Final Report of the Rural Water Systems Project

February, 1995

A Technical Assistance Project of the
Community Development Block Grant Program
Department of Economic Development, State of Missouri

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Introduction

This report presents the results of the Rural Water Systems Project, one part of a Technical Assistance Grant Program awarded to the Missouri Department of Economic Development from the U.S. Department of Housing and Urban Development.

State CDBG Program

The Department of Economic Development (DED) administers the Missouri Community Development Block Grant Program (CDBG) which provides approximately $30 million annually to communities for job creation, addressing public facility problems and neighborhood revitalization. Improving the living environment for low and moderate income persons is the primary program objective. Eligible communities are cities under 50,000 population and counties under 200,000. Approximately one half of the grants are awarded for public facility projects and the majority of these have been to solve serious water and sewer problems.

Technical Assistance Grant

The Federal government awarded a Technical Assistance Grant to the Department of Economic Development. One part of this technical assistance program is a Rural Water Systems Strategy Project. The purpose of this Project is to hold a series of public meetings throughout the State, use the information collected to prepare a summary of Statewide water system problems and needs, and develop long term strategies to help resolve water supply and wastewater treatment problems. This report presents the results of that Project. For further information about the Project or other activities of the Technical Assistance Grant, contact Joe Lopez, Technical Assistance Coordinator, at (314) 751-4146.

State Water Plan

The State Water Resources Law was enacted in 1989. RsMO 640.400 requires the Department of Natural Resources to ensure that the quality and quantity of Missouri's water resources be maintained at the highest possible level to support present and future beneficial uses, and to protect the public health, safety, and general economic welfare of the

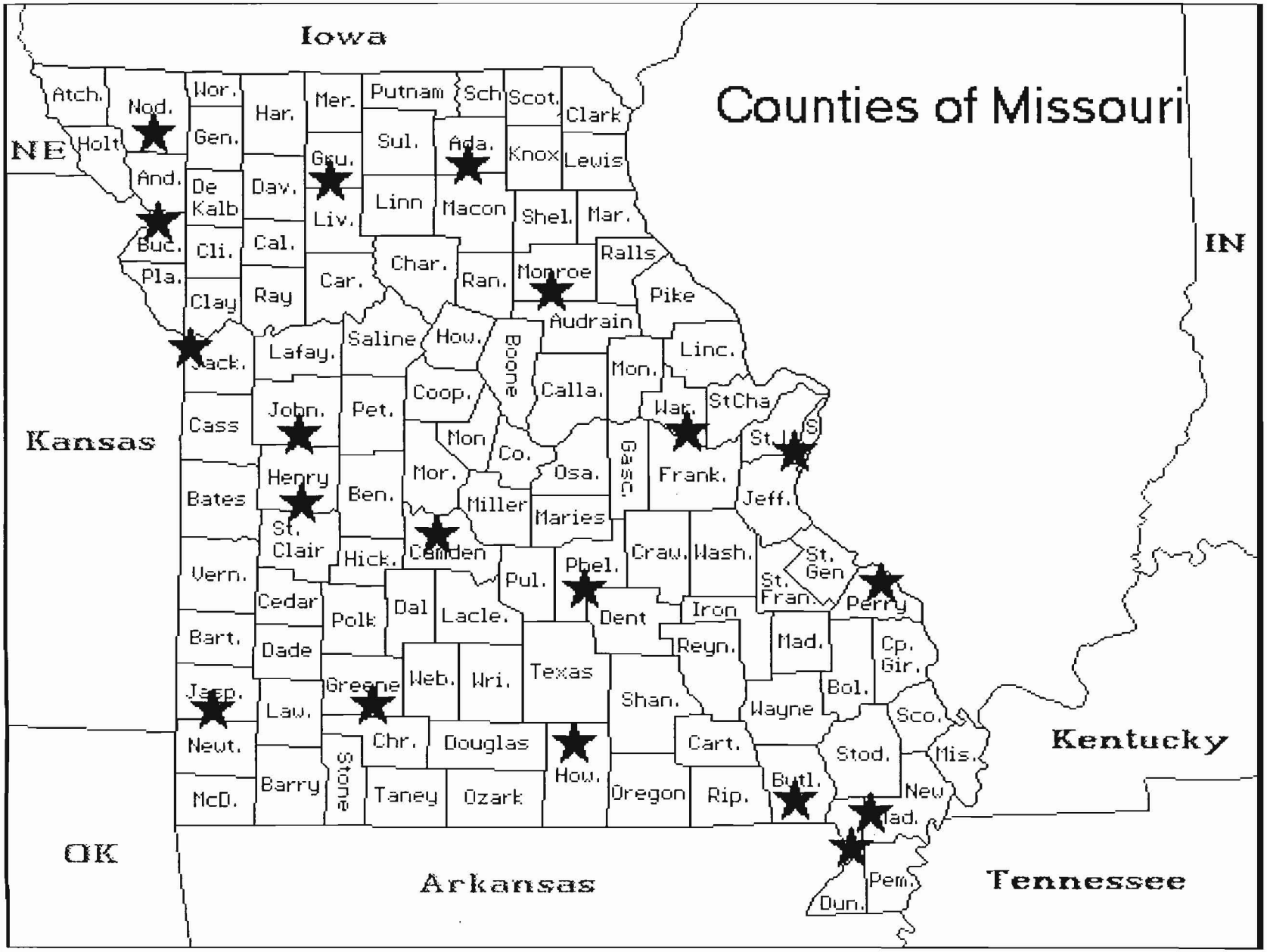
citizens of Missouri. One directive of the law requires the development and maintenance of a comprehensive statewide program, known as the State Water Plan, for the use of surface water and groundwater resources of the state. Three major water resource issues that have been identified for focused study are flooding, drought, and rural water supply. Another provision of the law refers to the establishment of procedures to ensure public participation in the development and revision of the State Water Plan. Focusing on the issue of rural water supply, the Department of Natural Resources is interacting with agencies, organizations, commissions, and other water interest groups to gain useful information for incorporation into the State Water Planning process.

Rural Water Systems Project Meetings

To collect information for this Project, nineteen meetings were held throughout Missouri during May to September, 1994 in cooperation with DNR and regional planning commissions (RPCs). Stars on the map on the following page show the location of the 19 meetings.

Appreciation is extended to the Department of Natural Resources, Missouri's Regional Planning Commissions, and everyone who helped arrange the meetings and contributed this Project.

1994 Rural Water System Project Meetings



Executive Summary - Strategies & Recommendations

There were many recommendations presented throughout this Project. Several general, positive comments were received about the State CDBG Program. Cases were cited where the CDBG program responded very effectively to resolve serious community problems. There were also some requests for minor modifications.

Six recommendations are presented in this report. They were selected based on their importance for improving rural water systems over the long term and on being responsive to the above stated problems and the concerns raised throughout the Project. The potential for improving cost-effectiveness and making the multi-agency funding process more easily understood and usable were especially important factors. It should also be emphasized that Recommendation 1 regarding regionalization was frequently mentioned as the most critical step the State could take to improve rural water services. The six recommendations are:

1. *PROMOTE THE ESTABLISHMENT AND EXPANSION OF REGIONAL RURAL WATER SYSTEMS,*

2. *INCREASE COORDINATION BETWEEN STATE AND FEDERAL WATER SYSTEM FUNDING AGENCIES THROUGH QUARTERLY MEETINGS,*

3. *PROVIDE MORE INFORMATION ABOUT FINANCING & TECHNICAL ASSISTANCE RESOURCES FOR WATER SYSTEMS,*

4. *ENCOURAGE OR REQUIRE ADEQUATE MAINTENANCE RESERVES TO FOSTER VIABLE WATER SYSTEMS,*

5. *USE A MORE FORMAL SYSTEM TO CATEGORIZE WATER NEEDS AND PROBLEMS, AND*

6. *ADD A "PROJECT IMPACT" FACTOR TO THE CDBG RATING CRITERIA.*

Water and Wastewater Problems

The following is a summary of the water and water system problems mentioned at the 19 Project meetings held throughout the State. This summary also includes comments submitted by regional planning commission organizations in response to a Project survey. Because of the space limits of this report and the need to organize the information, these summaries could not include all comments made at the meetings and in the survey responses. The comments that follow are those mentioned most often and the ones that seemed to deal with the most serious problems in each region. The Appendix of this report includes two lists of all the meeting comments.

Lake of the Ozarks Council of Governments

Camdenton Meeting
Counties: Camden, Laclede, Miller, Pulaski

Elevated coliform bacteria counts in private wells. Recent testing has shown that almost half the wells in specific areas of this region have bacteria problems.
Water testing procedures are too complicated. The State's testing procedures are so complicated and difficult that they are commonly ignored.
Water capacity and pressure are not sufficient for fire hydrant/protection. Water systems are not upgraded to a standard that will allow for fire hydrants. This has caused high fire insurance rates and hurts future expansion opportunities.
Wastewater systems need to be established to serve growth. Population growth is occurring at a rate of between 37% and 50% every ten years in some areas of this region. There needs to be a shift from individual septic systems to regional wastewater treatment facilities.

Southeast Local Elected Officials Association

Campbell Meeting
Counties: Butler
Cities: Advance, Arbyrd, Bell City, Bernie, Blodgett, Bloomfield, Campbell, Cardwell, Cooter, Dudley, Fisk, Gideon, Holland, Hornersville, Neelyville, Puxico, Qulin, Risco, Steele, Wardell

Water lines are old, contain lead joints and leak frequently. Several towns have old water lines installed in the 1930s and 1940s which leak often. In some cases water pressure problems are severe, especially during summer months, due to inadequate storage capacity.
Some rural areas are not served by any water system. Residents sometimes have no public water service and instead haul water or have private wells which are not always dependable. Attaining water system financing is difficult for towns that want to build new water systems.
Water contamination is problem. Shallow wells produce poor quality water and water line leaks cause contamination that require emergency responses.
Storage capacity is insufficient. Inadequate storage capacity causes water pressure problems which in turn causes water quality problems. The lack of fire hydrants produces high insurance rates.

Bootheel Regional Planning Commission

Malden Meeting
Counties: Stoddard, Scott, Mississippi, New Madrid, Dunklin, Pemiscot

Water quality is a problem. Boil water orders are issued often. Good quality water is ample, however water quality is lost because of distribution system problems.
Water system lines are old and need replacement. Water lines were laid in the 1930s and 1940s and need replacement. Corroding steel lines are also a problem.
Many areas are not served by a public system. Some areas in the region are not served, especially areas between county systems and city systems.
Communities do not have resources to replace old lines and make needed repairs. Cost of making repairs is beyond

capacity of small communities and the expense of repairing broken lines has a big impact on local budgets.

Show-Me Regional Planning Commission

Warrensburg Meeting
Counties: Lafayette, Johnson, Saline, Pettis

Water treatment and distribution facilities are antiquated. Distribution mains are old and undersized for the growing population that they serve which creates frequent and sometimes serious water pressure problems.
Septic systems are inadequate. Septic systems are not adequate because of improper design, construction or operation. There may be problems of water supply contamination from septic systems.
Flooding causes problems. Sewer systems and water treatment systems have had operation problems caused by recent floods. In one case a water treatment facility was submerged during the recent flood and contaminated water supplies.
Pesticide and herbicide use might be affecting surface water supplies. Concerns were raised about possible contamination of surface water supplies by use of herbicides and pesticides.

Meramec Regional Planning Commission

Rolla Meeting
Counties: Gasconade, Maries, Phelps, Crawford, Dent, Washington

New and improved water treatment and distribution facilities are needed. Water availability is not a problem. But the lack of adequate treatment systems endangers the drinking water of residents. New piping is urgently needed since many existing pipes were installed in the 1930s or earlier. Iron pipes impact water quality and undersized lines cause low water pressure.
Private wells have contamination problems. Many of these wells were constructed before current modern standards were established so sometimes they are too shallow and have other design features making them subject to contamination. Odor and taste problems occur. Water testing is complicated and costly.

Flood water contaminates water. Many private wells have been contaminated from the inundation of flood water.
Septic system problems. Many small communities do not have a wastewater treatment facility and use septic systems. There are documented cases of septic systems damaging well water and concerns about new State requirements for testing, testing costs, and cost of required improvements.

Ozark Foothills Regional Planning Commission

Poplar Bluff Meeting
Counties: Reynolds, Carter, Ripley, Wayne, Butler

Lack of wastewater treatment facilities is the most serious problem Some cities are completely without wastewater treatment facilities. Problems occur in finding lagoon locations and other conflicts occur.
Low or no-cost technical expertise is needed. Communities need good advice on how to address water system problems without having to go through the expense of hiring an engineer.
Water quality is sometimes a problem. Quantity of water from the source is not a problem. However, shallow wells, old distribution systems, lead joints in pipes, and seepage of chemicals into water systems have caused water quality problems in some cases. Boil water orders have been issued in some communities, especially remote rural areas.
Business development impacted by inadequate systems. Industrial growth in the area is being slowed in some small communities due to inadequate systems. Larger communities need bigger, modern systems to accommodate current and future business expansion.

Harry S Truman Coordinating Council

Joplin Meeting
Counties: Barton, Jasper, Newton, McDonald

Storage capacity is inadequate. Over half of the communities in the area do not have enough storage capacity to hold water for a single day's usage. If a large fire occurred or a system went off-line, residents would soon be without water service.
Very old water system pipes and mains. Some of the existing water distribution pipes are 80 to 100 years old and tend to

be too small to meet current needs.
Inflow and infiltration are the main wastewater system problems. During heavy rains, the water table rises and treatment problems occur such as sewage backup in homes, problems with flushing toilets, and raw sewage escaping into streets. Violation notices are being issued concerning capacity of sewer treatment plants and lagoons.
Concerns over water quality impact of expanding livestock operations. The explosive growth of livestock operations in the region over recent years has raised concerns over possible threats to drinking water quality.

Boonslick Regional Planning Commission

Warrenton Meeting
Counties: Montgomery, Warren, Lincoln

Wastewater treatment is a current and growing problem. The growth of water districts has expanded availability of inexpensive water but treatment efforts have not kept pace. The clay soil and rolling terrain of the area make septic system operation difficult.
Financing water system projects is a problem. Most communities in the area have few low-moderate income residents so they are ineligible for CDBG assistance. Some that do qualify should not be funded because they typically do not setaside funds for future maintenance.
Testing of water is a problem. Testing water quality is costly and frequently tests continue to be required for some contaminants such as lead and cooper even though test results are always negative.
Establishing linkups between water systems is difficult. Communities trying to solve water problems by linking up with other systems are unable to do so because of existing State laws that do not facilitate this. There are other obstacles to linkups such as communities resisting linkups because of possible water pressure loss or higher water rates.

Mid-America Regional Council

Kansas City Meeting
Counties: Platte, Clay, Ray, Jackson, Cass

Water service expansion not keeping up with growth. In some areas of this region a desire to live in rural areas is causing population growth and water services cannot keep pace. Costs of increasing services are high.
Testing of water is a problem. Lead testing rules are difficult to follow because contamination source could be in the home and not in the outside water distribution system. Testing is getting more expensive and the purpose of various testing procedures is not widely understood.
State laws on water rights hinders formation and expansion of regional water systems. Other States such as Kansas have laws that make it easier to start and expand water district systems. Missouri law does not promote expansion of regional water systems.
Funding is difficult to attain for water system projects. Funding procedures for water districts are extra difficult. The rule allowing only one county application a year to the CDBG program makes is difficult to expand water district services. It is difficult to get funding commitments from all necessary sources for a new regional system or expansion.

Northeast Missouri Regional Planning Commission

Kirksville Meeting
Counties: Schuyler, Scotland, Clark, Adair, Knox, Lewis

A few remote areas do not have adequate water service. Over recent years water services have greatly expanded to most areas of the region. However, there are a few remote areas with no service.
Wastewater treatment plants have not kept up with growth of water service. A longtime goal of expanding water service is being achieved but this has not been matched by growth in wastewater treatment facilities. New housing subdivisions are especially experiencing this problem.
Technical assistance is needed on setting up new wastewater treatment systems. Housing subdivision residents want to establish new sewer systems but do not have technical expertise on how to begin and get the job done.

Wastewater system cost is a concern. The higher costs of providing wastewater treatment service compared to water system service is a problem.

MO-Kan Regional Council

St. Joseph Meeting
Counties: Andrew, Buchanan, Clinton, DeKalb

Shallow wells are not a reliable source of quality water. Shallow wells, depth of about 100 feet or less, do not consistently provide good quality water. These shallow wells typically produce hard water which taxes wastewater treatment systems and are very subject to contamination. Recent floods contaminated these shallow wells.
Expansion of water systems is costly. In some areas of the region expansion of existing water systems is expensive because of low population density.
Additional storage capacity is needed for fire protection. Many areas do not have sufficient capacity for fire protection. Some building codes are requiring water sprinklers costing thousands of dollars for single family homes because water mains are not large enough to attach fire hydrants.
There is little awareness about the true costs of water. The costs of providing drinking water are rising and there is little understanding among elected officials and community residents about the causes of this, especially the new regulations and testing requirements.

South Central Ozark Council of Governments

Willow Springs Meeting
Counties: Texas, Wright, Shannon, Douglas, Howell, Ozark, Oregon

Distribution system pipes are old, undersized, deteriorated, and have lead joints. Lack of local funds do not allow for regular maintenance of pipelines. Some systems have dead end lines that cause stagnation and potential health problems.
Sparsely populated rural areas are served by inadequate private wells and wastewater treatment systems. Some households have to haul water for daily needs (cooking, drinking, bathing, washing, etc.) and depend on private wells.

Many areas have wastewater treatment that does not work properly due to improper design and soil conditions.
Water quality is sometimes a problem. Shallow wells not constructed to meet today's standards are the source of some water quality problems. One community is experiencing lead problems in the drinking water source.
Difficult to establish or expand regional systems. Funding guidelines and policies make it difficult to build systems to accommodate water service on a regional basis. Water main sizes are restricted and few incentives exist to plan or build for future needs.

Green Hills Regional Planning Commission

Trenton Meeting
Counties: Harrison, Mercer, Putnam, Daviess, Grundy, Sullivan, Caldwell, Livingston, Linn, Carroll, Chariton

Flooding causes infiltration problems. Recent floods have caused problems with water systems. A countywide water system was almost lost due to the recent flood.
Too many barriers to establishing/expanding regional systems. Missouri state law, concerns over loss of income, and funding guidelines of state programs (especially the guideline restricting counties to submitting only one application), create difficulties for regional water systems. Some areas still need water service.
Water must be protected against pollution.
The possibility of excessive nitrates in water should be dealt with through some effective well head protection or other programs.
Water systems need sufficient maintenance reserves.
Some systems do not have adequate funds setaside for future upkeep of water systems. More incentives or State requirements are needed to correct this.

Southeast Missouri Regional Planning Commission

Perryville Meeting
Counties: Ste. Genevieve, St. Francois, Iron, Madison, Bollinger, Perry, Cape Girardeau

Groundwater protection is important. In the past there was improper disposal of solid and hazardous waste in streams

and sinkholes. Wastewater system leakage into groundwater supplies and improperly capped wells have also been problems. Protection against this is needed to avoid contamination of water supply sources.

Testing is expensive and difficult. The cost of testing is high and getting higher due to new regulations both for private and public water systems. Examples given of testing costs are $400 for private wells and $6,000 for a public system. The Federal government has not yet reset acceptable levels on radionuclide which makes it difficult to respond at the local level when this is detected in water.

Proper wastewater treatment is difficult. Some wastewater treatment systems do not work well because of the region's karst terrain and the small lots of new housing being built in the area.

Mine trailing is a hazard. In the western portion of the region there are old mines. Mine tailings from this area could contaminate surface and groundwater supply sources.

Mark Twain Regional Council of Governments

Paris Meeting
Counties: Macon, Shelby, Marion, Randolph, Monroe, Ralls, Audrain, Pike

Water distribution is a problem. In some cases, facilities are not adequate to maintain sufficient water pressure and prevent water loss from leakage. Lines are old and need replacement.

There are a variety of water quality problems. The types of water quality problems reported in this region include low alkalinity; turbidity problems; and high levels of iron, magnesium, manganese, and nitrates.

Difficulties in understanding government funding priorities. Some communities go through the expense of submitting grant applications but are unaware of the chances of approval. They do not understand funding priorities. For example, they are unaware of whether water storage projects are likely to be funded.

Adequate wastewater treatment at hog farms. There have been concerns raised about the adequacy of waste treatment facilities at the new hog production complexes that are being

built in the region.

Southwest Missouri Advisory Council of Governments

Springfield Meeting
Counties: Dade, Polk, Dallas, Lawrence, Greene, Webster, Christian, Barry, Stone, Taney

Water/wastewater service cannot keep pace with explosive growth. The region is experiencing high business and population growth rates. This is severely taxing existing suppliers of water and wastewater treatment services.
Failing septic systems are a problem. Septic systems that are not operating properly may be polluting ground water supplies. This is especially a problem since there is a growing reliance on surface water sources for drinking water due to the depletion of groundwater sources.
Missouri State law makes it hard to resolve water problems. Unlike other states such as Kansas, Missouri has no water rights laws that regulate water use on private land. This leaves no remedies when wells are used to the point of depleting groundwater sources.
Gasoline and propane contamination. There have been cases of propane and gasoline contaminating private wells. It was reported that water from a residential faucet could be lit with a match. Tests have confirmed the presence of propane and the problems have not been fully resolved.

Northwest Missouri Regional Council of Governments

Maryville Meeting
Counties: Atchison, Nodaway, Worth, Gentry, Holt

Water treatment is a problem. Water in this northeast area is harder with more minerals than south Missouri. Treatment is costly especially when using river groundwater as a source.
Little awareness of true costs of water. Many communities do not know the true cost of water, especially the escalating costs of treatment and the need to allocate significant funds for future maintenance. The big challenge is to get people to acknowledge real costs and find ways to provide water economically.
Long range projects and planning missing. State funding and regulatory agencies do not encourage long range planning or

the construction of systems that accommodate future needs. Grants go to systems that do not plan and setaside maintenance funds thereby punishing those that do fund reserves. Local attitudes are the same except during crisis situations such as droughts or floods.
Some areas do not have water service. Sparse and declining population makes make it hard to bring water service to some still unserved rural areas. There are several serious obstacles to expanding regional systems to remedy this.

East-West Gateway Coordinating Council

St. Louis Meeting
Counties: St. Charles, Franklin, St. Louis, Jefferson

Distribution systems in poor condition. The pipes of water distribution systems are old (30 to 50 years old) and are typically undersized at 4 inches. Backup systems rarely exist for well water source.
Water system hookup costs are expensive. Residents of remote rural areas have to pay high costs to hookup to a water district. One example mentioned was estimated costs of $6,000 to pay for a line extension that is complicated by a creek crossing.
Promoting regional water systems and linkups is difficult. Water system operators recognize the benefits of regional systems such as economies of scale (electricity, personnel costs, chemicals, etc.), however the advantages are not widely accepted and recognized. Linkups for backups would be useful in drought and flood conditions.
Wastewater systems need expansion. Wastewater systems need to be expanded to serve areas without good working septic systems.

Kaysinger Basin Regional Planning Commission

Clinton Meeting
Counties: Bates, Henry, Benton, Vernon, St. Clair, Hickory, Cedar

Old, small, cast iron water mains need replacement. There are many old water lines that need to be upgraded. About $10,000 to $15,000 are spent on repairs each year because of these aging lines.

State programs fund too many small systems. State funding rules, practices, and policies favor giving grant awards to very small cities. This makes it hard to expand larger systems which have better ability to provide reliable service to more rural areas. The low-moderate income survey is structured to favor the smallest sized water systems which allows them to continue despite never ending financial problems. Financing should be devoted for transmission lines instead of for repairing improperly maintained systems.

Providing essential water services is difficult. Declining population and tax bases have made it hard for small communities to provide essential water system services to residents.

Wastewater systems are a problem. Soils in the region are not very suitable for septic systems. This increases expenses for new housing developments. Infiltration is a serious problem during heavy rains causing sewer drain backup into homes in some areas.

Strategies and Recommendations

The Rural Water Systems Projects collected strategies for solving water system problems by asking for recommendations at the 19 Project meetings and through the written survey sent to all Regional Planning Commissions. These two methods produced 181 suggestions. Many have similar ideas. For the record and future reference, they are all listed in the Appendix of this report.

All 181 suggestions were reviewed to narrow down the list to the ones worth pursuing in one way or another. The criteria used to select these were:

- good probability for success in producing better ways to address rural water system needs,
- whether it will lead to more cost-effective ways of using the limited amount of CDBG grant funds available,
- feasibility of implementation,
- mentioned frequently at Project meetings and in surveys by people with extensive water system experience,
- whether it is truly a long term strategy for addressing rural water system needs, and
- whether the recommendation or strategy has already been successfully used in some other State.

Based on this evaluation criteria, the following recommendations are presented for consideration:

1. Promote the Establishment and Expansion of Regional Rural Water Systems.

Throughout the entire Rural Water System Project, this was the most frequently mentioned suggestion for improving water service to people in rural areas over the long term. CDBG project administrators, engineers, water system operators, and other people with extensive water system experience from throughout the State said this is the most important and effective way to give rural areas reliable, quality drinking water services over the long term. Several times experts said spending government funds financing smaller systems in many cases can be counter productive for reaching the overall goal of establishing and maintaining dependable water service to all rural areas because this diverts funds away from building regional systems.

There are several benefits to gain from regional systems such as economies of scale, improved capability to comply with drinking water regulations, and more dependable and better quality drinking water to customers as shown in the chart on the next page.

Benefits of Regional Water Systems

Economies of Scale. Several people at Project meetings stated what they believe to be a basic and fundamental fact: like many other things, water is cheaper in volume. Overhead costs for such things as electricity, personnel, testing, chemicals, and maintenance, can be spread over a larger operation. This means that over the longer term there can be reduced costs on a per-gallon basis to the customer.

Adequate, Safe, Reliable, Quality Water to the Customer. Regional systems are well equipped to establish and fully fund future maintenance accounts and to hire well trained personnel because of the larger customer base that they work

Benefits of Regional Water Systems

- Economies of Scale
- Adequate, Safe, Reliable, Quality Water to the Customer
- Capability to Comply With Water Regulations

with. This strength can allow them to operate and maintain a system that consistently provides quality water. Complicated testing procedures can more easily be conducted with regional staff. Better responses to emergency situations such as loss of service can be delivered through a regional type system because of the larger resources it has at its disposal.

Better Capability to Comply With Increasing Regulations.

Regulations imposed on water operations are increasing at a steady rate. The burden of these regulations on a small water system is overwhelming while it is manageable for a larger scale regional system. A larger system can have trained staff knowledgeable about the requirements in order to continually be in full compliance. The costs of extra testing and treatment can be spread over a larger customer base, thus reducing the cost impact on individual customers. The difficulty of small systems complying with new regulations was frequently mentioned at Project meetings.

Implementing Regionalization Recommendation - The following are suggested methods for implementing the recommendation to promote the establishment and expansion of regional water systems:

a. Adopt a State CDBG Program policy statement as follows and incorporate this into program guidelines:

> *"Based on extensive public input, the 1994 Rural Water Systems Project determined that establishing and expanding regional water systems is a cost-effective and proven strategy for improving water service to rural communities over the long term. Therefore, it is CDBG Program policy to promote regional water systems where appropriate and feasible. Applications for water system project grants which involve regional water systems serving non-entitlement communities will receive high marks on the strategy criteria. This policy does not mean non-regional water system projects cannot receive high marks on strategy."*

This would not in any way rule out funding of non-regional water systems. But it would state the intention to promote regional systems given the effectiveness of this method for responding to Missouri's serious water needs in rural areas. This approach of adopting a policy statement is far more effective than dealing with cases on an individual basis. The policy statement would provide useful and clear guidance to CDBG staff, project administrators, engineers, and non-entitlement communities about the importance of finding a regional-type alternative for water service when practical and feasible.

b. Distribute More Information About Regional Water Systems

There are existing regional water systems that can serve as models for local communities to follow. The Clarence Cannon Water District and the Tri-County Authority are examples. Descriptions of these and other regional systems are included in the Appendix of this report. Information about other models such as an extensive multi-county system in southern Iowa should be circulated through newsletters and by other methods.

c. Consider Revising CDBG Program Policy To Allow Water Districts to Submit More Applications

Currently, counties can only submit one application per year on behalf of water districts. Therefore, each year, in every Missouri county, several cities can submit applications while there can be only one application for districts. Several people at Project meetings mentioned this as a serious obstacle blocking further development of districts and regional water systems.

d. Consider Revising CDBG Program Funding Policies to Accommodate Establishment or Expansion of Regional Water Systems

Establishing or even just expanding regional water systems usually involves a longer time frame and more financing needs compared to a non-regional, smaller system project. More time is needed to organize and commit resources for a regional water system. Intergovernmental agreements are needed and more planning is involved. CDBG funding policies should include special provisions that accommodate these needs. Exceptions to funding limits should be considered as well as time extensions for special cases. Written policies covering these topics could create powerful incentives for communities to move in the direction of supporting the more cost-effective regional system alternative.

e. Revise Missouri State Law to Create Incentives or Provisions to Promote Regional Water Systems

Obviously, this is not within the control of the Department of Economic Development. However, this is included in the report since several experts have stated that Missouri State laws could be revised to make it easier to establish, expand, and bond/debt finance rural regional water districts. They mentioned that other states such as Iowa and Kansas have statutes which facilitate formation of regional systems. This is a matter that might be appropriate for further work by the Department of Natural Resources' State Water Plan Program.

2. INCREASE COORDINATION BETWEEN STATE AND FEDERAL WATER SYSTEM FUNDING AGENCIES THROUGH QUARTERLY MEETINGS.

There are State and Federal agencies that provide funding for water system projects. This includes DED, Department of Natural Resources, Public Service Commission, and the U.S. Department of Agriculture. One suggestion mentioned frequently at meetings was the idea of more coordination. In addition, representatives of all these agencies have indicated they favor some increased coordination. Currently, an informal network of cooperation and coordination is being

used by these agencies to assure that agencies are not operating at cross-purposes, to share information about water system needs, and determine the status of all programs.

Attached to this report, a memorandum suggests continuation of this effective ongoing practice and the addition of a formal meeting on a quarterly basis. This report supports such quarterly meetings and further recommends that they be set on consistent dates, the second Wednesday of the first month of each quarter, and also that agencies rotate each year on the responsibility for organizing the meetings beginning with DED in 1995 (a schedule of meetings for 1995 is included in the Appendix of this report).

3. Provide More Information About Financing and Technical Assistance Resources Available for Water Systems.

Many communities are not fully aware of the various sources of financing and technical assistance available for water systems. Some people attending Project meetings stated the need for a clearinghouse of information on financing and technical assistance. There is a need for information about how to setup regional water systems, how to respond to different types of water system problems, and how to plan future water system improvements

In response to this need, the CDBG Program Office, the Missouri Rural Opportunities Council (MOROC), U.S.D.A., and the Department of Natural Resources have already prepared a guide entitled "Finance and Technical Assistance for Missouri Water Systems". This was developed as a project of the Missouri Rural Opportunities Council and is available by contacting the MOROC office in Jefferson City.

4. Encourage or Require Adequate Maintenance Reserves To Foster Viable Water Systems.

A consistent problem mentioned throughout the State was the inability of small water systems to respond to problems

by themselves. They are unable to finance the replacement of old water distribution lines and have difficulties paying for all the added costs that come from meeting new water regulations. Many people suggested that these problems have grown to almost crisis proportions in many communities because of inadequate maintenance and operating reserves. Often existing and new water systems do not have any or only minimal reserves for future maintenance and required system upgrades. Sometimes this results from a town's commendable desire to hold down costs and keep water rates low for community residents but this is done at the expense of having a prudent setaside of funds for making future system repairs and upgrades.

To address this problem, it was suggested that water system funding agencies step up their efforts to require adequate reserves. For new systems, there should be an honest assessment of whether anticipated future revenues (based on the number of customers, etc.) will be sufficient to make the necessary setasides of funds for repairs and other future needs. If the setaside is not done then grants or loans to the water systems will almost certainly lead to a perpetual cycle of needing other government subsidies in the future.

Another way to address the problem is to either encourage or require viability tests. Such tests would measure the ability of a system to operate successfully in the future, based on anticipated revenues and a realistic assessment of all future costs. Several States are moving toward viability requirements. The drawbacks of the requirement approach are costs and new burdens on local communities. Another more positive approach would be the provision of free viability assessments to communities as a technical assistance service of the State. Even a general assessment of viability could be useful to many communities. A low cost, viability computer model (PA Water Computer Model Package) is available from the National Drinking Water Clearinghouse. This model provides a realistic view of the full costs of constructing and operating a small water system. State funding agencies could possibly lend support to this effort by

requiring or favoring grant applications which have undergone such a viability test.

5. Use a Formal System to Categorize Water Needs and Problems.

One of the problems frequently mentioned at Project meetings was a desire to more fully understand the funding priorities of the CDBG program. Many people understood the emphasis on resolving "health and safety" problems, but there were several cases where people did not know if their water needs fell into that category. One common example is the lack of sufficient water storage. Many communities said they knew this was a problem because their system did not meet Department of Natural Resources standards for storage. However, they were not aware that this problem is not severe compared to other situations such as bacteria contamination of water. Community officials would like to see in writing how bad their own problems are so that they can judge whether it is worthwhile to pay the cost of preparing a grant application and engineer report.

One possible option is to use the following categorization system which is similar to that used by the State of Colorado (see Appendix for Colorado Water Needs Categorization List). All water needs/problems would be categorized into one of the three groups:

Category A - IMMEDIATE NEEDS

1. Demonstrated health hazard.
2. Violation of Missouri Drinking Water Regulations (MDWR) in a manner which results in an immediate detrimental health effect.
3. Inadequate supply of water to meet the basic needs of the current population.

Category B - LONGER TERM/EMERGING NEEDS

1. Potential health hazard (A condition exists which

will result in a detrimental health hazard if certain other events occur; includes inadequate fire flow).
2. Violation of MDWR in a manner which results in a long-term detrimental health effect.
3. Growth projections indicate that the current supply will not meet the basic needs of the projected population within 5 years.

Category C - NO KNOWN HEALTH HAZARD, MDWR VIOLATION, OR PROJECTED SUPPLY PROBLEM WITHIN 5 YEARS.

All applications for state or federal grants could be assigned to one of these 3 categories as they are received. The benefits of this system would be a standardized method of classifying water problems for use throughout the whole State. This method would be useful to communities because they would know how their problem compares with others throughout the State. This type of system could be tried on a pilot trial basis for 2 or 3 years then continued if found to be useful.

6. Add a "Project Impact" Factor to the CDBG Rating Criteria.

Currently, the CDBG Public Facility Rating and Ranking criteria has three major criteria used for evaluation: NEED, LOCAL EFFORT, and PAST PERFORMANCE. A review of rating systems used by other States across the Nation show that a PROJECT IMPACT factor is typically used. The advantage of this is that a grant application is clearly evaluated on how serious is the community problem (NEED) and then on how effective is the proposed solution (PROJECT IMPACT).

Actually, the currently used NEED criteria has five items that do not really relate to NEED: 1. Strategy, 2. Cost Effectiveness, 3. O & M Capacity, 4. Past Efforts, and 5. In-Kind Contribution. The first 3 items can be used in a new PROJECT IMPACT category (12 points). Past Efforts can be moved to the PAST PERFORMANCE category and move In-

Kind Contribution to LOCAL EFFORT. This proposed change can be easily accomplished by deleting the last sentence under the NEED section and making reassignments as described. The proposed changes are shown below (strikeout shows deletions and underlining shows new language):

(1) NEED (Maximum ~~75~~ 55 points):

Priorities (55 points): Public facility needs are prioritized as follows:

- Health or safety;
- Environmental damage;
- Property damage;
- Inadequate facilities/services commonly provided for existing residents;
- Cultural, recreational, or aesthetic;
- Inadequate facilities for potential (speculative) growth

Evaluation Factors: Each of the priorities is evaluated in terms of the intensity and urgency of the need; the frequency the need occurs; economic considerations due to the need; and concentration of persons within the area affected by the need. ~~Four points will be award to each of the following: Strategy, Cost Effectiveness, O&M Capacity, Past Efforts, In-kind Contribution.~~

(2) PROJECT IMPACT (12 points): Four points will be awarded to each of the following factors to evaluate the impact of the proposed project on addressing the need/problem: Strategy, Cost Effectiveness, and Operation and Maintenance Capacity.

(~~2~~ 3) LOCAL EFFORT (~~20~~ 24 points): There are ~~two~~ three parts to the scoring of "local effort".

(a) Leveraging (10 points): description...
(b) Tax-Fee Effort (10 points): description...
(c) In-kind contribution (4 points): description...

(4) PAST PERFORMANCE/EFFORT (~~5~~ 9 points): description...

Making these changes would help satisfy the concerns raised by some communities about how the CDBG program should be as clear as possible about funding priorities. The clarifications and changes made in this recommendation would also make the process simpler and more clear for program customers, administrators, CDBG program staff and DNR staff that assist in the evaluation process. Finally, it would clearly separate scoring on 1.) how serious is the community need and problem versus 2.) how responsive and appropriate is the proposed project for fixing the problem.

Appendix

1. Examples of Regional Water Systems:
    a. Clarence Cannon Wholesale Water Commission
    b. Tri-County Water Authority
    c. Pemiscot Consolidated Public Water Supply District #1
    d. Mozingo Reservoir and City of Maryville Water System
    e. Iowa Regional Systems
2. Rural Water Systems Project announcement flyer and mail-in comment form
3. Map of regional planning commissions
4. Colorado Water Needs Categorization List
5. Project description from 107 Technical Assistance Grant Application and Agreement
6. Water system rating factors of other state CDBG programs
7. *Small Systems & Safe Drinking Wate*
   Journal of American Water & Wastewater Association, May, 1994.
8. Department of Economic Development memorandum on inter-agency collaboration at the State level
9. Suggested 1995 schedule of quarterly meetings of State and Federal water system funding agencies
10. List of 181 recommendations collected from Project surveys and meetings
11. Categorized list of concerns, needs, and recommendations
12. Watersystem survey responses from Regional Planning Commissions

Missouri Regional Water System Example

Clarence Cannon Wholesale Water Commission

contact: Cecil Fretwell, Commission Chairman, phone (314) 672-3221
Route 1, Box 42
Stoutsville, Missouri

The Clarence Cannon Wholesale Water Commission (CCWWC) is the wholesale provider of water for 6 water districts and 7 communities in ***11 counties of Northeast Missouri***. CCWWC began operations in June, 1992 as the first Wholesale Water Commission organized in the State of Missouri. It is frequently mentioned as an example of regionalizing the supply of drinking water in Missouri. CCWWC is responsible for treating 2.3 million gallons of raw water per day, which ultimately provides safe drinking water to 25,000 persons in Northeast Missouri. It is estimated that 9,727 families receive water as a result of the efforts of the CCWWC. The Commission has approximately 155 miles of transmission lines and has the capacity to store 2.1 million gallons of water per day. Mark Twain Lake is the source of raw water for CCWWC. This wholesale water system does not sell retail service to individual users. Its wholesale rates to water districts and communities are calculated to be $12.45 per month for 5,000 gallons. Construction costs were $24.6 million.

CCWWC Wholesale Customers are:

1. City of Paris
2. City of Perry
3. City of Madison
4. City of Shelbyville
5. City of New London
6. City of Farber
7. City of Huntsville
8. Marion County PWSD No. 1
9. Monroe County PWSD No. 2
10. Cannon PWSD No. 1
11. Shelby County PWSD No. 1
12. Thomas Hill PWSD No. 1
13. Knox County PWSD No. 1

According to Cecil Fretwell, CCWWC Chairman, this regionalization project offers many advantages - a constant water supply, stable water costs, maintenance and repair in one central plant, and it is easier to comply with new standards and regulations.

Missouri Regional Water System Example

Tri-County Water Authority - Jackson, Cass and Bates Counties
Contact: John Overstreet, phone: (816) 796-4100, fax: (816) 796-5857
28405 East Blue Valley Road
Independence, Missouri 64078

The Tri-County Water Authority was established as a 501(c) non-profit corporation in 1991 to provide wholesale water. This organization structure gives all the participating municipalities and entities a direct ownership and control position to oversee operations and costs. Currently, its capacity is 2.5 million gallons per day. Approximately 6,500 customers (households, businesses, etc.) are served through the Authority. The water source is the Missouri River alluvium. The Authority has approximately 75 miles of transmission lines. The following are provided wholesale water by the Authority:

- Jackson County PWSD #12
- Jackson County PWSD #13
- Cass County PWSD #4
- Cass County PWSD #5
- Cass County PWSD #6 (portion)
- Cass County PWSD #9
- Cass County PWSD #11
- City of Lake Winnebego
- City of Pleasant Hill
- Bates/Cass County PWSD #12

Missouri Regional Water System Example

Pemiscot Consolidated Public Water Supply District #1

Contact: James Cook or Harrison Hostler - phone: (314) 359-1713
P.O. Box 36
Hayti, Missouri 63851

The Pemiscot Consolidated Public Water Supply District #1 (District) was established by the consolidation of several smaller districts in 1975. Since consolidation, the number of users in the District has doubled. Not including the new addition of Cooter, the District serves approximately 2,400 water meters and an estimated population of 9,350. A recent engineer's report estimated that during 1991, the capacity of its Stubtown, Pascola, and Homestown facilities was 658,000 gallons per day. The monthly cost per user for 5,000 gallons is $21.75. The District's water supply is obtained from deep wells. According to a recent engineer's report, the District's distribution system contains approximately 50 miles of cast iron mains and an mount of PVC pipe, ranging in size from two-inch to six-inch in diameter. In November, 1992, the City of Cooter voted to discontinue operation of its water supply system in favor of purchasing potable water from the District. Extension of District service to Cooter gave the City a favorable course of action to respond to the Missouri Attorney General's order to discontinue use of its own facilities. The following are provided water by this District:

- Bragg City
- Braggadocio
- Deering
- Rives
- Homestown
- Pascola
- City of Cooter (new service extension)
- and other rural areas of Pemiscot County & southern Dunklin County

Missouri Regional Water System Example

Mozingo Reservoir and City of Maryville Water System

Contact: David Angerer, City Administrator, City of Maryville
P.O. Box 438
Maryville, Missouri 64468
phone: (816) 562-8001

The City of Maryville water system currently provides water to the Nodaway County Water District. The District in turn provides service to several rural areas throughout the County of Nodaway. The recently dedicated Mozingo Dam and Reservoir project is positioned to be a major supplier of water through the Maryville and County Water District. The 1,000 acre dam project can be the source of water for public water systems throughout the region. It will be used for flood control and as a site for recreational facilities. Although not fully established and operating, this provides an excellent example of an emerging regional water system.

IOWA REGIONAL WATER SYSTEM EXAMPLES

Rathbun Regional Water

Contact: Kenny Owen, Manager; John Humphrey; John Glenn
Rural Route 3
Centerville, Iowa 52544
Phone: (515) 647-2416

This Iowa water system provides water service to approximately 14,000 people in twenty five cities. It covers all or part of thirteen Iowa counties. It also serves two systems in northern Missouri. Capacity of the system is 4,700 gallons per minute leaving the plant. Total transmission lines in the system comprise 5,500 miles. The organization is a non-profit corporation with a seven member board elected by water users. The primary water source is a lake. The monthly water rate for customers is $18 for the first 2,000 gallons, and $5.50 for the next 1,000 gallons, which produces a $34.50 charge for 5,000 gallons.

Southern Iowa Rural Water Association

Contact: Earl Hanthorn, Manager
Rural Route 3, Box 23
Creston, Iowa 50801
Phone: (515) 782-5744

This Iowa water system serves seven full counties and the edge of four other counties. Total customers served is approximately 5,000, including a few individual customers in northern Missouri. It serves twenty three communities through franchises, and ten other communities that run their own distribution system, but buy water from the Association. Total transmission lines is approximately 2,000 miles. The primary water sources are lakes. A seven member board of directors manages this non-profit organization, (one representative from each county). The monthly rate for customers using 5,000 gallons is $43.50, which includes an upcoming rate increase ($28.50 for 3,000 gallons, and $7.50 for the next 2,000 gallons). System capacity is approximately six million gallons per day. The system manager states that the 1988-89 drought drove the formation of this system to its present size. An abundance of funding was received from several agencies to form this system.

RURAL WATER SYSTEMS PROJECT

A Joint Initiative of the

Department of Economic Development
Department of Natural Resources

In Cooperation with Regional Planning Commissions

To improve the Missouri's ongoing efforts to better community water systems, this Project will collect information about water system problems, needs and remedies through a series of meetings beginning in May 1994.

You are invited to attend and discuss these two important questions:

1. What are the most serious water system problems in the region?

2. What long-term strategies can be used to solve these problems?

The meeting results will be used by the Community Development Block Grant Program (Department of Economic Development) to prepare improved strategies to help communities with their water systems problems. It will also be part of the information used by the Department of Natural Resources to write a State Water Plan. The following are Project meeting dates:

May 5, 1:30 p.m., Camdenton	Lake of the Ozarks Council of Governments
May 12, 7:00 p.m., Campbell	Southeast Missouri Local Elected Officials Association
May 19, 7:30 p.m., Malden	Bootheel Regional Planning Commission
May 26, 7:00 p.m., Warrensburg	Show-Me Regional Planning Commission
June 9, 5:00 p.m., Rolla	Meramec Regional Planning Commission
June 13, 7:00 p.m., Poplar Bluff	Ozark Foothills Regional Planning Commission
June 15, 6:30 p.m., Joplin	Harry S Truman Coordinating Council
June 23, 7:30 p.m., Warrenton	Boonslick Regional Planning Commission
June 28, 3:00 p.m., Kansas City	Mid-America Regional Council
June 30, 7:30 p.m., Kirksville	Northeast Missouri Regional Planning Commission
July 11, 7:00 p.m., St. Joseph	Mo-Kan Regional Council
July 12, 7:00 p.m., Willow Springs	South Central Ozark Council
July 21, 6:30 p.m., Trenton	Green Hills Regional Planning Commission
July 26, 2:00 p.m., Perryville	Southeast Missouri Regional Planning Commission
August 8, 7:00 p.m., Paris	Mark Twain Regional Council of Governments
August 24, 8:30 a.m., Springfield	Southwest Missouri Advisory Council of Governments
August 25, 7:00 p.m., Maryville	Northwest Missouri Regional Council of Governments
September 9, 10:00 a.m., St. Louis	East-West Gateway Coordinating Council
September 15, 7:30 p.m., Clinton	Kaysinger Basin Regional Planning Commission

Contact the Regional Planning Commission in your area or the Community Development Block Grant Program at (314) 526-6706 to confirm the meeting time and for more information about the Rural Water Systems Project.

Revised 8/22/94

Rural Water Systems Project

This Project is a series of meetings being held throughout the State during 1994. The purpose is to collect information about water system problems and solutions, and gather comments about the State Water Plan. In addition to having the opportunity to speak at the meetings, you can use this to mail or hand-in your comments.

1. What are the most serious water system problems in your region?

_____

_____

_____

_____

2. What long-term strategies can be used to solve these problems?

_____

_____

_____

_____

3. Comments about the State Water Plan.

_____

_____

_____

_____

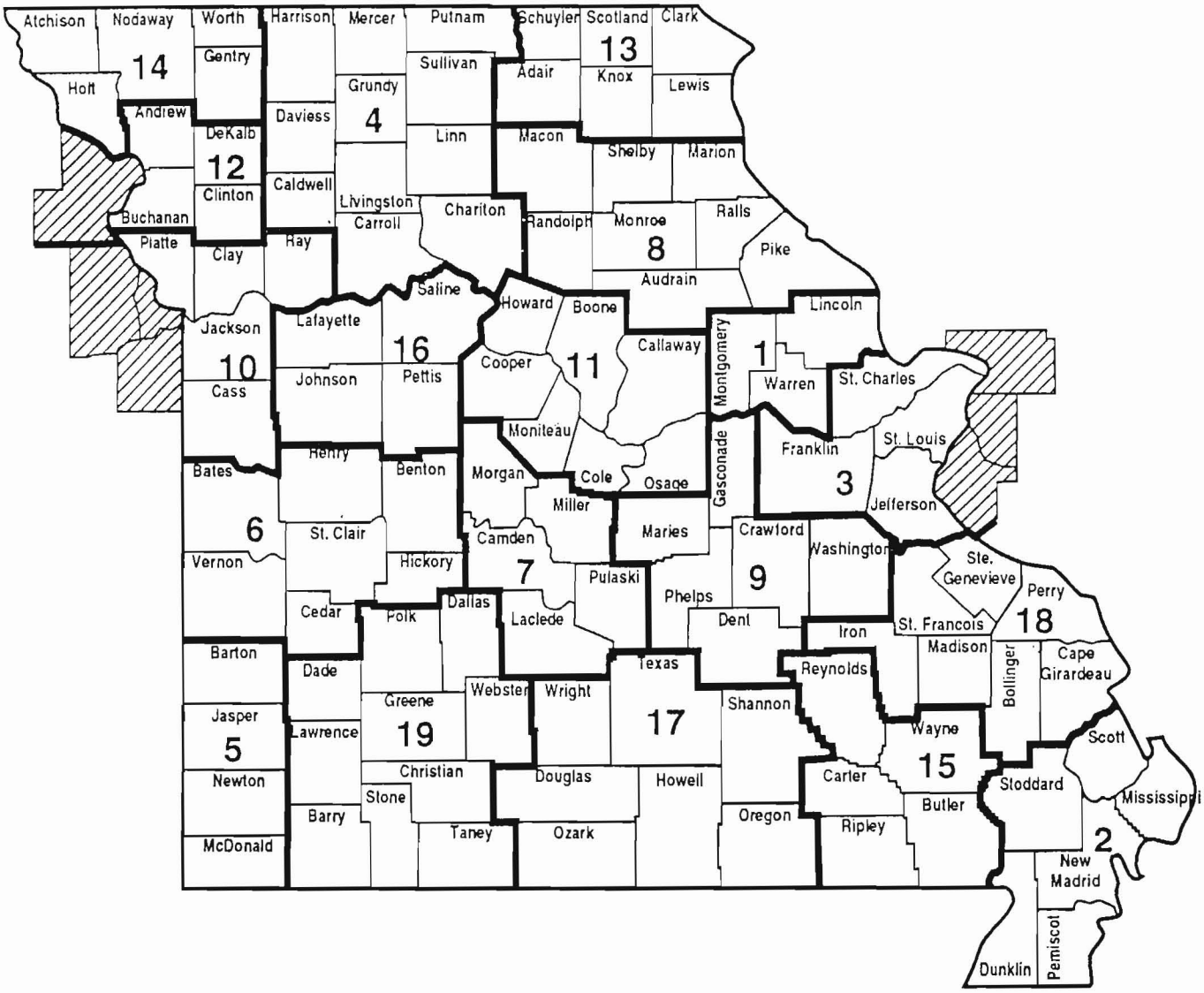
Name of your town or city_____county_____

After writing you comments, please fold, staple, attach a stamp, and mail; or hand-in at the meeting. Deadline for mailing in comments is October 1, 1994.

Place
Stamp
Here

Rural Water Systems Project
Attention: Joe Lopez
DED/CDBG Program
P.O. Box 118
Jefferson City, Missouri 65102

Missouri Regional Planning Commissions



1. Boonslick Regional Planning Commission
2. Bootheel Regional Planning and Economic Development Council
3. East-West Gateway Coordinating Council
4. Green Hills Regional Planning Commission
5. Harry S Truman Coordinating Council
6. Kaysinger Basin Regional Planning Commission
7. Lake of the Ozarks Council of Local Governments
8. Mark Twain Regional Council of Governments
9. Meramec Regional Planning Commission
10. Mid-America Regional Council
11. Mid-Missouri Council of Governments
12. Mo-Kan Regional Council
13. Northeast Missouri Regional Planning Commission
14. Northwest Missouri Regional Council of Governments
15. Ozark Foothills Regional Planning Commission
16. Show-Me Regional Planning Commission
17. South Central Ozark Council of Governments
18. Southeast Missouri Regional Planning and Economic Development Commission
19. Southwest Missouri Advisory Council of Governments

DLG

Technical Assistance

Colorado Water Needs List

Water and Wastewater Assistance

Division of Local Government
Department of Local Affairs

1313 Sherman St. Rm. 521
Denver, Colorado 80203
(303) 866-2156

COLORADO WATER NEEDS CATEGORIZATION LIST

Listed herein are community water suppliers (15 taps and/or 25 people year-round) in the State of Colorado, which have health or safety needs which fit the "A" or "B" criteria below. All entities not listed can be considered to belong in category C. The corporate status of a community is listed as either "public", private, nonprofit (NP), or unincorporated (UI).

This list represents only needs and criteria developed by the ad hoc Colorado Water/Sewer Needs Committee, which was formed in 1979 at the governor's request. Any funding agency may have its own specific program criteria for funding projects. Recent additions to the list are redlined, and recent deletions are ~~overstruck~~.

The Committee is composed of state agencies normally concerned with water and sewer issues, as well as representatives of the Colorado Municipal League, Special District Association of Colorado, Colorado Counties, Inc., the USDA Farmers Home Administration, Colorado Rural Water Association, and the Colorado Water Resources and Power Development Authority. This list is coordinated by the Colorado Division of Local Government. Comments or questions can be directed to the Division at (303)866-2156.

The list represents a ranking by category of need, based primarily upon health and capacity concerns. Data used for this list were obtained from various sources, including the files and District Engineers at the Colorado Department of Health as well as local input. It is updated quarterly at committee meetings when new qualitative and funding information is incorporated. It is the intent of the Committee that this list be used as a common base for all funding agencies when considering the immediacy of need and possibility of joint funding for a proposed project.

The following criteria are used to categorize each community's need:

A. IMMEDIATE NEEDS
   1. Demonstrated health hazard*.
   2. Violation of the Colorado Primary Drinking Water Regulations (PDWR) in a manner which results in an immediate health effect.
   3. Inadequate supply of water to meet the reasonable needs** of the current population.

B. LONGER TERM/EMERGING NEEDS
   1. Potential health hazard***
   2. Violation of the PDWR in a manner which results in a long-term health effect.
   3. Growth projections indicate that the current supply will not be meet the reasonable needs** of the projected population within five years.

C. No known health hazard, violation of PDWR or projected supply problem within five years.

* Includes inadequate filtration of a surface source or lack of disinfection on wells.

** 150 gallons per day per capita

*** A condition exists which will result in a health hazard if certain other events occur; includes inadequate fire flow.

ESTIMATED FUNDING NEEDS

Listed in this column are amounts of anticipated project costs. Where an entity's needs have been identified by completed engineering studies they are marked with an asterisk. (*) A program or agency is listed in the "Funding Needs" column when it has committed some funding for the listed need.

FmHA is listed when this federal agency is funding a project which will solve the problem described here. The status of the project is then listed with the problem description.

IA is listed when a project is being funded by means of an Impact Assistance grant or loan from the Colorado Department of Local Affairs. The status of the project is then listed with the problem description.

CDBG, when listed, means that the State of Colorado has awarded a Community Development Block Grant for the project. The status of the project is then listed with the problem description.

SWRP is listed when a Small Water Resources Projects loan has been made by the Colorado Water Resources and Power Development Authority. The status of the project is then listed with the problem description.

CWCB is listed when the Colorado Water Conservation Board Construction Fund will be used to fund all or part of the project. The project has undergone agency reveiw, with legislative approval to follow.

Place	County	Funding Needs	Funding Provided	Category	Pub/Priv.	Problem Description	DoLA Rep.	FmHA Rep.	CDOH Rep.
lacier View Meadows	Larimer	$508,000		A3	NP	Health hazard due to water and sewer lines in the same conduit. Freezing of lines in winter. Poor design. Lines being separated. FmHA preapp. for $508,700 pending.	Sandoval	Wirth	Sainz
ark Meadows Water Assn.	Boulder	$25,000		B3	NP	Storage may need work.	Sandoval	Wirth	Sainz
ill Creek Water & Imp. ssociation	Clear Creek	$100,000		A1	NP	Surface source; no filtration, sedimentation, coagulation.	Kirtland	Wirth	Snider
an Acacio Water Users	Costilla	$50,000		A3	NP	Well sanding in, reducing capacity; storage tank needs repair or replacement. Study being funded by DLA and CDH to be completed 12/31/92. FmHA preapp. for $148,000 pending.	Downs	Gomez	Horn
hawnee Water Users Assoc.	Park	$450,000		A1	NP	Surface sources with improper filtration.	Kirtland	Gomez	Snider
outhgate (now known as PAC ssoc.)	Weld	$50,000		A2	NP	Nitrates in excess of MCL.	Sandoval	Wirth	Sainz
ranquil Acres Water	Teller	$10,000		B3	NP	Storage tank needs repair.	Kirtland	Gomez	Soldano
attenburg	Weld	$220,000		A3	NP	Inadequate storage.	Sandoval	Wirth	Sainz
urora MHP	Arapahoe	$50,000		A3	PRIVATE	Storage and distribution problems.	Kirtland	Wirth	Snider
righton MHP	Adams	$50,000		A2	PRIVATE	Nitrates exceed MCL. Putting in new well. Under CDH compliance order.	Sandoval	Wirth	Snider
reen Acres MHP	Eagle	$50,000		A1	PRIVATE	Well is dry. Pumping unfiltered surface water from creek. Update: Filtration on line. Failed to operate acceptably. Under a boil order.	Shipley	Miller	Chubrilo
idden Valley Mutual Water ompany	Jefferson	$20,000		B2	PRIVATE	High No3 level in main well. Well has been recased.	Kirtland	Wirth	Snider
ndian Hills Trailer Court	Jefferson	$20,000		B3	PRIVATE	System approaching capacity. Trying to buy additional rights.	Kirtland	Wirth	Snider
ohnson's Village MHP	Chaffee	$50,000		A1	PRIVATE	Wells without disinfection; question of proximity of wells to leach field.	Downs	Gomez	Soldano
azy Glenn MHP	Pitkin	$25,000		B1	PRIVATE	Two shallow wells next to pond. Likely to fail particulate analysis.	Shipley	Miller	Chubrilo
ount Vernon Country Club	Jefferson	$20,000		B3	PRIVATE	Approaching system capacity.	Kirtland	Wirth	Snider
osewood Hills	Teller	$50,000		B1	PRIVATE	Infiltration gallery is questionable as groundwater source. Filtration may be needed.	Kirtland	Gomez	Soldano
oyal Trailer Court	Arapahoe	$50,000		A3	PRIVATE	Supply problems. Exploring connection to Englewood.	Kirtland	Wirth	Snider
ierra Vista Trailer Park	Weld	$75,000		A1	PRIVATE	Nitrate problem.	Sandoval	Wirth	Sainz
guilar	Las Animas	$198,000	IA-$198,000	B1	PUBLIC	Poor pressure; undersized line. Project under contract.	Lowrey	Gomez	Soldano
llenspark WSD	Boulder	$100,000		A12	PUBLIC	Plant can't handle high turbidity in spring: inadequate pre-treatment. Planning to build additional storage to address problem.	Sandoval	Wirth	Sainz
ult	Weld	$50,000		B1	PUBLIC	Distribution problem.	Sandoval	Wirth	Sainz
aca Grande W&S	Saguache	$61,900		B1	PUBLIC	Distribution problems.	Downs	Gomez	Horn
ayfield	La Plata	$100,000		BA3	PUBLIC	Need additional treated storage.	Charles	Miller	Horn
erthoud, Town of	Larimer	$1,000,000		B3	PUBLIC	Plan to connect to south pipeline. Need treatment plant expansion too. May apply to SWRP.	Sandoval	Wirth	Sainz
lanca	Costilla	$100,000		A3	PUBLIC	Supply problems from depleted aquifer. Study funded by DLA and CDH to be completed 12/31/92.	Downs	Gomez	Horn

Place	County	Funding Needs	Funding Provided	Category	Pub/Priv.	Problem Description	DoLA Rep.	FmHA Rep.	CDOH Rep.
Brownsville WSD	Weld	$50,000		B1	PUBLIC	Inadequate storage and marginal pressure for fire flow.	Sandoval	Wirth	Sainz
Brush, City of	Morgan	$810,000	SWRP-$810,000	B3	PUBLIC	Storage and distribution problems. Under construction; to be done 12/93.	Gumina	Wirth	Snider
~~Calhan~~	~~El Paso~~		~~FmHA-$125,000~~	~~A3~~	~~PUBLIC~~	~~Distribution system problems. Inadequate water supply.~~	~~Kirtland~~	~~Gomez~~	~~Soldano~~
Canon City (Prospect Heights)	Fremont	$50,000	IA-$50,000	B1	PUBLIC	North fifteenth street area has undersized lines in poor condition and no fire hydrants. (Region 13 COG).	Downs	Gomez	Soldano
Carbondale, Town of	Garfield	$500,000		A1	PUBLIC	Failed particulate analysis. Need to install surface water treatment.	Sarmo	Miller	Bowman
Collbran, Town of	Mesa	$572,600*	IA-$286,000	A1	PUBLIC	Failed particulate analysis. Indication that a treatment plant will be required. Engineering in process. Construction in '93.	Sarmo	Miller	Bowman
Cortez	Montezuma		IA & local	B~~3~~1	PUBLIC	Need ~~3 more rapid sand filters; nearing capacity. Under construction.~~ additional storage and line replacement.	Charles	Miller	Horn
Costilla County WSD	Costilla	$50,000		~~B~~A3	PUBLIC	Supply problem. Study funded by DLA and CDH to be completed 12/31/92. Repair leaks, need more storage.	Downs	Gomez	Horn
Creede, Town of	Mineral	$650,000		A1	PUBLIC	Failed particulate analysis. Infiltration gallery under stream. Need to install surface water treatment. CDBG app. pending for $385,000. Under compliance schedule and enforcement order.	Downs	Gomez	Horn
Cripple Creek, Town of	Teller	$1,500,000	CDBG-$129,940 FmHA-$1,000,000	B1	PUBLIC	Inadequate pressure. Plant in design. Project under construction spring '93.	Kirtland	Gomez	Soldano
Dinosaur, Town of	Moffat	$30,000		B1	PUBLIC	Current chlorination deficiency. IA app. pending for 26k. Possible contamination from adjacent source. Aquifer level has fallen. May need new well.	Sarmo	Miller	Chubrilo
Dolores Water Conservancy District	Montezuma	$124,000		B3	PUBLIC	Will not meet expected demand; feasibility study done.	Charles	Miller	Horn
Dove Creek	Dolores	$49,686	IA-$24,601	B1	PUBLIC	Frequently serious water shortages due to frozen pipes. Treatment has been upgraded in design.	Charles	Miller	Horn
Durango, City of	La Plata	$50,000		B~~3~~2	PUBLIC	~~Seasonal inadequacy of raw water; line and pumps needed.~~Need plant upgrades including filtration upgrade and chemical feeders.	Charles	Miller	Horn
Durango West WD #1 & #2	La Plata	$50,000		B3	PUBLIC	Capacity problem within 5 years based on growth projections.	Charles	Miller	Horn
East Valley WSD	Arapahoe	$50,000		B3	PUBLIC	Low yield wells; inadequate pumping capacity; plans for new well.	Kirtland	Wirth	Snider
Erie, Town of	Weld	$2,768,000		A3	PUBLIC	Inadequate raw water supply. Applications submitted to FmHA and CWCB for funding to connect to Southern Pipeline.	Sandoval	Wirth	Sainz
Firestone, Town of	Weld	$458,400		B1	PUBLIC	Trying to ~~install 200,000 gallon elevated tank to improve pressure~~ expand storage capacity for fire flows. IA app. for $298K withdrawn.	Sandoval	Wirth	Sainz

Place	County	Funding Needs	Funding Provided	Category	Pub/Priv.	Problem Description	DOLA Rep.	FmHA Rep.	CDOH Rep.
Fleming, Town of	Logan	$249,686	IA-$150,176	B1	PUBLIC	Drop in water table makes it difficult to meet demand. Project consists of metering and leak detection. Construction underway and to be completed Summer 1993.	Gumina	Wirth	Sainz
Florence, City of	Fremont	$2,800,000	FmHA-$2,000,000	B1	PUBLIC	Inadequate supply, need to expand storage, and upgrade treatment. Trying to supply Rockvale. FmHA app. for $2.4M pending.	Downs	Gomez	Soldano
Florissant Water & Sanitation District	Teller	$1,000,000	FmHA-$1,037,000	A3	PUBLIC	Supply problem. Reported that questionable materials used for distribution system. Sanitary defects on existing wells. New wells and distribution system under construction. Well gone dry Spring '93. ~~May go back to~~ FmHA preapp. for $325,000 pending for a surface water treatment plant.	Kirtland	Gomez	Soldano
Fort Lupton	Weld	$25,000,000	SWRP-$3,000,000	A2	PUBLIC	Radioactivity; nitrates exceed MCL. Found PCE in two wells-they have been shut down. CWRPDA loan for $3M will not pay all costs. Planning to connect to Southern Pipeline Project. FmHa preapp. for ~~$12M~~20,470,000 pending.	Sandoval	Wirth	Sainz
Fort Morgan	Morgan	$30,000,000		B2	PUBLIC	High TDS, sulfates, hardness, inadequate storage. Planning to connect to Southern Pipeline Project. $4-5M for first phase.	Gumina	Wirth	Sainz
Fountain	El Paso	$200,000		B1	PUBLIC	Distribution problems.	Kirtland	Gomez	Soldano
Fowler	Otero	$100,000		A2	PUBLIC	Recently developed springs need turbidity measurement. Currently developing new springs.	Lowrey	Nichols	Soldano
Glenwood Springs	Garfield	$5,300,000	SWRP-$32,700,000 IA-$100,000	A2	PUBLIC	Inadequate treatment; seasonal high turbidity. Planned plant renovation. Design complete, project to be completed 2/95.	Sarmo	Miller	Bowman
Granby	Grand	$492,432*	~~SWRP-$492,432*~~	B1	PUBLIC	Need improvements to diversion; high turbidity, SWRP ~~committed~~ approved for $400,000.	Shipley	Miller	Chubrilo
Gunnison, City of	Gunnison	$100,000		B1	PUBLIC	Passed particulate analysis. Shallow wells no longer a problem. Inadequate detention time.	Sarmo	Miller	Bowman
Gypsum	Eagle	$700,000		A3	PUBLIC	Inadequate supply during low flow period. $700k SWRP app. pending for water treatment.	Shipley	Miller	Chubrilo
Holly	Prowers	$389,000		B2	PUBLIC	Packing in east well needs repair; radioactivity exceeds MCL.	Lowrey	Nichols	Soldano
Hoover Hill WSD	Boulder	$217,000		B3	PUBLIC	Need to replace various sections of leaking water mains. Water is flooding basements, making houses inhabitable. IA app. of $200k for $217k project withdrawn. Project being funded with bonds. Project under construction.	Sandoval	Wirth	Sainz
Hot Sulphur Springs	Grand	$49,000		B3	PUBLIC	Need new intake structure and pump controls.	Shipley	Miller	Chubrilo
Hudson	Weld	$3,500,000	CDBG-$350,000	A2	PUBLIC	CDBG funding provided to repair distribution system. Nitrates exceed MCL. Under enforcement order. Planning to connect to Southern Pipeline Project. FmHA preapp. for ~~$2.42.790M~~ pending.	Sandoval	Wirth	Sainz
Idledale WSD	Jefferson	$718,000	IA-$50,000	A3	PUBLIC	Water system old, and one source is radioactive. Storage is insufficient. FmHA ~~preapp.~~ for ~~$388,300~~250,000 pending.	Kirtland	Wirth	Snider
Johnstown, Town of	Weld	$2,180,000		B1	PUBLIC	Water transmission line enclosure. CWCB loan for project given preliminary approval 11/93.	Sandoval	Wirth	Sainz

Place	County	Funding Needs	Funding Provided	Category	Pub/Priv.	Problem Description	DoLA Rep.	FmHA Rep.	CDOH Rep.
Julesburg	Sedgwick	$600,000		B1	PUBLIC	Distribution problems. High TDS, sulfates, nitrates, hardness. Can't find acceptable supply. Looking for alternate supply.	Gumina	Wirth	Sainz
Kim	Las Animas	$15,000		A2	PUBLIC	Nitrates exceed MCL.	Lowrey	Gomez	Soldano
Kit Carson	Cheyenne	$1,500,000		A2	PUBLIC	Capacity problems from aquifer depletion; hardness, alkalinity, sulfates, dissolved solids and nitrates all exceed MCL. Looking for alternate water source. Town is operating under a nitrate exemption.	Gumina	Nichols	Snider
La Veta	Huerfano	$382,900		A3	PUBLIC	Inadequate capacity and filtration to meet current demands. Summer water restrictions. CDBG app. for $306,320 pending.	Lowrey	Gomez	Soldano
Larkspur	Douglas	$312,800		B21	PUBLIC	High iron. Iron filters in place, not yet on line. CDBG app. pending for 165k to drill backup well to meet occasional high demand.	Kirtland	Wirth	Snider
Las Animas	Bent	$2,400,000	FmHA- $1,265,000 EDA- $847,000 CDBG- $300,000	B2	PUBLIC	Hardness, sodium, and sulfates. Testing pilot reverse osmosis plant.	Lowrey	Nichols	Soldano
Little Thompson WD	Larimer	$4,800,000		B3	PUBLIC	Need additional treatment. Planning treatment plant upgrade in 1994.	Sandoval	Wirth	Sainz
Loveland	Larimer	$13,000,000		B3	PUBLIC	Storage problems with lake. Feasibility study complete. 1996 construction expected.	Sandoval	Wirth	Sainz
Manzanola, Town of	Otero	$112,000	CDBG- $130,792	A3	PUBLIC	Old well not producing sufficiently, need improvements to metering and storage systems. FmHA app. for $50,000 ~~pending~~ withdrawn.	Lowrey	Nichols	Soldano
Mesa Water and Sanitation District	Mesa	$240,000	FmHA- $180,000	B1	PUBLIC	Shallow wells. Likely to fail particulate analysis. FmHA loan closed 10/92.	Sarmo	Miller	Bowman
Monte Vista, City of	Rio Grande	$100,000		B23	PUBLIC	~~O&M problem;~~ Insufficient storage.	Downs	Gomez	Horn
Montezuma, Town of	Summit	$50,000		B1	PUBLIC	Distribution system problems.	Shipley	Miller	Chubrilo
Monument, Town of	El Paso	$149,019	IA-$110,000	A3	PUBLIC	Inadequate water supply to meet existing peak demand periods. Emergency water restrictions have been imposed on a seasonal basis.	Kirtland	Gomez	Soldano
Morrison	Jefferson	$50,000		B1	PUBLIC	Need pre-sedimentation.	Kirtland	Wirth	Snider
Mt. Werner WSD	Routt	$4,600,000	SWRP- $4,600,000	B3	PUBLIC	Need additional storage on Fish Creek. ~~Doing~~ EIS completed.	Shipley	Miller	Chubrilo
Naturita	Montrose	$100,000		B3	PUBLIC	Need to improve pretreatment.	Charles	Miller	Bowman
North Shore WSD	Grand	$196,500	IA-$179,750	B1	PUBLIC	Old water lines deteriorating. Need additional fire hydrants.	Shipley	Miller	Chubrilo
North Weld WD	Weld	$1,000,000		B3	PUBLIC	Old lines, high growth.	Sandoval	Wirth	Sainz
Northridge MD	Jefferson	$100,000		B3	PUBLIC	Old lines; inadequate fire flow.	Kirtland	Wirth	Snider
Norwood, Town of	San Miguel	$700,000*	IA-$250,000 CWCB- $320,000	B31	PUBLIC	~~Treatment~~ Distribution and storage problems. ~~IA app. pending.~~	Charles	Miller	Horn
Nunn, Town of	Weld	$200,000		A3	PUBLIC	High Nitrates. Galleries run dry during summer months. ~~Proposal to hook up to N. Weld Water District.~~	Sandoval	Wirth	Sainz

Place	County	Funding Needs	Funding Provided	Category	Pub/Priv.	Problem Description	DoLA Rep.	FmHA Rep.	CDOH Rep.
)lathe	Montrose	$450,000	CDBG-$150,000 IA-$150,000	A3	PUBLIC	Insufficient storage capacity. Planning to build 1M gallon tank and transmission line.	Charles	Miller	Horn
)rchard City, Town of	Delta	$500,000		A1	PUBLIC	Failed particulate analysis. Need to install surface water treatment.	Sarmo	Miller	Bowman
)tero County	Otero	$50,000		B3	PUBLIC	Needs study to link many small supplies; low yield; failing wells force people to haul water from poor quality sources.	Lowrey	Nichols	Soldano
)uray	Ouray	$500,000	FmHA-$500,000	A1	PUBLIC	Unfiltered system; source is surfacing spring. In 3rd year of construction. Surface water influence on new spring. Probable completion 1993. May fail particulate analysis.	Charles	Miller	Bowman
Pagosa Area WSD	Archuleta	$3,800,000	CWCB-$1,900,000	B3	PUBLIC	Insufficient reservoir capacity.	Charles	Miller	Horn
Pagosa Springs	Archuleta	$150,000		B1	PUBLIC	Distribution problems.	Charles	Miller	Horn
Palmer Lake	El Paso	$500,000	IA-$500,000	B1	PUBLIC	Frequently frozen pipes.	Kirtland	Gomez	Soldano
Paonia	Delta	$872,000*	IA-$300,000	A1	PUBLIC	Inadequate treatment/storage. $179k needed for storage. Construction on treatment Summer '93. Failed particulate analysis Spring '93.	Sarmo	Miller	Bowman
Park Center Water District	Fremont	$1,450,000	FmHA-$1,200,000	B1	PUBLIC	Inadequate fire protection. Scaling of water pipes. Project under construction 1/94.	Downs	Gomez	Soldano
Parker WSD	Douglas	$600,000	SWRP-$600,000	B3	PUBLIC	New transmission line for additional supply.	Kirtland	Wirth	Snider
Penrose WSD	Fremont	$125,000		A3	PUBLIC	Distribution system problems. FmHA deobligated funds.	Downs	Gomez	Soldano
Pinewood Springs Water District	Larimer	$500,000		A3	PUBLIC	System capacity exceeded during late summer except in wet years. No outside use permitted. Need filtration. Under construction.	Sandoval	Wirth	Sainz
Placer Valley SD	San Miguel	$165,000		A1	PUBLIC	Sanitary survey showed high coliform in shallow wells. Central sewer system needed.	Charles	Miller	Horn
Platteville	Weld	$500,000	~~IA-$500,000~~	A2	PUBLIC	Nitrates in excess of MCL. May try to hook to Central Weld.	Sandoval	Wirth	Sainz
Ramah	El Paso	$400,000	FmHA-$400,000	B1	PUBLIC	Old wells and chlorinators--potential hazards; inadequate storage; old mains deteriorated. ~~Study completed 9/92.~~ Total distribution system replacement. Work begun 12/93. Completion 5/94.	Kirtland	Gomez	Soldano
Rico	Dolores	$75,000	~~IA-$180,000~~	A13	PUBLIC	~~Needs coagulation filtration. Failed particulate testing. Plans and specs approved. Expect completion by '93.~~ Distribution system leaking badly. Storage tank need rehab.	Charles	Miller	Horn
Ridgewood Water District	Teller	$30,000	IA-$26,000	B1	PUBLIC	Water supply problems. Need improvements to collection gallery.	Kirtland	Gomez	Soldano
Rockvale	Fremont	$862,500	CDBG-$500,000	B1	PUBLIC	Shallow wells, septic tanks; good O&M has put off serious problems. Study underway to review new storage scheme for municipal and recreational uses. ~~338k FmHA app. pending~~ funding approved under Florence project.	Downs	Gomez	Soldano
Round Mountain WSD	Custer	$50,000		B3	PUBLIC	Poor storage and line capacity; seasonal shortage; no fire protection.	Downs	Gomez	Soldano
Rye	Pueblo	$300,000		A1	PUBLIC	Surface source, old filters, no meters. New well high in radium. Looking for a alternate source.	Lowrey	Gomez	Soldano

Place	County	Funding Needs	Funding Provided	Category	Pub/Priv.	Problem Description	DoLA Rep.	FmHA Rep.	CDCH Rep.
Sanford	Conejos	$250,000	IA-$250,000	A3	PUBLIC	Inadequate supply. Lines too small.	Downs	Gomez	Horn
Silver Plume	Clear Creek	$160,000	IA-$140,000	B1	PUBLIC	Increased storage needed to hydraulically improve system for enhanced fire flows. Looping of distribution system required to prevent freezing and low water pressure.	Kirtland	Wirth	Snider
Steamboat II WSD	Routt	$922,000	IA-$200,000	A3	PUBLIC	The current three wells insufficient and subject to contamination. Planning to hook on to City supply.	Shipley	Miller	Chubrilo
Teller Co. WSD	Teller	$35,000		A1	PUBLIC	Wells with no chlorination. On compliance schedule.	Kirtland	Gomez	Soldano
Telluride, Town of	San Miguel	$384,000		A3	PUBLIC	Old transmission lines and diversion structures need replacement. IA app. for $288,000 pending.	Charles	Miller	Horn
Thunderbird WSD	Douglas	$20,000		B3	PUBLIC	Two wells, one with high iron. Need additional wells.	Kirtland	Wirth	Snider
Victor	Teller	$2,400,000		A1	PUBLIC	Inadequate chemical pre-treatment and filtration of surface source. Plans approved.	Kirtland	Gomez	Soldano
Walden, Town of	Jackson	$110,000		A1	PUBLIC	Failed particulate analysis, need surface water treatment. IA app. pending.	Shipley	Miller	Chubrilo
Walsenburg	Huerfano	$650,000		A1	PUBLIC	Raw water being delivered from surface source to 30 taps west of town; inadequate filtration to remove giardia in entire system.	Lowrey	Gomez	Soldano
~~Walsenburg (Atencio Addition)~~	~~Huerfano~~		~~FmHA-$314,000~~	~~B1~~	~~PUBLIC~~	~~Poor pressure. Water shortages. Fireflow problems. Needs new line.~~	~~Lowrey~~	~~Gomez~~	~~Soldano~~
~~Ward~~	~~Boulder~~		~~IA-$130,000~~	~~B1~~	~~PUBLIC~~	~~Frequently has shortage problems. Needs line replacement.~~	~~Sandoval~~	~~Wirth~~	~~Sainz~~
~~Wiggins~~	~~Morgan~~		~~IA-$125,000 - REA approved~~	~~B1~~	~~PUBLIC~~	~~Need to modify storage to remove iron & bacteria. Construction underway and to be completed by 6/93.~~	~~Gumina~~	~~Wirth~~	~~Sainz~~
Agate	Elbert	$50,000		B3	UI	Low water pressure. Fireflow problems. Needs to request money to complete study.	Gumina	Nichols	Snider
Baxter	Pueblo	$200,000		A1	UI	High nitrate levels in private wells. Can Baxter cooperate with St. Charles Mesa?	Lowrey	Gomez	Soldano
Chambers Addition Subdivision	Weld	$50,000		A2	UI	Nitrates exceed MCL.	Sandoval	Wirth	Sainz
Conejos W & S Assoc.	Conejos	$20,000		~~B3~~A2	UI	~~One shallow well~~ Supply does not meet occasional high demand.	Downs	Gomez	Horn
Cottonwood Subdivision	Chaffee	$275,000		A1	UI	Individual shallow wells; septic discharging to ground water. Study needed.	Downs	Gomez	Soldano
Newdale/Grand Valley	Otero	$100,000		B2	UI	Production dropping; State will not give replacement well permit; needs additional storage for backwash; high in iron content; (pending).	Lowrey	Nichols	Soldano
North Trinidad Area	Las Animas	$16,845	IA-$16,845	B1	UI	Low pressure problems. Costs of fixing entire area may have increased to $250,000. DOLA awaiting master plan before committing additional assistance.	Lowrey	Gomez	Soldano
Peyton	El Paso	$200,000		A2	UI	Elevated nitrate levels in private wells. Study underway.	Kirtland	Gomez	Soldano
Rye Ranchettes	Pueblo	$100,000		A1	UI	Private wells show contamination.	Lowrey	Gomez	Soldano
Wetmore	Custer	$280,000		A3	UI	Community well failed; no transmission lines; water hauled.	Downs	Gomez	Soldano

Place	County	Funding Needs	Funding Provided	Category	Pub/Priv.	Problem Description	DoLA Rep.	FmHA Rep.	CDOH Rep.
TOTAL STATE FUNDING NEED		$132,951,268							

Department of Economic Development
State of Missouri

John Ashcroft
Governor

David C. Harrison
Director

TARGETING PROPER STRATEGIES FOR RURAL INFRASTRUCTURE

The major infrastructure problem in non-metro Missouri is providing safe drinking water for residents. Many areas are without public water and many communities have serious water quality problems. Lower income residents often don't have the financial resources to get decent water. Even when assistance is provided, there is often a void in knowing what strategy to follow for developing proper water source, supply and treatment on a long-range as well as short-term basis. The drought of 1988 made it clear that the non-entitlement communities of Missouri, especially in the north one-half of the state, do not presently have the capacity to supply water to residents in critical periods of stress.

The specific Infrastructure strategy 107 program is to provide technical assistance for low-to-moderate income communities so that water improvement projects are submitted that best alleviate potential health threats and improve the quality-of-life for residents. The strategy would also allow state CDBG staff to select projects that employ a better long-term solution. For example, spending money on improving the water treatment plant or drilling a water well in a small city may not be the best solution often times, a Rural Public Water Supply District has built capacity for the small cities in its district or have lines that run near the towns. The town however, would rather keep its own water supply even though water pressure is low and citizens have to regularly boil the drinking water prior to use. The proper strategies would be determined.

The Technical Assistance Infrastructure Assistance would entail the 107 coordinator working to achieve the following:

1) Conduct a series of fifteen regional workshops to determine the immediate and long-term strategies for removing serious threats imposed by unsafe water systems in low-to-moderate income communities. In attendance at each meeting would be the 107 coordinator, plus local water district and municipal officials and their consulting engineers. At each meeting would be Missouri Department of Natural Resources staff from their Regional Offices, Public Drinking Water Program and Water Resources Program.

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2) A strategic plan would be developed which details the proper strategy to resolve water supply, source and treatment needs on a logical, long-term basis. Regional water supply and sources would be identified. Future water system improvements and expansion plans for both municipal and rural districts would be reviewed.

3) The strategy would be a tool to be used by eligible communities requesting CDBG assistance. The information from the regional meetings would be invaluable for the CDBG in evaluating funding requests (the majority of our applications are for water system improvements).

No specific additional contract costs would be incurred for Infrastructure Strategy as managing this initiative would be the major function of the 107 coordinator.

27 State CDBG Programs - Evaluation Criteria for Water Systems Projects

Summary of State Programs with Detailed or Unique Water System Rating Criteria

Arkansas

- To qualify must have State Heath Department finding of unsafe water (fecal coliform or chemical contamination) or no reliable water source with adequate pressure, State Health Department order, Imminent Health Threat designation, or regular septic tank failure

- Applications require engineer report with evaluation of feasible alternatives including cost for alternatives. Policy of State Water Plan and technical advisory committee is to promote regionalization concept for water supply, treatment, and distribution.

Colorado

- A State Committee prepares a Water and Sewer Categorization Needs List with 3 categories: 1) Immediate Needs, 2) Longer Term/Emerging Needs, 3) No known health hazard, violation of water regulations, or project supply problem within 5 years.

- Review factors include: 1) attempts to recover capital costs and 2) whether the project is on the Water or Sewer Needs Categorization List.

Iowa

- Information requested for water and sewer projects includes projected monthly residential bill without CDBG funds, and 2) projected monthly residential bill with CDBG funds.

Mississippi

- Demonstrated Need factor has 4 components: 1) Critical Need - 110 points, 2) Substantial Need - 80 points, 3) Moderate Need - 50 points, 4) Minimum Need - 0 points.

- Critical Need is based on high risk to health and/or imminent interruption of basic services essential to acceptable standards of living (other factors defined)

Nebraska

- Physical Need is one of four rating factors. Physical Need includes 100 points maximum for violations of health standards documented by a state or federal agency for which a compliance order has been issued.

New Hampshire

- Eligible only if State Department of Environmental Services determined that the improvement is required for public health and safety.

Oregon

- No points system evaluation criteria. No annual deadline for applications.

- Provides $10,000 grants for project oriented engineering and planning. $30,000 grants for comprehensive assessment of community's entire water and sewer system to produce a 20 year master plan.

South Carolina

- Has 5 categories to define existing problem with corresponding scores ranging from "Lack of public water or sewer facilities presents a documented threat to the health and safety of persons in the target area." to "No deficiencies, health threats, nuisances, or inconveniences are noted."

South Dakota

- Applicants can request a waiver on local cost sharing.

- Current and proposed fees requested for 7,000 gal/month or 935 cu. ft.

Tennessee

- Separate criteria for sewer line extension, water treatment plants, etc. Factors include quantity/supply, quality/bacteria, quality/minerals.

Washington

- Requests Problem and Solution Statements. Solution Statement requires Project Design, Alternatives Considered, Project Impact, and other factors.

27 State CDBG Programs - Evaluation Criteria for Water Systems Projects

State	Evaluation Criteria	Comments
Arizona	No overall criteria. Uses separate Methods of Distribution (MODs) depending on component of CDBG program.	No separate set aside or program exclusively for water and waste water projects. Uses regional funding approach. Allocations made to Councils of Governments.
Arkansas	To qualify must demonstrate one of following: 1) State Health Department finding of unsafe water (fecal coliform, chemical contamination) or no reliable water source with adequate pressure, 2) State Health Department order, 3) Imminent Health Threat designation, 4) regular septic tank failure	Engineer report must have narrative on project need, evaluation of feasible alternatives including costs for each alternative. Application instructions state it is policy of the Water/Wastewater Advisory Committee and State Water Plan to promote regionalization concept for water supply, treatment and distribution.
Colorado	1) Project Impact, 2) Public and Private Commitments, 3) Management Capability. - State Committee prepares Water Categorization Needs List with 3 categories: 1) Immediate Needs, 2) Longer Term/Emerging Needs, 3) No known health hazard, violation of water regulations, or projected supply problem within 5 years	Review factors for public facilities projects: 1) attempts to recover capital costs of CDBG financed improvements, 2) whether the project is on the State Water or Sewer Needs Categorization List.
Florida	Scope of Work - Benefit Summary - 650 points Equal Opportunity Employment - 100 points Community-Wide Needs Score - 250 points	Work Benefit Measures: Jobs for Low and Moderate Income Persons, Cost Per Job, Leverage, Average Hourly Wage Rate, Managerial Competence, Recapture of Funds, Equity Investment.
Idaho	Program Impact - 340 points National Objectives - 260 points Project Categories - 200 points Economic Advisory Council - 200 points	Separate applications and rating system for public facility/housing, senior citizen centers, and economic development projects.

State	Evaluation Criteria	Comments
Illinois	Public Facilities rated in four areas: 1) Community Need Factor 2) Project Benefit 3) Benefit to Low and Moderate-Income Persons 4) Resource Leveraging	State Environmental Protection Agency & Farmers Home Administration asked to review water & sewer projects. Project Benefit includes documented: facility deficiencies; & problems have occurred such as serious illness, disease outbreak, or serious environmental pollution.
Indiana	1) Project Design - 750 points readiness to proceed, benefit to low and moderate income persons, financial impact, project need, local effort, local match 2) Community Distress - 250 points unemployment rate by county, net assessed value per capita, median housing value per capita, median housing value, population size, % population change between 1980 and 1990	Public Facility Project applications require: copies of rate structure; history of rate increases; projected impact on rates; depreciation, maintenance, replacement, capital improvement, etc. component of rate; current bond indebtedness and capacity, current net assessed valuation, tax rate, components of rate.
Iowa	Magnitude of Need - 200 points Project Impact - 200 points Low & Moderate Income Benefit - 200 points Local Effort - 100 points Community Builder Community - 50 points	Information requested for water & sewer system projects: 1) number of residential users 2) average monthly residential bill 3) projected monthly residential bill without CDBG funds 4) projected monthly residential bill with CDBG funds 5) date of last rate increase
Kentucky	- Maximum Points for Public Facility 1) Community Need - 100 points 2) Project Need - 350 points 3) Comparative Costs - 150 points 4) Financing - 200 5) Project Effectiveness - 200 points - Maximum Points for Housing Applications is the same except Project Need maximum is 300 points.	- One of 5 stated Program Goals is: Goal 2. To provide public facilities to eliminate conditions which are detrimental to the public health and safety and which thus detract from further community development, or which are necessary to meet essential community needs. - Objectives: a. Improve existing public facilities, b. Provide new facilities when warranted by recent population growth, or when essential needs exist.

State	Evaluation Criteria	Comments
Louisiana	Benefit to Low/Moderate Income Persons - 10 pts. Cost Effectiveness - 20 points Project Severity - 50 points Engineering Plan and Specifications - 1 point Administrative Costs - 1 point	Assessment of conditions in violation of the State Sanitary Code is made by State environmental and health agencies. Agencies determine relative degree of risks to human health.
Michigan	Infrastructure Projects must meet each of the following: 1) 1:1 Leverage ratio 2) Other funding firmly committed and documented 3) Critical Need	One of the 3 major program objectives is: Address critical public infrastructure and community development needs of Michigan communities through grants primarily to those communities with the highest concentrations of low and moderate income people.
Mississippi	1) Low/Moderate Income Benefit/Slums, Blight - 100 points 2) Demonstrated Need for Project/Joint Action - 110 points 3) Priority Category of Activities - 50 points 4) Financial Participation - 50 points 5) Non-funded Bonus Points - 40 points 6) Meeting Past MBE/WBE Objectives - 40 points 7) Cost Benefit - 40 points	- Demonstrated Need has these components: Critical Need - 110 points Substantial Need - 80 points Moderate Need - 50 points Minimum Need - 0 points - Critical need based on high risk to health and/or imminent interruption of basic services essential to acceptable standards of living. - Technical Review is based on Recommended Minimum Design Criteria for Community Public Water Supplies: State Board of Health Division of Water Supply.
Missouri	Need - 75 points Local Effort - 20 points Past Performance - 5 points	Need Criteria includes following priorities: 1) Health or safety 2) Environmental damage 3) Property damage 4) Inadequate facilities/services commonly provided for existing residents 5) Cultural, recreational, or aesthetic 6) Inadequate facilities for potential (speculative) growth

State	Evaluation Criteria	Comments
Nebraska	Physical Need - 100 points Significance of Impact - 100 points Financial Need - 100 points Efficiency - 100 points	Physical Need includes 100 points maximum for violations of health standards documented by a state or federal agency for which a compliance order has been issued.
New Hampshire	Maximum - 140 points 1) Impact in Meeting Described Needs 2) Impact of CDBG Funding 3) Persons or Households Benefiting, Relative Cost 4) Commitment to Maintain Facilities 5) Long Term Benefit 6) Readiness for Implementation	- Commitment to Maintain Facilities based on submission of a proposed operations and maintenance budget and a letter of commitment to use local resources to maintain public facilities. - Eligible only if: 1) State Department of Environmental Services determined that the improvement is required for public health and safety, and 2) annual residential water rate for 90,000 gallons after project completion is not more than 1% of 80% of median family income.
New Jersey	Community Need - 150 points National Objective - 425 points Project Description and Justification - 350 points Facility Needs and Costs - 75 points	Evaluation Form asks whether applicant documents deficiencies with statements from State Department of Environmental Protection and county health department.
New Mexico	Need - 25 points Appropriateness - 25 points Fiscal Capacity - 25 points Leveraging - 15 points Citizen Participation/Planning - 15 points Feasibility/Readiness - 10 points Cost/Benefit - 10 points	Applications forward to Councils of Government and appropriate state agencies for technical review and comments. Review agencies include Environmental Improvement Division, Natural Resources Department, State Highway Department, State Engineer's Office, Construction Industries Division, Economic Development and Tourism Department and others.
New York	no State CDBG program	

State	Evaluation Criteria	Comments
Oregon	- No points system using evaluation criteria. No annual deadline for projects. Applications accepted and funded year round. Applications are reviewed in consultation with State and Federal agencies. - Selection criteria includes requirement that State CDBG office make determinations such as: 1) the proposed project is necessary to meet the needs of existing residents, 2) the activities proposed are CDBG eligible, 3) the ultimate construction project will meet a CDBG national objective, and others	Provides Preliminary Engineering and Planning grants. $10,000 available for project oriented engineering and planning. $30,000 available for a comprehensive assessment of a community's entire water and sewer system to produce a 20 year time frame plan master plan.
South Carolina	Identification of Existing Problem or Need - 20 points Demographics - Community Distress - 10 points Benefit Low & Moderate Income Persons - 30 points Impact of Proposed Project - 30 points Capacity and Performance - 10 points	Identification of Existing Problem or Need 20 points 1) 100% of points - Lack of public water or sewer facilities presents a documented threat to the health and safety of persons in the target area. 2) 75% of points - Deficiencies in existing public water or sewer facilities present a documented threat to the health and safety of persons in the target area. 3) 50% of points - Lack of public water or sewer facilities but no documented threat to public health or safety. 4) 25% of points - Deficiencies in existing water or sewer facilities area a nuisance or inconvenience rather than a threat to the health or safety of persons in the target area. 5) 0% of points - No deficiencies, health threats, nuisances, or inconveniences are noted.
South Dakota	Need/Number of poverty persons - 25 points Need/Percent of poverty persons - 25 points Need/Household income - 400 points Program Factors/Impact of program - 400 points Local effort - 100 points Fiscal capacity - 100 points	Application requests Water - Wastewater Fee Information current and proposed fees per 7,000 gal/month or 935 cu.ft. - last change in fee schedule - projected fees Applicants can also request a waiver for local cost sharing.

State	Evaluation Criteria	Comments
Tennessee	Community Need - 100 points Project Need - 100 points Project Feasibility - Threshold (pass/fail) Project Impact - 100 points	Separate Project Need criteria for sewer line extension, sewer system improvements, water treatment plant improvements, water line extensions. Criteria factors for water line extensions: quantity of source (supply), quality of source (bacteria), quality of source (minerals).
Texas	Community Distress - 55 points Benefit to Low/Moderate Income Persons - 40 points Minority Hiring - 25 points Project Impact - 170 points Matching Funds - 60 points Regional Review Committee Scoring - 350 points	One major component of the application evaluation system is the use of Regional Review Committees consisting of Governor appointees.
Washington	1) Citizen Participation/Community Development and Housing Plan - 50 points 2) Problem/Need Statement - 175 points 3) Solution Statement - 175 points 4) Benefit to Low and Moderate Income Persons - 100 points	1) Problem/Need Statement includes: Problem Description - 50 points Problem Impact and Severity - 75 points Past Effort - 50 points 2) Solution Statement includes: Project Design - 25 points Alternatives Considered - 10 points Project Impact - 50 points Administrative Plan - 15 points Budget - 25 points Relationship of CDBG Funds to other Funds/Resources - 50 points
West Virginia	1) Phase 1 review consists of eligibility, national objective and other determinations. 2) Projects passing Phase 1 will proceed to Phase II review which includes the following criteria and others: Readiness to Proceed, Severity of the Problem, Cost Effectiveness, Relationship to State Initiatives and Plans, and Number of Persons Served	Distribution of funds will emphasize the state's commitment towards: Public infrastructure projects with emphasis given to water and sewer projects that leverage dollars from local, federal, or private sources, and meet local health or environmental needs.

State	Evaluation Criteria	Comments
Wisconsin	Distress - 100 points Need - 75 points Planning - 50 points Past Effort - 25 points Ability to Pay - 50 points Leveraging - 100 points	Needs - Application must address deficiencies in public facilities that affect the public health and safety or some other essential need. Planning - Proposed activities must be based on a reasonable plan of action which is documented in the application.
Wyoming	Seriousness of the Problem - 150 points Urgency of the Problem - 75 points Integrated Effort - 50 points	Goal 3 of the Community Development Program is: To improve community infrastructure by eliminating health, safety, and welfare problems.

file:matrix

Small systems and SDWA reauthorization

USEPA's small systems coordinator summarizes key elements of the agency's report to Congress, emphasizing the issues of viability, low-cost technology, and financing.

Peter E. Shanaghan

The Safe Drinking Water Act (SDWA) was enacted in 1974 after more than four years of effort by Congress to develop a national program to protect the quality of the nation's public drinking water systems.[1] The SDWA was amended in 1977, 1979, 1980, and most extensively in 1986.[2] Issues associated with small water systems have been a prominent feature of these deliberations. Recently, Congress has begun the process of reauthorizing the SDWA, and once again small systems issues are prominent. In anticipation of reauthorization, the US Environmental Protection Agency's (USEPA's) 1993 Appropriations Act [Section 519(a) of Public Law 102-389] required USEPA to report to Congress on the technical and economic capacity of states and public water systems to implement drinking water regulations and to offer recommendations concerning the SDWA reauthorization.

Small systems issues have been a prominent feature of deliberations on the Safe Drinking Water Act (SDWA) and its reauthorization. In 1993 the US Environmental Protection Agency (USEPA) prepared a report to Congress that contained detailed discussion of the SDWA compliance challenges faced by small water systems. This article focuses on three of the major small system issues identified in the report to Congress—viability, lower-cost technology, and financing—and discusses how USEPA's reauthorization recommendations would address these issues.

USEPA issued its report to Congress and its recommendations (summarized on page 55) for SDWA reauthorization in September 1993. The report contained a detailed discussion of the SDWA compliance challenges faced by small water systems and identified a number of key categories of approaches to help small systems meet these challenges.[3] This article focuses on three of the major small system issues identified in the report—viability, lower-cost technology, and financing—and describes how USEPA's reauthorization recommendations would address these issues.

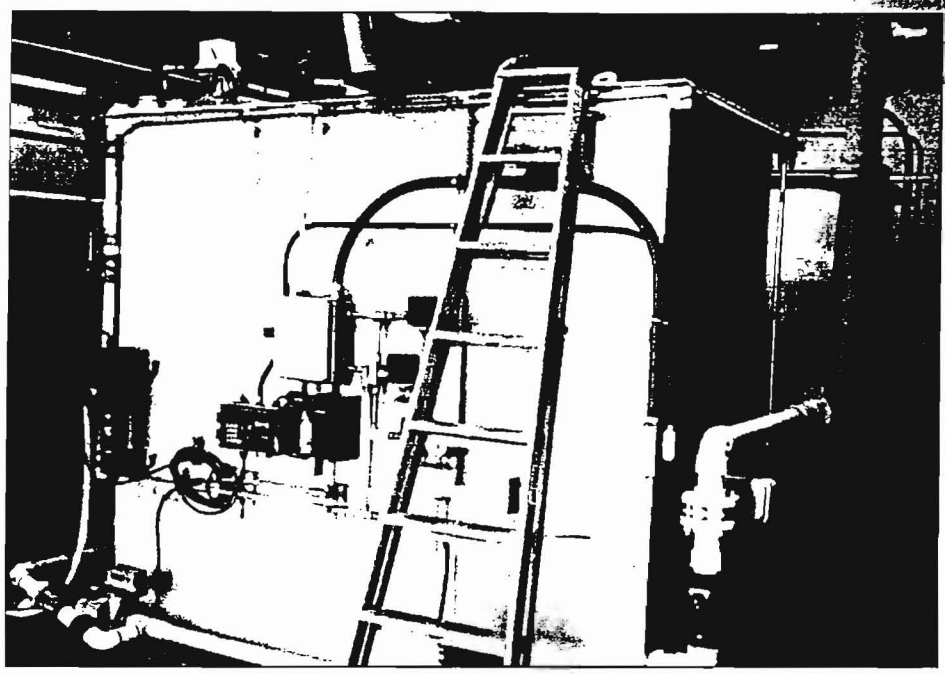
Community systems serve year-round population

There are about 200,000 public water systems regulated under the SDWA. A public water system is any system providing piped water for human consumption to at least 15 service connections or serving an average of at least 25 people at least 60 days per year.

The distinguishing characteristic of community water systems, a subset of public water systems and

the focus of this article, is that they provide water to the same population all year long. There are about 60,000 community water systems, two thirds of which serve 500 or fewer people (Figure 1). Eighty-seven percent of community water systems serve 3,300 or fewer people, the defining number USEPA uses to classify a system as small. Only 13 percent of community water systems serve more than 3,300 people. However, nearly 90 percent of the population served by community water systems is served by these larger systems. It is interesting to note that about half of all small community water systems lie within the boundaries of the US Census Bureau's Standard Metropolitan Statistical Areas.[3]

This package plant for coagulation, flocculation, and filtration was designed specifically for use by small systems.



Two other subsets of public water systems are nontransient–noncommunity water systems and transient–noncommunity water systems. Nontransient–noncommunity systems (e.g., schools and factories that have their own water supply) regularly serve at least 25 of the same people at least six months of the year; there are about 25,000 such systems. Transient–noncommunity systems, of which there are about 115,000 in the United States, have their own water supply but serve only transient customers in establishments such as rest stops, campgrounds, and gas stations.

In addition to being predominantly small, community water systems are characterized by an institutional diversity of ownership types (Figure 2). Unlike larger community water systems, which are almost exclusively either publicly owned or investor-owned water utilities, significant numbers of small community water systems are owned by mobile home parks or homeowners' associations for whom provision of drinking water is not the primary purpose.

Package plants should not be viewed as eliminating the need for site-specific engineering services.

Compliance challenges for small systems noted. The problems and difficulties faced by small water systems have been well documented.[3–12] These are among the systems' most significant problems:

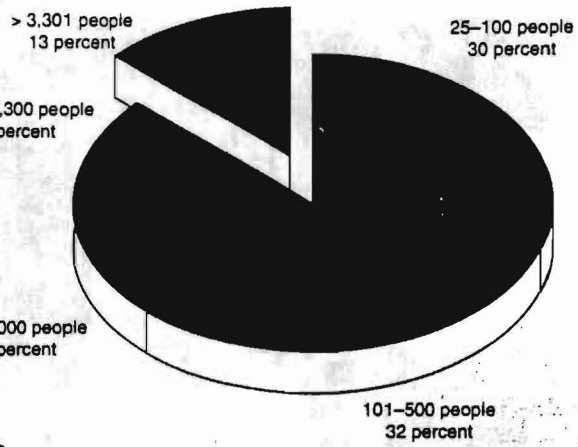
• *Deteriorated physical infrastructure.* In many cases, systems are facing the cumulative burden of decades of infrastructure neglect. In several states where needs surveys have been completed, it has been estimated that every dollar of small-system investment in compliance-related new treatment equipment will have to be matched by a corresponding dollar for infrastructure rehabilitation.[3]

• *Lack of access to capital.* Most small water utilities suffer numerous disadvantages that impede their ability to access capital at favorable rates and terms. One major disadvantage is that small systems often serve a customer base of limited economic diversity that is subject to sudden demographic shifts or economic changes (i.e., shutdown of a major employer). An additional disadvantage is limited familiarity with and recognition by capital markets, which leads to higher interest costs even if credit can be obtained.[13]

• *Limited customer and rate base.* Many small systems were initially undercapitalized.[10] In addition, because the systems serve only a few households, the revenue stream available to support water system operations is severely limited. Whereas larger systems can produce significant additional revenue for the utility by instituting a relatively small increase in the household water bill, smaller systems would need to institute a much greater rate increase to appreciably increase the revenue stream.

• *Inadequate rates and poor financial management.* Although small systems, on average, tend to

FIGURE 1 **Number of community water systems by size based on population served *(total number of systems—60,000)***



have higher rates than larger systems, many small systems simply do not charge enough to cover their full cost of service (including depreciation and equipment replacement). In some cases, small publicly owned systems are not operated on an enterprise fund accounting basis, and water system revenues are diverted to pay for public services not related to the water system.

• *Diseconomies of scale.* A prevailing characteristic of water supply technology is that unit costs increase as capacity decreases.[14] Thus, on a unit basis, a small system pays much more than a larger system to treat water. Other costs, such as monitoring, are also higher on a unit basis for small systems. This is illustrated in Figure 3, which depicts the estimated change in household cost for drinking water to comply with currently promulgated regulations in small systems.

• *Limited technical and managerial capabilities.* Many small systems are very well managed and provide excellent service to their customers at reasonable rates.[15–17] However, as noted earlier, many small systems are an incidental part of some other undertaking and bear little resemblance to water utilities. Some of these systems (as well as some systems organized as utilities) lack the management and operational expertise needed for successful operation.

USEPA's report to Congress highlights viability, lower-cost technology, and financing as major issues needing to be addressed to overcome the problems faced by small water systems.

Issue of viability involves underlying problems

Much has been written recently about water system viability, and a number of definitions for the term have been proposed.[10,11,18–20] Two common elements occur in proposed definitions of viability: first, that viability is related not only to a system's financial strength but also to its technical and management capabilities, and second, that viability is related to current performance requirements for a system as well as likely future changes in these performance requirements. For purposes of this article, the author proposes to define a viable water system as one that has the technical, financial, and managerial capacity to consistently comply with current and prospective performance requirements.

The concept of viability is important because it focuses attention on the underlying causes of most problems experienced by small systems. The performance problems of small systems have been well documented since at least the early 1970s.[4–6] Consistently, these performance problems can be traced to underlying weaknesses in the technical, financial, and managerial capabilities of these systems.

Programs assess, ensure viability. Several approaches have been developed to assess the viability of existing small water systems. The state of Washington has developed four tests to determine financial viability.[21] Rubin and O'Neal have proposed a quantitative viability assessment methodology for small, privately owned systems in Pennsylvania.[22]

epending on the unit and application, package systems can exceed, meet, or fall short of the performance of conventional custom-designed and custom-built systems.

They have devised an index of small water system viability (the SMURF index) based on 20 criteria, five each in the areas of size, management, rates, and finance. They analyzed 139 small, privately owned systems using the SMURF index and found about 9 percent of systems to be viable in their current configuration, 73 percent of systems to be capable of becoming viable by joining forces with other systems, and 18 percent to be "basket cases" requiring immediate assistance.

Beecher et al[18] and Dreese and Beecher[23] have suggested approaches for assessing viability that are based on financial distress models. Cromwell, Albani, and Schmidt have proposed a qualitative approach to assessing viability consisting of 12 categories of questions.[24] Their effort, undertaken as a project of the

AWWA Guidance Committee to Small Water Systems, is designed to provide a simple means of alerting small systems owners, managers, and customers to the true nature of the decisions they face. USEPA has also published a series of self-assessment guides for small water systems.[25–28]

A number of states are developing or implementing programs to address the viability of small water systems.[10–12,18] Such programs may have two major components. One is a program to ensure the viability of new systems before they are allowed to come into existence. The other is a program to evaluate the viability of existing systems and to promote system restructuring to improve viability.

Long-term planning, restructuring important to viability. Maryland, Washington, Connecticut, Pennsylvania, Montana, and California are among states developing or implementing programs to ensure the viability of new systems. In general, these states are requiring developers to demonstrate before construction begins that their proposed systems will be viable over the long term. Several states require financial, operational, and management evaluations before allowing installation of a proposed system. Some states already use some type of permitting process to ensure that new small systems comply with minimum design, operating, and construction standards.

Another approach to new system screening being considered by some states is to require financially backed assurances or guarantees of viability. Such approaches might include escrow accounts, an irrevocable letter of credit from a bank, reputable cosigners, and a contract with a reputable contract operations and maintenance (O&M) organization. For example, the California Public Utilities Commission may require proposed new investor-owned water systems to post a bond of up to $50,000 if projected gross operating revenues fall below $200,000. This requirement discourages the formation of new investor-owned systems that do not have adequate financial resources.[3]

Among states developing programs to ensure the viability of existing systems, Washington, Pennsylvania, Maryland, and Connecticut are leaders. These state programs dealing with existing systems generally have two components: the first promotes long-term planning by water systems, and the second component facilitates system restructuring to improve viability. Planning initiatives generally consist of development of system-level business plans and comprehensive water supply planning. These four states generally require systems to submit plans that describe their financial status and structure, including information about capital expenditures, O&M requirements, and revenue requirements. In the water industry, business plans are recognized as a useful tool to help water systems ensure their viability, even if such plans are not required by the state.[29] The facilitation of restructuring requires removal of barriers, provision of incentives, and mandatory restructuring of basket cases.

USEPA's recommendations for SDWA reauthorization

- Establish a drinking water state revolving fund.
- Maintain state primacy through SDWA authorization user fees.
- Implement programs to protect sources of drinking water.
- Provide flexibility to states with enhanced source water protection programs.
- Ensure viability of small systems.
- Establish "best available technology" (BAT) alternative for small systems.
- Train and certify systems operators.
- Improve the process for selecting contaminants for regulation.
- Increase flexibility for setting compliance time frames.
- Streamline and strengthen enforcement provisions.

Maryland and Washington both require comprehensive water supply plans. Maryland counties develop comprehensive plans that specify service areas, needs for new service over the next 10 years, and financing proposals. Washington's program has both financing and operations elements. The financial program is intended to facilitate financing of improvements required to operate the system, including estimating potential future growth, documenting the availability of adequate capital, and showing the existence of an adequate revenue stream. The operations program requires water systems to identify all those who are responsible for normal operations, preventive maintenance, troubleshooting, monitoring, budget formulation, and emergencies.[3]

For existing systems found to be less than fully viable, these state programs include provisions to facilitate restructuring. Restructuring encompasses a variety of operations or ownership changes systems can make that will improve their viability. Restructuring can be as simple as adopting appropriate inter-

FIGURE 2 **Ownership of small community water systems serving 3,300 or fewer people *(total number of small community systems—about 52,000)***

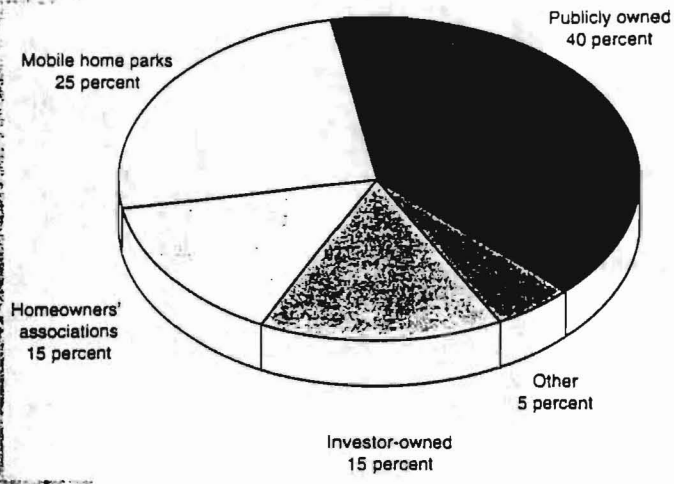
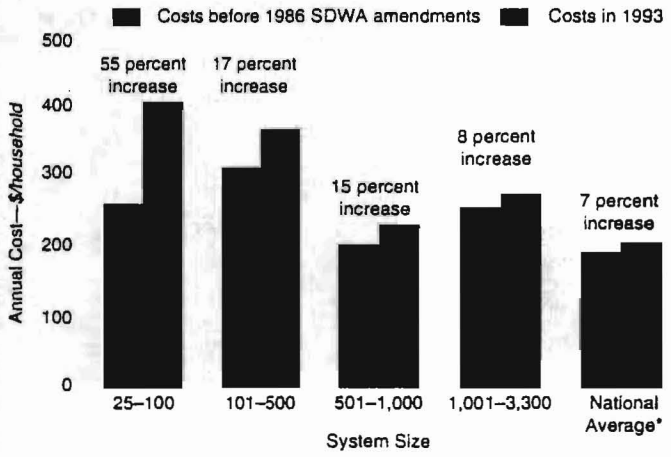


FIGURE 3 **Increase in average household cost for drinking water, 1986–1993**



* Includes all system sizes, weighted according to population served

nal fiscal and management discipline. Other restructuring options include informal purchasing cooperatives among systems, mutual aid networks, contract O&M, and wholesale purchase of water, as well as actual ownership consolidation. Figure 4 illustrates the author's belief that depending on their circumstances and preferences, systems can consider an entire spectrum of restructuring approaches. A key point is that restructuring need not involve loss of local control.[30,31]

Restructuring could help 50 percent of systems. Analysis in USEPA's report to Congress suggests that about 50 percent of small community water systems can potentially benefit from restructuring (Figure 5). About 30 percent of systems appear to be fully viable in their current configuration; 20 percent do not appear viable, nor do they readily appear to be candidates for restructuring.

The potential benefits of restructuring have been recognized for decades.[7,32,33] However, in spite of its obvious benefits, restructuring has not occurred to any appreciable extent in the United States. Why not? In general, the incentive and motivation to act have not been sufficient to overcome the barriers to effective restructuring that exist.[3,34] Barriers include local concerns about loss of control of a water system; lack of incentives for viable systems to acquire troubled systems; policies of state public utilities commissions and water resource agencies that govern water rates, the transfer of ownership, and water rights between systems; and peripheral issues such as high school football rivalries that are tied to a community's identity and economic character.

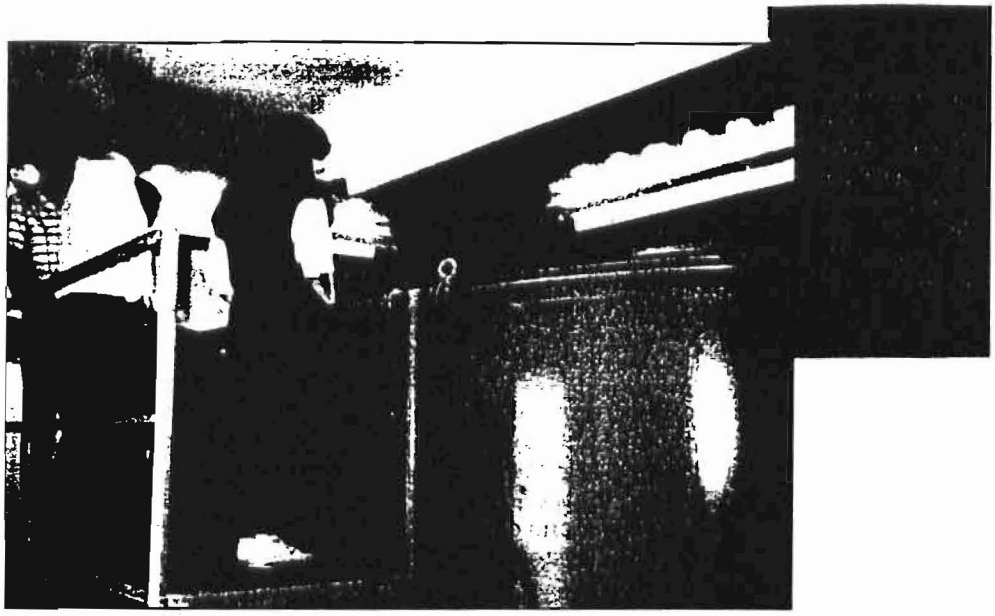
Both the regulatory demands of the 1986 SDWA amendments and the seriously dilapidated condition of the infrastructure of many water systems make restructuring a much more appealing and appropriate route for small water systems to pursue. States that are developing effective programs in this area recognize the potential barriers and are attempting to remove them and to create restructuring incentives.

For example, in 1992 the Pennsylvania Legislature passed the Small Water Systems Assistance Act. The legislation establishes two grant programs designed to serve as incentives to restructuring. One program provides grants to counties or groups of municipalities interested in forming a regional water authority. The other provides grants to county planning agencies for preparation of water supply plans and wellhead protection programs.[35] In addition, Connecticut, Pennsylvania, and Washington have enacted more liberal merger and acquisition adjustment laws that allow for increased restructuring. Many publicly owned and nonprofit water systems may be eligible for financial assistance for some restructuring costs through the US Department of Agriculture's Rural Development Administration (RDA).[36]

Provisions needed to compel restructuring. Clearly, restructuring will be most successful if water systems and their customers recognize its benefits and voluntarily work toward a solution tailored to the situation. Unfortunately, experience has shown that a small number of nonviable water systems do not try to improve their performance even in the face of substantial enforcement pressure. Effective state programs designed to ensure existing system viability must

include provisions to compel the restructuring of such systems.

For example, Connecticut statutes establish guidelines for ordering a municipality or private company to take over a failing water system. Specifically, a water system may be subject to acquisition if the system has repeatedly violated state regulations, if a notice of violation and an administrative order have been issued, and if the system has failed to comply with the administrative order. The acquiring facility must either extend its water mains to supply water or establish the system as a satellite. The acquiring system is allowed to adjust its rates to recover the reasonable costs of acquiring and operating the troubled system. Such authorities are expensive and difficult to exercise and are only used to deal with the most recalcitrant systems.



The compelled restructuring of nonviable systems is likely to involve financial subsidies of some sort.[3] Compelling a viable system to take on a nonviable one without some type of financial assistance or subsidy could seriously jeopardize the viability of the acquiring system. Federal and state financial assistance programs could be used to provide the necessary subsidies.

The unconditional provision of financial assistance can inadvertently discourage restructuring and prop up fundamentally nonviable systems.

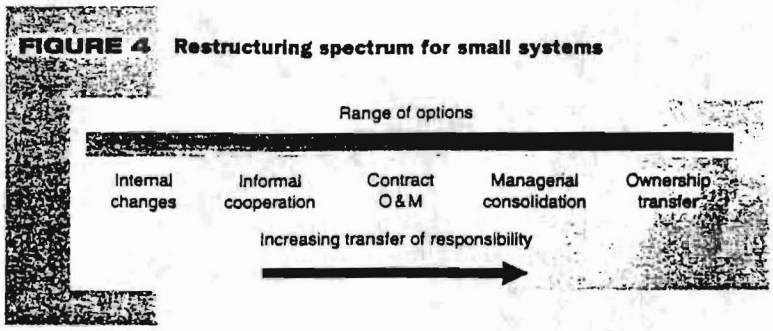
USEPA urges state viability programs. USEPA, as part of its SDWA reauthorization proposal, proposes to require states to develop and implement small system viability programs as a condition of primacy. Because circumstances and conditions vary greatly from state to state, one size does not fit all; states should develop programs and adopt viability assessment criteria that make sense for their unique circumstances. At a minimum, all state programs should contain approaches to prevent formation of new nonviable systems; systematically assess existing system viability and promote restructuring or otherwise provide for improving the viability of systems needing such improvement; and compel restructuring of nonviable, seriously noncompliant systems that are unwilling to take the steps necessary to achieve compliance.

USEPA proposes to make viability programs a condition of primacy because it believes only by addressing the underlying issue of small system viability will the long-standing "small systems problem" ever be resolved. Development and implementation of viability programs will require new, stronger authorities for many state drinking water programs as well as enhanced or new partnerships between state drinking water programs and other agencies of state government. Traditionally, most state drinking water programs have focused their efforts on assessing technology-related and operational issues. Solving long-standing problems will require the assessment of financial and management issues in addition to the technical issues. Ultimately, solving the more difficult small system problems will require the active involvement of state agencies dealing with poverty, economic development, and infrastructure. Forging new partnerships between state agencies and acquiring new authority will not necessarily be easy, and this anticipated challenge is another reason USEPA believes viability programs must be a condition of primacy.

Lower-cost technology needed for existing and forthcoming regulations

USEPA's report to Congress estimates that 40 percent of small systems will require no new treatment to comply with currently promulgated rules (i.e., Volatile Organic Chemicals, Surface Water Treatment, Lead and Copper, and Phase II and Phase V Synthetic Organic Chemicals and Inorganic Chemicals rules). Another 46 percent will need to install only corrosion

FIGURE 4 Restructuring spectrum for small systems



control. The remaining 14 percent will need to install other technologies to remove one or more regulated contaminants. Forthcoming regulations, including those for radionuclides, arsenic, groundwater disinfection, disinfection by-products, and other substances may increase the number of systems that need to install new treatment.

USEPA's estimates for the costs of treatment in small systems are based on assumptions regarding conventional custom-designed and -constructed in-place treatment that is appropriate and affordable for larger systems. Assuming such conventionally designed and constructed treatment, USEPA has estimated the cost of compliance for the 12 percent of small systems needing to install treatment beyond corrosion control as ranging between $200 and $1,600 per household per year.

On a unit basis, a small system pays much more than a larger system to treat water.

Pros and cons of package systems. Since 1988, USEPA has been spearheading a Small Systems Technology Initiative designed to promote the development and application of "packaged" treatment equipment for small systems. The goal has been to identify preengineered, prefabricated treatment systems that might be applicable in a broad spectrum of treatment applications. Such package systems would usually be shipped to the treatment site preassembled and ready for installation. They typically require a minimum of on-site assembly, construction, or interconnection with the existing system. Package plants may be automated to facilitate off-site monitoring and, when states allow, periods of unattended operation. Depending on the unit and application, package systems can exceed, meet, or fall short of the performance of conventional custom-designed and custom-built systems.

Package plants are not a new idea. In 1981 Clark and Morland concluded that package plants were an economical alternative to conventional treatment for small systems,[37] and many successful applications of package plants have been reported.[37–42] The importance of proper O&M for these package plants has been well documented. Numerous cases of poor performance have been reported when these units were not adequately operated and maintained. Modern telemetry devices and innovative system restructuring show great promise in offering the means for ensuring adequate system O&M.[42]

Package plants should not be viewed as eliminating the need for site-specific engineering services. Such services are essential to the successful application of package plants. Typical site-specific engineering services may include determination that treatment is possible and preferable to either restructuring or new source development; treatment unit selection and sizing; and integration of the package unit into the existing treatment and distribution system.

Generally, package plants may offer small systems a more cost-effective treatment alternative than conventional treatment plants. The latter, which employ slow sand filtration, diatomaceous earth filtration, ion exchange, granular activated carbon, air stripping, and other technologies, may be appropriate in certain circumstances.[43,44] Virtually all of these technologies are available as package plants. Cost savings associated with package plants occur because the process engineering costs are spread out over many units and because on-site assembly and construction are minimized. Long-term O&M cost savings may be realized by taking full advantage of off-site monitoring and design features that enable periods of unattended operation (if permitted by the state).

Projects identify barriers to package plant use. Since 1988, USEPA has worked with a loosely knit coalition of state drinking water programs, water treatment equipment manufacturers, and water industry associations to identify and overcome barriers to the expanded use of package plants. The initiative has had two major components: the first was the demonstration and documentation of package plant performance in the field; the second was the development and adoption by states of design review protocols that would promote wider use of package plants under appropriate circumstances.

Five demonstration projects have been undertaken as part of the USEPA initiative. Two of these projects have been successfully concluded, and results have been documented and reported.[41,42] In addition, the performance of nine existing package plant installations has been summarized.[39] In related work, USEPA and AWWA have evaluated many installed package plants and have reported preliminary

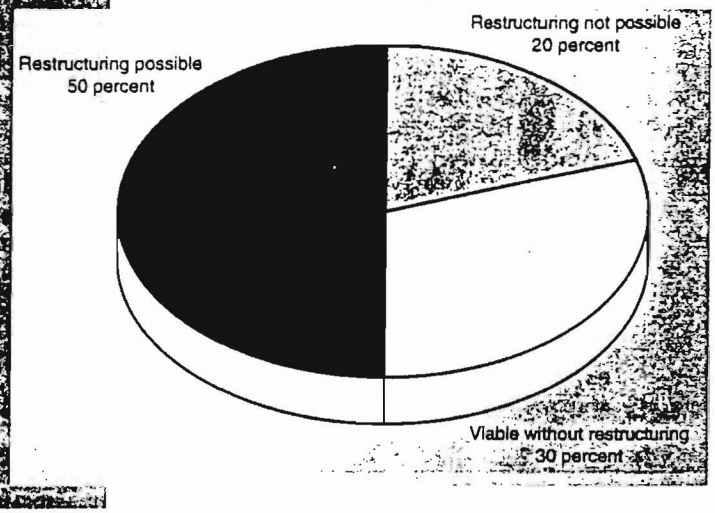
results.[40] USEPA is also conducting research evaluations of package plants in the field and the testing and evaluation facility in Cincinnati, Ohio.[45]

Certain state design review practices set up barriers to the use of unconventional treatment systems.[9,46] Several attempts have been made to address this problem. In 1992, several western states developed the "Consensus Protocol for Evaluation and Acceptance of Alternative Surface Water Filtration Technologies in Small System Applications."[47] This protocol offered a number of different approaches states could adopt to encourage use of potentially lower-cost technologies.

One especially promising approach is called "conditional acceptance with performance bond." This option allows a system to be installed and specifies minimum performance and operating standards. The state evaluates the unit against those guidelines after a year of operation. The equipment manufacturer provides a written money-back guarantee of performance and O&M expectations. If this approach is used, costly advance pilot testing can be virtually eliminated. Unfortunately, adoption and use of the protocol have been uneven, even among the states that helped develop it.

More recently, a committee of the Small Systems Technology Initiative has attempted to build on the western states' protocol by developing a draft "State Alternative Technology Approval Protocol." Once again the idea of conditional approval, as well as a number of other options, has been suggested. Work on this initiative is continuing.

FIGURE 5 **Estimate of restructuring potential for small community water systems serving 3,300 or fewer people *(total number of small community systems—about 52,000)***

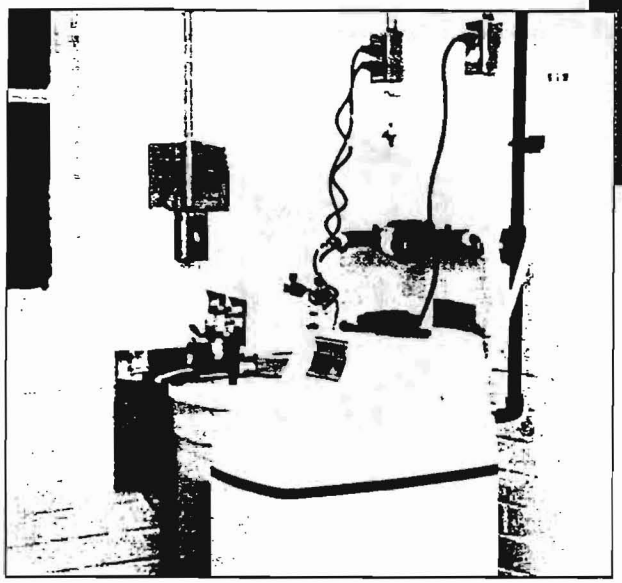


Restructuring need not involve loss of local control.

Many states are reluctant to change design review protocols because they lack information about the performance and operating ranges of package technologies in combination with various water characteristics. Other states have cited the lack of familiarity of system owners and operators and technical assistance providers with package plants as a barrier to their more widespread use.[3] To make information about actual package plant performance more easily obtainable, USEPA has been cooperating with the RDA-funded National Drinking Water Clearinghouse to create a database of package technology installations. The database will be known as RESULTS (Registry of Equipment Suppliers of Treatment Technologies for Small Systems). RESULTS will provide general descriptions of package technologies and will also contain basic information about specific small systems in which they have been installed. A key feature of the database will be the provision of names, titles, and phone numbers for primary contacts who can provide up-to-date cost and performance information for each specific installation. The RESULTS database should be available in mid-1994. Information on the status and availability of RESULTS may be obtained from the National Drinking Water Clearinghouse at 1-800-624-8301.

USEPA proposes treatment variances if systems install "small systems BAT." USEPA has traditionally designated best available technology (BAT) on the basis of conventionally engineered and constructed systems, which large utilities can afford. USEPA proposes to designate more affordable small system BAT and—for those systems having no other alternative—provide a streamlined process for states to grant five-year treatment variances to eligible systems that install small systems BAT and take other practical steps to protect public health.

An important element of this approach would involve assurances of proper O&M of small system BAT. USEPA proposes to require states to have operator certification programs in place that cover all community water systems, no matter how small. Relative to small system BAT, USEPA might specify the role of certified operators in the application of the technology. It is beyond the scope of this article to discuss the operator certification proposal in detail. However, among other objectives, the proposal is intended to promote the sharing of a qualified operator among several small systems as well as the development of contract O&M services firms.



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Targeted financial assistance can improve viability, compliance

USEPA has estimated that the total capital needs for SDWA compliance with currently promulgated regulations is $9 billion.[3] About 40 percent of the total can be accounted for by small system needs. Informal estimates suggest that over the next 20 years all water system needs, including SDWA compliance, infrastructure repair and replacement, and growth, will total about $120 billion.

Strategies and options for small systems to finance SDWA compliance have been discussed at length.[13,48–50] The importance of financial viability is pointed out repeatedly as a key factor enabling systems to obtain necessary financing.

Several state and federal programs have successfully increased small systems' access to capital and have helped systems correct institutional deficiencies that hamper direct financing. The successful methods include loan programs, bond banks, and grant programs. The largest and best known federal program is the one administered by the RDA that offers loans and grants to public and nonprofit water suppliers in low-income communities with populations of fewer than 10,000 people. RDA assistance may be used for installation, repair, improvement, or expansion of water systems. Campbell, Lykins, and Goodrich provide an excellent summary of federal and state financing assistance available for small water systems.[48]

As noted earlier, a substantial number of small systems are privately owned and generally ineligible for federal and state financial assistance. These systems therefore have fewer options for financing SDWA compliance needs. Fewer than 5,000 of the nation's 60,000 community water systems have established credit ratings. Commercial banks do not offer long-term, fixed-rate financing for water system improvements. One exception is CoBank, part of the Farm Credit System, which can offer long-term, competitive fixed-rate financing for water systems serving predominantly unincorporated areas or communities having populations of 20,000 or fewer. For example, CoBank has just established a loan program with the National Association of Water Companies (NAWC), through which eligible systems may borrow $50,000 to $500,000 for up to 20 years.[51]

The unconditional provision of financial assistance can inadvertently discourage restructuring and prop up fundamentally nonviable systems. Well-designed financial assistance programs can improve system viability and create systems that can comply continuously over the long term. However, grants may be useful as a one-time "shot in the arm" to help fundamentally viable systems finance a major capital expenditure to meet SDWA compliance needs. To ensure that systems receiving grants and loans practice sound management and to minimize the need for future assistance, grant and loan programs should include rigorous eligibility criteria. Such criteria could include requirements to evaluate restructuring opportunities and take advantage of them when they offer a cost-effective solution. Other eligibility criteria could include requirements for enterprise funds, capital planning, and full-cost pricing.

State revolving fund part of USEPA's reauthorization proposal. The Clinton administration has proposed establishing a drinking water state revolving fund to be capitalized at about $4.6 billion over five years. States would be eligible to receive capitalization grants under the proposal. These funds would be available to make low- or zero-interest loans to both publicly and privately owned systems. Capital improvement projects for compliance would be eligible, as would projects to develop local programs for source-water protection. Eligibility criteria would prevent loans for capital improvements if the applying system could consolidate less expensively.

All state programs should contain approaches to prevent formation of new nonviable systems.

Summary and conclusion

Small systems issues have been a prominent feature of deliberations on the SDWA since its initial

formulation. In anticipation of SDWA reauthorization, USEPA recently completed a report to Congress that identifies viability, lower-cost technology, and financing as the most significant small systems issues. Long-standing performance problems of small systems can be traced to underlying technical, financial, or managerial weaknesses. Viable systems have the technical, financial, and managerial capabilities to consistently provide quality service at an affordable cost. Several states are developing programs to ensure the viability of new and existing small systems. A variety of quantitative and qualitative approaches are available to assess viability, and a wide range of restructuring options exist through which system viability may be enhanced. As one of its SDWA reauthorization proposals, USEPA recommends that states be required to develop and implement programs to ensure small system viability.

Ultimately, solving the more difficult small system problems will require the active involvement of state agencies dealing with poverty, economic development, and infrastructure.

Conventionally custom-designed and -constructed in-place treatment facilities, which are appropriate and affordable for larger systems, are prohibitively costly for small systems. Preengineered, prefabricated package plants designed to simplify O&M may offer a more cost-effective alternative. Modern telemetry devices and innovative system restructuring show great promise for allowing effective O&M of package plants with limited staff. A few states have adopted more flexible approval protocols, which help encourage the use of such potentially lower-cost systems. In another SDWA reauthorization proposal, USEPA proposes to designate small systems BAT on the basis of these more affordable systems.

Several federal and state programs exist to help finance small system improvements. Well-designed financial assistance programs can be targeted to improving system viability and creating systems that have the capacity to sustain compliance in the long term. The Clinton administration has proposed creation of a state drinking water revolving fund, which would promote beneficial restructuring of small systems and assist systems in financing necessary compliance expenditures.

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Department of Economic Development
State of Missouri

Mel Carnahan
Governor

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Director

*** M E M O R A N D U M ***

DATE: May 23, 1994

TO: CDBG Staff

FROM: Terry Martin

SUBJECT: Conference report on financing water and wastewater projects: Inter-agency collaboration at the State level.

The conference was attended by about one hundred representatives from 32 states. The theme was the coordination of infrastructure funding at the state level with the targeted programs being CDBG, FmHA and SRF (DNR's State Revolving Fund). Representing Missouri were John Conway (FmHA), Sara Schwerdtfeger, Bob Miserez and me.

The first one-half of the meeting was spent listening to presentations from Arkansas, Ohio and Washington on "setting up" inter-agency councils for coordinating funding (and providing technical assistance) on rural water and wastewater projects. The councils were, again, formed to coordinate funding from CDBG, FmHA and EPA. John and I felt that a majority of the states were at the stage we were several years ago before we were effectively communicating.

The 32 state teams then met individually to discuss specific coordination problems and possible resolutions. We then reported our findings to the larger group. There were several recurrent problems with the state's coordination:

- In many states, the three primary funding agencies don't know what the other two are considering or don't want to work together (we regularly coordinate with DNR and FmHA);

- The three state agencies required three different engineering report reviews or in the case of CDBG, sometimes no review (DNR reviews our applications);

- Local communities don't know how to access the three funding programs (although this occasionally is a problem in Missouri, our constant public forums tend to negate this problem - plus our programs are, to an extent, engineer/administrator driven);

- Local communities can't afford initial engineering or planning costs (our basic, preliminary engineering report have not been a financial hardship to small communities);

- Agency funding cycles prohibit communities from obtaining approval for projects that require multi-agency participation (our contingency policy has solved this problem);

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- In many states, a community needing multi-agency assistance must submit six applications, three pre-applications and three final-applications (in Missouri, only FmHA has two applications and our clients have not complained excessively about the system); and

- The staff of the three funding agencies is always changing (in Missouri, the experience and stability of the players is a major reason for the success).

It was somewhat alarming to see that many (not all other) states were floundering in their attempts to deliver and coordinate their public facilities program. The only problem in Missouri we could report to the larger group was that there are some small communities that can't seem to ever get the application process started to address serious water and sewer needs. Based on the input from the meeting I would recommend the following minor procedural changes:

> Hold quarterly meetings of our informal water and sewer application team. The group is presently comprised of John Conway (FmHA), Ron Burgess (DNR's Public Drinking Water Program), Steve Townley (DNR's Water Pollution Program) plus Marilyn and me. We could expand the group to include Steve Mahfood with EIERA who assists on some water and sewer projects as well as our most prolific investment banker Eddie McLiney (picks up many small bond issues).

The basic reason for holding quarterly meetings and slightly formalizing the system is for long term stability. The system works, in part, now because the various inter-agency people communicate well together. This has not always been the case. Also it would give us a chance to invite communities, such as small cities in need of TA, to meet with the inter-agency team.

I am concerned that there are several states that want to follow the Arkansas model which involves a committee of six agencies (some other states have committees with representatives from more than 20 organizations) to review pre-applications and make recommendations. This process adds another layer which could slow the process down and gets too many agencies interfering (through individual agendas) with the process.

It is also worthy to note that many states have abandoned an annual public facility competition in lieu of a emergency program and would seem difficult to manage.

We later discussed the actions that could be accomplished at the federal level to make the delivery of the water and sewer programs easier and more effective. We then met with six managers of federal programs such as CDBG, SRF, EDA and FmHA programs, ~~etc.~~ Not much was accomplished since most of the state's concerns were Congressionally driven.

dle

Suggested First Year Schedule

Quarterly Meetings of State & Federal Water System Funding Agencies

2nd Wednesday of the first month of each quarter

1st Quarter	January 11, 1995
2nd Quarter	April 12, 1995
3rd Quarter	July 12, 1995
4th Quarter	October 11, 1995

file: 1.5

Strategies and Recommendations Collected from Surveys and Meetings

Survey Suggestions

1. choose a demonstration community and install the best available technology
2. state agencies should be more responsive to community needs and should look to them annually for setting priorities
3. address the most demanding need: help communities with little business to generate revenues and tend to have declining population bases
4. provide funds and technical assistance to remedy staggering problem of inflow and infiltration
5. provide funds to make wastewater treatment systems less flood prone during frequent flash floods
6. make sure engineering firms respect floodplain limits by thorough inspections before wastewater systems are completed
7. make serious health and maintenance problems top priority for funding, such as antiquated systems with lead jointed pipes
8. adequate storage facilities should be provided for each community or water district
9. expand rural water districts
10. install wastewater systems in communities which do not have these facilities
11. form rural population centers into wastewater districts
12. initiate water system strategies through a coordinated process in order to assure service is affordable to customers
13. plan service and supply lines a manner that will allow further expansions to efficient delivery water to the largest possible population and area
14. develop wastewater systems to accommodate demographic trends and require maintenance plans
15. use a funding formula that weighs the burden of self-financing a project (and its costs per person) instead of using the low-moderate income requirement (formula factors: land area served, population served, and estimated cost per person).
16. increase funding
17. more monitoring of new wells
18. replace transit piping
19. employ knowledgeable people with experience in handling improvements and test sampling
20. provide funds that require little or no local funding
21. fund additional water storage facilities
22. replace and upgrade size of piping
23. provide more education and legislation to prevent additional water source contamination
24. support additional wells and storage to facilitate growth
25. provide more capacity to handle storm water

26. completely remove oil and grease from sewage systems
27. fix infiltration
28. provide more funding that requires little or no match
29. remove hot water from industrial effluent to preserve capacity
30. set standards for public and private waste water systems
31. state should charge a user fee for all commercial users of water that produces foreign residues as a result of the product/processing methods, i.e. oils, grease, chemicals
32. investigate private septic tanks being connected to a community type of system, thereby having partially treated sewage
33. use septic system installation controls similar to wells - require building permits possibly and installer certification
34. ensure proper disposal of hazardous waste and solid waste to protect groundwater system
35. take measures to prevent waste disposal in sinkholes, underground caves, and streams
36. address the problem of mine tailing hazards that could contaminate water sources
37. provide additional funding
38. sell bottled water since present and future regulations are so costly to implement
39. streamlining government involvement in plan review for construction
40. educate public officials to consider non-standard answers to problems such as consolidation or regionalization
41. require engineering firms to consider long term system viability when designing improvements
42. provide education and improvements to sanitary and storm sewers
43. improve storm collection systems
44. control water infiltration
45. educate operators and public officials
46. provide continual upgrades of wastewater systems
47. consolidate and regionalize both water systems and wastewater systems as a way for smaller rural communities to afford improvements for compliance to new regulations
48. provide extensive training of operators and staff to handle tighter, more complicated regulations and effluent water quality standards
49. avoid putting grant money into smaller systems (nonconsolidated or nonregional) because it does not solve the primary source of current water system problems
50. use the Clarence Cannon Wholesale Water Commission project as a model of a system able to provide good quality and dependable water service
51. develop education awareness program to inform rural citizens of the need to test their private well waters regularly
52. develop education awareness program to inform rural citizens on the proper way to install septic tanks and construct drainage fields

53. set aside funding to encourage establishment of more rural water districts (PWSDs, Public water supply districts)
54. provide more state tax money toward improvements to establish municipal and rural water district improvements to bring them up to level of current demand
55. encourage cities to plan for the future for proper maintenance, upgrade and expansions
56. develop long-term comprehensive plans that address needs of cities in the future by increasing the current $120,000 statewide funding available in the 601(3)b fund
57. spend more state tax revenue on updating wastewater systems throughout the state on a need basis, in an effort to make them more efficient
58. adopt state legislation to encourage populations of certain density to be hooked up to a wastewater collection and treatment facility rather than use septic tanks and cess-pools so near each other
59. establish a Department of Natural Resources Emergency Fund similar to the Department of Economic Development's Emergency Fund to help communities in desperate need
60. identify high-growth areas exhibiting problems and begin the process of establishing wastewater treatment districts
61. consolidate and regionalize water and wastewater systems (MO Rural Water Association)
62. train operators and staff to handle tighter, more complicated regulations, and effluent water quality standards. (MO Rural Water Association)

Meeting Suggestions

63. assist communities to get upgraded water system for fire protection
64. help communities review private water company applications for service
65. eliminate or revise low-moderate income funding requirements to make more communities eligible for grants
66. make private well testing procedures less complicated
67. have more meetings like Rural Water System Project meetings with all State and Federal water agencies present
68. address individual community problems since type of problem varies
69. fix service problems by establishing linkups to or extensions from current systems
70. find ways to make grant review process based completely on technical reviews and hard data but do not use the former EPA process which was biased against smaller communities
71. establish school to train personnel to run water treatment plants
72. find the best and most cost-efficient technology for use in new and expanded systems
73. prepare maps of current distribution lines and specify line conditions
74. develop a new Statewide bond issue to provide more funding for needed water

system improvements
75. install chlorination treatment in water systems as the most effective way to save lives and stop serious health problems resulting from bad quality water
76. more work between farmers, residents, and government officials should be done to prevent pesticides and herbicides from going into water supplies
77. establish more programs to protect watersheds and water sources
78. more attention needs to be placed on preserving and protecting wetlands
79. revise or eliminate low and moderate income requirement for grant funding
80. education programs are needed for testing private water wells
81. establish better coordination between all State and Federal water system funding agencies and make the application process less costly
82. make all application deadlines the same for all State and Federal water system funding agencies
83. establish one central place to submit grant applications for water system projects
84. develop easy and standard methods for chlorinating water from private wells
85. streamline the long and costly process of applying for water system grants
86. technical assistance is needed to help communities determine how to address water problems without having to hire an engineer
87. a grant program should be setup to replace pipes with lead joints
88. follow the Arkansas model where small systems within a 95 area were linked together
89. revise or eliminate low-moderate income requirement for grant funding
90. provide more money for upgrading systems instead of just establishing new water systems
91. State should fund wastewater treatment plants in conjunction with funding water systems or require wastewater treatment plants before providing water service
92. review the priority points of the grant application evaluation process to make process easier to understand
93. require cities or counties to establish long-term maintenance fund prior to receiving grant award otherwise it is unfair to systems that setup maintenance funds
94. make district water system operators the wastewater system operators
95. use current water districts to provide wastewater treatment service
96. grant award process should favor water projects that show how wastewater is going to be treated
97. eliminate or revise regulations on lead and cooper since tests continually are negative
98. the State Water Plan should describe how water will be brought to all rural areas
99. Missouri State law should be revised to make water system consolidation easier and to create incentives for regional/consolidate systems
100. provide technical assistance to public water systems so that improvements are designed to accommodate future needs
101. State should provide continual consultation to cities instead of only assisting

during crisis situations -
102. revise current funding criteria to favor smaller cities
103. revise funding procedures to allow counties to submit more than 1 application per year otherwise biases in favor of small city systems and against water districts will continue
104. a State Clearinghouse or some other mechanism is needed to show all the funding sources available for water systems
105. create better coordination between State and Federal funding agencies
106. establish one place as a central source for getting water system funding
107. do not change CDBG guidelines so frequently
108. make low-moderate income surveys good for 3 years to avoid resentment from people that are asked continually about their income
109. provide some Statewide education on treatment and testing requirements so customers understand the increased costs of water service
110. change Missouri water rights law to promote formation of regional water systems
111. establish Statewide standards on backflow preventers
112. the State should work more with farmers on cleaning up possible contamination of water sources
113. allow CDBG funds to be used by one community to linkup to the wastewater treatment plant of another community
114. provide more grant money to wastewater systems to keep pace with the growth of water systems
115. setup workshops or educational training on how to get a sewer district started
116. create variance procedures in cases where there may be minor impacts on a wetlands project from building a reservoir
117. education people about how new regulations are driving up water costs
118. USDA financing programs should allow larger sized mains to be installed to serve broad areas and to provide fire protection services
119. CDBG program should encourage expansion of existing water districts rather than setting up new rural water districts
120. make the CDBG program administration simpler
121. use existing water district networks to provide wastewater treatment services
122. USDA financing programs only fund the minimum size of water main which does not allow for future growth
123. provide more information to elected officials on how to form water districts
124. all funding agencies should allow water projects to be designed to look at 10 year growth trends and service needs
125. make CDBG more flexible to allow people to donate land to a water system project and use saved funds to extend the water system further
126. revise CDBG program rules to encourage saving funds in implementation of water system project by allowing cost savings to be used for further system

improvements
127. finance more projects to flood proof water systems
128. establish more regional water systems to service communities
129. promote the establishment of regional water systems
130. regional projects should be funded instead of the bandaid projects which are being funded now
131. liberalize CDBG rules to allow counties to submit more than one application per year (in the past a county could apply for one district and one other jurisdiction)
132. produce a Missouri map similar to the State of Kansas map which shows existing water district service areas
133. change Missouri State law to make water system linkups easier
134. the Clarence Cannon system should be used as a model for other systems
135. establish water system interconnects for emergency purposes
136. through regular inspections, the State should require water systems to have a depreciation account to take care of future maintenance (should not be a requirement of grants or else grants application may not be submitted)
137. change Missouri State law to make it easier for water districts to be formed and extended
138. establish workshops and conduct other activities to promote regional water systems
139. more education is needed on water testing
140. establish new lake sources for water supply
141. notification letters denying grants should include some general reasons for the denial so that cities can avoid expense on continually applying for grants
142. grant programs should be more specific in funding priorities so that cities know the chances of getting a project funded and know how to design projects that will get funding
143. overall goal of CDBG program should be made more clear - is it to provide good drinking water to everyone or to develop communities or what?
144. Missouri State law should be tougher n discharges into rivers and streams to avoid pollution problems
145. conservation measures should be encouraged and adopted
146. establish rules to require some businesses such as golf courses to use "gray water"
147. the State should enforce regulations to require proper construction, operation, and maintenance of septic systems to avoid health problems and protect drinking water supplies
148. Missouri should establish a water rights law that will prevent a landowner from sucking a water table dry - current law is a first come, first serve situation allowing people to draw up as much water as they want and to use it however they want
149. only one agency in the state should provide water grants and loans or there should be better coordination between the existing funding agencies - goal should be to make it easier for people to apply for grants

150. regionalize water treatment part of water systems to help with high costs
151. educate people on the true costs of providing dependable sources of good quality drinking water
152. encourage water system operators to amortize their water system facilities
153. require cities to build up reserves for future maintenance
154. funds should be available or promoted to allow cities to gain water service from regional, privately owned, water systems
155. revise grant program rules so that cities are not rewarded by receiving a grant for system improvements when they do not build reserves
156. State water regulatory and grant agencies should go into a planning mode
157. award grant application review points to applications that come from a county which has a countywide water plan adopted
158. revise water grant programs to allow funding of projects that will service larger areas - accommodate growth
159. for water system goals, adopt the approach used for providing electric service, take the service to all residents in rural areas
160. do not provide grant funds to water systems that cannot continually afford to run their own systems
161. promote regional water systems and interconnections
162. educate elected officials about the value of water system linkups
163. revise CDBG program procedures and policies so that it is not so biased in favor of the smallest cities and thus the smallest possible water systems
164. revise the low-moderate income survey requirement because it favors the smallest possible water systems and makes it hard to establish more sensible larger systems
165. spend more money on regional transmission lines instead of building new water treatment facilities
166. water wells should be monitored to determine impact from hog operations
167. federal funding agencies should allow the construction of larger water main lines to permit construction of regional systems
168. cities need technical assistance of how to operate water systems

Mailed In Form Suggestions

169. provide more funding to water and wastewater districts
170. replace cast iron water mains
171. install large water mains (8" or 10") around the perimeter of cities and loop all dead end mains
172. install isolation valves in critical parts of a water system
173. increase charges to customers to build more water reserves
174. create a clearinghouse to coordinate and identify grants to solve all water system problems

175. promote the regionalization of water systems
176. make sufficient grant monies available to municipal water systems to insure that the necessary improvements can be completed in a timely fashion
177. shift funding away from small treatment plants and towards transmission mains
178. split applications into treatment projects and connection projects, with a smaller amount allocated to treatment
179. provide incentives or rewards in grant award systems to cities that are fiscally responsible by setting aside funds for future maintenance
180. promote the use of private water companies as a way to provide regional water system services to small cities
181. make the process of using tax-exempt bonds for water system improvements easier to use

file: 1.2

LIST OF CONCERNS/SOLUTIONS VOICED AT DED/DNR/RPC MTGS/SURVEYS HELD
5/5-9/15 1994

QUALITY

1) Water quality in karst topography [2]
2) Radionuclide contamination [1]
3) Nitrate contamination [2]
4) Lead problems and usage of lead pipes [4]
5) Wastewater treatment systems subject to flooding [4]
6) Failing septic systems, or none at all [7]
7) On site waste treatment not matched to soils and topography capability [3]
8) Contamination from septic tanks and sewage effluent [7]
9) Require septic system installer certification [1]
10) Need wastewater treatment district [7]
11) Personnel at facilities located in flood plain should receive disaster training [2]
12) Wells with elevated bacteria counts [7]
13) Private well and septic tank cross-contamination [2]
14) Abandoned wells not plugged [3]
15) Rural subdivisions without adequate wastewater treatment [1]
16) Sewage effluent discharge into a losing stream [2]
17) Dumping waste along streams [1]
18) Mine tailing reaching stream, slime pond failure risk [2]
19) Water systems without chlorination equipment [1]
20) Old, poorly constructed wells vulnerable to contamination [2]
21) Systems with frequent boil orders [3]
22) Well containing pesticides [3]
23) Reservoirs containing pesticides [3]
24) Need better well-head protection and watershed protection [9]
25) Pesticides in streams (Missouri River) [2]
26) Leaking gas and oil lines and facilities [2]
27) Pollution risk from corporate hog facilities [4]
28) Educate young groups about groundwater protection [1]
29) Education program encouraging regular tests of private wells [2]
30) Small and aging systems have difficulty meeting standards [1]
31) Quality concerns with water coming from other states [1]
32) Need for interstate compact with adjoining states [3]
33) Drinking water testing procedures need clearer instructions [2]

DISTRIBUTION

1) Systems with less than 24 hours use of treated water storage, some with no storage [5]
2) Lack of adequate elevated storage [8]
3) Systems near capacity with no growth potential, aging systems serving more connections [9]
4) Aging distribution systems, some over 80 years old [13]
5) Many areas do not have public water supply service [8]
6) Some households have to haul water for daily use [2]
7) Some lines too small to provide fire protection [6]
8) Stagnation in dead end lines [2]

9) Water treatment plants damaged by flooding [4]
10) Distribution systems with leakage and insufficient pressure [7]
11) Need for consolidation, regionalization, and interconnections [8]
12) Territory problems between municipalities and water districts [1]
13) Several private companies serving same city [1]

FINANCE AND FUNDING

1) Low connection density makes installation of water service hard to justify, some areas have 1-2 per mile [4]
2) Small communities lack finance ability [7]
3) Not enough properly trained and skilled operators [1]
4) Need guidance on expense tracking and accounting to determine real cost of water and fair rates [3]
5) Declining and/or aging population reduces tax base [2]
6) Small systems lose economy of scale and have difficulty being cost effective [4]
7) System upgrades needed without available funding [1]
8) Grant applications denied without reason to explain why [2]
9) Some funding sources limit line size to existing connections without expansion capacity [4]
10) Simplify and consolidate different agencies funding schedules, requirements, and application process for aid to communities [6]
11) Funding that requires little or no local match [1]
12) Systems designed with expansion capacity have more difficulty getting funded [1]
13) Need viability study of system before funding [4]
14) Systems with poor finance management without any reserves more likely to get grant [2]
15) DED scoresheet concerning LMI (low and moderate income) qualifier gives small system advantage since survey easier to perform [8]
16) Testing for contaminents in private wells costly, if not a routine test such as bacteria, nitrates, nutrients, or heavy metals done by Department of Health [1]
17) Need DNR emergency fund, like DED, to provide immediate help to communities in desperate need [1]
18) Fund relocation and/or flood proofing water and wastewater plants in flood plains [3]
19) DED grants made to city or county, not a water district [2]

SUPPLY / WATER SOURCE

1) Wells subject to flooding [4]
2) Shallow wells affected by drought [4]
3) Reservoirs subject to drought [1]
4) Reservoirs need dredging [1]
5) Older wells at risk from drawdown influence of nearby larger wells [1]
6) Larger raw water supply needed, more reservoirs/wells needed [7]
7) Groundwater depletion [3]
8) Need groundwater conservation practicesto counteract depletion [1]
9) Quantity concerns with water coming from other states [2]
10) Need for interstate compacts with adjoining states [1]

OTHER

1) Large fluctuations in releases from Truman Dam without local people having input opportunity [1]
2) Local community assuming operation responsibility for wastewater treatment plant with no additional capacity, currently being operated by the Federal Government [1]
3) Some components new with parts of system old, like new water treatment plant and reservoir, but old lines and tower [1]

[ ] Number in the brackets represents how many meetings of the 19 held voiced concern with this issue. Meeting comments and mail-in surveys were combined for each meeting site to get this number. If the issue was in the survey, if it was brought up at the meeting, or mentioned in both, or by more than one participant, it is counted one time. This approach is to prevent double counting.

MTRCOG Mark Twain Regional Council of Governments

P.O.Box 73 Perry, MO 63462
Tele: 314.565.2203 Fax: 314.565.2205

Joe Lopez, Technical Assistance Coordinator
Missouri CDBG Program
P.O. Box 118
Jefferson City, Missouri 65102-0118

May 17, 1994

Dear Mr. Lopez:

Please find enclosed the Mark Twain Region Water Summary report for the Rural Water Systems Strategy Project. This summary was prepared with the assistance of local water and wastewater facilities along with the Missouri Rural Water Association. As requested, this summary follows the format of the survey which was provided by the Department of Economic Development.

In addition to this report, please find enclosed, for your information and use, two articles which focus on smaller water systems and efforts in consolidation and regionalization. The first article is titled "*Small systems and SDWA reauthorization*". This articles points out some of the problems with smaller systems and the difficulties associated with restructuring. These include deterioration of physical infrastructure, lack of access to capital, limited customer and rate base, inadequate rates and poor financial management, the increase of unit costs as capacity decreases, and limited technical and managerial capabilities. In order for proper restructuring, certain barriers would have to be overcome, including the local concerns over loss of control of water systems, transfer of ownership and water rights between systems, and loss of a community's identity and economic character. The second article, titled "*Regional Water Supply Systems Good for Oklahoma Communities*", is a case study of a successful regional water supply system.

If Mark Twain Regional Council of Governments can be of any further assistance with this projects, please do not hesitate to contact us. We are looking forward the focus meeting for our region on August 8.

Sincerely,

Shelli Barr
Economic Development Coordinator

Mark Twain Regional Water Summary

Mark Twain Regional Council of Governments (MTRCOG) has prepared this regional summary with the cooperation with local and regional water treatment and distribution facilities and the Misouri Rural Water Association. The Mark Twain region consists of the following eight counties: Audrain, Marion, Macon, Monroe, Pike, Ralls, Randolph, and Shelby. We mailed a survey to local and regional facilities, similar to the survey provided to MTRCOG by the Missouri Department of Economic Development, and we received eleven completed surveys. We also spoke with the Director of the Clarence Cannon Wholesale Water Commission which supplies a large portion of the water in this region. Additionally, the staff of the Missouri Rural Water Association completed the survey by addressing the state as a whole. Please find, following this summary, the results we received from the individual facilities and a separate survey completed by the Missouri Rural Water Association.

Current Conditions and Most Serious Water Systems Problems in the Mark Twain Region

Most of the residents in the Mark Twain Region, between 90 to 100%, are estimated to be currently served by public water and wastewater systems. Less than 10%, as estimated, are served by private systems. The state, as determined by the staff of the Missouri Rural Water Association (MRWA), is slightly different from this region. The MRWA staff has estimated that approximately 60% of the state is serviced by public water systems, and 40% by private water systems. They also stated that over 80% of wastewater services are being provided by public systems, and only 20% by private systems. Additionally, the MRWA noted that a significant number of cities are totally unserved and many are not completely served.

The results received from local and regional facilities in this region showed the most serious water system problems to be associated with distribution. Two major problems with distribution are providing adequate and sufficient pressure and the loss of water from leakage. Some facilities reported problems with treatment facilities but were not specific as to what those problems entailed. Most of the Mark Twain region's water supply comes from surface water, while Palmyra is served by underground water supply. Some facilities did note difficulties with surface water, while Audrain County has pulled their water table down due to irrigation. The MRWA staff rated availability, treatment facilities an distribution to be among the top problems with water supply. They feel that treatment facilities do not have an adequate number of properly trained and skilled operators and that many distribution systems have older lines which will soon have to be replaced.

The problems with water quality were quite diverse thorughout the region. One facility noted problems of low alkalinity and high levels of manganese while others stated the difficulty of turbidity control of potable water while maintaining appropriate levels of calcium carbonate, which often results in an increase in turbidity. Many facilities are concerned that as water quality demands become more and more stringent, capital improvements and new technology will bear heavy expenses on smaller facilities. The MRWA noted that source water contamination is a major problems with water quality and suggests better and improved water shed protection and well-head protection. Additionally, the staff noted high levels of iron, magnesium, and nitrates in rural water.

Wastewater treatment facilities were noted as having some problems. The specifics were not mentioned but most problems are currently being addressed with improvements and upgrades of existing facilities. One plant in our regional reported difficulties with wastewater treatment during last summer's flood, while others were having difficulty with sludge disposal, inflow and infiltration. Statewide, facilities and capacity and current load are problems, and sludge rule compliance need to be enforced, which will require major construction efforts for compliance. Inflow and infiltration into sanitary sewers is a common problem statewide.

Though most facilities do not have major problems during normal flood conditions, last year's extraordinary conditions was an exception for a few of the plants. It was suggested by a regional district that those facilities in potential flood areas should have multiple water sources in order to ensure that as many people as possible will still be served in the event of a flood. Also, disaster training for personnel and disaster proofing should be required for water distribution and treatment facilities located in a flood plain. Approximately 57 wastewater plants, statewide, were out of service due to the flood of 1993. Many other systems were adversely impacted and almost every systems experienced increased flows, The MRWA suggests that all water treatment and distribution facilities should not be located in flood plains.

The major problems with water systems during drought conditions is the dramatic decrease in water supply. One facility noted that this factor prohibits large industries from locating in the community in which they serve, adversely inhibiting economic development. One other problem is the increase in manganese levels during the drought season. The MRWA notes that undersized mains and pumping capacity which will not be able to supply constant demand increases.

Future Water System Needs in the Mark Twain Region

The trends in growth and decline and trends in water demand were similar in all sectors. Most facilities are expecting steady growth and moderate increases in the domestic sector, but little to no growth in the industrial sector. The major difference was between local and regional facilities in the municipal sector. The smaller facilities expect municipal needs to remain stable while regional facilities expect sharp increases as the smaller systems turn to larger systems in order to feasibly comply with constant changes in federal water standards. Most facilities are confident that their water availability will meet domestic and industrial demands, but are concerned about the municipal sector if significant increases are incurred. The staff of the MRWA sees growth in all sectors statewide, but are concerned about northern Missouri's (including the Mark Twain Region) ability to meet future demands.

Long-Term Strategies to Improve Water and Wastewater Systems

The long-term strategies for water system improvements suggested by local facilities was, obviously, additional funding. One facility recommended that, under present and future regulations, it would be better to sell bottled water than trying to treat for total usage. A regional water supply district offered a variety of recommendations. These include: streamlining government involvement in plan review for construction, educating public officials to consider non-standard answers to problems, such as consolidation or regionalization, requiring engineering firms to consider long term system viability when designing improvements. Major long-term strategies for wastewater system improvements included education and improvements to sanitary and storm sewers.

Long term strategies for improvements to the wastewater systems in the Mark Twain Region include improvement of storm collection systems, controlling infiltration water, education of operators and public officials, and continual upgrades of wastewater systems. The staff of the MRWA suggests consolidation and regionalization of both water systems and wastewater systems. In addition, they suggest extensive training of operators and staff to handle tighter, more complicated regulations and effluent water quality standards.

Regional water and wastewater systems in this region, the staff of the Missouri Rural Water Association, and the Environmental Protection Agency suggest that for long-term planning purposes, consolidation and regionalization is the best answer. Due to increased regulations and mandates, the smaller systems, especially i the rural communities, will be unable to afford the necessary improvements for compliance. It was suggested that it is a waste of time and money to put grant money into the smaller systems because it does not solve the primary source of the problems. The Clarence Cannon Wholesale Water Commission (CCWWC) notes that overall, the purchasers of their water are happy with the water and services they are receiving and also the residents and local communities can participate in the decision making process, which is not always true with local and smaller water systems. The CCWWC had no delivery problems during last year's flood and have a permanent water supply which ensures no difficulties during drought conditions.

Priorities for State Funding of Water and Wastewater System Projects

The priorities for funding of water system projects were diverse. Public health and emergency repairs were major concerns, while age of the facility should be a consideration. It was mentioned that funding should be based on the long term benefits instead of simply the short term. Additionally, funding should be based on those facilities that are attempting to comply with new DNR regulations and demands. The MRWA agrees that even statewide, health threats should be of major priority. The staff also suggests prioritizing by true financial needs and system viability while accounting for the systems financial status, personnel, management and supply.

The priorities are similar for funding of wastewater system projects. Public safety was again a major concern while environmental awareness was also noted. Emergency repair should be a major priority in funding. Many facilities feel that because the treatment regulations are mandated, the state should fund those projects that will bring the water facilities into compliance. The MRWA, again, agrees that public safety should be a top priority, while accounting for threats to the environment and public water supplies.

Water System Problems & Long Term Resolution Strategies

Mark Twain Region

1. Current Conditions - Public vs Private Water and Wastewater Systems

1.1 Estimated % of persons in the region served by:

a) public water systems?	*Anywhere between 90 and 100%.*
b) private water systems?	*Between 0 and 10%.*
c) public wastewater systems?	*Local Systems: From 95 to 100%* *Regional Systems: From 0 to 5%*
d) private wastewater systems?	*Local Systems: Between 0 and 5%.* *Regional Systems: Between 95 and 98%*

2. The Most Serious Water Systems Problems in the Region

2.1 water supply problems

a) availability	*According to responses received by the water districts within our region, availability was not reported as a serious water system problem.*
b) source	*Three of the respondents considered source to be a problem with the water systems, with special emphasis on surface water.*
c) treatment facility	*There seem to be some difficulties with local treatment facilities, though no specifics were mentioned.*
d) distribution	*Distribution is considered to be the most serious water system problem throughout the Mark Twain Region. The problems range from water loss via leaks and providing adequate pressure.*
e) capacity and current usage	*Many facilities feel that their capacity is adequate enough for current usage, but that a substantial increase in usage would require major upgrades.*

2.2 water quality problems *Water quality problems were listed as follows:*

* *Low alkalinity and high levels of manganese.*
* *Turbidity control of potable water while at the same time maintaining positive langlier levels of calcium carbonate. Maintaining precipitation of CaCo3 causes turbidity to increase.*
* *High turbidity during wet season.*
* *THM's - sludge disposal.*
* *Costly capital improvements and expensive technology will be required to meet changing water quality demands.*
* *Increased federal regulations will cuse increased expenditures.*

2.3 wastewater treatment problems

a) facility	*Problems that have been incurred by local facilities are being addressed with upgrades to the existing facilities. Other problems noted with wastewater treatment are CSO and sludge disposal and*

inflow and infiltration. One plant reported flooding during the flood of 1993.

b) capacity and current load — *Capacity problems are again being addressed through upgrades of existing facilities and planning of new facilities.*

2.4 water system problems in flood conditions

Most facilities within this region do not have major impacts to their facilities due to flooding. The Great Midwest Flood of 1993 did impact some facilities by having to remove motors in old intakes and some had pump houses in jeopardy. One district suggested that potential flood areas need to have multiple water sources to insure continued service to as many people as possible if an area is flooded. It was also suggested that disaster training of personnel and disaster proofing should be required for water distribution and treatment facilities.One facility lost customers due to the flood and have been unable to defer the costs with new customers. Funding should be provided for flood proofing of water and wastewater plants located in flood plains

2.5 water system problems in drought conditions

Many facilities do not have major difficulties with their facilities or systems during drought conditions, but some did note that the manganese level tends to become higher during drought seasons and supply availability is dramatically affected. One facility noted that these decreases in supply during drought conditions would prohibit a large industry from locating in their community, which inhibits economic development.

3. Future Water System Needs in the Region

3.1 What are the projected growth or decline trends in the following sectors?

a) domestic — *Most facilities in the region are expecting steady growth with moderate increases.*

b) industrial — *The industrial sector is expected to grow at a slow pace with only slight increases.*

c) municipal — *While the smaller facility are expecting the needs to remain stable, regional water systems are expecting steep increases in future years as small towns look to larger systems to serve them in order to comply with federal water standards.*

3.2 What are the projected water demand trends in the following sectors?

a) domestic — *Again, steady growth with moderate increases.*

b) industrial — *Little to no growth.*

c) municipal — *Slight upward trends on the local level, but steep increases on the regional level.*

3.3 What is the adequacy of water availability to meet demands?

a) domestic — *Most facilities feel that their water availability is adequate to meet domestic demands.*

b) industrial — *Only one facility feels that they do not have adequate water adequate to serve the industrial needs.*

c) municipal — *While many facilities are confident they will be able to serve existing needs and demands, improvements and upgrades are likely if demand increases more than originally projected.*

4. Long-Term Strategies to Improve Water and Wastewater Systems

4.1 What long-term strategies do you suggest to improve water systems?

**Added funds.*
**Put in treatment modifications and equipment for monitoring.*
**New water mains, fire hydrants, storage tanks.*
**Educate.*
**Upgrading storage and enhancing existing lines.*
**Revise backwash system and new high service pump.*
**Under present and future regulations, it would be better to sell bottled water than try to treat for total usage. (Please note that there are no existing regulations for bottled water.)*
**Steady upgrades of system.*
**Streamlining of government involvement in Plan Review for construction, educating of public officials to consider non-standard answers to problems, such as consolidation or regionalization, requirements for engineering firms to consider long term system viability when designing improvements and as always, more and cheaper funding.*
** Flexible funding, grants, low interest.*

4.2 What long-term strategies do you suggest to improve wastewater systems?

** Storm collection systems.*
** Too much infiltration water.*
** Educate.*
** Install a grit chamber and new raw pump.*
** New treatment plant - for treating CSO discharge. Improve sanitary and storm sewers.*
** Steady upgrades of system.*

5. Priorities for State Funding of Water and Wastewater System Projects

5.1 What priorities should State government use to fund water system projects?

** Regional.*
** New water tower.*
** Public safety and economic alternatives.*
** Water systems should have priority over other projects.*
** Meeting new demands from DNR, age of facility, and future plant capabilities for growth. Since the regulations are mandated the state should fund any project needed to meet regulations.*
** Emergency repair should be priority.*
** First and foremost, protection of the public health. Problems with short term health risks must be given priority. Second, funding must look beyond solving immediate concerns and do away with the concept that modest is best. Funding should encourage solving problems in the long term.*
** Health risks should be first and secondly should be based on past history of management and reliability.*

5.2 What priorities should State government use to fund wastewater system projects?

* *Storm collection systems.*
* *Public safety and environmental awareness.*
* *Meeting new demands from DNR, age of facility and future plant capabilities for growth with consideration for those located in the flood plain.*
* *Since regulations are mandated, the state should fund any project needed to meet regulations.*
* *Emergency repair should be priority.*

MARCH - APRIL 1994

OKLAHOMA WATER NEWS

Bimonthly Newsletter of the Oklahoma Water Resources Board

from the desk of the Director...

For several years, disputed water purchase contracts and arguments over delivery areas have blocked some proposed consolidation of water service, creating duplication of facilities and higher prices to water customers. Some sellers of water wanted to charge high prices to outlying districts and cut off the supply if there was a shortage. Some districts wanted to retain their identities, even if consolidation would save money.

These battles flew in the face of the need to provide good water to all Oklahomans at the lowest possible cost. Enter Sen. Ed Long and the Rural Water Task Force.

Sen. Long and Rep. Sean Voskuhl authored legislation to establish a task force to seek solutions. They, with Sen. Jerry Smith, Rep. Mike Mass, the Oklahoma Rural Water Association, Oklahoma Municipal League and 12 citizen members, studied the problem and prepared recommendations that have resulted in legislation this session.

SB 616 creates the Oklahoma Water Resource Task Force to continue the work through 1997.

SB 617 authorizes the OWRB to review disputes involving municipalities and rural water districts and to recommend mediation as an alternative to lawsuits.

SB 618 requires training for elected board members of rural water districts to further address jurisdictional

Continued on page 2

Regional Water Supply Systems Good for Oklahoma Communities

Every year some communities and rural water districts lose access to dependable water sources, outgrow the capacity of their systems and struggle with keeping aged equipment and lines in service. Countless small water systems cannot afford modifications to bring them into compliance with expensive, inflexible mandates imposed by the EPA.

Throughout Oklahoma, water managers seek answers to these dilemmas. Some are beginning to realize that regional water supply systems -- where customers from many towns and water districts are served by a common water source -- are able to provide the most efficient, economical and reliable water supply. Regional systems promote unity and afford members opportunities to share in decisions regarding the system's operation, maintenance and administration. Today, such systems put dependable supplies of good quality water at the tap of thousands.

Tillman County's water system is a southwestern Oklahoma success story and an invention born of necessity. For decades, most of the 10,000 residents of the county relied on the Tillman Terrace aquifer to furnish drinking water to their homes and irrigation water to their cotton, alfalfa and wheat crops. However, the groundwater formation that nourished the strong agricultural economy suffered a critical water quality problem -- nitrate contamination. Several communities in the region reported nitrate levels that exceeded maximum contaminant levels in drinking water established by the EPA and the state Department of Environmental Quality.

The communities of Grandfield, Manitou, Davidson, Hollister and Tipton and Tillman County RWD #1 and other residents of the county relied on the nitrate-contaminated water supply. Problems with supply, storage and distribution had plagued some of the communities.

The communities lacked the financial resources to make the required improvements, but if they refused, the government could have launched disastrous legal actions against them.

Faced with a Catch-22 situation, the communities opted to share the costs through establishment of a regional water supply system. By blending their poor groundwater with good quality surface water from Tom Steed Reservoir and Lake Frederick (purchased from the town of Frederick), communities in the regional system were able to produce supplies acceptable to state and federal regulators.

The communities formed the Tillman County Water Development Authority to administer the countywide system and chose a phased construction scheme to make the project affordable. FmHA and the OWRB Financial Assistance Program enabled the water project with loan and grant funds, and the Association of South Central Oklahoma Governments provided technical guidance. Water Resources Board member Lonnie Farmer, mayor of the town of Davidson, recommends regionalization as means for blunting the impacts of new fed-

Continued on page 2

Director, continued from page 1
and financial issues.

SB 804, authored by Sen. Easley and Rep. Leist, would encourage consolidation by deleting language allowing municipalities to abrogate contract water sales.

Does it make sense to build two water treatment plants a half mile apart when one consolidated plant would provide better water at lower cost? Is it fair to the buyer when a water supplier, for no stated reason, announces that the price will increase 200%? Should homeowners be deprived of water because their district cannot provide water and a nearby district can, but is not allowed to?

These are critical issues for Oklahoma and I applaud Sen. Long and the task force for their efforts in finding answers. ☐

Water Systems, continued from page 1
eral water quality mandates and funding constraints.

"In Tillman County, we were fortunate in having the knowledge, perseverance and leadership to solve our problems," says Farmer.

The trend toward cooperation also caught on in McCurtain County, where the city of Broken Bow spearheads a regional system. In 1986, city officials began planning for a regional water treatment plant north of Broken Bow, encouraged by the McCurtain County RWD #1 request to purchase water and interest from an industry in locating there. City Manager Mark Guthrie said the water district, with 300 customers, was the first to join, followed by Tyson Foods, whose poultry operation now employs 1300, then Hochatown RWD #5.

According to Engineer Cecil Wildman of Spear & McCaleb, the towns of Valiant and Wright City await approval of FmHA loans and grants to finance their hookup to the Broken Bow water system. The state-of-the-art plant is capable of producing four million gallons a day (4 mgd) of treated water at a cost of 83 cents per thousand gallons, one of the lowest rates in the state. Wildman points out that the cost charged the system's customers has not changed since the plant came on line in March 1990.

Guthrie said still another expansion is in the works -- water service to 1000 rural residents in 10 communities north and northwest of the lake. The communities of Honobia, Pickens, Smithville, Bethel, Battiest, Mt. Herman, Watson, Plunketville, Octavia and Clebit comprise the largest area in the state that has never had water service. The rural families have relied on scanty wells of poor quality and have lacked adequate fire protection.

Guthrie said the Broken Bow Public Works Authority proposes a two-phase expansion to the north. The first stage would include construction of a main to pump water from the Broken Bow treatment plant to a storage tank atop Carter Mountain, eight miles distant. From mountaintop storage, water would flow by gravity to RWD #6, then by gravity and pump stations along 190 miles of line to communities in LeFlore and Pushmataha Counties.

Broken Bow Mayor Chuck Darby and PWA Chairman Jim Mack Hastings said the Valiant and Wright City expansion will be in service by early fall. They said the new system probably will provide water at a cheaper rate than the communities' previous systems.

Service to the other 10 communities is scheduled for completion in 6-7 years. According to Mayor Darby, the residents of the region served by the Broken Bow water system will enjoy water so pure that it will exceed EPA standards.

All agree that a reliable source of good quality water gives Oklahoma communities a big advantage when industries scout new locations. ☐

mainstream

OCWP Committee Announced

The OWRB announced 21 citizens have accepted invitations to serve on the Board's Advisory Committee for the Oklahoma Comprehensive Water Plan. Executive Director Patty Eaton said members have background in water issues and ability to provide citizens' perspective to the planning process.

Members include Jana Barker, Lawton; James R. Barnett, Ronn Cupp, Lou Gatti, Cecil Wildman, Oklahoma City; Gerald Borelli, Kingfisher; Ed Brocksmith, Tahlequah; Frank Condon, Idabel; Mark Derichsweiler, Norman; Jack Hudman, Chattanooga; Lewis Kamas, Freedom; Donna Kirby, Altus; Paul Matthews, Stillwater; Bill Miller, Guymon; Jan Norman, Grove; Fran Pace, Tulsa; Bob Portiss, Catoosa; Bill Southard, Ryan; Rob Stallings, Enid; Stan Stamper, Hugo; and Keith Wright, Wister.

Meetings are scheduled March 28 and April 25. ☐

Officials who were instrumental in bringing about the renovation of Holdenville Lake dam toured the site as the project neared completion at the end of February. Holdenville Mayor Jack Barrett is shown with OWRB Chairman Robert S. Kerr, Jr., Speaker Glen Johnson and OWRB Executive Director Patty Eaton. The improvements were enabled by financing from the Board's Financial Assistance Program.

Water System Problems & Long term Resolution Strategies
Missouri Rural Water Association - State Perspective

1. Current Conditions - Public vs Private Water and Wastewater Systems

1.1 Estimated % of persons in the region (in this case, the *state)* served by:

a) public water systems?	*60%*
b) private water systems?	*40%*
c) public wastewater systems?	*20%*
d) private wastewater systems?	*80%*

2. The Most Serious Water systems Problems in the Region

2.1 water supply problems

a) availability	*Top problem.*
b) source	*Not a major problem.*
c) treatment facility	*Top problem - number of improperly or insufficiently trained operators.*
d) distribution	*Top problem - Lots of systems have old lines which will soon need replacing.*
e) capacity and current usage	*Not a major problem.*

2.2 water quality problems *Source water contamination - There needs to be water shed protection and well-head protection.*

2.3 wastewater treatment problems

a) facility	*Top problem.*
b) capacity and current load	*Top problem.*
c) other	*Sludge rule compliance - major construction needed statewide to comply with this new regulation.*

2.4 water system problems in flood conditions

River crossing and electrical panels below flood levels and generally facilities should not be built in flood plains. Wastewater - During 1993, 57 wastewater plants were completely out of service due to flooding. Hundreds of other systems were also impacted. Virtually every system experienced increased flows.

2.5 water system problems in drought conditions

Undersized mains and pumping capacity which will not be able to supply constant increased demand.

3. Future Water System Needs in the Region

3.1 What are the projected growth or decline trends in the following sectors?

a) domestic	*Growth*
b) industrial	*Growth*
c) municipal	*Growth*

3.2 What are the projected water demand trends in the following sectors?

a) domestic *Growth*
b) industrial *Growth*
c) municipal *Growth*

3.3 What is the adequacy of water availability to meet demands?

a) domestic *Questionable in northern Missouri, but sufficient in southern Missouri.*
b) industrial *Questionable in northern Missouri, but sufficient in southern Missouri.*
c) municipal *Questionable in northern Missouri, but sufficient in southern Missouri.*

4. Long-Term Strategies to Improve Water and Wastewater Systems

4.1 What long term strategies do you suggest to improve water systems?

Consolidation and regionalization.

4.2 What long-term strategies do you suggest to improve wastewater systems?

Consolidation and regionalization. Training of operators and staff to handle tighter, more complicated regulations and effluent water quality standards.

5. Priorities for State Funding of Water and Wastewater System Projects

5.1 What priorities should State government use to fund water system projects?

Health threats - true financial needs - system viability - take into account the system's financial status, personnel, management, and supply.

5.2 What priorities should State government use to fund wastewater system projects?

Same as above as well as threats to the environment and public water supplies.

OZARK FOOTHILLS REGIONAL
PLANNING COMMISSION

BOX 1183 • 3019 FAIR • POPLAR BLUFF, MO 63901-1183 • PHONE 785-6402

May 18, 1994

Missouri CDBG Program
Attention: Joe Lopez
DED
PO Box 118
Jefferson City MO 65102

Dear Mr. Lopez;

Attached is the summary or water and wastewater problems and strategies for the Ozark Foothills Region. We hope this will be of help in the evaluation of current programs and future solutions. If you have any questions or comments about the report, please contact me.

Sincerely,

Carol Mitchell

Carol Mitchell
Grant Officer

Enc.

WATER SYSTEM PROBLEMS & LONG TERM RESOLUTION STRATEGIES

1. Current Conditions - Public vs. Private Water and Wastewater Systems

The five county region served by the Ozark Foothills Regional Planning Commission is largely rural in population and only a few water districts have been created within the area. Approximately 57% of the population is currently being served by private water systems such as shallow or drilled wells. The remaining 43% are served by public water districts; most of which were created through Community Development Block Grants.

The wastewater situation is somewhat more troubling thanthe water situation. Only 35% of the areas population is presently being served by a public wastewater system. That leaves 65% using either a septic system (many of which are outdated) or no system at all.

2. The Most Serious Water System Problems in the Region

2.1 Water Supply Problems

Of the items listed in your outline (availability, source, treatment facility, distribution, capacity and current usage) all seem to pose some seriousness for this region. With over half of the population obtaining their water from private wells, springs, or other sources, water quality and availability are probably the two major problems. Along with the problems of private systems, even some of the public facilities frequently incur major difficulties. Treatment facilities have become over burdened with expanding numbers of users and aging equipment. One district, in particular, has to issue boil water orders an average of once a month. The age of the lines in some areas also plays a major factor. When some of these water systems were installed, lead joints were still being used. Many of these have still not been replaced and at this time are creating serious health concerns to some of the users. The maintenance of these lines is also a problem as it is extremely difficult to find the right size fittings to repair broken lines and the mounting repair bills are a burden to the smaller communities.

2.2 Water quality problems

The water in this region is basically of good quality except for a few minor exceptions. Much of the land in our region is used for farming and, therefore, has been treated periodically with various farm chemicals. In a few areas of Butler and Reynolds Counties some of these chemicals have seeped into the water systems causing pollution problems. This continues to be an area of concern for many agricultural families as it is a threat to their health.

2.3 Wastewater treatment problems

The basic problem with wastewater treatment is the lack of treatment facilities. The facilities that we have in the region are basically modern, well-planned systems. The cities of Bunker and Grandin, however, are completely without wastewater systems of any kind. Both communities are in the process of installing systems and both have run into problems with lagoon locations as well as other conflicts. The rural areas of the regions are almost completely without public systems of any kind. The need for rural wastewater districts is extremely vital in this area.

2.4 Water system problems in flood conditions

Flood conditions are not a consistent problem in this region except for the communities of Doniphan and Ellington. Both of these cities have water wells located in the flood plain and both have experienced major flash flooding within the past few years. The citizens have been left with either no water or contaminated water for days or weeks at a time. During the month of November, 1993, the City of Ellington had their water system almost completely destroyed when flash floods wiped out their main well, pump and controls. Even though the system has now been repaired, the threat of future flooding remains a constant threat.

2.5 Water system problems in drought conditions

The City of Naylor in Ripley County is served by a shallow well and sometimes experiences a loss of water during drought periods. Also affected are rural districts in Butler County. These are basically agricultural areas and while the water level will be lower during these periods, the water usage usually increases. The two areas mentioned here are both adjacent to the bootheel and are basically extremely flat, with sandy soil, requiring extra water during hot, dry periods.

3. Future Water System Needs in the Region.

3.1 What are the projected growth or decline trends in the following sectors?

The three areas listed in the outline, (domestic, industrial, and municipal) are not forecast to show any large trends in either growth or decline over the next 10 years. Some growth is anticipated, but only minimal. Growth in the area of industry is always hoped for and this region expects some increase due to the creation of new industrial parks and expansion of present businesses. The City of Piedmont is currently in the process of building a new industrial park

outside the northern edge of town with one business ready to locate there as soon as a building is ready. Other industries are showing interest in locating within the new park. The City of Poplar Bluff has recently received word that one of its major employers, Briggs and Stratton, will be expanding within the next two to three years. Rowe Furniture expanded their process recently but has not reached their anticipated employment level yet. Ripley County has recently located a new industry in the County. Lignetics Industry opened within the last two years and has not reached their full capacity as of this date. If industry continues to expand, the region should see a need for expansion in both domestic and municipal needs as a result.

3.2 What are the projected water demand trends in the following sectors?

The sectors being domestic, industrial and municipal, the expected demands are various. There is currently a need for expanded storage facilities throughout the region and this need will increase as industry continues to expand. Domestic and municipal demands are not aniticpated to increase significantly over the next ten years. Only the cities of Doniphan and Poplar Bluff currently have emergency standby facilities. Perhaps some consideration should be given to emergency services for the other areas

3.3 What is the adequacy of water availability to meet demands?

Currently there is an adequate supply to meet the needs of all sectors of the populations; domestic, industrial and municipal. Water sources in most areas produce adequate amounts and pressure to keep the systems running properly and limit down time or boil water orders. Butler County PWSD #3 currently has more than their share of problems in meeting demands due to a lack of adequate storage and outdated controls. PWSD #3 has increased the number of customers they serve without the ability to expand the system. This is currently one of the most extreme needs in the area. The Village of Mill Spring in Wayne County currently receives its water supply from the village's name sake, the Mill Spring. This spring has served the community water needs for many years but the property where the spring in located was recently put on the market. If the Village is not successful in its attempt to purchase the property, they could end up without a water supply of any kind. As is evident, the supply is adequate, but there are problems in distribution.

4. Long-Term Strategies to Improve Water and Wastewater Systems

4.1 What long-term strategies do you suggest to improve water systems?

Most water systems in the region are antiquated. Some still have lead jointed pipe,

presenting both health and maintenance problems. Serious problems of this kind need to be identified and prioritized. These should be the first projects to be undertaken. Adequate storage facilities need to be provided for each community or water district and expansion of rural districts is needed. Emergency standby facilities need to be considered; especially in those cities where loss of service is a probability during extreme weather condition.

4.2 What long-term strategies do you suggest to improve wastewater systems?

Communities without wastewater systems should be identified and systems installed through CDBG funding or other sources. Rural population centers need to be formed into districts and wastewater/sewer districts formed.

5. Priorities for State Funding of Water and Wastewater System Projects

5.1 What priorities should State government use to fund water system projects?

Some of the top considerations should be: quality of water, environmentally sound use of existing supply, maintenance of system, age of current system, source of supply, and future growth expectations.

5.2 What priorities should State government use to fund wastewater system projects?

Priorities should be given to communities with no wastewater treatment facilities first, especially those were waste is flowing into streams, creating health hazards. Rural areas with concentrated populations need to be given the opportunity to form wastewater districts. Considerations should also be given to systems which are outdated or overused.

MISSOURI

ANDREW
BUCHANAN
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MO-KAN
REGIONAL COUNCIL
LOCAL GOVERNMENTS WORKING TOGETHER
1302 Faraon 816-233-3144
St. Joseph Mo. 64501

KANSAS

ATCHISON
DONIPHAN
Hiawatha
Morrill

19 May 1994

Joe Lopez
Technical Assistance Coordinator
Missouri Department of Economic Development
P.O. Box 118
Jefferson City, MO 65102-0118

Dear Mr. Lopez:

Enclosed please find the results of the information you requested. As you indicated, the information was not too difficult to gather.

We used a major water supplier as our information base in this matter. Missouri American Water Company is responsible for a large percentage of our Missouri region, either through direct supply or in-directly through Rural Water Systems scattered around northwest Missouri. Bill Cunningham, an engineer for Missouri American, was very helpful in supplying the information to complete your request.

If you have any questions about the following information, please don't hesitate to contact my office.

Sincerely yours,

Andrew Clements,
Regional Planner

Enc.

Water System Problems & Long Term Resolution Strategies

Mo-Kan Regional Council

Andrew, Buchanan, Clinton, and DeKalb Counties

Current public versus private water and wastewater systems analysis can be easily broken down into general percentages for our region. We estimate that approximately 95% of our population are served by public water systems; 5% are served by private water systems; 78.1% are served by wastewater systems; 21.9% are served by private wastewater systems. These statistics were reached by using a base population of 117,369 and extrapolating results from that base using known statistics.

It is important to realize that Mo-Kan's region is primarily composed of one large metropolitan area with a lightly populated rural land area surrounding it. When one subtracts St. Joseph's population of approximately 75,000 from the base, along with all the other cities with a population of 1,000 or more (12,424), the rural population for four counties is 25,836. When one subtracts the total population of incorporated cities or villages with a population under 1,000 (5,640) from 25,836, the rural population drops to 20,196. This population is scattered throughout a 1,655 square mile area comprising the four counties.

Having explained the preceding statistic, simply stating that 95% of our population is served by a given service is a bit misleading. Actually a greatly reduced estimate of <u>land area served</u> would approach the level of 20% for public wastewater systems and perhaps 60% for public water systems.

Private water supply problems can be summarized under the categories of quantity, reliability, quality, and expense.

Typical private wells are commonly dug to a depth of 100 feet or less, and are thus termed "shallow wells". During frequent drought conditions many of these wells are susceptible to a reduction in supply that is inadequate to meet the rural residential needs. In northwest Missouri, wells dug deeper than 100 feet are more resistant to such fluctuations, but the expenses of re-digging a well and replacing an old pumping system with a new one are often cost-prohibitive for an individual. Thus it is not uncommon to see rural residents hauling water for many months of any given year. It is simply cheaper to haul water than to undergo the prohibitive expense of installing a new well and delivery system.

The typical well of 100 feet or less is also commonly subject to a hardness level of between 200 to 250. This adds expense in the maintenance of private water systems and also taxes the common septic tank's capacity to treat increased volumes of effluent generated as a result of the required levels of detergents necessary to clean articles in hard water. Additionally, shallow wells are also very subject to contamination from sources such as agricultural chemicals, livestock waste, and miscellaneous petroleum products.

This past year, many residents found their wells were contaminated through floodwater infiltration. Rising floodwater contaminated the shallow aquifers and made many wells unsafe to use. Because much of Mo-Kan's region is criss-crossed by a plethora of drainage systems, this is probably a common problem than many residents is completely unaware of.

Missouri American Water Company (MAWC) is the largest single water supplier in our region. It serves the entire St. Joseph metropolitan region and also supplies water to many of the rural water systems in the region. It uses the Missouri River as its supply source and has encountered difficulty in the past with rising flood waters, an intake problem during the winter due to reduced river levels, and the high cost of treating this type of water source.

Public water systems in northwest Missouri commonly report adequate capacity, but find the cost of system expansion prohibitive. As alluded to earlier in this report, the rural population is so sparsely spread over a large land area that expansion of rural water service is difficult to justify on a cost per person basis.

Treatment facilities used in the small cities of the region are finding that modern sanitary regulations have made them obsolete, or nearly so. Updated construction/installation costs are cost prohibitive for such small populations who generally do not have the required LMI population to apply for CDBG assistance.

Wastewater treatment problems in some of the larger cities report difficulty with capacity. Residential and commercial expansion, combined with increased effluent levels per person, have made older facilities incapable of treating additional loads. Smaller towns with treatment lagoons have somewhat stable populations and therefore have not encountered problems with capacity. Again, many of the smaller towns in our region are unable to finance wastewater improvements because of their high cost per person and their ineligibility to apply for CDBG assistance. In these areas serious groundwater contamination and significant health risks may exist.

Domestic use of water is expected to increase throughout the region as the levels of modern residential cleaning appliances proliferate. Industrial use in the urban areas is expected to rise as well due to continued business recruitment efforts and anticipated new industrial openings. Missouri American representatives have expressed the feeling that their ability to supply the St. Joseph area, for instance, is easily met. Most municipal needs are anticipated to remain at stable levels.

Domestic population is expected to increase throughout the four county region, according to U.S. Census information. Following service financing pressure, area municipalities will likely annex additional areas in the future and will be required to serve the same with water and wastewater treatment services.

Water system strategies should be initiated through a coordinated process. Often expansion is not well planned and as a result the consumer is left without affordable service or with very expensive service. Main service and supply lines should be planned in such a manner that future expansions

of the system can be accomplished in phases that emphasize an efficient delivery of water to the largest possible population and area.

Wastewater system needs should be developed for the future, utilizing demographic information regarding population trends, etc.---. If a community is using a system that has a rated capacity to handle 1,000 residents, is treating 900 currently, and has a projected growth-trend of 10%, a watewater treatment crisis is not far behind. Communities should be required to establish and update a plan that takes such factors into consideration. It should outline plans for maintenance, expansion, and possible avenues of financing the same. In this manner a community would be forced to deal with a very expensive problem in a pro-active process.

State funding priorities for water system projects should utilize a formula that weighs the burden of self-financing a project (and its cost per person) versus the cumbersome LMI requirement now utilized. Many areas, although not officially "LMI", are incapable of self-funding a water system. A process needs to be developed to offer water system delivery to rural areas that will be unable to do so without financial assistance. A formula or ratio composed of land area served, population served, and estimated unassisted project cost per person should be used to develop guidelines for eligible entities. As a rule, this area constitutes the majority of the population not currently served be a sanitary water system.

Watewater treatment priorities should focus on the remaining, small, non-LMI communities for funding. Collectively, they represent a large segment of our region's rural population that is currently living in unsanitary conditions. The cost of developing effective treatment facilities per person has been prohibitive. A provision wherein cost of the project per person is used as a determinant factor should be used to offset the LMI level that now restricts a community from applying for assistance. A small population is as detrimental to project financing as low to moderate income levels in putting together the resources necessary to pay the exorbitant costs of a wastewater treatment facility.

SOUTHEAST MISSOURI REGIONAL PLANNING
& ECONOMIC DEVELOPMENT COMMISSION

P.O. Box 366
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PERRYVILLE, MO 63775
TELEPHONE: 314 547-8357 FAX 547-7283

H. Weldon Macke	Richard Caster	David Angerer	Willard R. LaPlant	Thomas G. Tucker
Chairman	Vice-Chairman	Secretary	Treasurer	Executive Director

May 20, 1994

Mr. Joe Lopez
Water Quality Planning Project
Community Development Block
Grant Program
P. O. Box 118
Jefferson City, Missouri 65102

Dear Joe:

Remembering that you had requested an overview paper of the water quality issues from our Region, I am transmitting, herewith, a copy of a short paper with various maps that I feel addresses at least the rudimentary elements of the situation within the Region. Obviously, the enclosed information has been developed over a period of years and from information that I am aware of within our own office.

I hope that the enclosed is in the basic format of what you are looking for. If not, let me know what else needs to be done, and I will do my utmost to address these issues.

I will be mailing the hard copy to you via U. S. mail with the hopes that it will arrive! I wanted to fax a copy to you so you would have it as soon as possible. I believe we agreed upon the 20th as the date that I would submit this.

Thanking you for your attention to the enclosed, I remain

Respectfully yours,

Thomas G. Tucker
Executive Director

TGT/kh

Enclosure

OVERVIEW OF WATER RESOURCES IN THE SOUTHEAST MISSOURI REGION

Prepared by
Thomas G. Tucker
Executive Director

The ability to produce, transmit, store and distribute a potable and usable water supply is key to survival of any civilization. Those civilizations that have tainted their water supplies have not survived.

Water resources for the Southeast Missouri Region will continue to be an important issue well into the 21st century and is presently an issue that needs to be addressed more thoroughly with appropriate planning and education of the public concerning the importance of protection of the resources that are available.

The Southeast Missouri Region encompasses slightly over 2.25 million acres of land. A majority of the land is rural in character, with only 2.5% urbanized. The cities in the Region are small, with most of the incorporated communities having populations of less than 1,000. Only nine cities have populations of 2,500 or more. The majority of the rural area of the Region is forested.

A considerable amount of the land area of the Southeast Missouri Region is held in public trust. The U. S. Forest Service's Mark Twain National Forest covers some 158,326 acres in Iron, Madison, Ste. Genevieve and St. Francois Counties. Another 54,000 acres of the Region have been developed as state parks, state forest, natural areas, and river access areas by the Missouri Department of Conservation and the Missouri Department of Natural Resources.

Within the Southeast Missouri Region, approximately 682,000 acres are held in cropland. Also, some 246,000 acres are held in pasture. Approximately 1.2 million acres are held in timberland, and 8,530 acres are covered with water.

From the standpoint of overall environmental resources, the Southeast Missouri Region is matched by few other areas in the midwest. These resources include outstanding and unique geological features, extensive and varied flora and fauna, beautiful scenery, clean air, and abundant water. A moderate climate and a recorded history dating from the earliest settlement of the Mississippi River valley are also evident in the Region. The Region is also rich in metallic and non-metallic minerals. Recognizing the value of these resources, the Southeast Missouri Regional Planning and Economic Development Commission supports programs for maintaining and enhancing the Region's environment.

The annual average rainfall in the Region varies from approximately 39 inches in northern Ste. Genevieve County, increasingly to 45 inches in southern Bollinger County. A map is attached which shows water resources in the Region. Average stream flow is largest on the Mississippi River, with 114 trillion gallons per day. Other major stream flows include flow from the St. Francis River basin, which varies from 100 million gallons per day in the north to 696 million gallons per day just south of Madison County. The Big River system flowing through St. Francois County has flow from approximately 100 million gallons per day in nearby Washington County to 415 million gallons per day at a point north of St. Francois County in Jefferson County. The Whitewater River and Diversion Channel drainage in southern Bollinger and Cape Girardeau Counties averages from 100 million gallons a day to 319 million gallons per day.

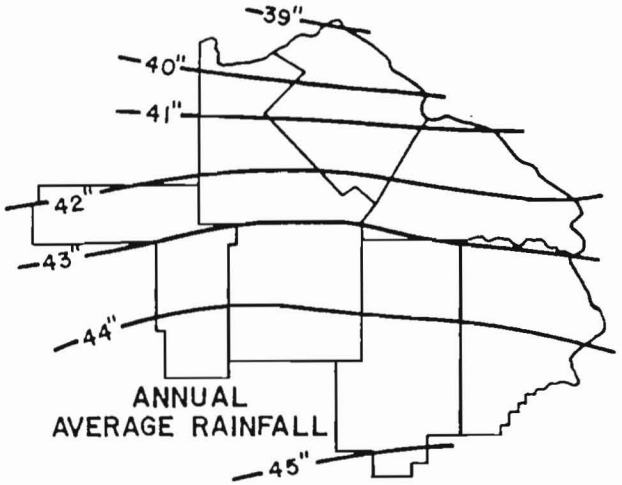
Water runoff in the Region averages from 12 inches in the northern portions of the Region to between 16 and 17 inches in southern Bollinger and Cape Girardeau Counties.

Important to the continued production of water also is the yields that are anticipated from various wells in the Region, and these are included on the exhibit enclosed. Yields in the area marked No. 1 on the map along the Mississippi River can be as much as 1,000 gallons per minute or higher in shallow wells; however, there is high iron content associated with the wells in this area. The No. 2 area in the Region in Ste. Genevieve County adjoining the Mississippi River and in portions of Perry County have yields of one to 10 gallons per minute to a depth of 450 feet and water that is mineralized below 450 feet. The area marked No. 3 in Perry and Cape Girardeau Counties has yields of 10 to 30 gallons per minute from shallow wells, with deeper wells having higher yields, but there is the potential for high mineralization. Area No. 4 affecting central Ste. Genevieve County, western Perry County, western Cape Girardeau County, and a majority of Bollinger County have yields from 10 to 30 gallons per minute from shallow wells and yields of 40 to 400 gallons per minute from deeper wells. Area No. 5, which encompasses a major portion of the Region, including western Ste. Genevieve County, virtually all of St. Francois County, virtually all of Madison County and all of Iron County, have yields of five to 125 gallons per minute in most of the area. Inter-mountain areas usually have yields of less than 20 gallons per minute, and the experience of the staff of the Southeast Missouri Regional Planning and Economic Development Commission is that some of the wells in this area also have radionuclide problems, but they are not felt to be high enough to affect the water for human consumption. The U. S. Environmental Protection Agency presently is studying resetting of the acceptable levels of radionuclides in potable water.

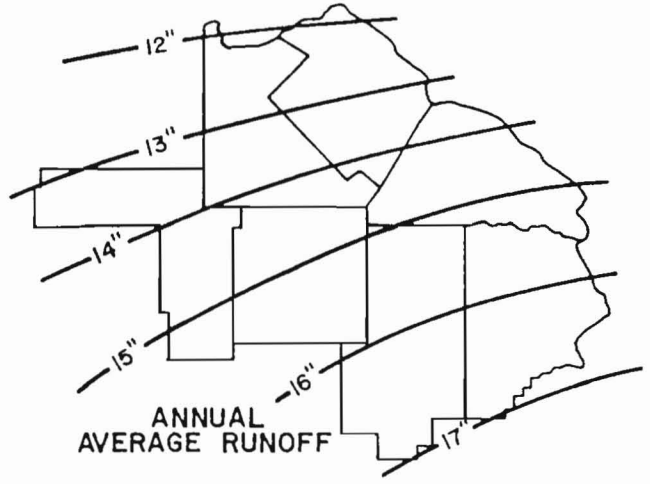
The topography, soils and geology are major physical planning factors in Southeast Missouri and factors which are considered whenever new developments of any kind are being considered. Topographic limitations imposed upon general development in the Southeast Missouri Region are varied, and there is a great contrast in land surface between the different parts of the Region. As an example, the nearly level Mississippi River bottoms impose virtually no topographic limitations upon any type of development,

SOUTHEAST MISSOURI REGION

WATER RESOURCES



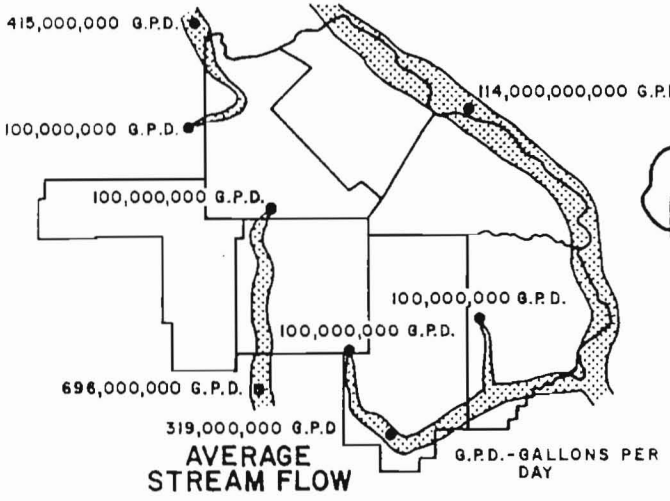
ANNUAL AVERAGE RAINFALL



ANNUAL AVERAGE RUNOFF

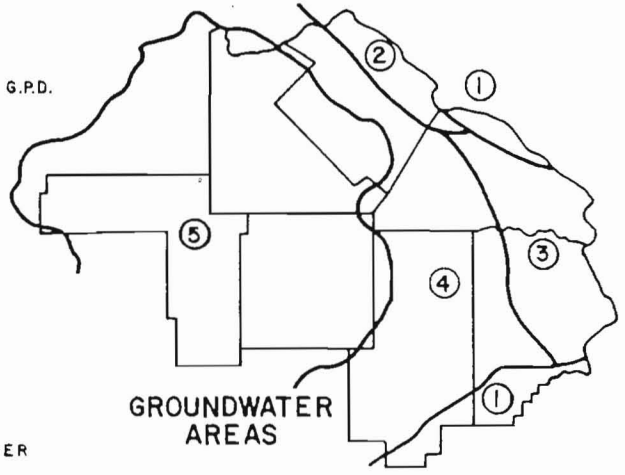
0 3 6 9 12 15

SCALE IN MILES



AVERAGE STREAM FLOW

G.P.D.-GALLONS PER DAY



GROUNDWATER AREAS

1. YIELDS OF 1,000 G.P.M. OR HIGHER, SHALLOW WELLS, HIGH IRON CONTENT.
2. YIELDS 1-10 G.P.M., DEPTH TO 450 FEET, MINERALIZED BELOW 450 FEET.
3. YIELDS 10-30 G.P.M. FROM SHALLOW WELLS, DEEPER WELLS HIGHER YIELDS BUT MAY BE MINERALIZED.
4. YIELDS 10-30 G.P.M. FROM SHALLOW WELLS, YIELDS FROM 40 TO OVER 400 G.P.M. FROM DEEP WELLS.
5. YIELDS 5-125 G.P.M. IN MOST OF AREA, INTERMOUNTAIN AREAS USUALLY LESS THAN 20 G.P.M.

G.P.M.-GALLONS PER MINUTE

SOURCE: WATER RESOURCES OF SOUTH-CENTRAL MISSOURI: U.S. GEOLOGICAL SURVEY, 1976.
GROUNDWATER MAPS OF MISSOURI: MISSOURI GEOLOGICAL SURVEY, 1963.

but there are certainly issues with regards to floodplain development. In contrast to this area, the area of the St. Francois Mountains has rugged terrain, high local relief, and frequent exposures of bedrock which present severe limitations for the development of more urban facilities. Much of the area also has steep to moderate slopes which present general problems for development and increase surface water problems.

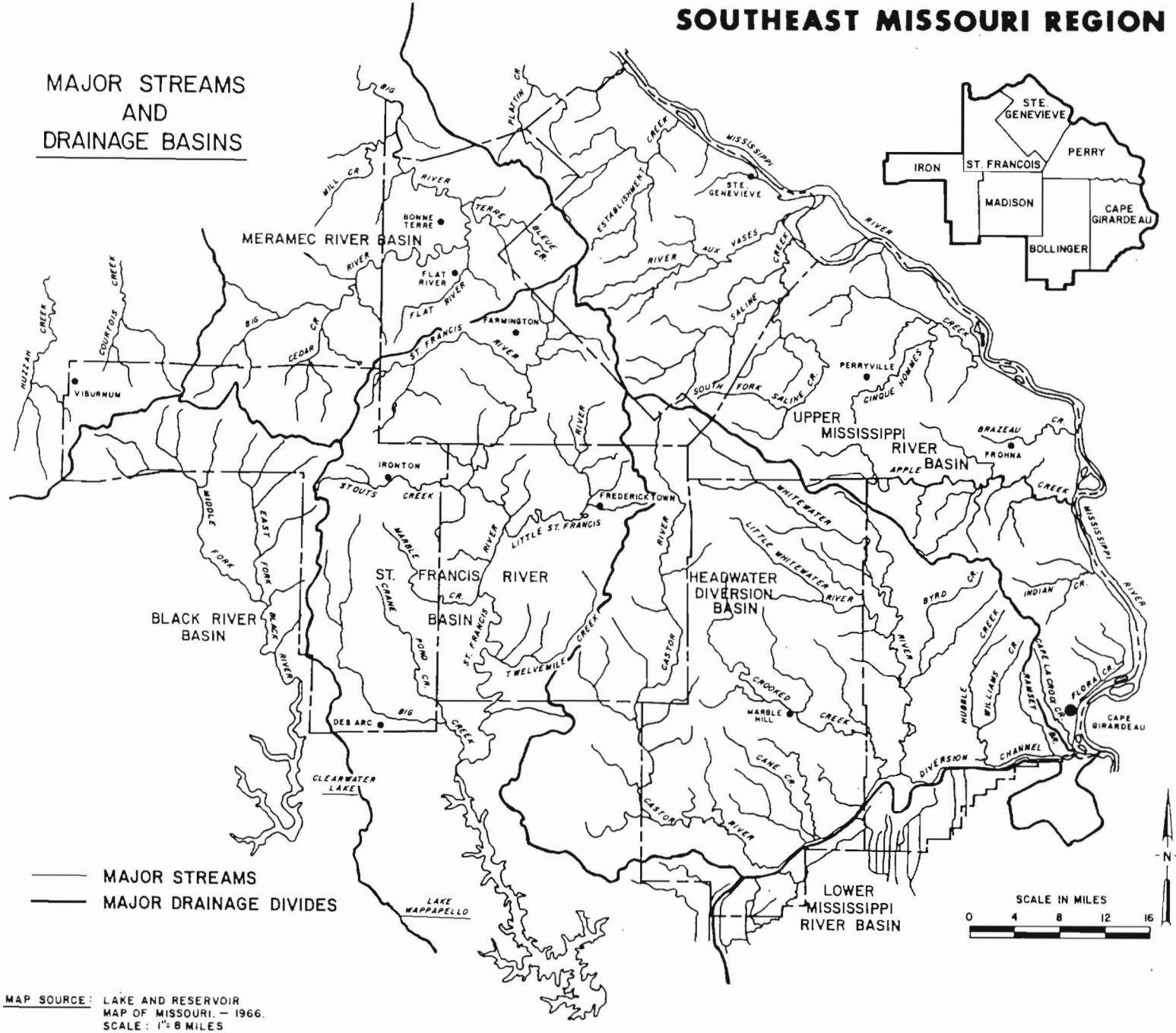
The soils of the Region are an important natural resource, providing structural support for buildings, highways, and the medium necessary for the growth of vegetation. The support of human life in modern society has profound effects on the natural environment. Cities and towns generally have much higher rates of surface water runoff and soil erosion than do rural areas, due to the covering of large areas of soil with buildings and streets. The soil is an important receptor of rainfall, absorbing approximately one-sixth of all water that falls on the surface. Rainfall is a major source of recharge for groundwater systems, providing a source of potable water for urban areas. The Southeast Missouri Region has a variety of soils with differing characteristics, and the reader is referred to detailed soils surveys completed for most of the counties in the Region for additional information.

Major geologic features of the Region include the presence of karst features, exposed bedrock, and several significant fault systems in or near the Region. Many of the soils in the Region also present problems for development, particularly from the standpoint of subsurface water movement.

The Southeast Missouri Region is dissected by numerous major streams and drainage basins. An exhibit is attached, herewith, depicting all of the major streams and drainage basins in the Region. The Southeast Missouri Region lies in the Upper Mississippi River Basin, which covers the majority of Ste. Genevieve County, a majority of Perry County and the northeastern section of Cape Girardeau County. The Headwater Division Basin covers southwestern Cape Girardeau County; virtually all of Bollinger County, except the most southern area; southwestern Perry County; the extreme southwestern tip of Ste. Genevieve County; eastern Madison County; and a portion of Wayne County, outside of the Region. The St. Francis River Basin covers a portion of extreme southwestern Ste. Genevieve County, southern St. Francois County from just north of Farmington, a majority of Madison County, and a majority of eastern Iron County. The Black River Basin affects the extreme western portion of the southern part of Iron County and the southern portion of the arm of Iron County toward Viburnum, but does not include Viburnum. The Meramec River Basin includes a portion of northeastern Iron County, all of the northern area of St. Francois County, and a small section of western Ste. Genevieve County. These major stream divides define the direction of flow for all surface water in the Region and are enunciated by the major stream divides.

The Southeast Missouri Region is particularly affected by the karst terrain that lies in the easter part of the Region with the surface expression of sinkholes and numerous underground caves. In fact, Perry County has the most caves identified in the State of Missouri, with the last count standing at 630 caves. The importance of this is that any

SOUTHEAST MISSOURI REGION



MAP SOURCE: LAKE AND RESERVOIR MAP OF MISSOURI. — 1966. SCALE: 1" = 8 MILES

water that falls on the surface of the earth and enters the underground cave system through the sinkholes and crevices in cracked bedrock in losing streams will eventually enter the groundwater system. It is critical that the water quality of the area be protected through ensuring that any hazardous waste and solid waste is properly disposed of in appropriate secure facilities. Past practices of dumping solid waste and containers from farm chemicals in sinkholes must be stopped in order to protect the groundwater system.

A major problem of the groundwater system has also been the introduction of human waste from septic tanks and direct pipes to sinkholes. This also is important in other areas of the Region, where untreated human waste has been allowed to enter various stream channels and affect the quality of water and, it is believed, enter into the groundwater system through fissures in the bedrock in losing streams.

The fact that such a large area of the Region has losing streams and also karst topography leads one to believe that the impact of improper handling of waste and other means of contaminating the groundwater system could impact an extremely large geographic area in the groundwater system. The practice of dumping waste materials along stream banks must also be controlled in order to avoid stream contamination.

In addition to these issues, there is also a mine tailing hazard which is present throughout much of the western portion of the Region in the old lead mining areas of St. Francois County and in the new Viburnum Trend, which affects Iron and surrounding counties. While there is hope that these mine tailing areas can be stabilized in order to ensure that the tailings do not reach stream beds, this has already happened in the case of the Big River in St. Francois County. There are numerous old slime pond dams scattered throughout the western portion of the Region which, if they were to fail because of earthquake or degradation of the dams themselves, could result in major flows of mine tailings into numerous streams which would affect the surface water system and, potentially, the groundwater system. A listing of the tailings dams in the Southeast Missouri Region is attached.

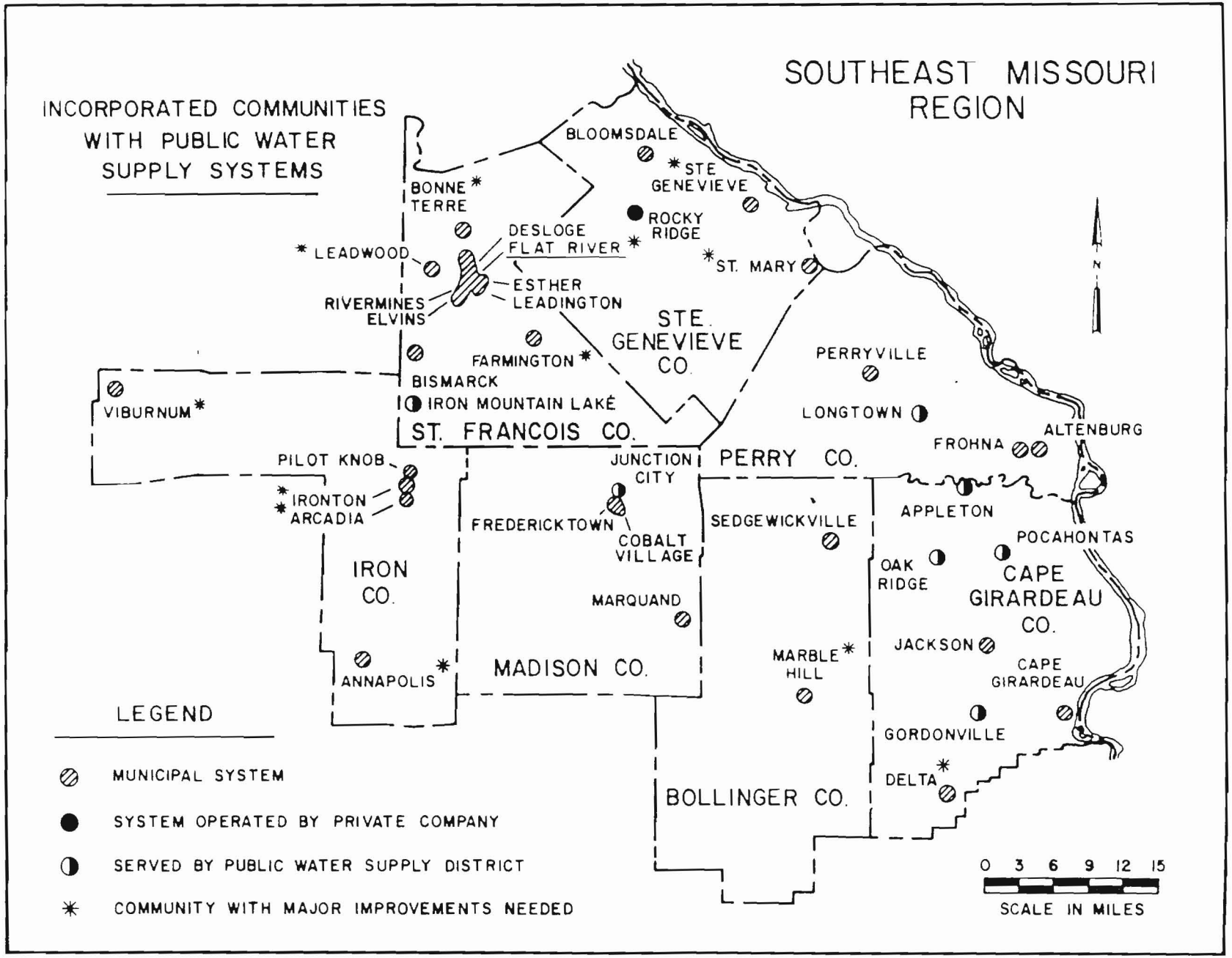
Numerous public water supply systems serve both incorporated and unincorporated areas in the Region. A map depicting incorporated communities with public water supply systems is attached to this section for information concerning the supply systems. In addition, numerous public water supply districts serve the Southeast Missouri Region and a map of these is also enclosed.

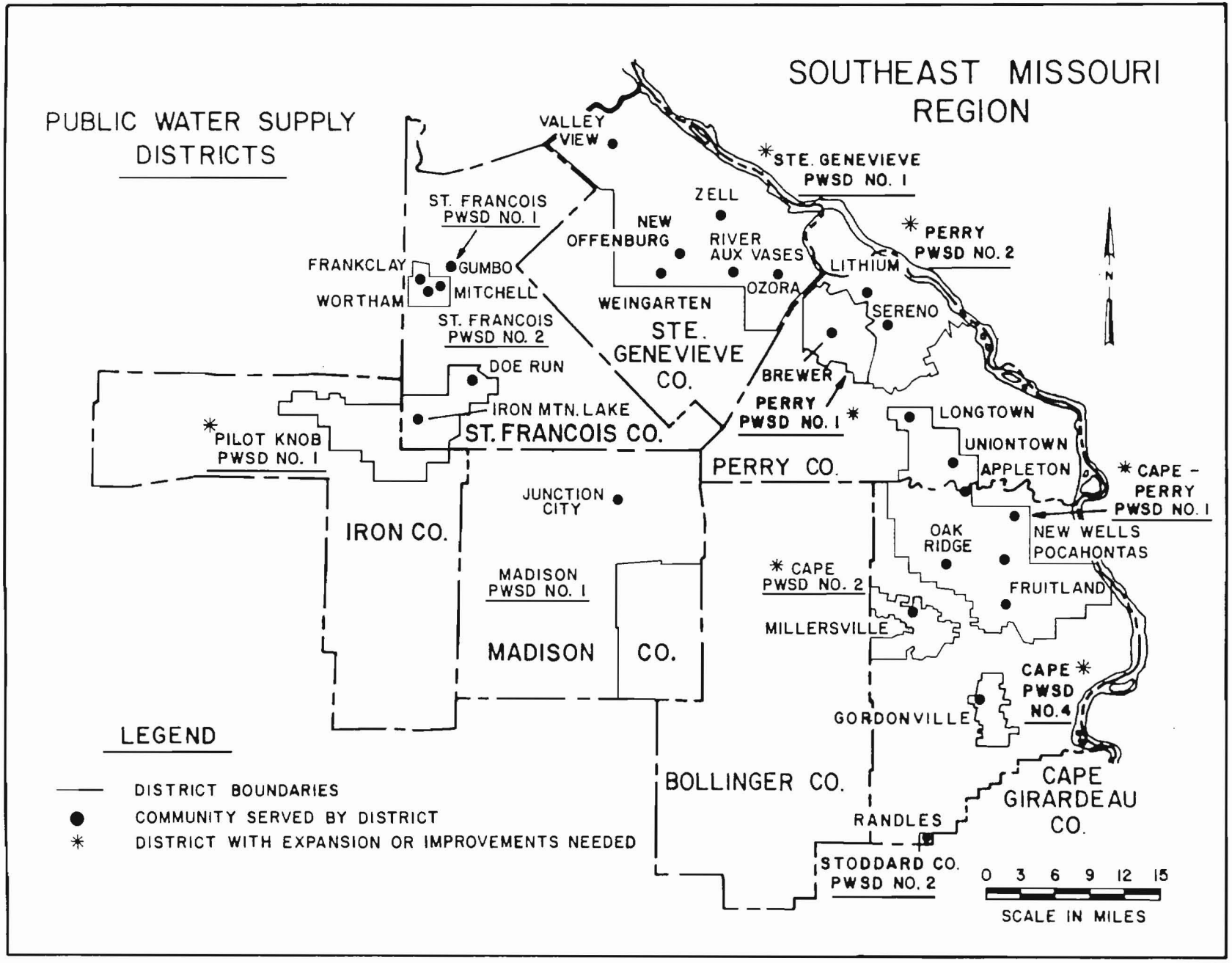
The quality of water is obviously impacted by the level of wastewater treatment that is provided by various urban developments in the Region. While there are numerous private wastewater treatment facilities in the area, the Southeast Missouri Regional Planning and Economic Development Commission does not have information on all of these. It does, however, have a map depicting the status of public wastewater treatment service in incorporated communities, and this map is attached.

Tailings Dams in the Southeast Missouri Region

State ID Number	Name	Maximum Storage (acre-ft)	Dam Height (feet)
Iron County			
30342	Viburnum Tailings Dam 1	3,600	117
30354	Iron Mountain Tailings Pond Dam	93	20
30917	Magmont Main Tailings Lake Dam	4,600	134
31013	Viburnum Tailings Dam 2	2,900	75
31014	County Road Dam (dry/tailings)	0	27
31015	No. 29 Mine Ore Haul Road Dam-North	440	66
31016	Viburnum Tailings Dam 5	3,000	85
31017	No. 29 Mine Ore Haul Road Dam-South	180	46
31231	New Viburnum Tailings Dam	3,500	115
Madison County			
30289	Mine LaMotte Dam	134	27
30611	Mine LaMotte Lake Dam	627	33
30612	Lake Harmony Dam	343	21
31082	Main Tailings Dam-Anschuty	557	35
St. Francois County			
30057	Iron Mountain Lake Dam	1,760	24
30274	Leadwood Tailings Dam-Eaton Branch	1,400	65
30277	St. Joe State Park Dam	1,951	134
30314	Lake No. 1 Dam	2,025	45
30903	Blackwell Pond Dam	185	55
31146	Dresser Minerals Dam Sec. 19 (dry)	107	40
31163	Eaton Dam	8,900	68

Source: Missouri Department of Natural Resources


SOUTHEAST MISSOURI REGION
INCORPORATED COMMUNITIES WITH PUBLIC WATER SUPPLY SYSTEMS
BLOOMSDALE
STE. GENEVIEVE
BONNE TERRE
ROCKY RIDGE
DESLOGE
FLAT RIVER
LEADWOOD
ST. MARY
ESTHER
LEADINGTON
RIVERMINES
ELVINS
STE. GENEVIEVE CO.
FARMINGTON
PERRYVILLE
BISMARCK
VIBURNUM
IRON MOUNTAIN LAKE
LONGTOWN
ST. FRANCOIS CO.
ALTENBURG
FROHNA
PILOT KNOB
JUNCTION CITY
PERRY CO.
IRONTON
ARCADIA
APPLETON
FREDERICKTOWN
SEDGEWICKVILLE
POCAHONTAS
COBALT VILLAGE
OAK RIDGE
CAPE GIRARDEAU CO.
IRON CO.
MARQUAND
JACKSON
MARBLE HILL
CAPE GIRARDEAU
ANNAPOLIS
MADISON CO.
GORDONVILLE
DELTA
BOLLINGER CO.
LEGEND
MUNICIPAL SYSTEM
SYSTEM OPERATED BY PRIVATE COMPANY
SERVED BY PUBLIC WATER SUPPLY DISTRICT
COMMUNITY WITH MAJOR IMPROVEMENTS NEEDED
0 3 6 9 12 15
SCALE IN MILES
N


SOUTHEAST MISSOURI REGION
PUBLIC WATER SUPPLY DISTRICTS
VALLEY VIEW
STE. GENEVIEVE PWSD NO. 1
ST. FRANCOIS PWSD NO. 1
ZELL
NEW OFFENBURG
RIVER AUX VASES
PERRY PWSD NO. 2
FRANKCLAY
GUMBO
WORTHAM
MITCHELL
LITHIUM
OZORA
WEINGARTEN
SERENO
ST. FRANCOIS PWSD NO. 2
STE. GENEVIEVE CO.
DOE RUN
BREWER
PERRY PWSD NO. 1
IRON MTN. LAKE
ST. FRANCOIS CO.
LONGTOWN
PILOT KNOB PWSD NO. 1
UNIONTOWN
APPLETON
PERRY CO.
CAPE - PERRY PWSD NO. 1
JUNCTION CITY
NEW WELLS
POCAHONTAS
IRON CO.
OAK RIDGE
CAPE PWSD NO. 2
FRUITLAND
MADISON PWSD NO. 1
MILLERSVILLE
MADISON CO.
CAPE PWSD NO. 4
GORDONVILLE
LEGEND
DISTRICT BOUNDARIES
COMMUNITY SERVED BY DISTRICT
DISTRICT WITH EXPANSION OR IMPROVEMENTS NEEDED
BOLLINGER CO.
CAPE GIRARDEAU CO.
RANDLES
STODDARD CO. PWSD NO. 2
0 3 6 9 12 15
SCALE IN MILES
N

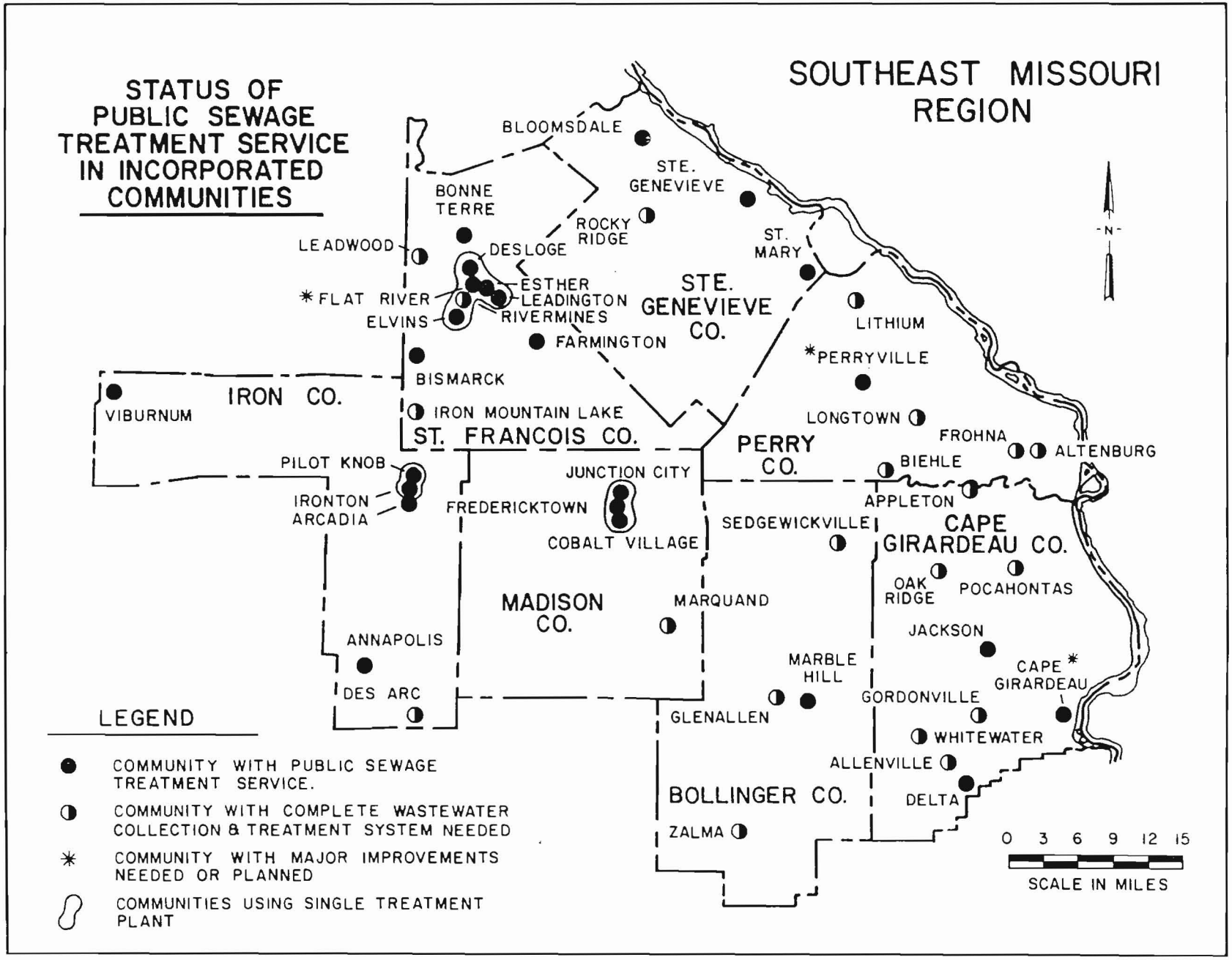
The provision of basic water, sewer and sewage treatment facilities throughout the Region has been an underlying objective of the Southeast Missouri Regional Planning and Economic Development Commission since it was founded. Viewed as basic and integral components of the community infrastructure necessary to achieve economic development, projects to develop these facilities where there are none, or to upgrade inadequate systems, continues to be a significant part of each year's work program for the Commission.

Within the Southeast Missouri Region, a large majority of the incorporated municipalities and all of the public water supply districts utilize groundwater through well systems to supply potable water. The City of Cape Girardeau, however, derives its water supply from the Mississippi River. Additionally, the City of Perryville relies on three wells and a water treatment plant located on the Saline Creek west of the City. The City of Fredericktown has a surface reservoir on the Little St. Francis River which supplies a pool of water for treatment for this community's needs. In addition, Fredericktown supplies water to Cobalt Village. In the case of the Park Hills area, served by the Park Hills Water Department, the water supply comes from the old lead mines that underlie the community. The Park Hills system serves the Cities of Park Hills, Desloge, Leadington. In Iron County, Pilot Knob has a water supply located five miles north on Pilot Knob Mountain, and this water comes from a former mine also. The City of Ironton also has a surface reservoir that retains water for treatment by the City for a potable water supply. All other water supplies in the Region, to the best of the author's knowledge, come from well supplies. This obviously headlines the importance of protecting the groundwater system for future potable water usage.

Due to the low yields experienced in the western part of the Region, it is anticipated that additional surface water reservoirs will be carefully studied over the next decade and beyond to determine the viability of constructing potable water supply systems utilizing such surface water.

While the Southeast Missouri Region has generally abundant water, with the exception of the western part of the Region, the integrity of the groundwater system needs to be protected more fully in order to ensure that potable water remains available far into the future. This must include protection of the groundwater system through the appropriate disposal of solid and hazardous wastes and ensuring that this material does not get into losing streams or into the karst terrain through the sinkholes. Any contamination of the groundwater system will likely have a far reaching effect and may affect groundwater for hundreds, or even maybe thousands, of miles.

The Southeast Missouri Regional Planning and Economic Development Commission has, by its previous history, exhibited its commitment to assisting in ensuring that a potable water supply continues to exist. The staff has spent untold hours working with local counties, communities and public water supply districts in addressing not only water needs, but also wastewater treatment needs.


STATUS OF PUBLIC SEWAGE TREATMENT SERVICE IN INCORPORATED COMMUNITIES
SOUTHEAST MISSOURI REGION
BLOOMSDALE
STE. GENEVIEVE
BONNE TERRE
ROCKY RIDGE
ST. MARY
LEADWOOD
DESLOGE
ESTHER
LEADINGTON
RIVERMINES
*FLAT RIVER
ELVINS
STE. GENEVIEVE CO.
FARMINGTON
LITHIUM
*PERRYVILLE
BISMARCK
IRON CO.
VIBURNUM
IRON MOUNTAIN LAKE
ST. FRANCOIS CO.
LONGTOWN
FROHNA
ALTENBURG
PERRY CO.
BIEHLE
PILOT KNOB
JUNCTION CITY
IRONTON
ARCADIA
FREDERICKTOWN
APPLETON
SEDGEWICKVILLE
CAPE GIRARDEAU CO.
COBALT VILLAGE
OAK RIDGE
POCAHONTAS
MADISON CO.
MARQUAND
JACKSON
ANNAPOLIS
MARBLE HILL
CAPE GIRARDEAU
DES ARC
GORDONVILLE
GLENALLEN
WHITEWATER
ALLENVILLE
BOLLINGER CO.
DELTA
ZALMA
N
0 3 6 9 12 15
SCALE IN MILES
LEGEND
COMMUNITY WITH PUBLIC SEWAGE TREATMENT SERVICE.
COMMUNITY WITH COMPLETE WASTEWATER COLLECTION & TREATMENT SYSTEM NEEDED
COMMUNITY WITH MAJOR IMPROVEMENTS NEEDED OR PLANNED
COMMUNITIES USING SINGLE TREATMENT PLANT

The Commission and its staff would welcome any opportunity to participate in additional programs appropriate for the organization and the area in order to ensure protection of groundwater and improvements to the quality of the water in the groundwater system.

MRPC

MERAMEC REGIONAL PLANNING COMMISSION

A Council of Local Governments
Serving the Meramec Area

101 West Tenth Street
Rolla, Missouri 65401
(314) 364-2993
FAX (314) 364-7235

May 20, 1994

Joe Lopez
Missouri CDBG Program Office
P.O. Box 118
Jefferson City, MO 65102-0118

Dear Mr. Lopez:

Please find enclosed our summary of serious water system problems in the region, suggested long-term strategies to improve water systems, and suggested strategies for state funding of water system projects. We are glad to be a part of the development of the state water plan.

We attempted to gather information on water system problems by creating a survey covering a broad range of topics associated with water quality, and mailing it to local officials, water superintendents and rural water district boards. Unfortunately, only 8 of 46 surveys were returned to us filled out. Because of this, we believe that the region may not have been adequately represented. The enclosed problem summary and strategy will be mailed to members of the commission in the next week. If we gather further information from this that more accurately represents the Meramec Region and the Commission, we will re-submit the summary and strategies in revised form.

We will also be mailing out flyers informing the commissioners and other interested parties of your visit before the regular commission meeting on June 9. We hope to have a fairly large group on hand to discuss water related needs and strategies in our region. We look forward to your visit.

If I can be of any further assistance, please feel free to call.

Sincerely,

David Manary
Assistant Flood Relief Coordinator

1969-1994
25
Twenty-five years together

Chairman: Robert Simpson
Washington County Presiding Commissioner
Vice Chairman: Randy Verkamp
Phelps County Presiding Commissioner

Secretary: James Kleffner
Maries County Presiding Commissioner
Treasurer: Searles "Andy" Anderson
Dent County Presiding Commissioner

Executive Director: Richard Cavender
PRINTED ON RECYCLED PAPER

Water System Problems & Long Term Resolution Strategies

1. Current Conditions - Public vs. Private Water and Wastewater Systems

The majority of the population in the region are served by private water and wastewater systems, as figures from the 1990 census indicate.

Estimated percentage of persons in the region served by:

- public water systems = 44%
- private water systems = 54%
- other water sources = 2%

- public wastewater systems = 37%
- private wastewater systems = 56%
- other means = 7%

Since then, there have been some changes in public systems throughout the region which might alter the percentages slightly. The cities of Belle and Irondale have added wastewater hook-ups to their systems. The town of Mineral Point is beginning construction on its first municipal water system. The city of Doolittle is applying for funds to install a city sewer system using the Rolla Treatment Facility, about five miles away. Presently the entire population of Doolittle uses independent septic tanks.

2. The Most Serious Water Systems Problems in the Region

Availability of water has not been identified as a problem in the region. The area has abundant natural springs and an adequate amount of groundwater, even during exceptionally dry periods. Because of this level of availability, all public water supplies in the region use groundwater wells as their main source.

Needs vary greatly within the region but there has been a definite need identified for new or improved treatment facilities in some cities in the region. The lack of adequate treatment systems endangers the drinking water of many residents.

A more urgent need exists for new piping to be used in public water systems. Many of the distribution systems being used in the area were installed in the 1930s or earlier and use cast iron pipes which cause high levels of iron sulfate to appear in the water supply. Many of these old lines are under-sized, causing low pressure and some have dead-ends rather than loops at the end of a service area. This causes stagnation of the water.

A need also exists for more water storage in many small municipal systems in the region. Despite steady growth, a number of towns in the region are still using the same tower systems that were constructed in the 1950s or earlier.

The potential of contamination of private wells is a real problem. Many of the wells in the region were drilled before any standards existed and are very shallow. This makes them especially vulnerable to contamination from surface water and sewage and also occasionally causes them to go dry during drought conditions.

Some of the out-dated public systems in the region have been tested and have not met DNR specifications in certain areas. Offensive odor and taste has been a problem in a small number of systems in the region. In the eastern part of the region, high levels of contaminants associated with the abandoned mining fields in the area have been identified in a number of untreated water samples.

Many small communities (pop. between 100 and 500) don't have a treatment facility or a large percentage of the residents aren't served by the existing system. The residents that aren't hooked up, use individual septic tanks or cess-pools. Extending the system and especially over some of the terrain -- is cost prohibitive.

For example, the City of Doolittle has recently submitted an annual competition grant application to CDBG that, if funded, would allow for sewage lines to be extended to allow wastewater from 205 homes to be piped to the Rolla treatment plant which is approximately five miles away.

There is also a need for some facilities to be updated to handle an ever-growing capacity. Most systems in the region are simple lagoon to land irrigation systems, and these could be improved to be more efficient, pending funds available.

The three communities in the region that are located along the Missouri River were the most affected by the water supply being tainted. For a short time after the great flood of '93, all three of these cities' wells were contaminated by the flood water, and tap water could not be used for drinking.

Many private wells were also contaminated from inundation of flood water. One unincorporated village in the Meramec Region was badly affected because it was situated very near the Gasconade River, which flooded on several occasions during 1993.

Because of abundant groundwater sources at a relatively shallow depth throughout the region, few supply problems have arisen during drought conditions. The one exception being the very old, very shallow private wells that were drilled or dug before statewide specifications had been adopted.

3. Future Water System Needs in the Region

Slow, steady growth was the general trend throughout the region between 1980 and 1990, and that same growth rate is expected to continue throughout the 1990s. The industrial sector in the Meramec Region has grown since the 1990 census data because of the establishment or expansion of industrial parks in several of the regions' cities. Taking this into consideration, the industrial and municipal sectors may grow at a slightly faster rate than the domestic sector during the next 10-15 years.

In many cases, the water systems around the region haven't been able to keep pace with the slow, steady growth in the area. These systems need attention first, to bring them up to the level of present demand. After this is accomplished, close monitoring and planning should be initiated so that water systems do not become undersized and are updated frequently in order to meet demand. By doing this, industry could be attracted to the area which would lead to greater demand in the industrial sector. Domestic and municipal demand are expected to be at a slow rate of growth over time. Some municipal systems will experience growth because of increased industrial activity.

4. Long-Term Strategies to Improve Water and Wastewater Systems

Although many problems and needs have been identified concerning municipal water systems, the most pressing problem within the Meramec Region by far is poor water quality in individual household wells in rural areas. Since the responsibility of testing is often left to the homeowner, the water quality goes largely unmonitored; it is not uncommon in the region for a well that has been in use for 30 years or more to have never been tested. When samples from these wells are tested, high levels of fecal-coliform bacteria and other contaminants are frequently found.

Many financial institutions are now requiring testing on wells and sewers prior to providing financing to purchase them. It is becoming common that it be a regulatory stipulation before property is bought or sold that the well and sewer on the property be tested.

An educational awareness program needs to be developed that would inform rural citizens of the need to test their well waters regularly. This program could also educate the citizens of how to properly install septic tanks and construct drainage fields. It should be emphasized that whatever is dumped onto the surface of the ground eventually ends up in the drinking water supply.

There should be funding set aside that would encourage the establishment of more rural water districts, otherwise known as public water supply districts (PWSDs) throughout the state. In the six-county Meramec region, only four PWSDs currently exist, and one is in the process of forming. There are several high-population-density, unincorporated areas in the region where districts could operate efficiently and be of great benefit to the residents within them. PWSDs must be tested regularly and comply with the same DNR specifications as municipal systems.

More state tax money should go toward improvements to established municipal and rural water district improvements in order to bring them up to the level of current demand.

Once brought up to date, it is important that cities begin planning for the future so that they can maintain, upgrade, and expand services. One solution would be the development of long-term comprehensive plans that addresses the needs of the city in the future. The intentions of the 601(3)b fund were to encourage statewide water and wastewater planning. The plan is effective in that it uses regional planning commissions to involve local governments in the process but the $120,000 set aside for statewide projects simply is not enough to address these issues.

More state tax revenue should also be spent on updating wastewater systems throughout the state on a need basis, in an effort to make them more efficient.

In order to protect groundwater, legislation is needed that would encourage populations of a certain density to be hooked up to a wastewater collection and treatment facility rather than use septic tanks and cess-pools so near each other.

A DNR emergency fund is also needed, much like the one that DED administers, that would provide immediate help to communities in desperate need.

5. Priorities for State Funding of Water and Wastewater System Projects

The first priority for state funding should be to address large systems that are now, or are known to have been contaminated in recent years; then address those same needs in other cities and towns.

Improvements then need to be made to existing systems to bring them up to date so that they can handle the current demand.

Develop a system where needs are identified and planned for, so that improvements can be made as needed, and all water systems can be kept up-to-date.

Priorities for funding wastewater system projects should also be based on need. The criteria that is used for CDBG Annual Competition Grants is a fair one, and could be adopted to use for funding programs associated with a state water plan.

MRPC

WATER QUALITY SURVEY

Conducted by the Meramec Regional Planning Commission
101 W. Tenth St., Rolla, Mo.

Name:_____

Title:_____

Representing:_____

Mailing Address:_____

_____

Daytime Phone:_____

Has your city / county / rural water district experienced recent problems in any of the following areas? (Check all that apply.)

_____ Low water pressure

_____ Offensive odor

_____ Offensive taste

_____ High levels of harmful bacteria

_____ High levels of other contaminants

Primary source of drinking water:

_____ city well _____ private wells _____ other: (please explain)

_____

If a city or a rural water district, what percentage of the residents living within your jurisdiction is served by your water system?

_____%

Describe your water system:

# of wells_____ year system was installed_____

size of lines_____ type of lines_____

total # feet of line_____ # of water hydrants_____

storage capacity_____ chlorination system?_____

metered system?_____ leak detection auditing?_____

Please describe major improvements made to the system in the last 10 years.

Please describe known deficiencies in the existing water system.

Please discuss any future plans to address these deficiencies.

Estimated cost to address these deficiencies?

What limitations do you face in attempting to address your communities problems?

When was the most recent groundwater test conducted in your area and by whom?

List the specific area(s) that the tests covered.

Is a copy of the test results available to the public?

What were the general findings of that study?

In your opinion, is there a need for another thorough water test to be conducted in your area?

If your area is served by a public water system, approximately how many customers does it serve and what approximate percentage of the water is used by the different sectors?

	# of customers	% of total use
Residential		
Commercial		
Industrial		
TOTAL		100 %

Is your jurisdiction served by a sewer collection system? yes no

If yes, please explain type of system, number of people served and percentage of your jurisdiction served.

What is your water rate? $_____

What is your sewer rate? (if applicable and known) $_____

Additional comments:

Please return survey to:

MRPC
Attn: David Manary
101 W. Tenth St.
Rolla, MO 65401

or fax to: (314) 364-7235

Please return survey by May 10. Your assistance is much appreciated.

MASTER FILE COPY

Lake of the Ozarks Council of Local Governments

Phone:
314-346-5616

Box 786
Camdenton, Missouri 65020

June 7, 1994

MR. JOE M. LOPEZ, COORDINATOR TA
Department of Economic Development
P.O. Box 118
Jefferson City, Missouri 65102-0118

Dear Joe:

Please find enclosed our agency's comments relating to the rural water systems project. As you can see, our region's major concern is water quality, not availability at this point.

If you wish any other information, please call.

Thank you.

Sincerely,

Jim Dickerson

Enclosure: Report

JD/djc

LAKE OF THE OZARKS REGION
WATER SYSTEM PROBLEMS AND LONG TERM RESOLUTION

Current Conditions- Public vs. Private

The region believes approximately 40% of the area population is currently served by private water systems and approximately 60% of the population is served by private septic tank wastewater systems.

Most Serious Water System Problems In Region

For the past year the Lake of the Ozarks region, composed of Camden, Laclede, Miller, Morgan and Pulaski counties, have been surveying water quality problems in the region, particularly those relating to the increasing development around the Lake of the Ozarks in Camden, Miller and Morgan counties.

A Camden County Water Quality Committee was formed in 1993 in an effort to determine where wastewater treatment districts might be advisable around the Lake of the Ozarks.

The committee initially operated from lake water quality tests--the last of which was conducted by the Missouri Department of natural Resources in 1991. Those tests showed lake water quality to be high but potential problem areas surfaced in densely settled cave areas of the lake.

The water quality committee then became aware of private well tests which had been conducted by University Extension and the Camden County Health Department in 1992. Those test, although extremely limited in number, showed almost half the wells in specific areas of Camden County (Auglaize Township and Pawhuska Township) showed elevated coliform bacteria counts.

In an effort to further determine problem areas relating to poor drinking water quality, the Camden County Extension Council began a drive in April, 1994 to have area residents pick up testing kits and test their own wells. The results of those tests should be available by June, 1994. The Extension Council has made arrangements for the Camden County Health Department to go conduct a second test where problems are indicated in the first round of tests just in case the initial tests conducted by property owners were done incorrectly.

One 70% of Camden County's population lives outside of incorporated area and over 50% of the region's population lives in unincorporated areas. Water quality and wastewater treatment are the primary concern relating to the regional water system.

With Camden County's population increasing from 37% to 50% every 10 years since 1970 and with Miller and Morgan counties expected to show similar increases in the future and with most of that growth occurring in unincorporated areas served by private wells and septic tank systems, the approaching threat is clear.

Water System Needs in the Region

The Lake of the Ozarks region remains, for the third decade in a row, one of the fastest growing in Missouri. Four of the region's five counties showed healthy growth from 1980-1990 with the following rates of growth: Camden 37%, Laclede 12%, Miller 13% and Morgan 13%. Only Pulaski County, because of fluctuations in population at Ft. Leonard Wood, showed a decrease of 17%. Similar growth patterns are expected for Camden, Laclede, Miller and Morgan counties and a 15% growth rate is projected for Pulaski County by 2000. Much of the region's growth, with the exception of Pulaski County, is again expected in the unincorporated areas of the region. Therefore, the rate of growth projected is expected largely in the domestic use category with approximately a 10% growth in industrial water use.

Long-Term Strategies to Improve Water and Wastewater Systems

The region's approach to this problem has already begun; although that solution is in very early stages. The region plans to identify high-growth areas exhibiting problems and to begin the process of establishing wastewater treatment districts in those areas.

Priorities for State Funding of Water and Wastewater Systems

The Lake of the Ozarks region, particularly in Camden, Miller and Morgan counties, will have need to establish wastewater treatment districts and systems in the unincorporated areas where growth is expected. Most of these areas are relatively high income retirement areas. The region will need to access large amounts of funding over a period of several years which is not income sensitive. The protection afforded by this funding will not only protect the environment of the retirees and other permanent dwellers but will protect an environment which is the basis for one of the state's major economic assets-- the Lake of the Ozarks.

SCOCOG
South Central Ozark
Council of Governments

P.O. Box 531 *Cabool, Missouri 65689-0531* *(417) 962-3238*

Joel

June 27, 1994

Mr. Joe Lopez
CDBG Technical Assistance Coordinator
P. O. Box 118
Jefferson City, MO 65102

Re: Rural Water System Problems and Strategies

Dear Mr. Lopez:

Enclosed please find the Composite Survey Response as requested. The information included was obtained from a direct mailing solicitation to each county, city, and water district in our seven county service area.

Our full commission meeting is still scheduled for July 12, 1994 at Grammas Kitchen, Highway 60/63 just south of Willow Springs, Missouri (on the north side of the highway). We will be notifying the members and water districts of the meeting agenda in the very near future.

Let me know what additional assistance or special arrangements need to be made for your presentation and discussion.

Sincerely,

Johnny W. Murrell, Jr.
Planner-In-Charge

Encl: Survey Response

JWM/sjb

RECEIVED
JUN 30 1994
BY

SOUTH CENTRAL OZARK COUNCIL OF GOVERNMENTS

REGIONAL WATER SYSTEM PROBLEMS
AND
LONG TERM RESOLUTION STRATEGIES

1. **Current Conditions - Public vs. Private Water and Wastewater System**

SCOCOG REGIONAL POPULATION 107,238

1.1 Estimated percent of persons in the region served by:

(A)	Public Water Systems:	40%
(B)	Private Water Systems:	60%
(C)	Public Wastewater System:	30%
(D)	Private Wastewater System:	70%

2. **The Most Serious Water System Problems in the Region**

2.1 (A) **Availability** - Sparce rural populations are for the most part served by private wells. Some individual households have to have haul water for daily needs, i.e. cooking, drinking, bathing, and washing clothes. Low incomes and property valuations prevent ability to debt service bond issues to construct much needed rural water supply districts or drill safe deep wells on private property.

(B) **Source** - Groundwater - (becoming contaminated requiring treatment).

(C) **Treatment Facility** - Chlorination when needed.

(D) **Distribution** - This is by far the most serious water system problems the communities in the region are experiencing. Most of the cities water system line are 30 to 50 plus years old, undersized compared to today's standards, contain lead joints in some cases, and have deteriorated to the point the city crews are patching pipes that desperately need to be replaced. Lack of local funds and low incomes of many of the communities do not allow for much needed capital improvement programs to be initiated. Many systems have dead end lines causing stagnation. The distribution lines are often times not large enough to provide fire flow protection.

(E) **Capacity and Current Usage** - For the most part the capacity of the water systems in the region is pretty good. There are, however, some places that need additional storage tanks - primarily in the rural water systems to provide for expansions and new users connecting to the systems.

2.2 Water Quality Problems - Most quality problems in the region is associated with old shallow wells. These wells were not constructed by today's standards and are still being used by the rural residents not being served by PWSDs. There are also several communities in the region who have been required to chlorinate their systems to prevent health problems arising as a result from contaminated water sources. One community is experiencing lead problems in the drinking water source.

2.3 Waste Water Treatment Problems - The major concerns with wastewater in the region is 1) lack of a system in some of the smaller communities and densely populated rural areas, 2) infiltration of storm water into the collection system, thus flooding the treatment plants, and 3) expansion of existing systems to accommodate growth that has occurred over the years. Another problem is the region's Karst Topography and shallow soils that do not provide for proper on site system (septic tanks, lagoons, leachate fields, etc) to effectively handle the effluent from the tanks and in many cases a discharge results. This is a very serious problem that is adding to the groundwater and the surface water degradation situation.

2.4 Water System Problems in Flood Conditions - Washing out water lines, flooding over private wells, subsequent turbidity in the water.

2.5 Water System Problems in Drought Conditions - This situation is primarily associated with those having shallow wells that go dry and are forced to haul water from town, nearby springs, rivers, etc. for their needs.

3. **Future Water System Needs in the Region**

3.1 What are the projected growth or decline trends in the following sectors?

		Growth Percent Next 10 Years	Decline Percent Next 10 Years
(A)	Domestic	20%	N/A
(B)	Industrial	25%	N/A
(C)	Municipal	25%	N/A

3.2 What are the projected water demands and needs in the following sectors?

		Growth in Gallons Next 10 Years	Decline in Gallons Next 10 Years
		* Per 1,000 gallons	
(A)	Domestic	3,000 to 4,000	N/A
(B)	Industrial	3,000 to 4,000	N/A
(C)	Municipal	2,300 to 2,500	N/A

(This is projected regional total needs)

3.3 What is the adequacy of water availability to meet demands?

		Excellent	Good	Fair	Poor
(A)	Domestic	36%	36%	28%	
(B)	Industrial	21%	57%	14%	.7%
(C)	Municipal	20%	60%	10%	10%

4. Long-Term Strategies to Improve Water and Wastewater Systems

4.1 What Long Term Strategies Do You Suggest to Improve Water Systems?
Increased funding, monitoring of new wells, replacing transit piping, employing knowledgeable people with experience in handling improvements and test sampling. Funds that require little or no local funding, additional storage, replace and upgrade size of piping, more education and legislation to prevent additional water source contamination, and additional wells and storage to facilitate growth. (These were the comments returned by the participants in the region-wide survey).

4.2 What Long Term Strategies Do You Suggest to Improve Waste-Water Systems?

More capacity to handle storm water, completely remove oil and grease from sewage systems, fix infiltration, more funding that requires little or no match, remove hot water from industrial effluent to preserve capacity, set state standards for public and private waste water systems (state should charge a user fee for all commercial users of water that produces foreign residues as a result of the product/processing methods, i.e. oils, grease, chemicals), investigate private septic tanks being connected into a community type of system, thereby having partially treated sewage, septic system installation controls similar to wells - require building permits possibly and installer certification. (These were comments received by the participants in the region-wide survey)

5. Priorities for State Funding of Water and Wastewater System Projects

5.1 What Priorities Should State Government Use to Fund Water System Projects?
Water storage, strict requirements for constructing new facilities, more funding must be provided to small cities, bad quality water areas or emergency repairing should come first to avoid health problems, local needs, economic development, population survey, percent of homes having to haul water or using cisterns. (These were comments received by the participants in the region-wide survey).

5.2 What Priorities Should State Government Use to Fund Wastewater System Projects?
New needs should be considered first, age and type of equipment/treatment used, relax present regulations or provide more funds for projects they feel is permanent, fund places that do not have sewer systems, economic development, emphasis on assisting installation of private septic systems properly and mandating such would be a start, fund areas of Karst topography and losing streams to a greater extent than other areas, fund those places that do not have a system. (These were comments received by the participants in the region-wide survey).

H S T C C **Harry S. Truman Coordinating Council**

211 S. Main, Suite 203
Joplin, MO 64801
417-782-3515
Fax 417-624-7948
1-800-788-3515

Joe Lopez
CDBG Technical Assistance Coordinator
PO Box 118
Jefferson City, MO 65102-0118

Dear Mr. Lopez:

I am writing in response to the request from your office for information regarding water systems in the region. The Harry S. Truman Council is very pleased that you are taking the time to collect this information. We feel strongly that problems can be more easily solved if those who deal with the issue daily are applied to for their input on solutions.

Our staff conducted a survey of all the communities in the region. The high level of response to the survey is an indicator of how important our member communities feel water and wastewater issues are. The information that follows is based on those surveys that were returned from the communities and information gathered from the various county commissioners.

Water Systems Information

1. Current Conditions:

Throughout the four counties, currently about 80% of the people are served by public water systems. The figure for public wastewater systems is between 60% and 70%. It is important to remember when looking at these figures that Jasper County accounts for over 1/2 of the region's population and Joplin represents 1/2 of the county population. There are many small towns which do not currently provide wastewater service to their residents.

2. The Most Serious Water System Problems in the Region

(From this point on I will be talking in terms of the number of towns more than total population.)

2.1 Water Supply Problems

There are two major problems in the area relating to water systems in the region. The first is a problem with storage. Over half the communities in the area do not have

enough storage capacity to hold water for a single days usage. Consequently, if a large fire occurred and drained the supply or if a problem occurred and the system went off-line, the communities would have very little time to correct the situation before residents would be without water service.

The second major water systems problem is related to distribution. Most of the towns in the area, particularly the smaller aging communities, have very old pipes and mains which tend to be too small to meet the current needs. The surveys I received reported pipes that were often 80-100 years old. There are many pipes rusting, mains break frequently and they simply do not have the capacity to meet the needs.

The region is served primarily by groundwater. Water itself is usually quite abundant, particularly in the southern stretches of the region.

2.2 Water Quality Problems

Though no communities related any water quality concerns in the survey, there is an issue that should not be overlooked. There has been tremendous expansion of concentration livestock operations in the region over the past few years. The number of broilers being produced has nearly doubled since the 1980 census. This could represent a tremendous threat to water quality if the growth continues without specific measures being taken to protect water supplies.

2.3 Wastewater Treatment Problems

The primary problem related to wastewater in the region is related to inflow and infiltration. This is a problem for virtually all of the communities in the area. Most of the sewer lines are old, many are clay and subject to frequent breakage. This high level of infiltration threatens the capacity of many of the sewer treatment plants and lagoons across the region. Many of the communities in the region have been given notices of violation from the Missouri Department of Natural Resources related to those problems.

There are also a few communities in the region which do not have adequate sewer lagoons. The single cell lagoon systems generally cannot meet the needs of even the smaller communities and there are problems with BOD loads.

2.4 Water System Problems in Flood Conditions

This entire region has problems in flood conditions with regard to wastewater systems. The generous supply of groundwater and springs in the area, while serving the needs of water supply nicely, cause tremendous problems for wastewater treatment. Many of these problems are directly related to inflow and infiltration. When the water table gets high from heavy rains, communities suffer everything from residents having trouble flushing their toilets, to sewers backing up into homes, to raw sewage escaping to the streets, to treatment plants and lagoons which do not have the capacity to handle the volumes of water.

The second type of problem is the direct cause of the placement of sewer treatment plants and lagoons. Many of these treatment facilities get physically flooded. Lagoons are essentially flushed into the creeks. Equipment in treatment plants is often damaged or destroyed.

These are not small scale or occasional problems. This area has enough rain and is subject to enough flash flooding that these problems happen most every year. During wet springs, such as the past two have been, these problems occur repeatedly.

2.5 Water System Problems in Drought Conditions

There are few drought related water systems problems in the region. The only problem mentioned in the surveys was too high BOD in lagoons in the dry periods.

3. Future Water System Needs in the Region

Growth is projected to continue much as it has over the past several years. The Joplin suburbs are experiencing rapid growth, particularly in residential sectors. These growth centers will have a difficult time meeting the increasing demands on the systems that are currently in place.

Many of the more rural areas are suffering from population declines. This may seem to be an indicator that their will be fewer needs arising in these areas. This is not the case. As population declines or as the existing populations age, the tax base deteriorates and the available revenues decline. Many of these areas which are facing these decreases in population of working age are already reporting that there water and wastewater systems need updating but they will not be able to accommodate those needs in their declining budgets.

4 & 5. Long-Term Strategies to Improve Water and Wastewater Systems and Funding Priorities

The survey responses varied somewhat on what should be done to improve the problems of water and wastewater systems. One community suggested that the state should choose them as a demonstration community and install all the biggest and best systems available. Others tended to suggest their most urgent need should be the highest priority. The survey answers were actually captured quite well by the mayor of one community who suggested that the state funding agencies should be more responsive to the community needs and should look to them annually for setting priorities.

It is clear that different regions of the state have different problems. A long-term strategy which would work well to improve systems in one area would not do much for another area. Perhaps the most demanding need that presents itself in this region is the need to help small communities which do not have much business or industry to generate revenues and which tend to have declining population bases. These communities are currently wasting money on trying to fix holes in systems that are simply going to fail again.

The second most pressing issue is that of inflow and infiltration. The levels of infiltration in this region are staggering and most communities do not have the technical ability to solve the problems on their own and they do not have the money to hire private engineering firms to take care of the task.

The third most pressing issue is to provide money to make wastewater treatment facilities less flood prone. Often all that is needed is berm work, additional gravel on lagoons, or improved valves on outlet pipes. Many of these problems could easily be solved if they were a funding priority. This has not been the case. Even though millions of dollars are being spent in the state for flood relief, the priorities for that money have been established such that these projects are not likely to get help. FEMA simply offers money to return the systems to their pre-flood conditions. That may be appropriate in areas where major flooding takes place once every 20 years but it does not make sense in areas that get hit every year by flash floods.

Flash flooding is a result of the topography of the area and most people have come to accept it as part of life in this area. However, as populations increase, the health and environmental problems related to lagoon overflows and treatment plant floods will likely increase. The amount of sewage escaping from broken pipes will increase. Industry will look to areas which can offer reliable water and sewer systems and thus will locate elsewhere. These problems need to be addressed.

There is one final point that I would like to make. I am not at all certain how this concern can be addressed but it has come to my attention that there are a number of wastewater treatment problems that are the direct result of engineering firms not respecting floodplain limits. It is clear that these plants and lagoons must be in low lying areas, that is the direction gravity takes the sewage. However, there should be ample investigation that as much protection as possible is provided against flooding. There are enough newly built systems in this region which flood for me to feel strongly that there should be more stringent monitoring of engineers building sewage treatment facilities. Issuing communities notices of violation after the fact is not as effective a method for solving the problems as is monitoring them before they are built.

Once again, we appreciate this opportunity to voice our concerns. We look forward to seeing you on June 15 to talk to you about more of these issues in person.

Sincerely,

Paula Owsley

Paula Owsley
Natural Resources Coordinator