBG program in North Carolina is administered by the Division of Community Assistance of the Department of Natural Resources and Community Development (DCA-DNRCD). The objectives of the program have been stated as follows:[34]

> [T]he State of North Carolina's overall community development is to provide decent housing and a suitable living environment and expand economic opportunities,

principally for persons of low and moderate income. To carry out this overall program objective, North Carolina's Small Cities CDBG program has been designed to give maximum feasible priority to activities which will benefit low- and moderate-income families or aid in the prevention or elimination of slums or blight. The method of distribution also includes activities which DNRCD certifies are designed to meet other community development needs having a particular urgency because existing conditions pose a serious and immediate threat to the health or welfare of the community where other financial resources are not available to meet such needs. A final community development objective of the State of North Carolina is to administer the Small Cities CDBG funds in a manner consistent with state policies and programs.

Funding is available in four categories: community revitalization, economic development, development planning, and urgent needs/contingency. Most funds (74 percent) are allocated to community revitalization projects, which include water and sewer facilities.[35] To be funded, a community revitalization project must employ in excess of 50 percent of CDBG funds to benefit low- and moderate-income persons.[36] The maximum grant in the category is $750,000.[37] Community revitalization grants, as well as those in the other categories, are distributed on a competitive basis. *Table 9* presents selection criteria and the weight assigned to each in the ranking of applicants.

Although a small portion of funds is allocated to development planning projects (1 percent), grants in the category can be significant since they provide assistance in planning projects that are eligible for grants in the other CDBG program categories. The maximum grant in this category is $20,000.[38]

South Carolina: The nonmetropolitan portion of the CDBG program in South Carolina is administered by the Division of Community and Intergovernmental Affairs within the Office of the Governor. Objectives of this program are as follows:[39]

1. Benefit low- and moderate-income families;

2. Aid in prevention or elimination of slums or blight;

3. Meet other community development needs having a particular urgency because existing conditions pose a serious threat to the health or welfare of the community where other financial resources are not available to meet such needs.

Applicants for grants under the South Carolina program must be nonmetropolitan units of general local government. Grants are available in two categories: economic development and community revitalization, the latter of which comprises construction or extension of public works, including water systems.[40] An applicant must provide matching funds equal to 10 percent of the grant and have the necessary management capacity to design and carry out the proposed project.[41] A unit of local government may make individual application for itself, on behalf of another eligible jurisdiction, or jointly with one or more other eligible applicants.[42] Only one individual application for a grant may be made during each funding period. Restrictions also apply to the other types of applications. The maximum grant for a single project is $500,000.[43]

The competitive process used for determining grant recipients involves the ranking of applicants at two levels: (1) by the Council of Governments (COG) serving the applicant's region and (2) by the state. Each COG ranks the applicants within its region on the basis of criteria established by the state. Using the same criteria, the state then ranks the applicants on a statewide basis. This ranking process is described in the following quotation:[44]

1. All the number one ranked applications from each COG shall be rated against one another to determine the application having the maximum impact. The application shall become the State's number one ranked application.

2. The next round in the competition will be between the remaining nine (9) number one ranked applications and the second ranked application from the region previously funded. The application exhibiting the maximum impact shall be deemed the State's number two ranked

application.

3. This process will continue until the available funds are exhausted.

The ranking of applicants by the COG's and the state is based on the assignment of points relating to four criteria. The applicant chooses the four criteria to be used from the following list of seven established by the state:[45]

1. Benefit to low- and moderate-income persons;

2. Conservation or expansion of residential properties;

3. Permanent job creation or retention which will occur;

4. Creation or retention of industry, business, or services;

5. Leverage of public and private commitments;

6. Elimination or prevention of slums or blight;

7. Resolution of a serious deficiency in public facilities affecting the health, safety, or local economy.

Virginia: Virginia administers the nonmetropolitan portion of the CDBG program through its Department of Housing and Community Development (DHCD). The goal of Virginia's program is "[t]o improve the economic and physical environment in Virginia communities and neighborhoods for the primary benefit of low- and moderate-income citizens."[46] The objectives for advancing this goal include improvements in economic development, housing, and community facilities.[47]

The Virginia program consists (after previously established HUD commitments have been met) of two types of grants: community improvement grants and community development planning assistance grants. Community development planning assistance grants, which are made available in a total amount equal to 2 percent of available CDBG funds, are limited to $25,000 each.[48] The purpose of such grants is to assist small localities in

developing plans to compete effectively for additional grants and is based on the recognition that smaller communities may lack the technical and administrative capacity to identify community development needs.[49] Although local governments are designated as the only legal recipients of such grants, nonprofit organizations may be designated to undertake project activities.[50] In addition to this special funding assistance, DHCD also conducts workshops and provides technical assistance to local governments on applications for funding community improvements.[51]

The community improvement grant program is the most significant program element of Virginia's CDBG program. Grants are made once a year on a competitive basis. Within the three objectives of economic development, housing, and community facilities, 23 types of eligible projects have been identified.[52] Included among eligible types in the community facilities category are the acquisition and/or development of water supply facilities. Many costs of project implementation are eligible for grant application,[53] including initial connection fees for new water and sewer service provided through a funded project. Operating expenses are not eligible, however.

Eligible recipients of grants under the community improvement program include local governments and nonprofit organizations designated by local governments to undertake project activities.[54] Applications for funding can be made for the applicant alone, on behalf of another eligible locality, and jointly with another locality(ies) for a regional project. Although one of each of these three types of applications can be made each year, the total grant for any one project cannot exceed $700,000. This limitation applies even if a project is funded under more than one application, one made by the locality acting alone and another made under a regional application encompassing the project.[55]

Requirements of the community improvement grant program provide for broad support and input regarding formulation of a grant request. At least one local public hearing is required prior to submission of an application,[56] and a funding request must be authorized by resolution of the locality's governing body.[57]

Grants are awarded on the basis of ranking within a project

selection system based on two categories of selection criteria: (1) a community's relative need for assistance and (2) the impact of the proposed project on community development needs and CDBG program objectives. Individual criteria within these two categories and the relative weights assigned to each are shown in *Table 10.* Additional consideration for funding is provided to projects designed to alleviate an emergency situation or an imminent threat to public health or safety.[58]

Evaluation by the selection criteria involves different groupings of the applications. To be ranked for "Reasonable Project Cost" *(Table 10),* for example, applications are grouped by the 23 eligible project types identified in the program requirements. To be ranked for four factors under "Impact on Community Needs and Objectives," applications are grouped by the three program objectives—economic development, housing, and community facilities.[59]

The inclusion of the "Leveraging" factor *(Table 10)* as an evaluation criterion indicates that the prospects of CDBG funding will be enhanced if other sources of project funding are available. Local governments, however, are not required to provide matching funds.[60]

Summary and Analysis: Although the CDBG program is primarily urban-oriented, it is a significant source of funding for rural water supply projects. Because of the wide range of activities fundable under the program, however, competition for funds generally is intense.

The CDBG program's recent change, allowing state administration of funding in nonmetropolitan areas, constitutes a major modification of the institutional framework for providing assistance to rural water systems. Although the limited experience under the new arrangement provides little basis for assessment of impact, it would appear that the change will increase the program's effectiveness because the states may be more responsive to local needs.

The provisions of federal law result in a degree of uniformity among individual state programs; nevertheless, significant differences exist among the programs of North Carolina, South

Carolina, and Virginia. Some of these differences involve program mechanics, while others involve such basic factors as the need for a matching contribution by local governments and maximum grant amounts. The limited operational history of these programs provides little basis for assessing the impact of these differences now.

C. U.S. Department of Commerce—Economic Development Administration

Introduction: The Public Works and Economic Development Act of 1965[61] (PWEDA) provides for assistance to areas with substantial unemployment and underemployment through the financing of public works and economic development activities. This program is administered by EDA-DOC. Funding must be preceded with long-range planning by the potential recipient, and the facilities funded must provide for more employment opportunities in the area of concern. PWEDA states specifically that this assistance is to be made available to both urban and rural areas. In general, assistance is to be used for economic development planning and for the long-term rehabilitation of economically deteriorated areas. Eligible recipients for assistance provided by PWEDA include states, public or private nonprofit organizations, political subdivisions, and Indian tribes.

To receive aid under PWEDA, a facility must be within a "redevelopment area" or "economic development district" as designated by the Secretary of Commerce. Redevelopment areas are defined to include the following:[62]

> [T]hose communities or neighborhoods (defined without regard to political or other subdivisions or boundaries) which the Secretary determines have one of the following conditions:
>
> (a) a large concentration of low-income persons;
>
> (b) rural areas having substantial out-migration;
>
> (c) substantial unemployment; or

(d) an actual or theoretical abrupt rise of unemployment because of closing or curtailment of a major source of employment.

An "economic development district" is defined as follows:[63]

> [A]ny area within the U.S. composed of cooperating redevelopment areas, and, where appropriate, designated economic development centers and neighboring counties of communities, which has been designated by the Secretary as an economic development district.

An "economic development center" as used in the above quotation is defined as ". . . any area . . . which has been designated by the Secretary as eligible for financial assistance. . . ."[64]

The Local Public Works Capital Development and Investment Act of 1976[65] (LPWCDIA) provides that financial assistance be furnished to states and localities for public works development or renovation. For a project to receive assistance under LWPCDIA, it need not be located within an economic development district or redevelopment area, but priority is given to those areas that have substantial unemployment rates.[66] Eligible recipients are the same as those authorized by PWEDA, and the assistance program is administered by EDA.

EDA administers three programs affecting rural water supply: technical assistance, public works and community development facilities, and the local public works capital development and investment program.

Technical Assistance Program: The EDA's Technical Assistance Program,[67] authorized by PWEDA, provides for technical assistance to redevelopment areas or other depressed areas to combat unemployment and economic depression. Eligible recipients include state and federal agencies, municipalities, individuals, firms, and partnerships. Assistance may take the form of management and operational aid, economic planning and feasibility study aid, or planning aid for development facilities design. Specifically, assistance includes EDA staff assistance, payment of funds to other departments or agencies of the federal

government, grants-in-aid to appropriate public or private nonprofit organizations, and contracts with private individuals or organizations. Loans may cover up to 100 percent of the necessary technical assistance costs, and grants up to 75 percent of such costs.[68]

Repayment for technical assistance may be waived under the conditions listed in the following quotation:[69]

(a) Whenever repayment is likely to result in a loss of economic development benefits;

(b) Whenever any of the following conditions are intrinsic to the technical assistance:

(1) It has indirect benefit to the whole community;

(2) It benefits the general business community or interest;

(3) It is already being funded, in substantial proportion, by the recipient; and

(4) It is for an applicant or beneficiary located in one of the most economically depressed areas of the country.

Public Works and Economic Development Facilities Program: PWEDA specifically authorizes EDA to provide financial assistance to localities and states for public works and other community development facilities. Both direct and supplementary grants are available for land acquisition and public works development. Such projects must be within an economic development district or redevelopment area. To be eligible for assistance, project costs must meet the following criteria:[70]

1. Costs must be necessary and reasonable for the project and not general expenses required to carry out the overall responsibilities of the recipient.

2. Costs must be authorized and not prohibited by applicable federal, state, or local laws or regulations.

3. Costs must be accorded consistent treatment through application of appropriate, generally accepted accounting principles.

4. Costs must not be allocable to or included as a cost of any other federally financed project in either the current or a prior period.

Direct grants cannot exceed 50 percent of total project costs, and supplementary grants cannot increase the composite federal share to greater than the maximum allowable limit with regard to the other participating agency or agencies. Increases in grant funds are allowed for construction cost increases after the grant issuance date. Loans have no limitation on percentage of project cost covered and must be repaid within a reasonable time period consistent with the financial position of the recipient; a maximum of 40 years is permitted.[71] The financial assistance must contribute to improving conditions for establishing commercial operations, must create more employment opportunity, and must benefit primarily low-income families. Municipalities, agencies, quasi-public corporations, and public or private nonprofit organizations are all eligible for assistance, provided that they represent a redevelopment area or economic development district.[72]

Local Public Works Capital Development and Investment Program: This assistance program is authorized by LPWCDIA and administered by EDA. Its major objective is to combat unemployment and to encourage industrial development. The program provides both direct and supplemental grants for local public works projects in which federal assistance is authorized by any federal statute. A project need not be located within an economic development district or redevelopment area to receive aid; however, the area must have a significant unemployment or underemployment rate. For example, applications for projects that represent areas in which the unemployment rate is greater than the average national rate are expedited and given top priority; 70 percent of the annual program appropriations must be allocated to such projects.[73]

Direct grants are provided to states or units of local government to finance local public works construction costs. The grants may

include funds to finance already initiated planning and preliminary engineering studies. The grant is for 100 percent of the project construction costs exclusive of any other funds previously budgeted by the recipient. No grant funds can be used to pay for project operation or maintenance costs.[74]

Supplemental grants are subject to the same terms and conditions as direct grants. Supplemental grants, however, do not cover 100 percent of the project construction costs but instead are used to increase any other federal agency contribution to 100 percent of such costs.[75] Supplemental grants may be issued for the purpose of providing the recipient with a state or local share as required by another federal agency or state or local law.

Summary and Analysis: Although most of the funding under these programs has gone to rural areas,[76] funding and technical assistance for rural residential water supply development is not available in any EDA program. The agency has limited legal authority; its purpose is to assist in developing the economic base within areas of the United States that have unusually high rates of unemployment or underemployment. This task is to be accomplished through the provision of financial and technical assistance directed towards the stimulation of industrial development and other private commercial operations. Hence, assistance for rural water supply and other public works must directly encourage employment generation. As a result, only water supply development for individual industries and industrial parks can receive EDA assistance. It is possible that a water distribution system established for industrial purposes may be extended into surrounding residential areas; however, EDA will not fund such expansion.

D. U.S. Environmental Protection Agency

The SDWA of 1974[77] authorizes the EPA Administrator to guarantee private market loans made to small public water systems, a term not defined by SDWA.[78] These loans must be used for purposes of enabling the water system to comply with the National Interim Primary Drinking Water Regulations (NIPDWR), but such a loan cannot increase the total federally guaranteed debt of the recipient to greater than $50,000. A guarantee will not be

made unless the system cannot obtain assistance elsewhere. EPA also must determine that any facilities funded will not be made obsolete by subsequent changes in SDWA or NIPDWR.

There are two basic problems regarding this program. First, upgrading water treatment plants for the purpose of reducing metals, inorganic chemicals, and organic chemicals to within the established MCL's requires expensive treatment processes and engineering studies often costing significantly more than $50,000. Second, private market interest rates and loan repayment periods essentially are prohibitive for small water suppliers. Thus, EPA authority in this area is not a significant factor in rural water supply assistance.

E. Appalachian Regional Commission

The Appalachian Regional Development Act of 1965[79] (ARDA) established the ARC, a state-federal agency whose purpose is to assist in the development of the mountain regions of Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, Pennsylvania, North Carolina, Ohio, South Carolina, Tennessee, Virginia, and West Virginia. It is termed a state-federal agency because each of the 13 states must develop its own rules and regulations along with a plan for spending the funds. The commission consists of one federal member and the governors of each of the 13 states. One of the governors is elected to serve as cochairman with the federal member.[80]

ARC is authorized by ARDA to furnish a variety of federal assistance programs, ranging from demonstration health projects to airport safety improvements. Included is a program designed to supplement federal grant programs authorized on or before December 31, 1978, specifically including the grant programs authorized by the previously discussed CFRDA and PWEDA.[81] This program's purpose is to allow states, communities, and local development districts to take full advantage of federal grant programs. Within limits established by law, ARC may provide funding to a locality that cannot furnish the needed amount of a matching grant.

Each state ARC office ranks its own applicants by priority in

accordance with regulations that it has promulgated. Priorities are established in one process encompassing applications for a variety of projects. Most ARC funds in Virginia, North Carolina, and South Carolina have been spent in conjunction with the FmHA Water and Waste Disposal Grants and HUD CDBG. Only those projects approved by another federal agency are eligible for ARC funds. For the past decade, water and sewer projects have ranked high on the priority list in these three states. In the past six years, such projects have been ranked first or second on a continual basis.[82] This program therefore has been an important source of rural water supply assistance in those geographical areas where it has been applicable.

F. Comparative Analysis of Federal Assistance Programs

Federal efforts to provide financial assistance for rural water supply development are characterized by diversity in approach. FmHA is committed to a loan-oriented philosophy, with grant funds used only to supplement loans to adjust long-term debt such that user costs are reduced to within a reasonable level. HUD is committed to an urban-oriented block grant program from which a wide variety of community development projects may receive grant funds; the former Small Cities Program now is administered by the states within the study region. Provided another federal funding agency already has approved the project and/or provided financial assistance, ARC furnishes supplemental grant assistance for rural water supply projects within Appalachia. EPA is authorized to guarantee private market loans issued for small water system improvements or construction, if the federally guaranteed debt of the applicant does not exceed $50,000. EDA's limited legal authority does not encompass assistance for rural water supply projects that benefit only residential water users; industrial users must be the primary, if not sole, beneficiaries of such a project. Thus, assistance from EDA and EPA is minor relative to that from FmHA, HUD, and ARC.

The FmHA and HUD programs are the major federal efforts to financially assist rural water supply development on a direct basis. FmHA provides the only federal attempt to offer financial assistance solely for rural public water and sewer system development, with water projects given priority. In addition, the

FmHA Rural Housing Loans and Grants Program is the only federal effort to supply rural area residents with grant and low-interest loan funds for the construction of individual domestic well systems or payment of public water system connection fees.

When urban-oriented federal assistance programs are compared to those of rural orientation, some interesting distinctions become obvious. Comparison of the HUD urban-oriented grant approach to residential and public works development with the FmHA emphasis on loan rather than on grant assistance reveals that the overall federal assistance effort discriminates against rural areas.

Access to federal agency offices differs among programs. FmHA is the most accessible agency since it has both district and county offices, with over 1,500 county offices nationwide. EDA, HUD, and ARC are essentially equal in accessibility, with only one office for each agency in each state. States administering the CDBG program in nonmetropolitan areas generally maintain one office but make special provisions for contact with local governments.

Related to the access issue is the fact that the federal programs essentially function as banking operations; potential recipients must come to them and meet specific and primarily inflexible terms and conditions. Little or no needs-assessment activities are performed. An effective federal resource commitment cannot be made if the rural water supply development need has not yet been ascertained. Presently, the demand for federal funds far exceeds those available; efficient allocation of financial resources is especially crucial in view of such shortages, and lack of emphasis on needs assessment has likely hindered program effectiveness. In addition, a significant need for assistance with preliminary planning and preproject organization and coordination has not been met by federal programs.[83] These problems may be mitigated through state administration of the CDBG program in nonmetropolitan areas.

Lack of appreciable state involvement has been another relatively common defect of federal assistance programs, which generally have channeled funds directly to localities, thus bypassing direct state-federal agencies. ARC is organized as a cooperative state-federal agency and therefore includes greater state involvement

than have the other programs. If the states were more involved in project selection and other planning activities, perhaps a more precise needs determination, and thus a more efficient allocation of funds, would exist. Delegation of part of the CDBG program to the states has been a major step in this direction.

II. State-Level Financial and Technical Assistance Programs

Among the three states in the study region, North Carolina and South Carolina operate state-level rural water supply assistance programs. Because of budgetary constraints, the Virginia General Assembly on several occasions has turned down proposals for a state grant program (aside from state participation in the HUD CDBG program).[84]

A. North Carolina

Background: In North Carolina, the first concern for state assistance in water supply was expressed officially in 1969 when the state legislature directed the Legislative Research Commission to report to the 1971 session of the legislature about the status of local and regional water supplies and the need for additional state legislation.[85] The resulting findings are contained in the following quotation:[86]

> 1. The existing pattern of public water supply development in North Carolina is dominated by many small systems serving small numbers of customers. Of the 1,782 public water systems of record on July 1, 1970 . . . over 80 percent were serving less than 1,000 people each. These small systems are often underfinanced, inadequately designed and maintained, difficult to coordinate with nearby regional systems, and generally inferior to systems serving larger communities as regards adequacy of source, facilities and quality. The situation which has developed reflects a need for better planning at both state and local levels.
>
> 2. [S]parsely populated counties are losing residents to the more densely populated counties, while the State's total population is increasing. . . . It is estimated that

countywide or regional water systems are needed now by 50 counties.

3. If the future public water supply needs of the state are to be met, a change in the existing pattern of public water supply development and management must be undertaken. . . . The creation of countywide or regional water supplies with adequate interconnections is necessary in order to provide an adequate supply of high quality water to the State's citizens, to make supplies less vulnerable to recurring drought conditions, and to have systems large enough to justify the costs of adequate facilities and of proper operation and maintenance.

4. The state should provide a framework for comprehensive planning of regional water supply systems and for the orderly coordination of local actions, so as to make the most efficient use of available water resources and economies of scale for construction, operation, and maintenance. The state should also provide financial assistance to local governments and regional authorities in order to assist with the cost of developing comprehensive regional plans, and countywide plans compatible with a regional system.

As a result of these findings, the North Carolina Regional Water Supply Planning Act of 1971[87] (NCRWSPA) was enacted. It sets forth the state's role and function in water supply development as follows:[88]

1. Identify major raw-water sources for regional water supply systems and raw-water interconnections if they are desirable and/or feasible;

2. Identify suitable areas for regional water system development;

3. Establish priorities for each region;

4. Develop plans for the connection of proposed regional systems to major supply sources;

5. Review and approve plans for proposed regional systems, also for proposed county and municipal systems compatible with a regional plan;

6. Administer a state program of financial assistance to local governments and regional planning agencies;

7. Provide technical assistance to local and regional planning agencies and also to consulting engineering firms.

NCRWSPA established the Water Supply Assistance Program, which is currently administered by the Division of Environmental Management (DEM) of the DNRCD. (This program is discussed in the next subsection.) NCRWSPA also created the Regional Water Supply Planning Loans program, which was subsequently discontinued. This program used a $200,000 revolving fund from which planning loans for regional water supply systems could be made by the DHS-DHR.[89] The loan program was not successful largely because loan repayments were not timely, and it was abolished in 1981.[90] Another significant institutional development was the establishment of a state water supply grant program funded by bond sales. This program was initiated by 1971 legislation authorizing bond issues to provide funds for construction grants for water and wastewater projects.[91] A bond referendum approved in 1972 provided $150 million: $75 million was committed to wastewater collection and treatment projects, $70 million to water supply projects (Water Supply Systems Account), and $5 million to a contingency account. Up to 25 percent of eligible project costs could be funded by this grant program. Federal grants also were available in approximately a fourth of the water supply projects funded, but most of the financing burden was borne by the local governmental unit. The grant funds were spread out over a 5-year funding period, which began in 1972 and ended in 1977. The $70 million for water supply projects was committed to 432 projects, with a total cost of approximately $400 million.[92]

The Water Supply Systems Account was divided into two separate allocations; $50 million from this account was allocated to each of the state's counties in proportion to the ratio of the county

population to the total state population. The remaining $20 million was put into a statewide allocation for general use. In addition, $1.75 million from the contingency account was allocated to water supply projects. Total costs for individual projects assisted ranged from a low of $10,708 up to $12 million for large regional systems. New water systems were constructed, many were upgraded, and some were incorporated into larger regional systems.[93] All funds were committed by the end of 1977 as called for in the 1971 legislation.

Subsequently, the North Carolina Clean Water Bond Act of 1977 (NCCWBA) was passed and authorized a referendum for a $230-million bond issue for continuing the program through 1982.[94] Legislation authorizing a referendum on a third bond issue was approved by the 1981 session of the state legislature.

Under this enabling legislation, North Carolina has operated two assistance programs: the Water Supply Assistance Program and the Water Supply Grant Program. Each is considered below.

Water Supply Assistance Program: Communities that face water supply problems can receive technical assistance from this nonregulatory program administered by the DNRCD-DEM. The program "aids local governments and their consulting agencies with water quantity problems by assisting in the gathering of hydrologic data, providing regulatory process information, and identifying possible and conflicting demands on limited resources. . . ."[95] Overall, the program provides information and advice to communities regarding (1) water conservation methods, (2) expansion of existing facilities, (3) water supply planning, and (4) state and federal funding assistance.

In the past, using specialists with primary interests in other areas, DNRCD administered water supply assistance requests from communities and industries on an ad hoc basis. Therefore, the DNRCD staff developed the current program exclusively to assist communities, industries, and their consultants. The DNRCD Water Supply Assistance Program staff, along with DHR personnel, works with local officials and consulting engineers on a request basis. The program does not provide detailed system design assistance. The role of the consulting engineer is not replaced; in

many cases, projects for local consultants are generated.[96]

Water Supply Grant Program: The current Water Supply Grant Program, administered by DHR-DHS, is authorized by the 1977 NCCWBA. NCCWBA establishes the Clean Water Fund for management of bond revenues;[97] the fund is the responsibility of the North Carolina Department of Administration. The agency must direct the disbursement and receipt of all the bond revenues provided for by NCCWBA.

The $230-million Clean Water Fund is divided into three separate accounts. The largest account is the Pollution Control Account, which is to be used for wastewater system development. This account is administered by the DNRCD-DEM and is allotted $112 million.[98] The second largest account is the Water Supply Systems Account, administered by the DHR-DHS. This account is allotted $110 million, of which $79 million is allocated among counties on the basis of population. This county allocation is subject to the following restrictions:[99]

1. No more than $15.8 million can be committed in the first fiscal year (July 1, 1977 to June 30, 1978);

2. No more than $31.6 million in the first two fiscal years (July 1, 1977 to June 30, 1979);

3. No more than $47.4 million in the first three fiscal years (July 1, 1977 to June 30, 1980);

4. No more than $63.2 million in the first four fiscal years (July 1, 1977 to June 30, 1981);

5. No more than the total appropriation, $79 million in all five years of the program (July 1, 1977 to June 30, 1982).

The $31 million remaining after the $79 million deducted from the Water Supply Systems Account is allotted to a general fund not subject to county allocations. *Table 11* provides specific details concerning yearly allocations. The final and smallest account is the Contingency Account, $7.5 million, to be used for two distinct purposes: (1) to pay grant program implementation expenses

incurred by the Department of Administration, the Department of State Treasurer, the DHS, and the DEM, and (2) to provide grant funds when funds allocated for any given year are inadequate.[100]

Awarding of individual grants within this program is guided by the following statement of purpose:[101]

> [T]he issuance of $230 million in bonds of the state to provide funds for environmental improvement through grants to units of government for construction and improvement of wastewater treatment works, wastewater collection systems, and water supply systems.

The act also states:[102]

> [F]unds derived from the sale of the bonds authorized by this act shall be used primarily to encourage and assist local government units to meet their responsibilities; it is not intended nor is it possible for the state to assume those responsibilities.

As a result of this policy, primary consideration for granting funds depends upon the following factors:[103]

1. The availability of matching grants and loans from other sources;

2. The creation of efficient systems of regional wastewater disposal and regional water supply;

3. The willingness and ability of local government units to meet their responsibilities through sound fiscal policies, creative planning, and efficient operation and management.

An applicant must satisfy the following conditions to be eligible for assistance:[104]

1. Be an incorporated city, town, village, county, sanitary district, water/sewer district, water/sewer authority, special purpose district, or other political subdivision or

public corporation;

2. Have the financial capacity to provide its share of the funds;

3. Substantially comply with all applicable laws, rules, regulations, and ordinances at the federal, state, and local level;

4. Agree by resolution, to put into effect before project completion, a schedule of fees and charges. Such funds must provide coverage for operation, maintenance, and administrative expenses.

All applications received by DHR-DHS concerning water supply systems are assigned a priority rating semiannually.[105] An applicant's priority depends upon the following factors:[106]

1. Public necessity of the project in promoting the public health, safety, and welfare;

2. Eligibility of the proposed for federal grants;

3. Compatability with state and regional plans and the population to be served;

4. Fiscal responsibility of the applicant;

5. Applicant's need for funding assistance.

The actual procedures involved with the rating method are displayed as *Appendix C.*

Limitations upon individual grant amounts provide that the maximum grant cannot exceed 25 percent of the total construction costs, or 50 percent of the nonfederal share, whichever is less.[107] Construction costs include planning, designing, and constructing any project;[108] environmental assessment, evaluation, and rehabilitation; engineering, legal, fiscal, and administrative expenses; remodeling, adding to, or altering existing systems; and development of new water systems. Recurring annual

expenditures for administration, operation, and maintenance are not fundable.

DHS may increase a grant to 30 percent of total construction costs under the following conditions:[109]

1. If more funds are needed to qualify for a federal loan or grant;

2. If an extreme public necessity must be met;

3. If funds for acquiring necessary real property cannot be obtained through federal grant or loan.

Summary and Analysis: The state of North Carolina provides grants and technical assistance for rural water supply development. The grants program was initiated in 1972 when a state bond referendum authorized by the NCCWBA of 1971 was approved. The $70 million allocated to water supply projects was committed to 432 projects, which had a total cost of approximately $400 million.[110] These grant funds were spread over a 5-year funding period from 1972 to 1977.

The NCCWBA of 1977 then was passed to authorize another bond issue and to continue the program through 1982. The bond issue allocated $110 million, an average of $22 million per year for fiscal years 1978-1982, to water supply projects. Nearly all eligible applications received during 1977 were offered grants;[111] however, in 1978 and 1979, sharp increases in construction and engineering costs resulted in a shortage of funds, and only 60 percent of the applicants received grants. The limitation of available funds has been reported to have held back many worthwhile projects and to have caused others to proceed on a reduced basis.[112]

The technical assistance program authorized by the NCRWSPA is administered by designated DNRCD-DEM personnel who assist local governments and their consultants with water supply problems on a request basis. Such a state-level program is significant since small communities often have limited governmental capabilities and often are unaware of the existence

of outside financial assistance. This program facilitates local contact with federal agencies and also assists local governments in meeting both federal and state agency requirements. Although other states have financial assistance programs for rural water supply development and provide some technical assistance through their state health departments, few provide planning and technical assistance on a direct, independently administered basis.[113]

B. South Carolina

Background: South Carolina operates two state funding programs that encompass rural water supply systems: the Rural Water and Sewer Grant Program and the Rural Improvement Program.

Rural Water and Sewer Grant Program: The Rural Water and Sewer Grant Program has existed since 1974. Funding sources consist of federal revenue sharing and general state appropriations. The program is operated within the Department of Health and Environmental Control[114] (DHEC) and is administered by a DHEC advisory committee, composed of one DHEC employee and one person from each of the state's five congressional districts. Annual program appropriations from its beginning in 1974 to the present are shown in *Table 12.*

Any public water supply district, water authority, rural community water district, or nonprofit organization is eligible for funding. However, to qualify, a municipally owned system must serve a town of less than 1,500 people.[115] At least 35 percent of the annual appropriations for this program must be allocated to unincorporated rural areas.[116] These funds can be used for engineering and legal costs; construction costs; reduction of user fees to a reasonable level; supplementation of federal loan funds; and the purchase of land necessary for treatment, storage, and intake sites.[117] Funds cannot be used for administrative costs resulting from application preparation, however.[118]

A single project grant cannot exceed $300 per connection or 25 percent of the total project cost, whichever is less.[119] The maximum amount available for any single project is $200,000, and a system cannot receive more than one grant per year. Because of

program funding limitations, the 25 percent of total project cost and the $200,000 maximum per project rules contained in the statute become meaningless. If those rules governed the administrative policy, very few projects would receive assistance. To determine the amount of grant funds awarded, the administration primarily relies on the $300 per connection provision.[120] The average grant amount per project per year has been approximately $40,000, with a range of $7,338 to $125,000 per project per year. However, 89 percent of the 44 rural water projects funded have ranged from $10,000 to $50,000 per project per year. Consideration of the $300 per connection rule and the average grant amount of $40,000 indicates that the average water system given assistance has 134 connections.

The grant program advisory committee relies heavily upon FmHA recommendations, and FmHA provides the major funding for all state grant recipients.[121] All projects must be approved by either FmHA or another federal funding agency before they can receive state financial assistance. Even those applicants who derive their primary funding from the private market must comply with the applicable FmHA regulations.

The main purpose of the South Carolina program is to assist localities by supplying the required local share needed to obtain federal grants and/or loans as indicated in the following statement:[122]

> It is important to note that without the funds made available by the South Carolina Rural Water and Sewer Grants Program, the applicants probably could not have utilized these additional funds (federal loans and grants) because they lacked sufficient funding to pay for their share of the project, or the user charge to the customer was high. Therefore, by using a small amount of state funding, the committee has been able to leverage the utilization of a much larger sum of other funding in order to provide adequate water or sewer service to these areas of the state.

The grant program advisory committee has developed a priority rating system for applicants. The criteria used and their weight factors are displayed in *Table 13.* The actual mathematical

procedure for determining project priority is presented as *Appendix D.*

Rural Improvement Program: A second grant program that applies to rural water systems is the Rural Improvement Program under the control of the South Carolina Budget and Control Board. Although the program has existed for a longer period, it has been administered since 1978 by the division of local government within the board. The program is not limited to water supply projects but covers a wide range of local governmental needs. The program is supported entirely by state funds; during the 1981-82 budgetary period, total program expenditures equalled $3,763,613. Several water system improvements were included in this total, but expenditures have not been categorized on the basis of project type.[123]

Summary and Analysis: South Carolina provides grant assistance for rural water supply development; however, at present there are no loan or independently staffed technical assistance programs. A principal asset of the grant program is its effect on coordinating state and federal activities in the rural water supply area. State-level awareness of federal involvement in South Carolina rural water supply development is enhanced through the state's interaction with FmHA.

A summary of the accomplishments of the South Carolina Rural Water and Sewer Grants Program, prepared by the program's administrators, follows:[124]

1. The program has received a total of $1,736,486 in state appropriations over the past six years (FY 1975-1980).

2. Forty-four rural water projects have been funded along with two rural sewer projects and one combined water and sewer project.

3. These 47 projects have been located in 24 counties statewide.

4. Grant projects are located in each state congressional district.

5. Thus far the projects have provided for 24,998 residential and commercial water supply connections (103,989 persons) and 610 sewer connections (2,438 persons).

6. In the 44 water supply projects there is potential for 7,067 additional connections (28,268 persons) without the necessity for additional construction, aside from connection laterals. The same is true for an additional 67 sewer taps (286 persons).

7. The entire $1,736,468 appropriated from program initiation has been granted. None of these funds has been used for staff support, overhead, or administrative expenses.

8. These 47 grantees have been able to obtain $20,149,979 in additional loan funds and $20,835,304 in additional grant funds from other sources (federal, state, or local) to support these projects.

The program has three main institutional deficiencies in the view of DHEC personnel.[125] First, no special staff exists to administer the program; DHEC personnel have indicated a need for a special staff to replace the advisory committee. However, total abolition of the advisory committee would result in loss of the broad input provided through this mechanism. Second, a more active state role in planning and technical assistance is seen as needed; this could be accomplished through the staffing effort. Third, the less than 1,500 population rule regarding municipal eligibility is seen as too restrictive.

C. Comparative Analysis of North Carolina and South Carolina Grant Assistance Programs

North Carolina and South Carolina both provide grant assistance to localities for rural water supply projects. Although the programs are quite different in structure and impact, they do share certain similarities. Both programs are administered through state-level health department offices, and governing policies are similar. Both states provide only supplemental grant assistance; there is no intent to replace federal funding or local responsibilities. The

emphasis is on supplying the locality with the required local share to obtain federal assistance and/or reduce fees to an acceptable level. In both instances, only capital and construction costs are eligible; predevelopment, operation, and maintenance costs cannot be funded.

South Carolina's Rural Water and Sewer Grants program is implemented through DHEC by a six-member advisory committee (one person for each of the state's five congressional districts and a DHEC employee). There is no special staff to administer the program; the advisory committee works closely with FmHA, and relies heavily upon FmHA recommendations. Alternatively, North Carolina's Water Supply Grants Program is implemented through the DHR-DHS staff members, and a separate program for planning and technical assistance is available. Thus, the North Carolina program more directly involves the state in rural water supply problems.

Table 14 indicates that North Carolina's program provides more extensive funding. Appropriations for its program come from a 1977 state bond issue which provides $110 million (an average of $22 million per year) for water supply project financing through 1982. Appropriations for South Carolina's program average $364,000 per year and come from general state appropriations to the DHEC and federal revenue-sharing trust funds.

III. National Demonstration Water Project

A. Background

The National Demonstration Water Project (NDWP) is a unique organization involved in improvement of rural water supply conditions by channeling public financial assistance into special areas of need and by seeking institutional change. This nongovernmental organization began in 1968 when residents of the five counties surrounding Roanoke, Virginia, decided to combat water supply problems in their areas. They sought the assistance of a local community action agency, Total Action Against Poverty (TAP), to provide water for needy rural residents. In July 1968, the group formally became incorporated as Demonstration Water Project (DWP). Approximately one year later, they received a grant

from the Office of Economic Opportunity (OEO) and became functionally independent.

During 1970 and 1971, Roanoke DWP activities proceeded at both local and national levels. Under the local DWP program, community projects were identified and assisted in development through community organization, financing, obtaining official approvals, public education, planning, design, and construction. At the national level, a plan was developed to expand the program throughout the United States, with an emphasis on linking field demonstration projects to state and federal reform efforts. Such a program design was proposed to OEO and subsequently funded in 1972. In 1973, this national effort became known officially as the NDWP. The board of directors consisted of DWP field directors and other persons who had joined the program, and the national program coordinator became the NDWP executive director. NDWP's continuing goal is to reform the present system for delivering water and waste disposal services to rural residents, especially low-income families.[126]

In 1975, DWP expanded statewide to become the Virginia Water Project (VWP), an affiliate of the NDWP program. The primary objective of VWP is to implement a program of technology transfer to all Community Action Agencies (CAA) throughout the state, thus enabling the CAA's ultimately to take over the functions that VWP and NDWP have today.[127] Specifically, VWP performs the following activities in cooperation with CAA's:[128]

1. Provides technical assistance to outreach workers and local officials;

2. Links local governments with FmHA and federal agencies;

3. Assists communities in preparing grant, loan, and other such applications.

B. NDWP Philosophy and Approach

NDWP is a small organization with limited resources. To make the greatest use of opportunities that present themselves, NDWP has

adopted an operational approach known as "disciplined opportunism."[129] For example, the freeze on federal spending in 1973 by President Nixon was viewed by NDWP as an opportunity to convince state governments to establish their own funding programs.

The NDWP has focused on institutional change to reform delivery of rural water and sewer services. It has attempted to adapt the existing delivery system to its own goal of affordable water and sewer service for low-income rural residents.

When NDWP believes that programs fail to meet the needs of low-income persons, it works to change the programs but does not take them over or provide water and sewer services on a sustained basis. This position frees NDWP to take risks that more permanent and rigid institutions cannot. Believing that water and sewer services should not be regarded as a commodity subject to the forces of supply and demand, NDWP has adopted the concept of social water. It views these services as merit goods defined as follows:[130]

> [S]uch services should be considered a 'merit good' to which all people are entitled, regardless of their economic circumstances and for which a public responsibility should be assumed. Good water-sewer services benefit communities, not just individuals and should thus be classified with roads, postal service, and schools, not as luxuries like mink coats and diamond rings. . . .

The NDWP program involves the following three basic strategies:[131]

1. Demonstrating workable techniques in the field;

2. Technology transfer—spreading of acquired information through publications;

3. Directly dealing with policy-makers to induce reform.

C. Affiliates and Contractors

NDWP uses the affiliate program to demonstrate effective water projects. Water and/or sewer systems that become a part of the national program agree to work jointly with NDWP to:[132]

1. Develop facilities locally according to NDWP guidance,

2. Accomplish other special objectives (which vary with each affiliate),

3. Participate in the national program.

In response, NDWP agrees to provide technical assistance and part of the funds for facilities' development and operational expenses. The special objectives in the second item listed above are the workable techniques that are intended for demonstration. Growth has been slow, with affiliates added carefully so as not to outstrip the manpower and other resources of NDWP. There are presently 30 affiliates that are conducting field projects;[133] these are listed in *Appendix E.*

NDWP does not have an extensive staff; instead it contracts with other organizations for staff services. NDWP presently has a core group of approximately 50 professional staff members, and at least 50 other professional personnel are associated with it. The primary contractor is Conset Corporation, a Washington, D.C. based management and development firm that specializes in rural affairs. Conset provides the NDWP executive director and also an organizational headquarters. Contracting enables NDWP to pursue only the services that it needs and thus reduces personnel concerns. Other program contractors include the National Water Well Association (NWWA), Ground Water Council, Mitre Corporation, and System Sciences.

From initiation in 1973 until the present, NDWP has received approximately $13.1 million in federal funds. In 1979, the total appropriation was $2.3 million and $1.3 million in 1980.[134] Sources have included the OEO-Community Services Administration, EPA, EDA-DOC, FmHA, and HUD.

IV. Footnotes

1. Housing Act of 1949, 42 *U.S.C.A.,* sec. 1471-1490g (1978 and Supp. 1980).

2. *Id.* sec. 1471.

3. *Id.* sec. 1474.

4. Farmers Home Administration, "Rural Housing Loans and Grants," 7 *C.F.R.,* sec. 1822.1-1822.18 (1979).

5. *Id.* sec. 1822.4.

6. *Id.* sec. 1822.6.

7. *Id.*

8. Farmers Home Administration, "Rural Housing Loans and Grants," 7 *C.F.R.,* sec. 1822.61 *et seq.* (1979).

9. *Id.* sec. 1822.63.

10. Personal communication from W. Warren, Virginia Water Project, Roanoke, Va. to K. Patrizi (July 24, 1980).

11. Consolidated Farm and Rural Development Act of 1961, 7 *U.S.C.A.,* sec. 1921-1995 (1973 and Supp. 1980).

12. Farmers Home Administration, "Development Grants for Community Domestic Water and Waste Disposal Systems," 7 *C.F.R.,* sec. 1942.351 *et seq.* (1980).

13. Farmers Home Administration, "Community Facility Loans," 7 *C.F.R.,* sec. 1942.5 (1980).

14. *Id.* sec. 1942.6.

15. FmHA, *supra* n. 12 at sec. 1942.356(b).

16. *Id.*

17. *Id.*

18. *Id.* sec. 1942.17(c).

19. Safe Drinking Water Act of 1974, 42 *U.S.C.A.,* sec. 300f *et seq.* (1980).

20. National Demonstration Water Project, "Circuit Riding: The Regional Support Company as a Vehicle for Rural Water-Wastewater Service Delivery" (unpublished report, June 1980).

21. U.S. General Accounting Office, *Rural Water Problems: An Overview,* Report No. CED-80-120, U.S. Government Printing Office, Washington, D.C. (1980).

22. *Id.*

23. Ad Hoc Task Force on Rural Water/Sewer Program Reform, "The Reform of the Farmers Home Administration's Water and Waste Disposal Grant and Loan Program," at 10 (1980).

24. *Id.* p. 16.

25. *Id.* pp. 14-18.

26. Personal communication from H. Hawkes, Director, Farmers Home Administration, Virginia State Office, Richmond, Va. to K. Patrizi (Oct. 27, 1980); Personal communication from R. Muncey, Director, Farmers Home Administration, Virginia District II Office, Wytheville, Va. to K. Patrizi (Oct. 21, 1980).

27. *Id.*

28. NDWP, *supra* n. 20.

29. Housing and Community Development Act of 1974, 42 *U.S.C.A.,* sec. 5301 *et seq.* (1977, Supp. 1981, and 1980-81 Supp. Pamp.).

30. Housing and Urban Development Act of 1965, 42 *U.S.C.A.,* sec. 1491-1497 (1977 and Supp. 1980).

31. U.S. Department of Housing and Urban Development, "Community Development Block Grant Program," 24 *C.F.R.,* sec. 570.1 *et seq.* at sec. 570.101 (1983).

32. *Id.* sec. 570.488 *et seq.*

33. *Id.* sec. 570.489(b).

34. North Carolina Department of Natural Resources and Community Development, "Final Statement, State of North Carolina Administration of the Small Cities Community Development Block Grant Program," p. 1 (1982).

35. *Id.* p. 5.

36. North Carolina Department of Natural Resources and Community Development, "North Carolina Community Development Block Grant Program," *N.C. Admin. Code,* subch. 13L at sec. .0502 (1982).

37. North Carolina Department of Natural Resources and Community Development, *supra* n. 34 at p. 5.

38. *Id.*

39. South Carolina Governor's Office, "Community Development Block Grant Small Cities Program—State of South Carolina," p. 1 (1982).

40. *Id.* pp. 6-7.

41. *Id.* p. 5.

42. *Id.* p. 14.

43. *Id.* p. 2.

44. *Id.* p. 3.

45. *Id.* pp. 8-11.

46. Virginia Department of Housing and Community Development, "Commonwealth of Virginia Community Development Block Grant Program—Community Improvement Grant Instruction Manual and Proposal Forms," p. 3 (1982).

47. *Id.*

48. Virginia Department of Housing and Community Development, "Fund Distribution Plan—Commonwealth of Virginia Community Development Block Grant Program," p. 21 (1982).

49. *Id.* p. 4.

50. *Id.* p. 21.

51. *Id.* p. 8.

52. *Id.* Appendix B.

53. Virginia Department of Housing and Community Development, *supra* n. 46, Appendices 1-3.

54. Virginia Department of Housing and Community Development, *supra* n. 48 at p. 7.

55. Virginia Department of Housing and Community Development, *supra* n. 46 at pp. 3-4.

56. Virginia Department of Housing and Community Development, *supra* n. 48 at p. 8.

57. Virginia Department of Housing and Community Development, *supra* n. 46 at p. 4.

58. Virginia Department of Housing and Community Development, *supra* n. 48 at p. 18.

59. Virginia Department of Housing and Community Development, *supra* n. 46, Appendix 5 at p. i.

60. Virginia Department of Housing and Community Development, *supra* n. 48 at p. 7.

61. Public Works and Economic Development Act of 1965, 42 *U.S.C.A.,* sec. 3121-3245 (1977).

62. *Id.* sec. 3161(a,b).

63. *Id.* sec. 3171(d).

64. *Id.* sec. 3171(e).

65. Local Public Works Capital Development and Investment Act of 1976, 42 *U.S.C.A.,* sec. 6701 *et seq.* (1977 and Supp. 1980).

66. *Id.* sec. 6707.

67. Economic Development Administration, "Technical Assistance," 13 *C.F.R.,* sec. 307.1 *et seq.* (1980).

68. *Id.* sec. 307.15.

69. PWEDA, *supra* n. 62 at sec. 3131.

70. Economic Development Administration, "Public Works and Development Facility Loans," 13 *C.F.R.,* sec. 305.21 *et seq.* at sec. 305.62 (1980).

71. *Id.* sec. 305.24.

72. *Id.* sec. 305.2.

73. Economic Development Administration, "Local Public Works Capital Development and Investment Program," 13 *C.F.R.,* sec. 316.1 *et seq.* at sec. 316.7 (1980).

74. *Id.* sec. 316.4.

75. *Id.* sec. 316.5.

76. N. DeWeaver and H. Lichtenstein, "The Role of the Federal Government in the Financing of Rural Water and Sewer Facilities," Center for Community Change, Washington, D.C. (unpublished report Jan. 1976).

77. SDWA, *supra* n. 19.

78. *Id.* sec. 300J-3(d).

79. Appalachian Regional Development Act of 1965, 40 *U.S.C.A.,* Appendix, sec. 1 *et seq.* (1969 and Supp. 1980).

80. *Id.* sec. 101 (Supp. 1980).

81. *Id.* sec. 214.

82. Personal communication from E. Deane, Evaluation Specialist, Virginia Department of Housing and Community Development, Office of Regional Development Services, Richmond, Va. to K. Patrizi (Nov. 19, 1980).

83. Ad Hoc Task Force on Rural Water/Sewer Program Reform, "The Reform of the Farmers Home Administration's Water and Waste Disposal Grant and Loan Program," Appendix I (1980).

84. Personal communication from R. Taylor, Technical Services Chief, Virginia Department of Health, Division of Water Supply Engineering, Richmond, Va. to K. Patrizi (Oct. 17, 1980).

85. Regional Water Supply Planning Act of 1971, *N.C. Gen. Stat.,* sec. 162A-20 *et seq.* (1976 and Supp. 1979).

86. *Id.* sec. 162A-21.

87. *Id.* sec. 162A-20 *et seq.*

88. *Id.* sec. 1.

89. *Id.* sec. 162A-24.

90. Personal communication from C. Yarborough, North Carolina Department of Human Resources, Division of Health Services, Raleigh, N.C. to K. Patrizi (Oct. 10, 1980); Personal communication from J. Riley, Administrative Officer, Sanitary Engineering Section, and Director, North Carolina Clean Water Bond Act Grant Program, North Carolina Department of Human Resources, Raleigh, N.C. to K. Patrizi (Sept. 25, 1980).

91. J. Riley, "A State Grant Program for Water Supply Projects," *Journal of the American Water Works Association,* Vol. 68 (Aug. 1976).

92. *Id.*

93. *Id.*

94. North Carolina Clean Water Bond Act of 1977, *N.C. Sess. Laws,* ch. 677, sec. 1 *et seq.* (1977).

95. Personal communication from A. Dieteman, Director, North Carolina State Water Supply Assistance Program, North Carolina Department of Natural Resources and Community Development, Office of Water Resources, Raleigh, N.C. to K. Patrizi (Oct. 22, 1980).

96. *Id.*

97. *Id.* sec. 6.

98. *Id.* sec. 7.

99. *Id.*

100. *Id.*

101. NCCWBA, *supra* n. 94 at sec. 1.

102. *Id.* sec. 2.

103. *Id.*

104. *Id.* sec. 10.

105. *Id.* sec. 11.

106. *Id.*

107. *Id.* sec. 7(2).

108. *Id.* sec. 3.

109. *Id.* sec. 7(2).

110. J. Riley, *supra* n. 92.

111. J. Riley, *supra* n. 92.

112. J. Riley, *supra* n. 92.

113. E. Cobb, *A Sense of Urgency,* National Demonstration Water Project, Colorform Press, Inc., Washington, D.C., pp. 160-61 (1977).

114. *S.C. Code,* sec. 6-19-30 (1977).

115. *Id.* sec. 6-19-10.

116. *Id.* sec. 6-19-70.

117. *Id.* sec. 6-19-20.

118. *Id.* sec. 6-19-60.

119. *Id.* sec. 6-10-50.

120. Personal communication from F. Coleman, Advisor, South Carolina Rural Water and Sewer Grants Program, South Carolina Department of Health and Environmental Control, Columbia, S.C. to K. Patrizi (Sept. 23-24, 1980).

121. *Id.*

122. Memorandum from F. Coleman, Advisor, South Carolina Rural Water and Sewer Grants Program, Columbia, S.C. to T. Barnwell on "Accomplishments of the South Carolina Department of Health and Environmental Control" (Sept. 23-24, 1980).

123. Division of Local Government, South Carolina Budget and Control Board, "Annual Report 1981-1982."

124. Memorandum, *supra* n. 123.

125. F. Coleman, *supra* n. 121.

126. E. Cobb, *supra* n. 114.

127. *Id.*

128. *Id.*

129. *Id.* p. 160.

130. *Id.* p. 161.

131. *Id.* p. 107.

132. *Id.*

133. Personal communication from M. Sciacca, Director of Technical Services, National Demonstration Water Project, Washington, D.C. to K. Patrizi (Nov. 24, 1980).

134. W. Warren, *supra* n. 10.

INSTITUTIONAL FRAMEWORK FOR REGULATION OF PUBLIC WATER SUPPLY

Public water supply operations are subject to extensive governmental regulation because of the relationship between quality of drinking water and the public health; control over quality of water supplied by public systems is a well-established governmental function. Governmental controls also apply to water rates and quality of service for water supply operations provided by private organizations. Regulation of these aspects of water supply operations often is combined with other utility regulation and administered independently of health-related controls.

At both state and federal levels of government, regulation of water supply operations is a significant function. The states traditionally have been the primary regulators, both in the area of health and the area of utility operations. While these functions continue, the federal government now has assumed an important regulatory role in drinking water quality through enactment of the SDWA.[1] The following subsections consider, first, the national SDWA program and, second, the state regulation of drinking water quality and utility operations within North Carolina, South Carolina, and Virginia.

I. Safe Drinking Water Act

The primary objective of SDWA is to establish national standards for the quality of water supplied by public water supply systems. SDWA charges EPA with the responsibility of developing such standards in the form of "primary drinking water regulations"[2] to protect health and "secondary drinking water regulations"[3] to protect the public welfare by controlling aesthetic characteristics such as odor and appearance.

SDWA contains provisions for individual states to assume primary enforcement responsibility (primacy) for the regulatory program after the EPA administrator determines that each state program is in compliance with requirements of SDWA, including the existence of drinking water regulations no less stringent than the federal primary drinking water regulations.[4] Each of the three states in the study region has assumed primacy. However, EPA

retains certain regulatory powers even after a state assumes primacy.[5]

Although SDWA provides for establishment of both primary and secondary drinking water regulations, only the primary regulations are federally enforceable;[6] therefore, the primary regulations are the central component of the federal program. The primary regulations, called the NIPDWR,[7] contain several specific requirements for water suppliers defined as "public water systems." Included in this term are all systems that have at least 15 service connections or regularly serve no less than 25 individuals for at least 60 days out of the year.[8] Exempt is any water supply system meeting all the following conditions:[9]

(a) Consists only of distribution and storage facilities (and does not have any collection and treatment facilities);

(b) Obtains all of its water from, but is not owned or operated by, a public water system to which such regulations apply;

(c) Does not sell water to any person; and

(d) Is not a carrier which conveys passengers in interstate commerce.

Examples of water supply systems that are not public systems and, therefore, not subject to regulation include (1) small trailer courts with their own water supply systems which serve less than 25 residents or 15 service connections and (2) an industry that purchases water from a municipality for its own private use.[10] A town or other system which obtains water from a nearby city is not exempted by this provision if it in turn sells the water to its customers.

The basic regulatory mechanism employed by NIPDWR to control water quality within water systems under its jurisdiction is the MCL. SDWA establishes MCL's for each harmful contaminant for which measurement is technologically and economically feasible.[11] An MCL is defined in SDWA as "the maximum permissible level of a contaminant in water which is delivered to

any user of a public water system."[12] MCL's for specified contaminants contained in NIPDWR are presented in *Table 15.* In cases of harmful contaminants not reasonably subject to measurement, SDWA provides for the EPA administrator to specify treatment techniques as an alternative to the MCL approach.[13] Specific provisions regarding MCL's and the other requirements of SDWA vary among different types of public water supply systems.

The classification of a system as "community" or "noncommunity" affects the specific requirements imposed. A community system is "a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents," while a noncommunity system is a public water system that "is not a community water system"[15]— for example, a restaurant which has its own well and which serves more than 25 customers per day. In general, the regulations for noncommunity systems are less stringent than those for community systems.

Both community and noncommunity water systems must conduct analyses for coliform bacteria. Samples must be taken at points that are representative of distribution system conditions. These samples are to be taken at regular intervals, with the frequency of sampling dependent upon the size of the population served.[16] Frequencies for distribution systems serving up to 10,000 individuals are contained in *Table 16.* A community system with a protected groundwater source can receive permission to sample every 3 months rather than every month. For noncommunity systems, the right hand column in *Table 16* becomes "per 3 months" instead of "per month."

Monitoring frequency requirements also vary between community and noncommunity systems. Community water systems are required to sample for specified inorganic chemicals at yearly intervals. A noncommunity system also is required to sample at yearly intervals, but only for nitrate.[17] Turbidity monitoring is required for both community and noncommunity systems that use surface water sources. Measurements must be made by nepholometer at least once per day.[18] Only community water systems which utilize surface water sources are required to monitor for specified organic chemicals.[19] Samples must be

collected during the part of the year when pesticide contamination is most likely to occur. Analyses are repeated at intervals as determined by the state, but no less frequently than once every 3 years. Radioisotope sampling is required at least every 4 years.[20] For the first year, sampling is required every three months to obtain a representative background level. Monitoring requirements in general are increased whenever an MCL is exceeded.[21]

The results of all tests must be reported to the state within 40 days following the actual measurement or analysis.[22] If a supplier fails to comply with a primary drinking water regulation (contaminant level or monitoring requirement), the failure must be reported to the state within 48 hours. If a community water system does not comply with an MCL or specified testing procedure, the supplier must notify all customers by (1) including a note in their water bills, (2) publishing notice in the local newspaper, and (3) informing local radio and television stations. Noncommunity systems also must provide notices in such cases, with the manner of display and type of notice to be specified by the state.[23]

SDWA provides for variances[24] and exemptions[25] through which noncompliance with MCL's or required treatment techniques can be authorized under special conditions. Issuing either a variance or an exemption is subject to the condition that it produce no unreasonable risk to the health of the water system customers.[26] EPA has published guidelines for determining what constitutes an unreasonable risk.[27]

Variances apply to situations in which water systems, because of poor source-water quality, cannot comply with an MCL even after application of the most effective treatment methods.[28] Both existing and new systems are eligible for variances. Although the recipient of a variance is subject to a compliance schedule for meeting MCL requirements, SDWA imposes no fixed deadline for compliance.

Exemptions apply to water systems unable to comply with an applicable MCL because of "compelling factors," a term which may include economic limitations.[29] The exemption mechanism recognizes that small systems are likely to experience particular hardship in complying with MCL's that are based upon use of

technology reasonably available to large systems.[30] Exemptions are limited to systems in operation on the effective date of the MCL or treatment requirement involved or to a new system which is the only "reasonable alternative source of drinking water."[31] The recipient of an exemption must comply with the requirement in question as expeditiously as practicable but not later than January 1, 1984 (January 1, 1988 for regional water systems).[32]

Analysis of Impact on Small Communities

EPA has estimated that there are approximately 61,500 community and 200,000 noncommunity water systems within the United States.[33] Ninety-five percent of the community systems serve less than 10,000 residents. Hence, the majority of individual public water systems affected by SDWA are small systems, many of which exist in rural areas. These are also the least sophisticated and most financially troubled systems; therefore, compliance with SDWA and the related NIPDWR is likely to create difficulties. The impact upon larger utilities generally is not as severe because they possess greater managerial capabilities and financial resources.

Major impacts of SDWA upon small water systems include (1) additional operational and administrative costs and (2) increased capital costs for new or upgraded treatment if violation of an MCL must be corrected. The operational and administrative costs result from monitoring and analysis requirements. Depending upon whether a ground or surface supply is used and whether the system is classified as community or noncommunity, these costs will vary considerably among systems.

The monitoring impacts are relatively small, however, compared to costs incurred by additional or upgraded treatment processes. These requirements are most likely to consist of disinfection and filtration, treatment processes that have been accomplished in the past by many small systems. The costs of removing specified heavy metals, inorganic and organic chemicals, and radioisotopes can be much greater. Such removal may require the use of denitrification, ion exchange, reverse osmosis, and other complex processes that may be financially infeasible for some small water systems.[34] It is estimated that small systems requiring additional or upgraded treatment facilities to comply with SDWA will encounter a per-

capita cost up to seven times greater than will a larger system.[35] *Table 16* displays annual per-capita treatment and monitoring costs for four water-system size categories.

Alternatives to expensive treatment that may be available to small community and rural systems include shifts in source of supply, merger of nearby systems, and purchase of treated water from another utility.[36] Of course, not all of these alternatives are always available, and small water systems often are forced to file for an exemption or variance. This has happened in coastal areas of South Carolina where natural groundwater fluoride concentrations exceed the specified MCL. South Carolina's DHEC has surveyed approximately 50 small water systems within the state for natural fluoride contamination. Cases analyzed in this survey illustrate the impact of MCL-related treatment costs on small water systems.

The Little River water system[37] consists of 200 connections and serves a population of 600 having an average annual income of $6,684. Finished-water fluoride concentrations range from 4.0 to 4.5 mg/l; the MCL for fluoride is 1.6 mg/l. If fluoride removal equipment were installed and financed entirely through user fees, the average monthly water bill would increase from a present $15.40 per month to $54.50 per month. Under EPA guidelines, a compelling economic justification for granting an exemption exists if the average monthly water bill is greater than 2 percent of the average monthly customer income;[38] therefore, an exemption has been granted since the average water bill exceeds the 2-percent limit before fluoride removal is considered.

The Grand Strand Water and Sewer Authority[39] consists of 46 connections and serves 184 persons whose average annual income is $5,947. The finished water fluoride concentrations average 4.0 mg/l. If fluoride removal equipment were financed entirely through user fees, the average monthly water bill would increase by $58 per month. An exemption also has been granted in this situation.

These cases indicate the problems that small communities may face in meeting drinking water quality requirements imposed under SDWA. Since the economic burden in many situations cannot be met locally, financial assistance from external sources

will continue to be important. This situation illustrates the significance of the exemption provision of SDWA. Without its continuation, many small systems, at least in the short run, would be in violation of the act, or, in the event of strict enforcement of the act, would be forced to discontinue operations.

II. State Regulation

Since North Carolina, South Carolina, and Virginia have assumed primacy under SDWA, their regulation of drinking water quality exhibits common characteristics. Although states with primacy can adopt drinking water standards more stringent than those imposed by NIPDWR, these states have chosen to adopt and enforce the minimum federal standards. In other areas of health regulation, however, certain differences exist among the states. Furthermore, each state imposes additional regulations on water rates and quality of service where private water suppliers are involved.

A. North Carolina

In North Carolina, waterworks regulations are administered by the DHS-DHR.[40] Approval of plans and specifications and issuance of permits are expressly required before construction or operation of a community water system is possible.[41] Regulations do not address noncommunity water systems; such criteria are assessed on a case-by-case basis.

Regulations provide that "the source supply shall be sufficient in capacity to satisfy anticipated needs of the users for the period of design."[42] In an unimpounded stream, the minimum daily flow of record or the minimum flow estimated must exceed the maximum daily draft of the proposed water system.[43] If the source is groundwater, the well system must be sufficient to provide the average daily demand in less than 12-hours pumping time.[44]

Operators of community water supply systems must be certified.[45] For systems that require only disinfection, part-time operator hours are permissible; however, for systems requiring filtration, the operator must be on duty whenever the treatment system is operating.[46]

North Carolina also regulates certain private water suppliers through NCUC. The Public Utilities Act provides for the "fair regulation of public utilities in the interest of the public."[47] This act empowers NCUC to set reasonable rates and to compel a public utility to render adequate service.[48] For small water utilities, NCUC must adjust rates fairly for both the utility and the customer.[49] In addition, NCUC can inspect the records of private water companies.[50]

B. South Carolina

In South Carolina, waterworks regulations are administered by the Division of Water Supply of the DHEC.[51] Approval of plans and specifications and issuance of permits are required for both community and noncommunity water systems before construction or operation is possible.[52]

Adequacy-of-source requirements pertain to both community and noncommunity systems.[53] Acceptance of source quality is based on an assessment of the capability of the proposed treatment process to reduce contaminants to respective MCL's. The source must (1) meet projected peak daily water demand (150 percent of the average demand) as shown by calculations based upon extreme drought of record, (2) provide a surplus for anticipated growth, and (3) compensate for losses caused by silting, evaporation, and seepage. If a groundwater source is proposed, a minimum of two wells is required for all systems serving 50 or more connections.

Design requirements for treatment and distribution are identical for community and noncommunity systems.[54] Operators for surface supply systems must be on duty during periods of treatment operation.[55]

In South Carolina, any privately-owned incorporated or unincorporated company that supplies water to the public (one person or more) for compensation and profit is considered a "public utility" subject to regulation by the South Carolina PSC.[56] To be regulated, the company does not have to be exclusively in the water supply business.[57] These requirements apply only to those companies that sell water retail; a public utility that sells water

wholesale to a municipality is not regulated.[58] PSC has regulatory powers over rates charged,[59] financial investigations,[60] and adequacy of service.[61]

C. Virginia

In Virginia, waterworks regulations are administered by the Bureau of Water Supply Engineering of the State Health Department.[62] A permit approving plans and specifications must be issued for both community and noncommunity water systems before construction is possible.[63] Source adequacy is determined for both the quality and the quantity of the proposed supply. The quality of a supply can be approved only if "the water is continuously amenable to available treatment processes."[64] The quantity available must (1) supply the current demand of the service area, (2) provide a reasonable surplus for anticipated growth, and (3) compensate for all losses. Whenever water production reaches 80 percent of the rated capacity of the waterworks for any consecutive 3-month period, the owner generally is required to develop plans for system expansion.[65] Where an impoundment is the source of supply, safe yield is defined as the minimum withdrawal rate occurring since 1930 (the minimum daily withdrawal rate for the low flow with a 30-year recurrence interval where free-flowing streams are used).[66] If the source is groundwater, the system-owned well lot must be large enough to provide for a 50-foot radius from the well.

Separate design requirements exist for community and noncommunity systems. Noncommunity water-system design requirements are less stringent in the following ways:[67]

1. Treatment and pumping facilities may be located within the 100-year floodplain.

2. Exceptions to the minimum well-lot size requirements may be made.

3. Well-construction requirements are more lenient.

4. Certain exceptions to community system treatment and distribution design criteria are permitted.

Operators of all water systems, either community or noncommunity, must be certified.[68]

Utility regulation of private suppliers is a function of the SCC. Under existing law, any private water company proposing to serve more than 50 customers must incorporate as a public service company.[69] This provision, however, does not apply to companies incorporated before and operating a system on January 1, 1970. SCC approval of water supply operations by companies subject to its jurisdiction can be granted only where a need exists for the service, where other public or private systems cannot supply the needed service, and where the applicant can provide the service in question.[70]

In addition to original approval, SCC "shall have the power, and be charged with the duty, of supervising, regulating and controlling all public service companies doing business in this state, in all matters relating to the performance of their public duties and their charges therefore, and of correcting abuses therein."[71] It is the duty of SCC to conduct an annual review of the rates of all public utilities.[72] If such rates are "found to be unjust, unreasonable, insufficient, or unjustly discriminatory or to be preferential or otherwise in violation of any provisions of law, the State Corporation Commission shall have the power to fix and order substituted therefore such rate or rates . . . as shall be just and reasonable."[73] The books, papers, and documents of such companies are subject at all times to inspection by SCC.[74]

Although certain water companies are not regulated as public utilities, unregulated companies that serve more than 50 customers are subject to special controls under certain conditions. If the SCC receives an application from the majority of the water company's customers or from the company itself, the SCC may hold a hearing and order improvements or rate changes. When such action is taken, the water system remains subject to SCC's regulatory authority in the same manner as a public utility for such reasonable period as the SCC directs.[75]

Another provision establishes a procedure for SCC to investigate complaints against water companies which are not regulated as public utilities and which serve 50 or more customers.[76] This

procedure requires SCC to initiate an investigation if 50 or more subscribers (each from a different household), who have contracts with the company, file a petition alleging inadequate service. However, SCC does not have the power to adjudicate the rights of the parties in such situations.[77]

D. Comparative Analysis of Water Supply Regulation in North Carolina, South Carolina, and Virginia

Regulation of water supply operations does not vary significantly among North Carolina, South Carolina, and Virginia, although individual program details differ. In the control of drinking water quality, SDWA serves as an influence for consistency.

A general view prevails that minimum standards for health, safety, and quality of service be uniform for customers of community water supply operations considered "public"; therefore, control measures, such as treatment facility design and adequacy-of-source requirements, usually do not vary with the size of public systems. Systems do not have uniform ease in complying with these requirements, however, because of economies of scale and factors arising from size differences. Small systems, which include most rural systems, generally have greater difficulties in complying than do larger systems.

The three states differ in the extent to which community and noncommunity water supply systems are given similar regulatory treatment. In Virginia, separate treatment/distribution system design requirements exist for community and noncommunity systems. North Carolina imposes standard design requirements only upon community systems; requirements for noncommunity systems are determined individually. In South Carolina, the same design requirements pertain to both community and noncommunity systems.

Noncommunity drinking water supplies—private individual water supplies and all water systems serving less than 25 individuals or having less than 15 service connections—have been subject neither to federal health regulations nor to state control. The quality of such supplies is considered questionable by the states' health officials who routinely receive reports from citizens about

quality problems associated with individual sources.[78] The possibility of pollution and contamination of groundwater, the source for the majority of individual supplies, is ever increasing. Presently, Virginia and North Carolina have no compiled data on the extensiveness of the nonpublic water supply problem. South Carolina's DHEC reported that 40-45 percent of the approximately 4,500 water samples received from individual supplies in 1980 showed positive coliform counts.[79] This result is biased, however, because many of the persons submitting samples were likely to have suspected a quality problem. Nevertheless, these data suggest that private water supplies have significant quality problems. This conclusion recently has been affirmed by EPA's rural water survey. For example, the water supply of over 40 percent of all households served by individual systems and multi-connection systems with fewer than 15 connections was found to contain total coliform organisms in excess of one coliform per 100 ml of water. In contrast, approximately 15 percent of households served by community systems exceeded this rate of coliform presence.[80]

III. Footnotes

1. Safe Drinking Water Act, 42 *U.S.C.A.,* sec. 300f *et seq.* (1980).
2. *Id.* sec. 300g-1(a).
3. *Id.* sec. 300g-1(c).
4. *Id.* sec. 300g-2.
5. *Id.* sec. 300g-3.
6. *Id.* sec. 300g-3(d).
7. U.S. Environmental Protection Agency, National Interim Primary Drinking Water Regulations, 40 *C.F.R.,* sec. 141.1 *et seq.* (1979).
8. *Id.* sec. 141.2(e).
9. *Id.* sec. 141.3.
10. U.S. Environmental Protection Agency, Region VII, "Answers to Questions About the Safe Drinking Water Act," Report No. EP 1.2: W29/32/977, Kansas City, Missouri (July 1977).
11. SDWA, *supra* n. 1 at sec. 300g-1.

12. *Id.* sec. 300g-1.

13. *Id.* sec. 300g-1.

14. EPA, *supra* n. 7 at sec. 141.1(e)(i).

15. *Id.* sec. 141.1(e)(ii).

16. *Id.* sec. 141.21.

17. *Id.* secs. 141.11 and 141.23.

18. *Id.* sec. 141.22.

19. *Id.* sec. 141.24.

20. *Id.* sec. 141.26.

21. *Id.* sec. 141.21(d).

22. *Id.* sec. 141.23.

23. *Id.* sec. 141.32.

24. SDWA, *supra* n. 1 at sec. 300g-4.

25. *Id.* sec. 300g-5.

26. *Id.* secs. 300g-4(a)(1)(A) and 300g-5(a)(3).

27. U.S. Environmental Protection Agency, "Guidance for the Issuance of Variances and Exemptions" (1979).

28. SDWA, *supra* n. 1 at sec. 300g-4(a)(1)(A).

29. *Id.* sec. 300g-5(a)(1).

30. EPA, *supra* n. 27 at p. I-3.

31. SDWA, *supra* n. 1 at sec. 300g-5(a)(2).

32. *Id.* sec. 300g-5(b)(2).

33. "EPA's Interim Final Policy for Compliance of Small Public Drinking Water Supply Systems," *Environment Reporter: Current Developments,* pp. 291-94 (June 20, 1980).

34. South Carolina Department of Health and Environmental Control, Water Supply Division, "Staff Study—Cimeron Plantation," Columbia, S.C. (unpublished report 1978); South Carolina Department of Health and Environmental Control, Water Supply Division, "Staff Study—Garden City," Columbia, S.C. (unpublished report 1978); South Carolina Department of Health and Environmental Control, Water Supply Division, "Staff Study—Little River Water Company," Columbia, S.C. (unpublished report 1978); U.S. General Accounting Office, "Rural Water Problems: An Overview," Report No. CED-80-120, U.S. Government Printing Office, Washington, D.C. (1980).

35. U.S. Environmental Protection Agency, "Economic Evaluation of the Proposed Interim Primary Drinking Water Regulations," Report No. 570/ 9-75-002, Office of Water Supply, Washington, D.C. (Oct. 1975).

36. *Id.*

37. Information taken from South Carolina Department of Health and Environmental Control, Water Supply Division, "Staff Study—Little River Water Company," Columbia, S.C. (unpublished report 1978).

38. EPA, *supra* n. 27 at p. II-3.

39. Information taken from South Carolina Department of Health and Environmental Control, Water Supply Division, "Staff Study—Cimeron Plantation," Columbia, S.C. (unpublished report 1978).

40. North Carolina Department of Human Resources, "Rules Governing Public Water Supplies," *N.C. Admin. Code,* tit. 10, sec. .0600 *et seq.* (1980).

41. *Id.* sec. .0901.

42. *Id.* sec. .0802.

43. *Id.* sec. .1003.

44. *Id.* sec. .1002.

45. *Id.* sec. .1100.

46. *Id.* sec. .1102.

47. Public Utilities Act, *N.C. Gen. Stat.,* sec. 62-1 *et seq.* (1975 and Supp. 1979) at sec. 62-1.

48. *State ex rel Utilities Company* v. *Morgan,* 117 S.E. 2d 405 (N.C. 1970).

49. Public Utilities Act, *supra* n. 47 at sec. 62-133.

50. *Id.* sec. 62-34.

51. South Carolina Department of Health and Environmental Control, "State Primary Drinking Water Regulations" (interim draft).

52. *Id.* sec. R61-58.1.

53. *Id.* sec. R61-58.2.

54. *Id.* sec. R61-58.3.

55. *Id.* sec. R61-58.7.

56. *S.C. Code,* sec. 58-5-10 *et seq.* (1977 and Supp. 1979).

57. *Id.* sec. 58-5-20.

58. *Id.* sec. 58-5-40.

59. *Id.* sec. 58-5-210.

60. *Id.* sec. 58-5-230.

61. *Id.* sec. 58-5-730.

62. Commonwealth of Virginia State Board of Health, "Waterworks Regulations" (1982).

63. *Id.* sec. 3.14.

64. *Id.* sec. 8.01.

65. *Id.* sec. 5.08.01.

66. *Id.* sec. 8.02.01(b).

67. *Id.* sec. 13.00.

68. *Id.* sec. 5.02.

69. *Va. Code Ann.,* sec. 13.1-50 (Supp. 1981).

70. *Id.* sec. 56-265.3 (1981).

71. *Id.* sec. 56-35.

72. *Id.* sec. 56-234.2.

73. *Id.* sec. 56-235.

74. *Id.* sec. 56-36.

75. *Id.* sec. 13.1-50 (Supp. 1981).

76. *Id.* sec. 56-265.10 *et seq.* (1974).

77. *Sydnor Pump and Well Co.* v. *Taylor,* 110 S.E. 2d 525 (Va. 1959).

78. Memorandum from F. Coleman, Advisor, South Carolina Rural Water and Sewer Grants Program, Columbia, S.C. to T. Barnwell on "Accomplishments of the South Carolina Department of Health and Environmental Control" (Sept. 23-24, 1980); Personal communication from J. Southerland, North Carolina Department of Natural Resources and Community Development, Raleigh, N.C. to K. Patrizi (Oct. 8, 1980); R. Suppalla, "Workshops on Socioeconomic Aspects," presented at the November 4-5, 1976, Water Problems in the Rural Environment Conference, Nebraska Institute of Agricultural and Natural Resources, held at Lincoln, Neb., pp. 119-22 (Nov. 1976).

79. Personal communication from G. Caughman, Regulation and Surveillance Section, South Carolina Department of Health and Environmental Control, Water Supply Division, Columbia, S.C. to K. Patrizi (Sept. 23, 1980).

80. J. Francis, B. Brower, W. Graham, O. Larson III, J. McCaull, and H. Vigorita, "National Statistical Assessment of Rural Water Conditions—Executive Summary," p. 6 (1983).

CASE STUDIES

This section presents a brief discussion of five public water supply systems serving small communities and/or groups of rural residents. Three systems are located in Virginia, one in North Carolina, and one in South Carolina. The case studies were not chosen at random but rather were selected individually on the recommendation that they were successes or failures. These water systems, therefore, are not presented as representative of small systems in general but as a basis for observing particular characteristics of some small systems and for identifying factors related to their success or lack thereof.

I. Wythe-Bland Water and Sewer Authority

The Wythe-Bland Water and Sewer Authority[1] (WBWSA) was created in 1968 pursuant to the Virginia Water and Sewer Authorities Act.[2] This system provides water service to three separate areas within Wythe and Bland counties. Data concerning operations in these three areas are contained in *Tables 17* and *18.* Joint management is necessary because of the two-county service area; the WBWSA board of directors is composed of individuals from both Wythe and Bland counties. Located in southwestern Virginia, these counties are rural in character, share a common border, and contain several small towns. Each of the three individual systems is discussed in the following sections.

A. Ivanhoe System

WBWSA was created to provide needed water supply service to the Ivanhoe-Piney area of Wythe County. Groundwater levels in this area had been lowered substantially by mining operations which dried up individual wells. The mining company had initiated a program of hauling water to tanks installed at each individual's residence. After 10 years of service, the tanks had begun to deteriorate, and no provision or agreement to replace them existed. Residents desired a permanent source of water supply, and the Ivanhoe water system, the largest of the three in the WBWSA, was built.

A major problem in the operation of the Ivanhoe system has been

failure to secure the anticipated number of customers, a situation creating significant financial difficulties. As a condition for approval of funds, FmHA originally required that approximately 500 potential customers agree to be served by the system. To find persons assenting to service, the consulting firm, hired to perform the feasibility and design studies, surveyed five miles outside Ivanhoe. The system has not been extended that far, however, and only 170 customers within the immediate Ivanhoe area have connected to the system. When the project was formulated, FmHA did not require a mandatory hookup ordinance, and the contract signed by the 500 potential users was not an enforceable document. These actions, therefore, left WBWSA with an immediate financial burden of loan repayments based upon service to 500 customers.

Charles R. Huddle, WBWSA executive director, has stated that FmHA's suggestion to increase the Ivanhoe system user fees to meet the required monthly loan repayments is unworkable since this would require an average user fee of $30 per month and would affect 170 of the lowest income families in the county. When an industry left Ivanhoe approximately 10 years ago, the families that could afford to leave also departed. Only the lowest income persons remained in Ivanhoe. Huddle stated that increasing the rates for the Ivanhoe sytem, without similarly increasing the rates in the other two systems under his authority, would have led to severe public relations problems. For this reason, a single rate structure for all three systems continues to be viewed as necessary.

Operation of the Ivanhoe system requires two full-time operators. The water source is a small stream; raw water is disinfected by chlorine and continuously monitored for turbidity and residual chlorine.

B. Bland System

The water system serving the town of Bland also has had serious problems. Approximately 10 years ago, the State Health Department condemned the spring that had been the town's supply source since the Civil War. State health officials determined that the spring was too contaminated for the existing treatment

operation. Pollution was a result of surface runoff, with a high coliform count the main concern. WBWSA was ordered to construct an additional 1.5 miles of pipeline to a new and acceptable source, a small creek. Approximately $355,000 in FmHA loan funds was used to construct the pipeline and needed treatment facilities. Huddle believes that a new source was unnecessary and that proper disinfection would have alleviated the spring contamination problem. However, the raw-water coliform count ruled out this solution under Health Department regulations.[3]

The new line was connected to Bland's old distribution system constructed during the Civil War. Because of increased pumping pressure and higher flow rates, the distribution system developed breaks, and substantial leakage occurred—approximately 60 percent of the flow. When the distribution leaks occurred, the system had to be shut down to replace these lines. During the shutdown period of approximately one year, customers refused to pay for water not being received; therefore, WBWSA fell behind in FmHA loan payments.

The Bland system employs one full-time operator and uses a small stream as the supply source. The raw water is filtered, disinfected with chlorine, and continuously monitored for turbidity and residual chlorine.

C. Speedwell System

Funds for development of the Speedwell system originally were obtained to develop a system for the town of Bastian in Bland County. However, in the interim, the Health Department found the spring that served Speedwell unfit for human consumption because of a high coliform count. Since this situation was considered an emergency, the Bastian funds were diverted to Speedwell, and 133 Speedwell residents agreed to connect to the system. This was estimated to be sufficient for debt retirement at a monthly rate of $7 (for up to 3,000 gallons of water per customer). Only 80 residents actually connected to the system, however. This left WBWSA with insufficient revenue to meet the monthly FmHA loan repayments and with a deficit of $800 per month in the Speedwell area.

The Speedwell system is supplied with groundwater. Chlorine disinfection is the only treatment necessary, and thus only one part-time operator is required.

D. Observations

One of the significant issues affecting WBWSA has been the lack of a mandatory hookup ordinance. Attempts to establish a hookup ordinance have presented special problems because the jurisdiction of WBWSA extends over two counties making it necessary for the boards of supervisors of both Bland and Wythe counties to agree on the problem. Wythe County officials have viewed the ordinance as urgently needed, but Bland County officials have not agreed to it. Therefore, a stalemate has existed, and no progress has been made toward enactment of the hookup ordinance. Bland County officials apparently favor dissolution of the authority and abandonment of the three systems entirely.

Virginia FmHA officials believe that poor planning and management have existed among the two county governments and the WBWSA board of directors,[4] communication with the engineering consultants has been inadequate,[5] and awareness and participation by the citizens have been insufficient. Furthermore, no bookkeeping or accounting records were available for the first four years of system operation.[6]

From the perspective of WBWSA, the amount of paperwork required by FmHA is an important issue. According to Huddle, more paperwork was required for a $50,000 FmHA loan than was required for a total of $800,000 received in HUD and ARC grants. He stated that FmHA has offered WBWSA additional loans, but he has refused further dealings with the agency. His belief is that WBWSA does not need more loans; it needs more customers and a mandatory hookup ordinance.

II. Fork Union Sanitary District

Fluvanna County, Virginia, is located east of Charlottesville; Fork Union Sanitary District[7] (FUSD) encompasses approximately 15 square miles of the total 282 square miles within the county. Although this land area is only 5 percent of the county's total area,

approximately a fourth of the population resides within FUSD. Of the total 351 actual and potential customers in the district, 44 percent are low- or moderate-income persons.

Since the land area within the district is largely underlain with granite and the soil is relatively shallow, many individual wells have problems with water quality and/or quantity. Contamination from septic-tank-drainage fields is widespread. Because many families have neither a well nor in-house plumbing, they are forced to haul water from nearby streams. Both the county government and the citizens of the proposed district have recognized the need for a central water supply system at an affordable user cost.

A referendum was passed in 1968 allowing Fluvanna County to create a sanitary district and provide service to these low- and moderate-income persons with inadequate individual supplies. An original FmHA grant of $67,340 and a loan of $368,000 were obtained in 1968. These funds were sufficient to finance the construction of a water treatment plant, with the James River as its water source, and to install the main section of the distribution system. However, no distribution lines were extended into several sections of FUSD where low-income black citizens lived.

Despite warnings from FmHA's national office, the plant was built within the 100-year flood plain. Subsequently, the plant was destroyed by flooding from Hurricane Camille in 1969. Reconstruction began the same year, with the James River still serving as the water supply. The plant was constructed on the same site, only to be destroyed again in 1972 by Hurricane Agnes. At this time, the surface-supply plant on the site was abandoned. FUSD received an EDA $50,000 disaster grant and turned its efforts toward the development of a groundwater supply.

The district's disaster grant funds were used to connect the distribution system to the well system of Fork Union Military Academy and also to develop two additional wells to provide a sufficient supply. FUSD used these groundwater sources from 1977 through 1979. Treatment was not required for any of the wells; however, the State Health Department suggested that FUSD abandon the Academy's wells since they were low lying and

subject to surface runoff. This was carried out in 1979.

Because of the destruction of the treatment facilities in 1969 and 1972, FUSD fell behind in repayments on the 1968 FmHA loan; repayment did not begin until 1976. Since distribution lines were never extended into the low-income black areas, only 110 residents were connected to the system, and user charges were insufficient for debt retirement. The loan had to be repaid over a 34-year period at 5-percent interest, resulting in payments of approximately $37,000 per year for 34 years. To meet this obligation, the county levied a special real estate and personal property tax upon all district residents. The tax rate was established at 14.5 cents per $100 of assessed real estate value over and above the existing county levy of 58 cents per $100 of assessed value, thus making a total of 72.5 cents per $100 assessed value. The special tax also included a levy of $3.10 per $100 of assessed personal property value over the existing county levy of the same amount, for a total of $6.20 per $100 of assessed personal property value. Although these increased taxes applied to all district residents, not all residents were receiving water service at the time the taxes were adopted.

In 1976, the county applied for HUD funds to further develop the system. An application for $600,000 in Small Cities Program grants was submitted, but a grant of only $240,000 was received. These funds were designated specifically for expansion of the distribution system into areas where low-income black citizens lived. The county government believed that the grant amount was insufficient for that purpose; instead, it had the funds diverted to finance land acquisition, construction of a storage tank, and additional well development to facilitate system expansion. The diversion of these funds came to the attention of a VWP staff member, working at that time through Monticello Area Community Action Agency (MACAA). The VWP staff member pointed out to the agency that HUD funds were intended to be used to directly assist low-income persons and that this was not the situation at FUSD. The action resulted in a HUD investigation. HUD informed the county that any future funds received must be used to directly benefit the low-income areas, and that the purpose of a grant cannot be changed without notifying HUD.

From this time, MACAA helped secure funds necessary for system completion. In 1979, county officials received a HUD Small Cities Program grant of $600,000 to be used for completion of the distribution system.

When the system was finished, however, the existing wells did not provide enough water. Therefore, a new well site had to be developed. Although all four wells previously developed had not required treatment, water from the fifth well contained manganese, iron, and turbidity at concentrations three times greater than the existing standards permitted. To develop this site and construct necessary treatment works, the county needed additional funds. After another request to the FmHA, FUSD was awarded a $400,000 grant on the condition that the county government fulfill one requirement: 100 new households must be recruited for connection to the system.

In addition to this funding, a VWP grant of $15,000 was obtained to cover low-income residents' connection fees. At $250 per household, this would have provided assistance for approximately 60 residents.

At the time of this study, the system served 130 customers, operated from four wells, and employed one full-time operator. The user rate was $4.25 per month for up to 2,000 gallons. Treatment was not required for any well. Revenues were approximately $2,000 per month, and operational expenses were $1,900 per month. FmHA loan repayments equalled approximately $3,083 per month, and currently they are financed through the special taxes. Attempts are being made to secure the 100 additional customers needed to receive the $440,000 FmHA grant and begin final supply development.

Observations

Planning and development of the FUSD system have been described as an "engineering fiasco" because of faulty planning and hasty decision making by the county government and the engineering firm involved. To obtain the initial FmHA grant in 1968, the county simply surveyed until it obtained the required number of residents and then arbitrarily established boundaries.

Initial exclusion of other nearby low-income minority areas without adequate water supply is an example of poor planning. Location of facilities within a floodplain also indicates a poor planning decision, one which has proved costly to FUSD.

Organizational assistance from MACAA has been a significant factor in development of water supply facilities in FUSD. This assistance has been especially important in obtaining certain grants for the district.

III. Pulaski County Public Service Authority

Pulaski County, located in southwestern Virginia, consists of 322 square miles of land area and has a population of 33,000. Before a countywide water project was initiated, the only water systems in the county served the towns of Pulaski and Dublin and the community of Fairlawn. The extent of the combined service area for these three systems was approximately 6 square miles. Groundwater supplies traditionally had been used safely by county residents; however, because of rising residential and industrial development, along with agricultural operations, these once-safe supplies had become contaminated in some situations.[8]

In 1970, the charter for the Pulaski County Public Service Authority[9] (PCPSA) was approved. In 1971, a full-time county administrator was appointed. To identify local issues that were a major concern to county citizens, the local PDC began a needs-assessment survey in 1972 to identify local issues that were a major concern to county citizens. The results indicated that citizens were concerned with roads, law enforcement, trash collection, and water/sewer service.[10]

The citizen survey was highly publicized. Conclusions were presented to county and town officials and also to local civic, church, and citizen organizations. The intent primarily was to raise citizen awareness of the increasing contamination of individual groundwater supplies and the possible development of a countywide water system.

A local engineering firm was hired by the county board of supervisors to perform a feasibility study. Although feasibility

studies are eligible for federal funding, historically agencies often have been reluctant to fund such costs.[11] Rather than rely on federal assistance, the county board of supervisors appropriated $60,000 from local tax funds for the study.

The project was determined to be feasible; at this time an additional publicity campaign was initiated. Presentations were given to the school board, chamber of commerce, and local industries. Individual citizens were reached through a variety of organizations and community groups. Letters of support, prepared by these community organizations and individual citizens, demonstrated to federal funding agencies that there was broad community support.[12]

The county authorized PCPSA to begin a countywide project that would supply water to at least 2,500 residences. Since federal agencies were hesitant to fund a countywide system, $325,000 in local funds was contributed for the needed engineering studies. County officials anticipated that these funds eventually would be repaid through subsequent federal assistance. All local monies have been reimbursed by the federal government, except for the initial $60,000 used for a feasibility study. Funding sources and amounts are shown in *Table 19.*

After completing the preliminary engineering study, PCPSA, the county planner, and the county administrator began preparation of the various federal grant and loan applications. The county Department of Social Services assisted in collecting demographic and socioeconomic information needed for the applications. The survey was accomplished by a door-to-door approach, thereby providing citizen participation in the planning operations.

The major concern during the early planning stages was the cost to potential users. As in many rural areas, the low-income residents needed the system most urgently. VWP provided a $30,000 grant to finance connection fees for 200 low-income families.[13] This assistance also facilitated passage of a countywide mandatory hookup ordinance.

Along with VWP assistance, the New River Community Action Agency performed a door-to-door survey in an effort to determine

the number of low-income families needing hookup assistance and/or FmHA RH loans or grants.[14] Because of such dual agency collaboration, many of these families received FmHA Section 504 RH loans and grants for indoor plumbing. In addition, with outside assistance from such agencies as VWP, the administrative costs of grant and loan application were kept to a minimum.

When the first part of the system had been completed, resistance to system connection became a major concern. Potential users were reluctant to connect to the system and incur monthly water bills. They generally believed that wells used for years were an adequate and free source of supply. County officials realized that a successful system required passing a mandatory hookup ordinance. This action was preceded by a public support campaign. Again, citizens were reached through civic groups and public hearings. Citizens supporting the system were asked to speak in favor of the ordinance at such meetings and at the final public hearing. Supporters of the system outnumbered those opposed by five to one, and the ordinance passed by a unanimous decision of the county board of supervisors.[15]

At the time of this study, the system consisted of 160 miles of water transmission lines and served 2,000 customers. The treatment plant operated at 1-million gallons per day (MGD) and had a capacity of 3 MGD.[16] As funds become available, plans provide for expansion into outlying rural areas. It should be noted that Pulaski County has an average population density of 90 persons per square mile, with many areas having less than 50 persons per square mile. This implies that expansions would not be economically feasible without substantial reliance on grants.

According to Sidney A. Clower, Pulaski County administrator, resistance to system connection and/or payment of water bills is a problem in spite of the mandatory hookup ordinance. Some people simply refuse to connect to the system, and some, already connected, refuse to pay the monthly water bills. Clower states that legal action or condemnation proceedings can be taken against such persons, but on a large scale such action would be damaging to relations between citizens and county government.

In 1978 and 1979, the countywide system lost an average of

$57,000 per year because of operation and maintenance expenses, excluding capital and depreciation costs. The current average water bill is $7.21 per month; a bill of $25.28 per month would be necessary for the system to break even. Clower contends that the sole cause of this problem is too many miles of waterlines and too few customers. He also believes that in spite of past success in funds procurement, citizen involvement, and interagency collaboration, the county has "failed to attract the quality of management people needed to administer the system." In his opinion, there has been insufficient planning, especially concerning water-line cost analysis. For the future, he sees a need to "tighten up management" of the system, along with a need to improve financial management and cost analysis of new extensions.

Observations

Pulaski County's experience in creating a countywide water system illustrates several requirements for successful rural water supply development. A major factor is the general support of the county government and its ability to advance funds at critical periods without waiting for approval of external assistance. Of course, the project indicates the importance of external financial assistance to avoid high water rates; centralized water service in areas of low-population density does not appear feasible with local funding alone.

The Pulaski project has involved effective use of many funding sources, an approach requiring full knowledge of funding availability. From the perspective of the program administrator, the HUD funding program has been superior in quality compared to other federal programs. Nevertheless, both FmHA and EDA are viewed as understaffed and subject to associated weaknesses.

The Pulaski project illustrates an attempt to inform widely and to involve fully the affected citizens in water supply system management. This effort has existed throughout the planning and development of the project and is seen as important to the success of various elements of the project, such as the mandatory hookup ordinance.

Even with the approval of the mandatory hookup ordinance, however, this case study illustrates the problem of citizen resistance to system connection and use. This problem assumes added importance in areas of low-population density where the number of potential customers, and therefore system revenues, is already low. Although the adoption of a mandatory hookup ordinance is a basic response to the problem, the Pulaski project indicates that ordinance adoption may not be the total solution.

IV. Wake Forest Municipal Water System

The town of Wake Forest, North Carolina, the Wake County seat, is located approximately 25 miles east of Raleigh, the state capital. In April 1912, the town board of commissioners appointed a committee to investigate the possibility of building a municipal water-supply system. In a referendum on the issue, public response was favorable, and in October 1920, the board of commissioners agreed to purchase land for a water plant and other necessary facilities. By 1921, the water supply and sewage systems were completed.[17] Approximately 10 years later, water demand had increased, necessitating plant expansion. A subsequent study revealed that expansion would not be feasible with the existing supply source. The town needed a new and adequate raw-water supply, and another nearby surface-water source was selected. In 1936, a low dam, a pump station, and a 300,000-gallon elevated storage tank were constructed, and an 8-inch water main was extended from the intake structure to the treatment plant.

Toward the end of the 1950's, demand again approached system capacity. The existing facilities did not warrant expansion; therefore, it was decided to construct another treatment plant and supply reservoir. The dam and reservoir construction activities were completed in 1960, and the entire system began operating in 1968. The new water supply, Wake Forest Water Reservoir, is a 63-acre lake that has a capacity of 228-million gallons. In 1981, 37 miles of distribution main were serving 1,400 customers, of whom 208 lived outside the municipal limits. The existing plant has a capacity of 2 MGD, but the current demand is only 1 MGD. Treatment includes alum coagulation, flocculation, chlorination, and fluoridation. The retirement dates for a $425,000 municipal

revenue bond issue, which was authorized in 1967 for financing the new treatment plant, range from 1981 through 1990. Because sufficient revenues exist, it is anticipated that bond retirement will be timely.

The distribution system was financed through three sources of grant funds. The two major sources included Wake County and the North Carolina Water Supply Grant program. The Wake County grants were allocated from a general revenue-sharing fund and could be used only for extensions that lay outside the Wake Forest corporate limits. Those distribution lines inside the municipal boundaries were financed primarily through the state-grant program. A HUD Small Cities Program grant of $400,000 also was received for this purpose. Excluding the HUD grant, approximately $5.5 million in grant money was received between 1974 and 1981, 75 percent from Wake County and 25 percent from the state.

In 1981, the Wake Forest water system was connected to the Raleigh distribution system. Wake Forest is not dependent upon this connection but uses the 60,000-gallon per day flow to supplement water it sells to a nearby community (Rolsville). Eight hundred additional residences are serviced in the Rolsville vicinity.

Observations

The Wake Forest municipal water system was created by county officials as part of a countywide plan for industrial and economic development. The emphasis was on increasing the county tax base and providing additional employment opportunities in the area. This plan was responsible for the substantial commitment of county grant funds. State grants also have been significant. In addition, because Wake Forest is located in the same county as the state capital, it drew upon a substantial county tax base.

Financially, the water system realizes a profit. In 1979, water sale revenues amounted to $204,000. All operational expenses were paid from revenues (user fees and connection charges), and no tax funds were used for this purpose. Funds for the administration of the system were allocated from the general fund for public utilities administration. At the end of the year, all tax dollars were paid

back into the general fund from revenues generated by the water system. The system, therefore, was self-supporting in operating costs. The only administrative costs were the wages of one person, employed as a biller and bookkeeper, and one full-time treatment plant operator, and related supplies.

V. Cassatt Water Company

Cassatt Water Company[18] (CWC), a private, nonprofit cooperative, was conceived in 1969 because of the absence of public water supply and unsatisfactory individual wells in the small, rural community of Cassatt, located approximately 40 miles northeast of Columbia, South Carolina. Hettie Rickett, a retired nurse concerned with public health, initiated the project. Existing individual wells were predominantly the dug type, located in hilly areas with extremely sandy soils, and generally shallow, 30-50 feet deep. They were prone, therefore, to pollution from surface runoff and septic tank drainage fields and also to water shortages during summer. The income level of the area population was very low; families served by the wells had an average annual income of $4,500.

The present water system was developed in six planning and construction phases; it now extends into two counties (Lee and Kershaw) and still is expanding. The original plan (phase one), conceived by Rickett, included only a small area in Kershaw County. Planning activities for the first phase began late in 1969. A volunteer town committee performed a door-to-door user survey and developed a preliminary map of the affected area. A consulting firm was then hired to carry out a feasibility study in conjunction with FmHA personnel. Following a positive feasibility report, a charter for company formation was established; Rickett became the executive director and held this position until 1977.

Construction of CWC's original distribution system began in early 1971. This system consisted of 25-30 miles of pipeline, two high-yield wells, two hydropneumatic storage tanks, and one 60,000-gallon elevated storage tank. According to William Allen, present executive director, the company was "very fortunate to find a very fine water source. . . ." The two high-yield wells were approximately 250-300 feet deep and totally free of coliform

bacteria. The water had a somewhat low pH and, therefore, was slightly corrosive. This condition was not corrected until September 1980. Approximately 190 residences and several small businesses benefited from this project. Twenty-five percent of these 190 residential customers previously had no permanent water supply; water had to be hauled to their homes. FmHA served as the major funding source for this first phase and for all phases until the present. For the first phase, FmHA provided CWC with a loan of $175,000, along with a grant of $98,000; a county contribution of $13,000 also was included.

In 1971, planning was initiated to survey residents in additional outlying areas and to assess the economics of a phase-two expansion. With 134 additional pipeline miles, phase two served 125 new customers. A third well was drilled that also did not require treatment, and another hydropneumatic storage tank was constructed. Public interest in this expansion stemmed from phase one. The existing system was extended from the main roads serviced in phase one to connecting secondary roads. Construction was completed and all service connections were made by December 1974. Financing for phase two was accomplished through an FmHA loan of $275,000 and a grant of $270,000. After completing this phase, CWC had more than 350 customers, and the importance of the company as a major community service was apparent. Furthermore, by this time, the company had become well established and financially sound.

To initiate the third phase of the CWC water system (1975), Rickett applied to NDWP, and CWC became an affiliate member of that organization. Assisting CWC to determine where additional interest in a public water supply system was centered, local resident volunteers surveyed potential users in both Kershaw County and neighboring Lee County.

The first part of the construction activities for phase three was the expansion of the water system into two small communities (Beaver Dam and Robinson). In addition, expansion into three small communities (Sandy Grove, Mt. Hebron, and Mt. Zion Church) in southeastern Kershaw County was begun. It was anticipated that the system would extend further to serve unincorporated and outlying portions of southeastern Kershaw County and northern

Lee County.

These two construction projects added 60 pipeline miles to the existing system and provided service to 332 additional residences. The total construction cost was approximately $788,404. FmHA provided a $330,000 loan and a grant of $276,000 which were supplemented by a state grant of $67,000, a NDWP grant of $67,500, and a sum of $10,000 allocated from connection fees.

While these phase-three construction projects were underway, CWC also was engaged in two other activities. CWC bought three smaller, nearby private water systems (Valley Park, Pickett Thomas, and Lake Elliot). This purchase was financed through a state grant of $69,000 and provided CWC with 165 new users. All three systems were connected to the existing distribution system. Two months later, in November 1977, another private system (Wateree Hills Water Company) was acquired. This purchase provided CWC with 34 additional users and was financed by an FmHA loan of $21,322. By this date, the number of connections had increased to 973 residences. The Wateree Hills addition operated separately for one year before being incorporated into the main distribution system.

Phase four constituted the largest expansion CWC had undertaken. This expansion served the northern section of Lee County and areas of Kershaw County, with the largest part of the project in Kershaw County. In Lee County, 200 residences that desired service were added. In Kershaw County, 500 residences were serviced; this section alone was as large as the first three phases. The area serviced was located 10 miles from the main system; therefore, one elevated and three hydropneumatic storage tanks had to be constructed.

The total project cost for phase four, financed through local, state, and federal assistance, amounted to $1,950,810. FmHA provided a loan of $817,000 along with an $802,000 grant. In addition, NDWP provided a $127,000 construction grant, and a state grant of $125,000 was issued. The phase-four customers provided the local contribution of $53,000 in connection fees. Upon completion of this phase in November 1979, CWC's customers totaled nearly 1,800.

The next expansion, (phase 5-a) was CWC's smallest project, intended primarily to provide water for a new high school in Kershaw County. Four additional miles of pipeline were installed to service the school and 21 new residences. Financing was provided through an FmHA loan, a $7,000 NDWP grant, and a $9,000 state grant. Construction was completed in August 1979.

Immediately following this expansion, CWC initiated another project to install a treatment plant for the two high-yield wells constructed as part of phase one. The water from those wells was slightly low in pH and required neutralization and chlorination. Funds were provided through an NDWP grant of $29,000. Construction was completed in September 1980, and CWC increased in size to its present 1,800 users.

CWC has developed a plan for an additional expansion (phase five) to serve two geographical areas. The first area lies within Kershaw County and encompasses 75 square miles, including three small, rural communities (DeKalb, Clyburn, and Westville) and other small clusters of homes. This project is expected to require approximately 30 miles of distribution pipeline. The second area lies entirely within Lee County, including approximately 120 square miles to be served by 72 miles of distribution pipeline. Nine small, rural communities anticipate service from this part of phase five (Ionia, Cedar Creek, Spring Hill, Woodrow, Ashwood, Red Hill, Manville, Hickory Hill, and Browntown). These expansions would provide CWC with a combined total of 350 additional customers. The Kershaw County project would require new wells, storage tanks, and a separate distribution system. This phase (both projects) was estimated to cost $3,206,300.

However, phase five has been temporarily cut in half because of limited FmHA funds. CWC has received an FmHA grant of $97,300 and an FmHA loan of $478,500; state grant funds of $41,000 and a $12,000 NDWP construction grant also have been received. Because of this funding limitation, however, only the Kershaw portion of the project went forward in 1980. Provided funds become available, the Lee County portion was scheduled to begin at a later date (as phase six).

CWC has evolved into a successful, rural public utility. Several factors contributed to this success. From initiation of the company through phase three, all employees performed voluntarily, and since uncontaminated groundwater was the supply source, there were no substantial water treatment requirements. Therefore, in the early stages, overhead and capital costs were low.

The NDWP grant funds proved to be a valuable asset since the money was available for predevelopment costs—planning and preliminary engineering costs necessary for feasibility studies and well tests. The executive director has expressed concern that these funds from NDWP are no longer available to CWC since the potential for such funding from other sources is limited. It is believed that the predevelopment funding has allowed for much more effective planning than would have been possible otherwise. CWC, along with the South Carolina Water Association, now is trying to persuade South Carolina FmHA officials that predevelopment funding should be a major national FmHA endeavor.

A portion of the grant funds received from NDWP was used to assist customers with connection fee payments. Such assistance was valuable to CWC because it helped alleviate citizens' resistance to connection. This resistance was not extensive, and the reason, according to CWC executive director, was that CWC had been involved throughout its development in a continual promotion process. To promote the water system and to arouse public awareness and interest, newsletters and newspaper advertisements were circulated continually within Lee and Kershaw counties.

Another asset to CWC has been its institutional position. Both county governments have designated CWC as the mechanism for rural water development. Regional water supply development interests have been shared among the county governments and the water company. Both counties have representatives on the CWC board of directors, and interaction between the two counties and the water company has been cooperative and constructive. With such collaboration, the water company has been able to

obtain operating funds from both counties. For example, in 1975 CWC received a grant of $25,000 from each county, and this total of $50,000 was matched by NDWP through another $50,000 grant. These grant funds, used entirely for operational needs, allowed CWC to employ an executive director and four full-time employees. The company also purchased a pickup truck, a car, and a trencher-backhoe with a boring unit, so that, without subcontracting, it could clear well sites and install distribution laterals (up to 2,000 feet per year). The operational funds received, therefore, were important to CWC in eliminating substantial subcontracting expenses.

CWC currently has a centrally located office and maintenance building. All billing, collection, maintenance, and managerial activities are conducted from this site. The executive director and four full-time employees are responsible for billing, collecting, meter reading, general office work, maintenance, and repairs.

For fiscal year 1980, the CWC budget was $236,000, with total expenses of $233,434. The company was current on all loan repayments and financially sound. The average monthly customer bill was $9.50. The projected typical operating budget for fiscal year 1981 is represented in *Table 20.* Note that this estimate is based upon completion of phases five and six.

VI. Composite Observations Based on Case Studies

The case studies indicate that many factors contribute to the success or failure of rural water supply efforts. One obvious factor is the dependence of most small systems on a broader-based political institution for financial support. Because of low population densities, centralized public water systems generally cannot be funded entirely by system customers at reasonable rates. While common perceptions of reasonable water rates may be subject to question, the fact that residents of many rural areas are in low-income categories makes this problem particularly significant. Successful rural systems generally have developed effective sources of outside funding.

The support of general-purpose local governments is another factor directly related to rural water system success. The

importance of county funding for the essential aspects of system initiation and operation is illustrated by the Pulaski County Public Service Authority, Wake Forest municipal water system, and Cassatt Water Company cases. The impact of the lack of strong local government support is shown by the Wythe-Bland Water and Sewer Authority case.

Related to local governmental support is general public acceptance of a centralized system. Success of a central system in areas of low-population density may depend on a high proportion of households connecting to the system and paying applicable service charges. The Wythe-Bland case demonstrates the impact of the absence of a mandatory hookup ordinance; however, the Pulaski case indicates that adopting such an ordinance does not necessarily resolve all problems related to public acceptance. In the Pulaski case, this problem is significant, especially in view of the public relations efforts that have accompanied system development.

The cases collectively illustrate the importance of sound planning and financial management during water system development and operation. When resources are scarce, there is a tendency to give inadequate attention to management, and the adverse effects of such practice can be widespread. One consequence of poor management, illustrated by the case studies, is inadequate assessment of the number of customers that realistically can be served by a central water system. Although this particular problem has been alleviated somewhat by requirements imposed by funding agencies, it does indicate the weaknesses often inherent in the existing institutional framework for rural water supply decision making.

VII. Footnotes

1. Unless otherwise noted, all information for this case study was obtained through personal communication from C. Huddle, Executive Director, Wythe-Bland Water and Sewer Authority, Wytheville, Va. to K. Patrizi (Aug. 6, 1980).

2. Water and Sewer Authorities Act, *Va. Code Ann.,* sec. 15.1-1239 *et seq.* (1973).

3. Personal communication from W. Hayes, Sanitary Engineer, Wythe County Health Department, Wytheville, Va. to K. Patrizi (Oct. 21, 1980).

4. Personal communication from H. Hawkes, Director, Farmers Home Administration, Virginia State Office, Richmond, Va. to K. Patrizi (Oct. 27, 1980); Personal communication from R. Muncey, Director, Farmers Home Administration, Virginia District II Office, Wytheville, Va. to K. Patrizi (Oct. 21, 1980).

5. National Demonstration Water Project, "Circuit Riding: The Regional Support Company as a Vehicle for Rural Water-Wastewater Service Delivery," Washington, D.C. (unpublished report 1980).

6. Personal communication from H. Hawkes, Director, Farmers Home Administration, Virginia State Office, Richmond, Va. to K. Patrizi (Oct. 27, 1980).

7. Unless otherwise noted, all information for this case study was obtained through personal communication from J. Booker, member, Fluvanna County Board of Supervisors, Fork Union, Va. to K. Patrizi (Aug. 11, 1980).

8. W. Warren, "Linking Water/Sewer Development to Rural Economic Development in Virginia," Virginia Water Project, Roanoke, Va. (unpublished report).

9. Unless otherwise noted, all information from this case study was obtained through personal communication from S. Clower, Pulaski County Administrator, Pulaski, Va. to K. Patrizi (Aug. 7, 1980).

10. W. Warren, *supra* n. 8.

11. *Id.*

12. *Id.*

13. *Id.*

14. See text of Section III *supra* at n. 1.

15. W. Warren, *supra* n. 8.

16. Personal communication from J. Cox, Treatment Plant Operator, Pulaski County Water Authority, Dublin, Va. to K. Patrizi (Aug. 4, 1980).

17. Unless otherwise noted, all information for this case study was obtained through personal communication from J. Walters, Wake Forest Town Manager, Wake Forest, N.C. to K. Patrizi (Oct. 22, 1980).

18. Unless otherwise noted, all information for this case study was obtained through personal communication from W. Allen, Executive Director, Cassatt Water Company, Inc., Cassatt, S.C. to K. Patrizi (Oct. 1, 1980).

CONCLUSION

The foregoing study indicates the significant problems related to water supply for residents of rural areas and analyzes the laws and governmental programs devised to address these problems. These laws and programs prescribe the organizational arrangements for provision of public water supply, regulate water providers to protect public health and welfare, and provide financial assistance. A principal characteristic of these governmental measures is that they focus largely on systems that provide water supply as a service to independent customers. Although limited measures (for example, certain financial assistance) apply to self-supplied water users, this class generally falls outside the jurisdiction of most governmental measures.

Since most rural water supply problems are related to shortages of funds, there is the tendency to prescribe greater funding by federal and state governments as the remedy for existing problems. However, there is no general agreement on the appropriate level of funding that should be provided. At one end of the spectrum is the view that water should be made available as a governmental service without regard to the individual's ability to pay for the service. Adopting this view obviously would involve significant increases in funding from general tax revenues. In the opposing view, water is a commodity that individuals, or groups of individuals, must obtain at a price reflecting associated costs. The existence of limited financial assistance programs indicates that the currently accepted view falls somewhere between these two extremes.

At the federal level of government, which has provided the greatest funding, levels recently have decreased, perhaps partly because of philosophical views about the role of the federal government, but mostly because of budgetary constraints. If it is assumed that no major increases in federal funding levels can be anticipated in the near future, emphasis will be placed on the need to use existing funding in the most effective manner. Competition for funds can be expected to be intense, stressing the importance of adequate criteria for assessing the relative merits of project proposals. The selection process should give primary emphasis to the urgency of the need to mitigate health risks or other significant

problems and to the degree of financial hardship existing within the affected groups. While these factors are considered under current funding guidelines, certain program procedures may not adequately incorporate these factors in determining priorities among competing applicants. For example, FmHA's "1-percent rule" and "similar-communities rule" do not appear to provide an adequate basis for determining priorities.

At the state level, funding activities vary substantially. The study area for this report includes a state with no financial assistance program (aside from the state participation in the HUD CDBG program), one with a small-scale program, and one with a relatively substantial program. The experiences of the two states with programs, North Carolina and South Carolina, indicate that the programs can significantly help resolve rural water supply problems. State involvement not only can provide direct state funds for the project but also can increase the project's chances of receiving federal funds. In addition to resolving rural water supply problems through direct financial assistance, states also can provide planning and other technical or managerial assistance. Because of their limited planning and managing capabilities, many rural areas and small communities need such assistance, especially in the initial project planning and implementation stages. The North Carolina program of this type provides a useful model.

The recent modification of the HUD CDBG program delegating the nonmetropolitan portion of the program to the states provides for a substantial increase in state involvement. Although this increased involvement generally appears to be a positive development, delegating this program can create potential coordination problems. In North Carolina and South Carolina, for example, the delegated program is administered independently of previously existing state grant programs. Further experience in operating these programs is necessary before potential problems can be analyzed, but fragmentation of authority is a possible defect within the system which could adversely affect the total assistance program unless proper coordination is achieved.

Related to funding and other forms of assistance to rural water supply systems is the impact of state and federal regulation. The

federal government's entry into this area within the last decade has increased the burdens placed on water suppliers. Because of the prevalence of water quality problems associated with rural systems, this development has benefited rural residents from the perspective of health; however, it has created additional financial problems which may have jeopardized the continued existence of certain public water supply systems.

Public water systems that cannot reasonably meet standards imposed under the federal Safe Drinking Water Act vary in the extent to which they pose a threat to public health. If a significant risk to health exists, forced termination of such operations appears to be the logical solution where necessary improvements cannot be implemented. If the risk to health is relatively low, however, the system may be preferable to alternative water supplies, even though it violates certain legally imposed standards. An example of this situation would be an area in which the alternative to a public water supply system involves use of privately owned individual wells dependent upon a contaminated groundwater supply source. SDWA recognizes such situations and provides for exceptions, in the form of variances and exemptions, from certain of the law's requirements provided that no unreasonable risk to public health is created thereby. These provisions distinguish between a "risk" to public health, which is assumed to occur whenever a primary drinking water standard is violated, and an "unreasonable risk," which may be judged to occur at some level of contamination after the applicable standard already has been violated. This approach attempts to avoid excessive rigidity in application of the law.

Exemptions have been particularly significant to many rural water supply systems. When compliance with certain water quality requirements is impossible because of such factors as economic conditions, exemptions may allow continued operation of the system. Exemptions now are scheduled to expire by the beginning of 1984 (1986 for regional systems). Prior to the expiration date, this provision will need re-evaluation to determine if conditions merit continuing the exemption mechanism.

Many of the unresolved issues associated with rural water supply involve value judgements along with technical and economic issues. Questions such as the proper level of funding assistance

require consideration of the role and responsibility of government, issues that are broader than is the water supply problem. Similarly, questions of whether and under what conditions exemptions from drinking water standards under SDWA should be continued are a basic policy issue not subject to scientific determination. The existence of these and other unresolved questions indicates that governmental response to rural water depends upon social policies that can be determined only by action of a political majority at a particular time.

Despite the prevailing political concensus on these fundamental issues, a continued attempt should be made to assure that institutional mechanisms for implementing policy operate effectively. This is needed to achieve the greatest benefit from a given commitment of resources. A major consideration is the need for coordination of related programs, especially in the area of financial assistance where multiple programs that vary with the amount of local cost sharing create inefficiencies and confusion. One prominent characteristic of the rural water supply situation is the absence of centralized responsibility. Public involvement includes all different levels of government. Although it is unlikely that complete consolidation would be either possible or desirable, increased coordination of the component parts of the institutional structure would be beneficial.

State government should have a primary role in coordination. While local governments in rural areas have neither the necessary resources nor the managerial capabilities to solve certain problems, and the federal government is too far removed to give detailed consideration to local problems, state government provides unique managerial capabilities. Direct responsibility for system construction and operation should continue to be a local responsibility, but state government should provide planning and other assistance as necessary. The federal government should continue to provide some financial assistance and set regulatory guidelines for consistent health protection among the states, but federal funding and regulation should be implemented through, rather than independently of, state governments. The HUD CDBG program for nonmetropolitan areas is a good example of this approach. Acceptance of this responsibility by state government and development of effective state programs for resolving rural

water supply problems constitute a significant step in the improvement of the institutional framework affecting rural water supply.

TABLES

TABLE 1
Comparative Costs of Water Supply According to Size of Service Population*

	Size of Population Served			
	<1,000	100-10,000	10,000-100,000	100,000
Number of systems	22,954	8,992	2,442	243
Population served (Millions)	6.6	26.7	73.8	85.1
Operation (Mean dollars 1,000/gal.)	0.77	0.60	0.40	0.31
Interest (Mean dollars/ 1,000/gal.)	0.15	0.10	0.07	0.05
Depreciation (Mean dollars 1,000/gal.)	0.21	0.07	0.05	0.04
Capital (Mean dollars/1,000 gal./yr)	14.52	9.47	4.84	3.49

*Source: U.S. Environmental Protection Agency, "Water Supply/Wastewater Treatment Coordination Study," pp. 300-301 (Draft 1979).

TABLE 2
Annual Per Capita Treatment and Monitoring Cost Ranges for Four Size Categories*

Treatment†	Smallest Systems (25-99 People Served)	Small Systems (100-9,999 People Served)	Medium Systems (10,000-99,000 People Served)	Large Systems (Over 100,000 People Served)
Disinfection	3.85- 2.10	2.75- 0.30	0.45- 0.15	0.25
Turbidity Control	152.00- 52.00	78.00-16.00	20.00-12.50	15.00
Heavy Metal Removal	237.00-101.00	142.00-25.50	35.00-13.00	18.00
Lead Control—pH	2.60- 1.20	1.80- 0.30	0.40- 0.20	0.30
Fluoride/Arsenic	11.80- 7.85	11.30- 3.15	5.00- 3.15	3.55
Monitoring	15.80- 0.85	3.75- 0.05	0.20- 0.05	0.05

*Source: U.S. Environmental Protection Agency, "Water Supply/Wastewater Treatment Coordination Study," pp. 300-301 (Draft 1979).

†Lower cost limit is based on the assumption that the treatment plant was built to treat average daily demand, and upper cost limit is based on maximum daily demand, except for the Large Systems category in which costs are based on average daily demand only.

TABLE 3
Characteristics of State-Authorized Institutional Arrangements for the Provision of Public Water Supply in North Carolina

Entity	Creation Method	Independent Public Corporate Body	Regulation Issuance	Eminent Domain	Taxing Power	Bonds Issuance	Contract	Subject to N.C. Utilities Commission Regulation	Debt Limit
Municipal and County Governments	Action of governing body	yes	yes	yes	yes	yes	yes	no	40 years
County Water and Sewer Districts	Resolution by county board of commissioners	yes	yes	yes	yes	yes	yes	no	40 years
County Service Districts	Resolution by county board of commissioners	no	yes	yes	yes	yes	yes	no	40 years
Metropolitan Water Districts	Petition to county board of commissioners by 2 or more localities	yes	yes	yes	yes	yes	yes	no	40 years
Sanitary Districts	Citizen petition to county board of commissioners	yes	yes	yes	yes	yes	yes	no	40 years

TABLE 3 (continued)

Characteristics of State-Authorized Institutional Arrangements for the Provision of Public Water Supply in North Carolina

Entity	Creation Method	Independent Public Corporate Body	Regulation Issuance	Eminent Domain	Taxing Power	Bonds Issuance	Contract	Subject to N.C. Utilities Commission Regulation	Debt Limit
Water and Sewer Authorities	Resolution by 2 or more incorporated political subdivisions	yes	yes	yes	no	yes (revenue only	yes	no	40 years
Private Water Supply Companies	Application to N.C. Utilities Commission & filing of articles of incorporation with state	no	yes	yes	no	no (stocks only)	yes	yes	inapplicable
Cooperative Associations†	Mutual agreement among at least 5	no	yes	yes	no	no	yes	yes	40 years

*For those institutional entities that are not independent public corporate bodies, the subsequently listed powers and characteristics are vested in the county or municipal government responsible for their creation.

†This entity is an exception to the above footnote. Private nonprofit corporations are not public corporate bodies; however, the powers are vested in the Board of Directors.

TABLE 4

Characteristics of State-Authorized Institutional Arrangements for the Provision of Public Water Supply in South Carolina

Entity	Creation Method	Independent Public Corporate Body*	Regulation Issuance	Eminent Domain	Taxing Power	Bonds Issuance	Contract	Subject to S.C. Public Service Regulation	Debt Limit
Municipal and County Governments	Action of governing body		yes	yes	yes	yes	yes	no	40 years
Special-Purpose Districts	Citizen petition to county court	yes	yes	yes	yes (upon county approval)	yes	yes	no	40 years
Rural Community Water Districts	Citizen petition to county or municipal government	yes	yes	yes	no	yes (revenue only)	yes	no	40 years
Private Water Companies	Application to S.C. Public Service Commission & filing of articles of incorporation with state	no	yes	yes	no	yes (stocks also)	yes	yes	inapplicable

TABLE 4 (continued)

Characteristics of State-Authorized Institutional Arrangements for the Provision of Public Water Supply in South Carolina

Entity	Creation Method	Independent Public Corporate Body*	Regulation Issuance	Eminent Domain	Taxing Power	Bonds Issuance	Contract	Subject to S.C. Public Service Regulation	Debt Limit
Private Nonprofit Corporations†	Filing of articles of incorporation with state by 3 or more persons	no	yes	yes	no	yes	yes	no	40 years

*For those institutional entities that are not independent public corporate bodies, the subsequently listed powers and characteristics are vested in the county or municipal government responsible for their creation.

†This entity is an exception to the above footnote. Private nonprofit corporations are not public corporate bodies; however, the powers are vested in the Board of Directors.

TABLE 5

Characteristics of State-Authorized Institutional Arrangements for the Provision of Public Water Supply in Virginia

Entity	Creation Method	Independent Public Corporate Body*	Regulation Issuance	Eminent Domain	Taxing Power	Bonds Issuance	Commission Contract	Subject to State Corporation Regulation	Debt Limit
Municipal and County Governments	Action of governing body	yes	yes	yes	yes	yes	yes	no	40 years
Sanitary Districts	Citizen petition to circuit court	no	yes	yes	yes	yes	yes	no	34 years
Public Facility Districts	Citizen petition to circuit court	no	yes	yes	yes	yes	yes	no	40 years
Service Districts	Request by a local government within a Planning District	yes	dependent upon charter	yes	dependent upon charter	yes	yes	no	40 years
Water and Sewer Authorities	Resolution by county or municipal governing body	yes	yes	yes	no	yes (revenue only)	yes	no	40 years

TABLE 5 (continued)

Characteristics of State-Authorized Institutional Arrangements for the Provision of Public Water Supply in Virginia

Entity	Creation Method	Independent Public Corporate Body*	Regulation Issuance	Eminent Domain	Taxing Power	Bonds Issuance	Commission Contract	Subject to State Corporation Regulation	Debt Limit
Private Water Companies	Application to State Corporation Commission & filing of articles of incorporation with state	no	yes	yes	no	yes (stocks also)	yes	yes	inapplicable

*For those institutional entities that are not independent public corporate bodies, the subsequently listed powers and characteristics are vested in the county or municipal government responsible for their creation.

TABLE 6
Rural Water Supply—Federal Assistance Programs

Federal Department, Agency, and Programs	Authorizing Statute
U.S. Department of Agriculture—Farmers Home Administration	
1) Rural Housing Loans (sec. 502)	Housing Act of 1949
2) Rural Housing Loans and Grants (sec. 504)	
3) Water and Waste Disposal Loans and Grants	Consolidated Farm and Rural Development Act of 1961
U.S. Department of Housing and Urban Development—Office of Community Planning and Development	
1) Community Development Block Grant Program*	Housing and Community Development Act of 1974
U.S. Department of Commerce—Economic Development Administration	
1) Public Works and Economic Development Facilities Program	Public Works and Economic Development Act of 1961
2) Technical assistance	
3) Local Public Works Capital Development and Investment Programs	Local Public Works Capital Development and Investment Act of 1976
U.S. Environmental Protection Agency	
1) Private Market Loan Guarantees	Safe Drinking Water Act of 1974
Appalachian Regional Commission	
1) Supplementary Grant Program	Appalachian Regional Development Act of 1965

*State government can obtain approval to administer in nonmetropolitan areas.

TABLE 7
Farmers Home Administration Section 502 and Section 504 Rural Housing Loan and Grant Appropriations for FY 1980*

Type of Assistance	North Carolina	South Carolina	Virginia
502 Subsidized	$109,000,000	$51,000,000	$64,000,000
502 Nonsubsidized	50,000,000	22,000,000	13,000,000
502 Guaranteed	20,000,000	10,000,000	11,000,000
504 Subsidized	100,000	570,000	470,000
504 Grants	210,000	560,000	520,000
Total	$179,310,000	$84,130,000	$88,990,000

*Personal communication from H. Hawkes, Director, Farmers Home Administration, Virginia State Office, Richmond, Va. to K. Patrizi (October 27, 1980).

TABLE 8
Farmers Home Administration Water and Waste Disposal Loan and Grant Program Appropriations*

Type of Assistance	Appropriations			
	FY 1980			
	National	Virginia	North Carolina	South Carolina
Loan Funds	$700,000,000	$18,140,000	$30,690,000	$16,995,000
Grant Funds	$300,000,000	$ 7,765,000	$13,135,000	$ 7,280,000

Projected National Allocation for Water and Waste Disposal Loan and Grant Program

FY 1981

Loan Funds	$400,000,000
Grant Funds	$100,000,000

*Personal communication from H. Hawkes, Director, Farmers Home Administration, Virginia State Office, Richmond, Va. to K. Patrizi (October 27, 1980).

TABLE 9
Selection Criteria for Community Revitalization Grants Under the North Carolina CDBG Program*

Selection Criteria	Points
Community needs	100
Financial design	150
Program design	250
Benefit to low- and moderate-income persons	200
Other public and private funds	100
Consistency with state policies/programs	100

*Division of Community Assistance, North Carolina Department of Natural Resources and Community Development, "North Carolina Community Development Block Grant Program," *N.C. Admin. Code,* subch. 13L at sec. .0505 (1982).

TABLE 10
Weighting System for Community Improvement Grant Selection in Virginia's CDBG Program*

Criteria		Percent Weight
Indicators of community relative need		
Income (adjusted gross income and transfer payments)		10
Population change		8
Unemployment		8
Tax effort/ability index		8
Total community relative need		34
Indicators of community grant impact		
Relationship to state priorities		8
Relationship to regional priorities		8
Impact on community needs and objectives		50
Impact on local objectives	5	
Reasonable project cost	5	
Leveraging	10	
Benefit to low- and moderate-income residents	15	
Impact on community economic development housing and/or community facility needs	15	
Total community improvement grant impact		66
System Total		100

*Virginia Department of Housing and Community Development, "Fund Distribution Plan—Commonwealth of Virginia Community Development Block Grant Program" (1982), Appendix C at p. 35.

TABLE 11
Account Appropriations and Annual Allotments of the North Carolina Clean Water Fund

Fiscal Years	Clean Water Fund (Total)	Water Supply Systems Account		Pollution Control Account	Contingency Account
		County Allocation	General Allotments		
1978	$ 46,000,000	$15,800,000	$ 6,200,000	—	—
78-79	$ 92,000,000	$31,600,000	$12,400,000	—	—
78-79-80	$138,000,000	$47,400,000	$18,600,000	—	—
78-79-80-81	$184,000,000	$63,200,000	$24,800,000	—	—
78-79-80-81-82	$230,000,000	$79,000,000	$31,000,000	$112,500,000	$7,500,000
5-year total	$230,000,000	$110,000,000		$112,500,000	$7,500,000

TABLE 12
South Carolina Rural Water and Sewer Grant Program—Annual Appropriations*

Fiscal Year	Appropriation
1974	$100,000
1975	$500,000
1976	$100,000
1977	$576,648
1978	$130,000
1979	$347,400
1980	$430,000

*Memorandum from F. Coleman, Advisor, South Carolina Rural Water and Sewer Grants Program, to Barnwell on "Accomplishments of the South Carolina Department of Health and Environmental Control," Columbia, S.C. (September 23-24, 1980).

TABLE 13
Criteria for Determining Applicant Priority Under the South Carolina Water Supply Grant Program*

Criteria	Weight Factor
1. Anticipated water bill/month	4.57
2. Ratio customers signed/potential customers in project area	4.00
3. Median family income/year for project area	5.00
4. Project cost/connection	2.28
5. Loan portion of cost/connection	2.00

*Personal communication from F. Coleman, Advisor, South Carolina Rural Water and Sewer Grants Program, South Carolina Department of Health and Environmental Control, Columbia, S.C. to K. Patrizi (September 23-24, 1980).

TABLE 14
Comparison of Funding Under the North Carolina and South Carolina Water Supply Grants Program

	North Carolina	South Carolina
Average number of water supply projects funded per year	86	9
Average annual appropriation committed to water supply projects	$22,000,000	$ 364,000
Average annual total costs of water supply projects funded	$85,000,000	$10,000,000
Average percentage of total project cost financed through state grant money	25	5

TABLE 15
Primary Maximum Contaminant Levels for Specified Contaminants as Set Forth by NIPDWR*

Substance	Primary Maximum Contaminant Level (mg/l)
Inorganic Chemicals	
Arsenic (As)	0.05
Barium (Ba)	1.0
Cadmium (Cd)	0.010
Chromium (Cr)	0.05
Fluoride (Fl)	1.4-2.4
Lead (Pb)	0.05
Mercury (Hg)	0.002
Nitrate (AsN)	10.0
Selenium (Se)	0.01
Silver (Ag)	0.05
Organic Chemicals	
Chlorinated hydrocarbon insecticides	
Endrin	0.0002
Lindane	0.004
MethoxyChlor	0.1
Toxaphene	0.005
Chlorophenoxy herbicides	
2,4-D	0.1
2,4,5-TP or Silvex	0.01
Radiological Quality	
Total Radium (Radium-226 and Radium-228)	5 p Ci/l
Gross alpha activity (including Radium-226 and excluding Radon and Uranium)	15 p Ci/l

*Source: U.S. Environmental Protection Agency, "National Interim Primary Drinking Water Regulations," 40 *C.F.R.*, sec. 141.1 *et seq.* (1979).

TABLE 16
Frequency of Coliform Sampling*

Population Served	Minimum Number of Coliform Samples Per Month
25-1000	1
1001-2500	2
2501-3300	3
3301-4100	4
4101-4900	5
4901-5800	6
5801-6700	7
6701-7600	8
7601-8500	9
8501-9400	10
9401-10300	11

*Source: U.S. Environmental Protection Agency, "National Interim Primary Drinking Water Regulations," 40 *C.F.R.*, sec. 141.21 (1979).

TABLE 17
Number of Customers and Delivery Rate for Each Wythe-Bland Water and Sewer Authority System*

	Population Served		Delivery Rate (gpd)
	January 1980	May 1980	
Ivanhoe	260	289	42,000 to 65,000
Bland	143	140	45,000 to 55,000
Speedwell	90	92	20,000 to 30,000
Total	493	521	

*Personal communication from C. Huddle, Executive Director, Wythe-Bland Water and Sewer Authority, Wytheville, Va. to K. Patrizi (August 6, 1980).

TABLE 18
Funding Sources and Amounts for Wythe-Bland Water and Sewer Authority*

Source	Grants	Loans
Farmers Home Administration	$600,000	$694,000 (1968-1979)
Department of Housing and Urban Development	$370,490 42,000	
Appalachian Regional Commission	$203,110	
Local matching	$226,400	

*Personal communication from C. Huddle, Executive Director, Wythe-Bland Water and Sewer Authority, Wytheville, Va. to K. Patrizi (August 6, 1980).

TABLE 19
Funding Agencies and Amounts for Pulaski County Water Authority

Agency	Loans	Grants
Farmers Home Administration	$4,971,300	$2,373,500
Department of Housing and Urban Development		1,000,000
Appalachian Regional Commission		1,000,000
Virginia Water Project		30,000
Total	$4,971,300	$4,403,500

TABLE 20
Typical Operating Budget for Cassatt Water Company*

Budget		
Income (Typical year 1980-1981)		
Water sales (2450 users x $9.50/mo x 12 mo/yr)	$279,300	
Membership fees (100 x $10)	1,000	
Tap fees (100 x $240)	24,000	
Late, reconnect, and service charges (2% of sales)	5,585	
		$309,885
Operation and Maintenance Expenses		
Personnel (5 full-time employees)	$70,000	
Directors	1,600	
Annual meeting	500	
Office expenses	22,500	
Utilities, repairs, fuel, supplies, etc.	50,000	
Taxes	500	
Doubtful accounts	2,000	
Contingencies	11,400	
Subtotal	$158,500	
Debt Payment		
1st Loan (Phase I)	10,284	
2nd Loan (Phase II)	11,016	
3rd Loan (Phase III)	19,572	
4th Loan (Wateree Hills)	1,410	
5th Loan (Phase IV)	48,492	
6th Loan (Phase V-Proposed)	46,710	
Total debt repayment	$137,484	
Reserve	13,748	
Total Operation and Management, Debt Repayment, Reserve		309,732
Balance		$ 153

*Personal communication from W. Allen, Executive Director, Cassatt Water Company, Inc., Cassatt, S.C. to K. Patrizi (October 1, 1980).

APPENDICES

APPENDIX A

Ad Hoc Task Force Recommended Project Selection System for Farmers Home Administration's Water and Waste Disposal Loan and Grant Program*

*Center for Community Change, Ad Hoc Task Force on Rural Water/Sewer Program Reform, "Grant Rate Determination: A Recommended Formula," Washington, D.C. (unpublished report 1980).

Over the past three years, FmHA has distinguished itself by redirecting scarce program funds through private banking and bonding markets to those rural areas with the worst needs and the least capacity to deal with them. However, because the targeting of water and waste disposal funds has not progressed as well as in other areas (particularly housing), we suggest that FmHA consider at least two alternatives to use in the water and waste program for establishing a project selection system based on community need. The first alternative is based on FmHA's own proposed ranking system for funding rural rental programs; the second uses the HUD Community Development Block Grant system, with modifications.

The principles of these proposed ranking systems are simple:

1. All preapplications should be pooled and ranked quarterly, probably at the state office level to ensure the sufficiency of grant funds for the highest priority projects.

2. All preapplications should be subject to the system. The national office reserve could operate to fund projects of importance to FmHA (for example, on Indian reservations, joint-funded minority projects, very low-income projects) which did not rank high enough to be fully funded with the available grant allocation to the state.

3. If factors are important enough to be included in a ranking system, then they should all be considered, allowing their relative worth to be taken into account by a simple numerical weighting system, rather than by a system which permits the satisfaction of one factor to wipe out all others.

A Proposed Ranking System: the FmHA Housing Model

The data needed for certain factors should be taken from the best available source covering the smallest geographic area possible; enumeration district census data and town surveys, for example, are more likely to provide a more accurate description of the project service area than would countywide data, which may encompass significant differences in the income and racial composition of the population.

Criteria	Points
A. Projects serving communities with high levels of poverty. Poverty level is defined as 50% of household median income.	
25% or more below poverty level	5

20-24% below poverty level	4
15-19% below poverty level	3
10-14% below poverty level	2
Less than 10% below poverty level	1

B. Projects serving smaller communities.

Less than 1,000 population	5
1,000 to 2,500 population	4
2,500 to 4,000 population	3
4,000 to 5,500 population	2
5,500 to 10,000 population	1

C. Projects remedying health hazards (well contamination, sewage surfacing, etc.).

Health hazard	5
No health hazard	0

D. Projects remedying inequality in service to minority or low-income populations.

Within corporate boundaries or service area	5
Immediately adjacent to the above	5

E. Communities supporting the upgrading or development of low- and moderate-income housing.

Actions in support of the above	5
Actions in opposition to the above	0

APPENDIX B

Ad Hoc Task Force Recommended Grant-Rate Determination Formula for Farmers Home Administration's Water and Waste Disposal and Grant Program*

*Center for Community Change, Ad Hoc Task Force on Rural Water/Sewer Program Reform, "Grant Rate Determination: A Recommended Formula," Washington, D.C. (unpublished report 1980).

FmHA currently uses two separate and independent rules to determine the percentage of grant funds it will provide to any water or waste disposal facility project: a modified form of the "1-percent rule" and "similar-communities" or "reasonable-rate rule."

Several serious problems are associated with the use of these rules:

- Empirical analyses show they do not achieve their intended targeting effect.
- They provide an incentive to increase the capital cost of the project by offering a community all-grant funding (subject only to the 75-percent limitation) for all additional capital costs once the "1-percent rule" level on debt burden is achieved.
- They provide a disincentive to joint funding by requiring the withdrawal of FmHA funds if other program funds will reduce the debt service portion of the user bill below the amount required under the "1-percent rule."
- They are interpreted in very different ways in different FmHA state offices.
- An applicant cannot predict the grant rate for which it may qualify.

Recommended Formula

The Ad Hoc Task Force recommends the following formula based on the two factors of a community's income level and size:

$$G = 204 - 1.67M - 0.0085P$$

G is the grant rate percentage to be applied to the project. It will not exceed the statutory maximum rate of 75 percent. Any project in which G equals less than 25 percent will not receive any FmHA funds. This will avoid draining grant funds off to projects in larger or higher income communities.

M is the community's median family income expressed as a percentage of the statewide rural median family income. The percentage is used in this formula as a whole number. The community is the "project area" for the project, for example, the geographic area directly served by the project's facilities.

P is the total population of the "project area." (In multi-community projects it is calculated in the same way as it is for the project selection system.)

The formula's operation is illustrated in the attached table showing the grant rate percentages for communities of different size and median family income levels.

Rationale for Recommended Formula

The recommended formula is based on two measurable indicators of need—income and community size—both of which are related to a community's ability to finance its own facilities.

The recommended formula would replace both of the existing rules, the modified "1-percent rule" and the "similar-communities rule." The new formula can be calculated independently of factors relating to a system's debt, the user rates, or the nature of the other financing involved, all of which imply certain subjective judgments by federal staff concerning the community's worthiness for federal assistance.

The recommended formula would be:

- Provide an incentive to reduce project cost by forcing the community to raise a percentage of the project cost for all aspects of the project.

- Be simple to use, predictable in its application and treat all applicants uniformly.

- Relate the targeting of grant funds directly to a community's ability to pay.

- Reflect actual experience in the administration of the program.

APPENDIX C

Project-Priority Rating System for the
North Carolina Water Supply Grant Program*

*North Carolina Department of Human Resources and Department of Natural Resources and Community Development, "Rules and Regulations Governing State Grants for Wastewater Treatment Works, Wastewater Collection Systems and Water Supply Systems," *N.C. Admin. Code,* tit. I, ch. 22 (1977).

Administration - Clean Water Bond Act 22.0700

Section .0700 - Priority Criteria for Water Supply Systems Projects

.0701 Public Necessity: Health, Safety, and Welfare
Maximum Value—55 points:

(1) System and Service Area Needs: (Maximum Points—20)

(a) The project is intended solely to increase the source of raw water to meet existing service area needs or to alleviate water shortage problems. 12 points

(b) The project is intended to improve an existing system with no increase in the area to be served. 12 points

(c) The project is intended to increase the existing area to be served without improvement of the existing system. 14 points

(d) The project is intended to increase the existing area to be served and includes needed improvements to the existing system. 16 points

(e) The project is intended to significantly increase the existing area to be served, includes needed improvements to the existing system, and is so designed as to permit interconnection at an appropriate time with an expanding metropolitan, areawide, or regional system. 20 points

(f) The project is intended to provide for construction of a basic system for a unit of government which is not presently served by an approved public water supply system. 20 points

(2) Public Health Need (Maximum Points—15). If one item of this categorical element applies, the value of 10 points will be awarded. If both items apply, a maximum of 15 points will be awarded:

(a) The project is intended to alleviate an urgent or immediately anticipated water shortage problem which has significant public health implications. 10 points

(b) The project is necessary to eliminate a potential public health hazard. 10 points

Notwithstanding other provisions relating to the assignment of priority

point values for various categorical elements and items, the division of health services may award a higher priority value to an eligible application if the proposed project is required to eliminate a demonstrated or critical hazard to the public health.

(3) Capacity for Future Growth (select one) (Maximum Points—20):

(a) The project is intended to provide for the immediate needs. 6 points

(b) The project is intended to provide for the reasonable foreseeable growth needs of the area during the next 5-10 years. 10 points

(c) The project is intended to provide for the reasonable foreseeable growth needs of the area during the next 11-15 years. 12 points

(d) The project is intended to provide for the reasonable foreseeable growth needs of the area during the next 16-20 years. 14 points

(e) The project is a proposed regional system or a major component of a regional system which is intended to provide for the reasonable foreseeable growth needs of the area to be served during the next 20 or more years. 20 points

History Note: Statutory Authority S.L. 1977, Ch. 677; Eff. February 1, 1976; Readopted Eff. February 27, 1979.

.0702 Compatibility with State, Regional, and Local Planning
Maximum Value—10 points:

The value of this categorical element is the sum of the points awarded to either Item (1), (2), or (3), and the points assigned to Item (4) of this Rule:

(1) In the absence of applicable local, areawide, or regional planning, the project has been endorsed officially by the appropriate planning agencies or by the appropriate elected officials of the county or counties in which the project is located or proposed to be located. 5 points

(2) The project is compatible with applicable local, areawide, or regional planning in the county or counties in which the project is located or proposed to be located. 6 points

(3) The project is compatible with applicable local, areawide, or regional planning in the county or counties in which the project is located or proposed to be located and has been officially endorsed by the appropriate planning agencies. 8 points

(4) The project is compatible with the state's general program of water supply planning for the county or counties in which the project is located or proposed to be located or is in compliance with a regional water supply system plan approved by the division of health services. 2 points

History Note: Statutory Authority S.L. 1977, Ch. 677; Eff. February 1, 1976; Readopted Eff. February 27, 1979.

.0703 Financial Considerations
Maximum Value—35 points:

(1) Financing of the Project (Select One) (Maximum Points—10):

(a) Applicant has received a commitment for a grant from a federal agency. 5 points

(b) Applicant has funds available or bonds have been authorized to provide the applicant's share of the project costs, but a commitment for a grant has not been received from a federal agency. 5 points

(c) Applicant has funds available or bonds have been authorized to cover project costs over and above the state grant funds requested. 10 points

(2) Fiscal Responsibility of the Applicant (Maximum Points—10). The value of this categorical element shall be the sum of the points awarded Items (a) to (e) of this Paragraph:

(a) The applicant has followed proper accounting and fiscal reporting procedures as reflected in the applicant's most recent report of audit, and the applicant is in substantial compliance with the provisions of the general fiscal control laws of the state. 2 points

(b) The applicant has an effective tax collection program. 2 points

(c) The additional debt service requirements resulting from the project will not increase the existing tax rate excessively. 2 points

(d) Estimated revenues will provide funds for proper future operation, maintenance and administration, reasonable expansion of the project, estimated annual principal and interest requirements for the project debt, and annual principal and interest requirements on the outstanding debt incurred for existing facilities. 2 points

(e) The applicant has established or has submitted a resolution of its governing body directing the establishment of a capital reserve fund into which all surplus revenues from charges and fees will be placed for the purposes specified in Rule .0205(b) (4) of this Chapter. (Copy of the resolution must be submitted with the application.) 2 points

In determining the points to be awarded this categorical element, the division of health services may seek the comments of the Secretary of the Local Government Commission. Applicants not authorized to levy taxes shall be eligible to receive two points for Item (b) and two points for Item (c) of this Paragraph.

(3) Financial Need of the Applicant (Maximum Points—15). The financial need of the applicant will be determined by the following formula:

f x 100 (Total Bonded Indebtedness plus Total Estimated Points = Projected Cost)
Total Appraised Property Valuation

"Total bonded indebtedness" includes all outstanding bonds as of the first day of the quarter in which the project application is eligible for consideration for the assignment of a priority but shall not include bonds already authorized or sold to finance the proposed project.

"Total appraised property valuation" refers only to real property valuation based on the most recent appraisal for tax purposes as officially recorded in the county or counties in which the service area of the proposed project is to be located.

"f" shall be a factor of 1.5 for project applications from units of government located in counties or areas designed by the Economic Development Administration as a "qualified area" under the Public Works and Economic Development Act of 1965 as amended. For all other applications, the factor shall be 1.25.

"f x 100" is used in the formula to provide point values for this categorical element.

History Note: Statutory Authority 5.L. 1977, Ch. 677; Eff. February 27, 1979.

.0704 Environmental Assessment

No points will be awarded to this categorical element. However, both the beneficial and adverse effects of the project on the environment will be considered in the award of points on related applicable elements and items in Rules .0701 and .0702 of this Section.

History Note: Statutory Authority S.L. 1977, Ch. 677; Eff. February 27, 1979.

APPENDIX D

Priority Rating System for South Carolina
Rural Water and Sewer Grant Program

A. Extract value for each criterion item from project application and supporting data.

B. Normalize data for each criterion such that the value for the highest priority item is reduced to (1) and all other to less than (1).

   a. On items for which higher value has higher priority, divide value for each project by highest value.

   b. On items for which lower value has higher priority, divide value for each project into lowest value.

C. Multiply reduced numbers by weight value for that item.

D. Determine project priority by summing weighted values for all items for that project. The higher value obtained has the higher priority.

   Weight factors were determined by the grants committee:

   1. Criteria were selected.
   2. Each committee member arranged in order of recommended priority.
   3. Average ranking of each item is its weight factor.

Criteria	Weight Factor
1. Anticipated water bill/month	4.57
2. Ratio customers signed/potential customers in project area	4.00
3. Median family income/year for project area	5.00
4. Project cost/connection	2.28
5. Loan portion of cost/connection	2.00

APPENDIX E

National Demonstration Water Project's
Current Affiliate Projects

1. Appalachian Water and Sewer Development Association, Logan, West Virginia.

2. Beaufort-Jasper Comprehensive Health Services, Inc., Ridgeland, South Carolina.

3. Cassatt Water Company, Cassatt, South Carolina.

4. Colorado Rural Housing Development Corporation, Brighton, Colorado.

5. Community Resources Group, Inc., Fayetteville, Arkansas (an organization serving three community action agencies).

6. Community Water and Sewer Association, Quincy, Florida (a consortium of rural electric cooperatives in Florida and Alabama).

7. Government Services Equalization Center, Washington, D.C. (working in Georgia and Florida).

8. Institute for Rural Water, Washington, D.C.

9. Kentucky Rural Housing and Development Foundation, Inc., Louisville, Kentucky.

10. Lee County Cooperative Clinic, Marianna, Arkansas (a major part of the project is conducted by Delta Utilities Service Company).

11. Louisiana Housing Assistance Corporation, Baton Rouge, Louisiana.

12. Low-Income Housing Development Corporation, Durham, North Carolina.

13. Military Highway Water Supply Corporation, Progreso, Texas.

14. Mississippi Institute for Small Town Development (Small Town Water/Sewer Research and Demonstration Project), Jackson, Mississippi.

15. Montana League of Cities and Towns, Helena, Montana.

16. Montgomery County Office of Environmental Planning, Rockville, Maryland.

17. Monroe Health Center, Union, West Virginia.

18. National Conference of Black Mayors, Atlanta, Georgia (working in Texas and Virginia).

19. National Council of La Raza, Washington, D.C. (serving Arizona and Colorado).

20. National Water Well Association, Columbus, Ohio (working in West Virginia).

21. New England Rural Community Assistance Program, Inc., Stratham, New Hampshire.

22. New Mexico Water Development and Support Corporation, Albuquerque, New Mexico (this program is conducted through Home Education Livelihood Program, Albuquerque; Northern Rio Grande Water Development and Support Corporation, Espanola; and Dona Ana Development and Support Corporation, Las Cruces).

23. Orange-Chatham Comprehensive Health Services, Inc., Carrboro, North Carolina.

24. Rural Cities Administration Program, Walnut Grove, Minnesota.

25. Rural Community Assistance Corporation, Sacramento, California.

26. Rural Housing Improvement, Inc., Winchendon, Massachusetts.

27. Southern Rural Health Care Consortium, Red Bay, Alabama.

28. Virginia Water Project, Inc., Roanoke, Virginia.

29. Water Resources Assistance Corporation, Prestonburg, Kentucky.

30. Wisconsin Rural Housing Cooperative, Madison, Wisconsin.