

## University of Missouri Extension

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# Rural Water Districts Costs and Funding

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The *1977 Census of Public Water Supplies in Missouri*, published by the Missouri Department of Natural Resources, lists 179 public water supply districts serving rural areas and 180 communities in the state.

Many Missouri rural areas experienced considerable population growth during the 1970s. As rural population increases, especially in the Ozarks, there will likely occur an increasing need for safe drinking water. In 1977, 34 counties had no rural public water supply districts; 18 of those were in the Ozarks.

## Characteristics of water districts

In 1977 most water districts in the Ozarks, 73 percent, had wells that furnished water not requiring treatment. Most districts in the remainder of the state, 65 percent, purchased water from other utilities. Purchased water was usually finished and treated. Average monthly consumption of water per hookup (meter connection) in 1978 was 4,522 gallons in the Ozarks districts compared to 5,671 gallons in districts outside of the Ozarks. There were 11 hookups per mile of distribution pipeline in the Ozarks compared to six hookups per mile in the remainder of the state.

Treatment practices are reported in the 1977 Census of Public Water Supplies. Most well water supplies in the Ozarks require no treatment practices. About one-fifth of the Ozarks well supplies require disinfection, except in the St.

Francois Mountains, where about one-half of the well water supplies need disinfection. Hypochlorinators may be used for this purpose. More extensive treatments are generally needed elsewhere in the state, especially in northern Missouri. Such treatment can be obtained by using factory-built complete treatment plants with modules for aeration, chemical mixtures, sedimentation, filtration and disinfection.

## Construction costs

Construction of rural water districts can be expensive as noted by selected costs listed in Table 1. Costs for items commonly used in Missouri's rural water districts were obtained from contractors' bids received in late 1977 and 1978. These costs include not only material but also labor and installation.

No economies of construction associated with large scale projects versus small scale projects was detected. On the other hand, regional differences in construction costs were detected for service meters, distribution pipeline and gate valves. These items, furnished and installed, cost more per unit in the Ozarks than in the remaining areas of the state. Rocky, mountainous terrain likely accounts for cost differences. For example, pipeline costs were 65 percent higher in the Ozarks than elsewhere in the state.

**Table 1**

Average construction costs of selected items, December 1978

<b>Treatment plant</b>	
Complete package plant	
100 hookups	\$75,000
500 hookups	\$105,600
Hypochlorinators	\$2,390
Standpipe 8-foot diameter x 110 feet high	\$58,963
Mile of class 160 PVC pipe	
2-inch diameter	\$5,597
4-inch diameter	\$9,293
6-inch diameter	\$14,203
Gate valves	
2-inch diameter	\$146
4-inch diameter	\$213
6-inch diameter	\$257
Customer meters	\$220
End of line flush hydrants	\$347
40 feet highway crossing	
For 6-inch line	\$1,465
For 4-inch line	\$1,277

## Operating costs

Operating costs were acquired from accounting reports filed with the Farmers Home Administration (FmHA) for 1978. Average annual operating costs per hookup were:

- \$52.62 for non-Ozarks districts with their own wells and no treatment practices;
- \$71.39 for Ozarks districts with their own wells and no treatment practices;
- \$77.49 for non-Ozarks districts with their own wells and treatment practices; and
- \$99.05 for districts purchasing treated water.

Operating costs included salaries, accounting and legal fees, utilities, insurance, repairs, chemicals and other supplies; operating costs excluded water line extensions, interest and debt repayment.

Noticeable cost differences included higher salary costs for Ozarks districts with wells and for other districts with treatment practices. In the Ozarks case, this may be partly explained by the higher amount spent on repairs and maintenance. In the latter case, higher salary costs likely reflect the need for treatment plant operators. Costs for utilities were lowest for those districts without wells that purchased treated water. On the other hand, these districts spent more than \$43 per hookup for purchasing water. Most districts purchasing water paid a flat rate per 1,000 gallons. The average rate was \$0.56 per 1,000 gallons. Costs for supplies and chemicals were highest for those districts with treatment facilities.

Operating costs per hookup were nearly constant for districts purchasing treated water and for districts with wells and

fewer than 700 hookups. No economies of large scale operation were detected for such districts. For districts with wells and more than 700 hookups, economies of size might possibly be attained with more than 1,000 hookups. However, our sample contained only a few such districts, and no definite answer could be ascertained.

### Revenue sources

Sources of revenue include hookup fees, water sales and construction grants obtained from FmHA, other Federal agencies or the Missouri Department of Natural Resources.

Hookup or connection fees are flat fees charged customers when they sign a water users' agreement with the public water supply district. Typical hookup fees have increased from about \$40 to \$60 between 1971 and 1977. Currently, FmHA's recommended guideline for hookup fees is \$60 or twelve months' minimum water bills, whichever is greater. For districts financed by FmHA, monies from hookup fees are usually set aside in an initial operations-maintenance fund and/or a bond reserve fund for loan repayment.

Average monthly water rates per 1,000 gallons in both the Ozarks and in the remainder of the state decreased as more water was purchased (Table 2). The minimum monthly water bill is usually stated as the charge for the first 1,000 gallons. Rates per 1,000 gallons usually remained constant after 6,000 gallons were purchased.

An argument for using decreasing water rates is that **all** users should contribute to repayment of high fixed costs of construction, whereas users of additional water should pay only the additional operating costs incurred. Higher water rates in the non-Ozarks areas of the state can be attributed to purchases of water from other utilities and the use of treatment facilities.

**Table 2**  
Average monthly water rates per 1,000 gallons, 1977

Per 1,000 gallons	Ozarks	Remainder of state
1,000	\$5.47	\$6.24
2,000	3.05	3.56
3,000	2.01	2.50
4,000	1.48	1.52
5,000	0.98	1.17
6,000	0.91	1.09

## **Federal funding**

The Farmers Home Administration provides loans and/or grants for water facilities development through the Water and Waste Disposal Systems for Rural Communities Program. Funds provided under this program may be used to finance installation, repair, improvement or expansion of a rural water system including distribution lines, wells, pumping facilities and related costs. The applicant must be a public body, nonprofit corporation or Indian tribe that has the legal authority to pledge security, bonds, for a loan. The service area cannot include any portion of a city having more than 10,000 people.

Grants cannot exceed 75 percent of the project's capital costs. Grant shares are determined by a set of rules that include the area's median family income and average user charges of similar water systems. All grants are subject to the availability and appropriation of monies by the Federal Government. FmHA loans generally have a 35-year term with only interest payable during the first two years and both interest and principal payable during the remaining 33 years. The current interest rate is 5 percent.

Communities interested in the FmHA program should contact FmHA district offices in St. Joseph, Trenton, Kirksville, Clinton, Columbia, Springfield, Lebanon, Ellington or Sikeston.

The Economic Development Administration (EDA) provides grants and loans through its Economic Development — Grants and Loans for Public Works and Development Facilities Program. Eligible applicants include states and their subdivisions, Indian tribes and non-profit organizations representing an EDA-designated area. For designation, an area must have high unemployment and low family incomes.

The Small Cities Program of the Department of Housing and Urban Development (HUD) provides loans and grants for the development of water and sewer systems in cities with less than 50,000 population. Grants are competitively awarded to communities having the greatest needs as evidenced by poverty and substandard housing.

Programs summarized above are described in greater detail in *The 1978 Catalog of Federal Domestic Assistance*, published by the U.S. Office of Management and Budget, also lists the above programs; numbers 10.418, 11.300 and 14.219.

## **State rural water supply regulations**

The Missouri Department of Natural Resources (DNR) is empowered to make rules and regulations for the maintenance of safe quality water dispensed to the public in accordance with the U.S. Safe Drinking Water Act and the National Interim Primary Drinking Water Regulations. All plans for installations and extensions of water supply systems are submitted to DNR for approval. DNR can also furnish assistance in planning, designing and financing rural water systems and in training operators.

Missouri statutes for rural water systems are governed by Revised Missouri Statutes Sections 247.010 through 247.220.

## Related MU Extension publications

- EQM103F, Drinking Water Well Management (Fact Sheet)  
<http://extension.missouri.edu/p/EQM103F>
- EQM103W, Drinking Water Well Management (Work Sheet)  
<http://extension.missouri.edu/p/EQM103W>
- G1800, Sources for Farm and Home Water Supply  
<http://extension.missouri.edu/p/G1800>
- G1801, How to Size a Farm and Home Water System  
<http://extension.missouri.edu/p/G1801>
- NRAES47, Private Drinking Water Supplies: Quality, Testing, and Options for Problem Waters  
<http://extension.missouri.edu/p/NRAES47>
- NRAES48, Home Water Treatment  
<http://extension.missouri.edu/p/NRAES48>

Order publications online at <http://extension.missouri.edu/explore/shop/> or call toll-free 800-292-0969.



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