TENNESSEE RURAL WATER NEEDS REPORT

Tennessee Department of Environment & Conservation
Division of Water Supply

Commissioner Betsy L. Child

January 2005

ACKNOWLEDGEMENT

The Rural Water Needs Survey was a major undertaking and would not have been possible without the assistance of a large number of people. This assistance included the collection of data with regard to existing utility service areas, areas without public water, water quantity and quality issues, cost estimates, obstacles to the extension of water service, and population. It is not possible to name each of those individuals that provided assistance in completing this project. The Division of Water Supply would like to acknowledge and thank each of the city mayors, county mayors, water utility officials and operators, development districts, local and state planning agencies, consulting engineers, highway officials, and county 911 agencies that worked with the Division to obtain the information for this report.

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INTRODUCTION

Having an adequate supply of water is the most important physical need for human existence. While many areas in Tennessee are blessed with adequate water supplies, other areas around the state are lacking. The expansion of many water utilities in the past few decades has increased many Tennesseans' standard of living. In an effort to gain a better understanding of the current rural Tennesseans' need for public water, the Department of Environment and Conservation was charged by the legislature to undertake a comprehensive study to identify areas of the state lacking public water supplies.

Chapter No. 754 amends Tennessee Code Annotated, Title 68, Chapter 221, relative to rural water supply and became law on May 24, 2004. This Act requires an investigation of the needs for public water service in rural areas of Tennessee. The text of the Act is as follows:

> The water resources division of the department created by Tennessee Code Annotated, Section 69-8-101, shall investigate the needs of rural areas of the state for services by public water systems. This investigation shall identify particular areas in need of such service, estimate the cost of providing the service through extending water lines, or other means, and consider the impacts of providing the service. The division shall file a report with the chairs of the conservation and environment committee of the house and the environment, conservation, and tourism committee of the Senate by January 31, 2005, detailing the results of the investigation and proposing options for future legislation to the general assembly.

Personnel from the Tennessee Division of Water Supply conducted the required investigation during the summer and fall of 2004. Division of Water Supply staff in the Chattanooga, Columbia, Cookeville, Jackson, Johnson City, Knoxville and Nashville field offices gathered information from each county in their respective areas of the state. This investigation was broad and time consuming. Senior Division of Water Supply staff commends the Division field offices for their efforts and for the quantity and quality of information collected. To provide a comprehensive look at rural water needs, a variety of methods were used to collect information. Division of Water supply field office staff interviewed public water system managers, city officials, county mayors, development district staff, engineering consultants and county highway department superintendents. Other sources of information included water system maps, county road maps, census data, electric service records, county 911 address records and Division of Water Supply records.

EXECUTIVE SUMMARY

A review of public water system inventory data and Tennessee census data indicates that over 94 percent of Tennessee's total population (approximately 5.6 million people based on the 2000 census) is served by public water supplies. This investigation presents a county-by-county review of the areas that are not served by public water systems, and estimates the cost of extending public water service to those areas. The information presented in this report regarding the number of residences without public water service, the facilities (pipelines, tanks, pumps etc.) required to provide public water service, and the cost of providing public water service are "ballpark" estimates. Detailed information on the rural areas to be served will require engineering studies and house-by-house surveys that are beyond the scope of this report. Engineering studies will more specifically define the required facilities and projected costs. House by house surveys are needed to document the desire for public water service and determine eligibility for need based grants. Tennessee's public water suppliers extend service along hundreds of miles of roads each year. The information contained in this report is a "snapshot" of a continuously expanding public water supply network.

The capital cost of designing and constructing public water system extensions is perhaps the chief impediment to the extension of public water service into rural areas. Water line construction projects can typically cost from $50,000 to $150,000 per mile depending on topography, subsurface conditions, economic conditions and other factors. Public water suppliers as well as lending and funding agencies are reluctant to commit large sums of money to serve sparsely populated areas. In many cases, the projected return (tap fees and water sales revenues) on the capital investment makes the project financially unattractive. While many of the county maps included in Part VII of this report show large geographic areas that do not have public water service, in most cases the areas are sparsely populated. Some of these areas and homes experience significant problems (water quality and quantity) with private water supplies while others are content with their private water supplies.

Major public water suppliers in each county are listed in Part VI (pages 13-24) of this report. While this is not a complete list of public water systems in Tennessee, it includes all suppliers capable of extending service to rural areas. The impacts, both positive and negative, of public water service extensions are discussed in Part III (pages 6-9). Funding sources for public water projects are included in Part IV (pages 10-11). The summary table in Part VI shows for each county, the approximate number of homes without public water service, the approximate miles of water lines needed for complete service, and a cost estimate. Finally, Part VII (pages 25-351) includes a map of each county showing areas/roads without public water service. County maps are arranged alphabetically and project description sheets that give more details about specific areas within that county follow each county map. Statewide, it is estimated there are well over 110,000 homes without public water service. It is further estimated that over 18,000 miles of water lines and approximately $1.7 billion would be needed to extend public water service to all areas of Tennessee.

IMPACTS OF RURAL WATER EXTENSIONS

The legislative mandate for this rural water needs investigation called for consideration of the impacts of rural water service extensions. The impacts of extending public water service into rural areas are numerous and stakeholders hold diverse positions. These include farmers, real estate investors, developers, the water well drilling industry and the home water treatment industry. There are positive and negative impacts associated with extending water lines. There would likely be disagreements among the impacted parties as to whether the impacts are positive or negative. The following is a brief discussion and summary of the potential impacts of extending public water service into rural areas.

Public Health and Safety:

Having a continuous supply of water that is adequate in quantity and quality is imperative to the health and well being of the people of Tennessee. Domestic needs include water for drinking, food preparation, dish washing, toilet use, laundry, bathing/showering, personal hygiene and general sanitation. The Tennessee Safe Drinking Water Act (T.C.A. 68-221-702) states:

> "Recognizing that the waters of the state are the property of the state and are held in public trust for the benefit of its citizens, it is declared that the people of the state are beneficiaries of this trust and have a right to both an adequate quantity and quality of drinking water".

It is recognized that a very small percentage (less than 1%) of the domestic water used in a typical household is for drinking purposes. Rural homes that do not have public water service may experience problems with the quality, quantity and dependability of their private water supplies (wells, springs, cisterns etc.). These problems could include bacteria and other microorganisms, tastes, odors, discoloration, iron and manganese, turbidity, inadequate wells, pump/equipment failures and power failures. Sources of potential contamination such as subsurface septic systems, pesticides, herbicides, fertilizers, animal wastes, solvents and petroleum products may also be present in close proximity to the private water source. Rural homeowners may have to spend large amounts of money for home water treatment systems or resort to hauling water when they experience private water supply problems. Extension of public water service to these homes would solve many of their private water supply problems. It must be noted that some rural homeowners are content with their private water supplies and might not connect to a public water supply even if it were available.

The Water Well Drilling and Home Water Treatment Industry:

Extension of public water service into rural areas that currently use private wells would reduce the demand for private wells, well casing materials, well pumps and the associated home water treatment equipment. The Division of Water Supply currently licenses and regulates water well drillers, pump installers and home treatment device installers. The Division of Water Supply also regulates public water systems in Tennessee. Well drillers and equipment suppliers would be negatively impacted by the loss of business when public water systems extend into their markets.

Cross Connection and Well Abandonment Problems:

When public water service is extended into areas previously served by private sources, there are concerns about creating illegal cross connections. A cross connection is a connection between a public water supply and another source of unknown or questionable quality. Rural homeowners may wish to keep their private water sources active after connecting to a public water supply. This arrangement is illegal under the Tennessee Safe Drinking Water Act because the private water source could be pumped or drawn back into the public water lines. Cross connections have contaminated public water systems and caused illnesses in Tennessee. Public water system personnel would have to conduct periodic inspections to make sure homeowners do not have alternate water supplies connected to the public water system. Abandonment of private wells can create a conduit to contaminate the ground water if the abandoned well is not properly sealed/backfilled. Dumping of wastes, chemicals, petroleum products etc. into abandoned wells or wells never abandoned and left open is an environmental concern and is a hazard for children and animals.

Water Source and Treatment Capacity Issues:

Much of the State of Tennessee is blessed with adequate quantities of source water to supply the water demands of existing customers as well as future population growth. There are some areas of the state where water sources are limited. Before major water service extensions are considered in these areas of limited supply, the water sources must be evaluated for adequacy. Growth and increasing water demands could result in voluntary or mandatory water conservation/rationing if the sources are limited during drought conditions. Public water supply is one of several uses to consider for source waters. The source water must also be protected for fish and wildlife as well as other uses such as irrigation and discharges. Although not as limiting as source capacity issues, existing public water systems may also have to expand water treatment, pumping, storage and transmission capacity to extend service into rural areas.

Growth and Development Issues:

The availability of public water service is one of the critical pieces of infrastructure that must be in place for growth and development to occur in undeveloped areas. When public water service is extended into rural areas, the potential for residential (subdivisions) and commercial growth is greatly increased. This growth can change the nature and characteristics of a rural area. There would likely be local residents that support development and the economic opportunities that come along with it. There would likely be other residents that oppose growth and development. Land use, zoning and annexation would be issues for local governments to deal with. Local government tax revenues could be increased by growth and development in rural areas. Growth and development in rural areas may cause traffic problems and necessitate road improvements. An increase in population density can lead to wastewater disposal problems, failing septic systems and the need for public sewer systems. Population increases would increase the demand for public services such as schools, garbage collection, storm drainage, police, fire protection and other public services. Local economies would see an increase in construction business, real estate business and other sales and service businesses. The provision of one or two services often leads to demands for additional services and urban sprawl.

Water Quality Issues for Public Water Systems:

Rural public water extensions that involve many miles of water lines in areas of low population density can cause water quality problems for the public water supplier. Long pipelines and low water usage results in slow water turnover and stagnation of the water. The chlorine residual in the public water supply can dissipate over time resulting in bacteriological growth, slime growths in the pipelines, tastes, odors and loss of disinfection capability. Disinfection by-products in drinking water also build up over time with slow water turnover. Loss of chlorine residual and increases in disinfection by-products could have negative health effects on the public water customers. To combat these problems the water supplier may have to regularly flush large volumes of water out of the lines to increase water turnover. This would cost the public water supplier money and waste valuable water resources, particularly in areas of the state where the water resources are limited. Public water systems might have to install booster chlorination stations to insure that properly disinfected water reaches the remote, rural areas.

Fire Protection:

Extension of public lines into rural areas would be of benefit to homeowners and rural fire departments. Availability of water to fight fires would be increased. The time and distance to transport water in fire trucks would be decreased. The fire insurance ratings in rural communities would improve.

Capital Costs:

The capital cost of designing and constructing public water system extensions is a significant impediment to extending public water service into rural areas. Water line construction projects in Tennessee can typically cost from $50,000 to $150,000 per mile depending on topography, soil conditions, market conditions and other local factors. Rural areas requiring many miles of water lines to serve relatively few residences requires large investments which produce relatively small returns (water sales revenues). Public water suppliers and funding sources generally do not want projects that are not financially feasible. This is why many rural areas in Tennessee have not been served by public water systems.

Operation & Maintenance Costs:

Public water systems would incur additional operation and maintenance costs when extending water service into rural areas. Personnel costs would increase due to additional meter reading, line flushing, line maintenance, water sampling, cross connection inspection and complaint response requirements. Equipment and material costs would increase due to leak repairs, water loss (flushing and leaks), pump and tank maintenance, vehicle costs, fuel costs, chemical costs, power costs and depreciation. As a result, the cost of water per gallon would be higher for everyone. Public water system operational revenues would increase through collection of monthly water bills and tap fees for new customers.

FUNDING SOURCES FOR RURAL WATER EXTENSIONS

There are several funding sources currently available for extension of public water systems into rural areas. The following is a brief description of funding sources for public water projects.

USDA Rural Development Grants & Loans:

The United States Department of Agriculture administers a grant and loan program for public water supply projects. Projects are funded through a combination of grants and loans. Areas with greater community need receive a higher percentage of grant funding.

HUD Community Development Block Grants:

The United States Department of Housing and Urban Development distributes community development block grant (CDBG) funds to states for water projects. The Tennessee Department of Economic & Community Development administers the program in Tennessee. Cities and counties can apply for up to $500,000 in grant funds for water projects. To qualify for grant funds, applicants must be predominantly low and moderate-income areas, slums and blight, or have an imminent community health threat.

Drinking Water State Revolving Fund (DWSRF):

The Department of Environment & Conservation administers a state revolving loan program for drinking water projects. Funds for this program come from the federal capitalization grant and state match. Applicants may apply for loans to extend water service to rural areas. Applicants are prioritized based on the existing water problems and the community need. There is a relatively small amount of loan funding available in comparison to statewide rural water needs. Water lines for areas experiencing poor water quality or quantity problems are eligible for DWSRF loans.

Private Loans:

Communities, public water suppliers and rural residents can obtain loans from private lending sources for public water extension projects.

TAUD Construction Loan Program:

The Tennessee Association of Utility Districts (TAUD) administers a low interest construction loan program for construction of public water supply projects.

Public Water System Funds:

Municipalities, counties and utility districts can use in house cash reserves to fund public water extension projects.

Homeowners:

Groups of homeowners can pool their funds and petition nearby public water suppliers for water line extensions.

Developers:

Many public water suppliers require developers to fully fund or share the cost of water system extensions to serve new developments and subdivisions. Existing homes along the new water lines could then obtain public water service.

OPTIONS FOR FUTURE LEGISLATION

The legislation requiring this rural water needs investigation specified that future legislative options that the Tennessee General Assembly might consider be included. When considering the extension of public water service into rural areas, several key barriers can be identified. Potential barriers would include:

1. Lack of capital funds for design and construction of public water system facilities (pipes, pumps, storage tanks, treatment facilities etc.).
2. Difficult topographic and geologic conditions, which tend to isolate the area and increase construction costs.
3. Low population density, which limits the projected revenue (tap fees and water bills) and makes the project financially unattractive.
4. Lack of adequate water resources in some areas to serve additional demands.
5. Lack of desire for public water service where private supplies are adequate.
6. Lack of willingness by existing public water suppliers to serve areas that are either outside of their jurisdiction, low in revenue potential, high in operation and maintenance costs, or likely to create water quality problems due to large distances and slow water turnover.

If the legislature determines that public policy requires extension of public water service into rural areas, future legislative action by the general assembly should reduce or remove barriers. During the course of this rural water needs investigation, interviews with existing public water supply managers indicated that the lack of capital funds (item 1) is the primary barrier to providing public water service in rural areas. Lack of funds is one barrier that is amenable to legislative action. This report does not recommend an investment of funds. Rather this report acknowledges the fact that this barrier is one that public water supply managers and utility officials identified.

RURAL WATER NEEDS SUMMARY TABLE

COUNTY	SYSTEM NAME	POP. SERVED	APPROX. # OF RESIDENCES WITHOUT SERVICE	APPROX. MILES OF WATER LINES NEEDED	COST ESTIMATE
Anderson	Anderson County Utility Board Clinton Utilities Board Lake City Water Department Norris Water Commission North Anderson County UD Oak Ridge Dept. of Public Works	8,835 14,298 2,142 1,801 10,577 29,315	607	27	$3,000,000
Bedford	Bedford County UD Bell Buckle Water System Flat Creek Co-Op Shelbyville Water System Wartrace Water System	14,527 1,763 1,989 20,642 2,480	1665	278	$23,400,000
Benton	Big Sandy Water Department Camden Water Department Harbor Utility District	941 9,518 521	1500	300	$23,500,000
Bledsoe	North Bledsoe County UD Pikeville Water System Taft Youth Center	100 3,239 1,000	255	61	$6,800,000
Blount	Alcoa Water System Maryville Department of Water Friendsville Water Works Tuckaleechee Utility District South Blount Utility District	23,223 32,280 3,915 8,299 30,725	1800	165	$14,300,000
Bradley	Cleveland Utilities Hiwassee Utility Commission Ocoee Utility District	68,235 97 12,525	170	47	$4,200,000
Campbell	Caryville-Jacksboro UD Deerfield Resort Water System Jellico Water Department La Follette Water Department	8,803 910 4,414 21,748	354	72	$8,500,000

COUNTY	SYSTEM NAME	POP. SERVED	APPROX. # OF RESIDENCES WITHOUT SERVICE	APPROX. MILES OF WATER LINES NEEDED	COST ESTIMATE
Cannon	Woodbury Water System	7,590	1500	150	$13,200,000
Carroll	Atwood Water System Bruceton Water System Cedar Grove Utility District Clarksburg Utility District Hollow Rock Water Department Huntingdon Water Department McKenzie Water Department McLemoresville Water Department Trezevant Water System	1,296 1,715 1,264 1,286 919 5,750 5,632 343 1,068	3000	530	$42,000,000
Carter	Elizabethton Water Department First UD of Carter Co Hampton Utility District North Elizabethtown Water Co-Op Peters' Hollow Water System Roan Mountain Utility District Siam Utility District South Elizabethton UD	27,495 6,951 3,480 1,559 139 823 2,432 5,053	1042	84	$11,700,000
Cheatham	Ashland City Water Department East Montgomery UD Pleasant View Utility District River Road Utility District Second South Cheatham UD	5,332 13,270 11,846 2,660 7,976	364	39	$2,700,000
Chester	Henderson Water Department	7,413	1500	235	$18,500,000
Claiborne	Arthur-Shawanee UD Claiborne County UD Clear Fork Utility District Cumberland Gap Water Services Lincoln Memorial University	6,954 12,251 1,513 310 1,870	2775	360	$38,000,000
Clay	Celina Water System Northwest Clay County UD	4,320 3,075	250	54	$5,000,000
Cocke	Newport Utilities Board	22,035	333	62	$8,300,000
Coffee	Duck River Utility Commission Hillsville Utility District Manchester Water Department Tullahoma Board of Utilities	25 7,460 13,078 22,813	2700	192	$16,400,000

COUNTY	SYSTEM NAME	POP. SERVED	APPROX. # OF RESIDENCES WITHOUT SERVICE	APPROX. MILES OF WATER LINES NEEDED	COST ESTIMATE
Crockett	Alamo Water Department Bells Public Utility District County Wide Utility District Crockett Mills UD Friendship Distribution System Maury City Water Department	2,993 2,310 8,258 792 843 1,151	100	150	$11,500,000
Cumberland	Catoosa Utility District Crab Orchard Utility District Crossville Water Department Renegade Mountain Water System South Cumberland UD West Cumberland UD	7,705 14,646 15,938 246 7,705 3,674	500	100	$9,500,000
Davidson	Harpeth Valley UD Lakewood Water Department Madison Suburban UD Metro Nashville Water Department Old Hickory Utility District	32,336 2,185 42,886 381,110 3,857	31	10	$2,000,000
Decatur	Decaturville Water System North UD of Decatur/Benton Co. Parsons Water Department Perryville Utility District	2,010 2,675 3,889 2,443	100	180	$14,000,000
DeKalb	Alexandria Water System Dekalb Utility District Dowelltown-Liberty UD Smithville Water System	1,755 9,975 889 5,080	400	85	$7,500,000
Dickson	Sylvia-Tenn City-Pond UD Vanleer Water Department Water Authority of Dickson County	4,007 2,849 30,411	1174	224	$19,500,000
Dyer	Dyersburg Water Department Dyersburg Sub Cons UD Newbern Water Department Northwest Dyersburg UD Trimble Water System	20,000 3,917 7,841 3,860 747	300	300	$23,500,000
Fayette	Gallaway Water Department La Grange Water Department Moscow Water Department Oakland Water Department Piperton Water System Rossville Water System Somerville Water System	976 214 575 5,997 1,003 523 4,707	5000	580	$46,000,000

COUNTY	SYSTEM NAME	POP. SERVED	APPROX. # OF RESIDENCES WITHOUT SERVICE	APPROX. MILES OF WATER LINES NEEDED	COST ESTIMATE
Fentress	Allardt Water Works Chanute-Pall Mall UD Fentress County UD Jamestown Water Department	2,337 947 11,075 3,257	200	50	$5,000,000
Franklin	Belvidere Rural UD Center Grove-Winchester Springs Cowan Board of Public Utilities Decherd Water Department Estill Springs Water Department Huntland Water System Sewanee Utility District Winchester Water System	1,190 5,366 2,083 3,700 3,675 1,606 4,658 17,316	634	136	$13,000,000
Gibson	Bradford Water System Dyer Water Department Gibson Water Department Gibson Co. Municipal Water Dist Humbolt Utilities-Water Depart Milan Water Department Milan Arsenal #1 Rutherford Water System Trenton Water System	1,285 2,651 468 8,298 9,225 9,758 775 1,446 5,200	2800	410	$32,000,000
Giles	Ardmore Water System Fairview Utility District Lynnville Water Department Minor Hill Water UD Pulaski Water System South Giles Utility District Tarpley Shop Utility District	1,359 3,564 803 4,942 9,341 3,448 2,453	2464	460	$34,500,000
Grainger	Bean Station Utility District Rutledge Water System	5,791 1,319	494	48	$4,800,000
Greene	Chuckey Utility District Cross Anchor Utility District Glen Hills Utility District Greeneville Water & Light Comm Mosheim Utility District North Greene UD Old Knoxville Hwy UD	8,889 6,640 12,626 22,967 1,595 4,448 6,545	1848	285	$34,400,000
Grundy	Big Creek Utility District Monteagle Public Utility Board Tracy City Water System	7,620 3,071 3,627	25	12	$1,200,000

COUNTY	SYSTEM NAME	POP. SERVED	APPROX. # OF RESIDENCES WITHOUT SERVICE	APPROX. MILES OF WATER LINES NEEDED	COST ESTIMATE
Hamblen	Alpha-Talbott Utility District Morristown Water System Russellville Whitesburg UD Witt Utility District	14,467 29,909 15,314 3,339	680	40	$4,300,000
Hamilton	Eastside Utility District Grindstone Estates MHP Hixson Utility District Mowbray Mountain Utility District Sale Creek Utility District Savannah Valley UD Signal Mountain Water System Soddy-Daisy-Falling Water UD Tenn-American Water Company Union Fork-Bakewell UD Walden Ridge Utility District	37,261 747 52,914 2,875 1,499 14,342 7,553 9,597 171,679 3,386 6,227	355	33	$5,500,000
Hancock	Sneedville Utility District	2,032	1500	278	$34,000,000
Hardeman	Boliver Water System Grand Junction Water Department Grand Valley Lakes Owners Assoc Hornsby Water Department Middleton Water Department Riviera Utilities Resort of TN Spring Creek Utility District Toone Water System Whiteville Water Department	7,227 1,290 691 975 965 192 2,337 486 1,541	4000	540	$42,700,000
Hardin	Aqua Utilities Co, Inc. First UD of Hardin County Saltillo Utility District Savannah Utility Department	422 5,430 1,764 16,928	400	260	$20,500,000
Hawkins	First UD of Hawkins County Lakeview Utility District Mid Hawkins County UD Mooresburg Utility District New Canton Utility District Persia Utility District Rogersville Water System Stiggersville UD Surgoinsville Utility District	16,698 3,005 528 810 431 3,792 8,085 1,210 2,057	1300	146	$20,500,000
Haywood	Brownsville Water Department Haywood Co. Utility District Stanton Water System	13,851 875 738	1200	445	$35,000,000

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Henderson	Lexington Water Systems Sardis Water System Scotts Hill Water System	21,667 969 3,585	200	190	$15,000,000
Henry	Antioch Water Company Henry Water System Northeast Henry County UD Northwest Henry County UD Paris Board of Public Utilities Puryear Water System South Paris Water Co-Op	181 545 3,515 1,034 11,900 882 1,918	3200	610	$48,000,000
Hickman	Bon Aqua-Lyles UD Centerville Water System Turney Center	8,407 8,055 1,430	3013	538	$47,900,000
Houston	Erin WTP Tennessee Ridge Water System	5,087 3,380	304	104	$7,900,000
Humphreys	New Johnsonville Water Dept McEwen Water Department Waverly Water Department	2,237 2,632 6,978	2735	447	$40,000,000
Jackson	Gainsboro Water System Jackson County UD	1,436 5,108	155	49	$4,000,000
Jefferson	Baneberry Utility District Dandridge Water Department Jefferson City Water & Sewer New Market Utility District Shady Grove Utility District White Pine Water System	538 4,562 7,968 3,807 14,268 2,739	690	27	$3,000,000
Johnson	Brownlow Utility District Carderview Utility District Cold Springs Utility District Dry Run Utility District Mountain City Water Department	479 733 717 517 9,593	1800	178	$20,600,000
Knox	First UD of Knox County Hallsdale Powell UD Knoxville Utilities Board-KUB Knox-Chapman Utility District Northeast Knox UD West Knox Utility District	64,230 59,876 190,324 26,262 16,651 48,120	3287	164	$30,200,000

COUNTY	SYSTEM NAME	POP. SERVED	APPROX. # OF RESIDENCES WITHOUT SERVICE	APPROX. MILES OF WATER LINES NEEDED	COST ESTIMATE
Lake	Reelfoot Utility District Ridgely Water System Tiptonville Water System	640 2,124 2,487	150	136	$10,700,000
Lauderdale	Gates Water Department Halls Water System Henning Water Department Lauderdale County Water System Ripley Water System West TN State Penitentiary	750 5,567 1,403 9,786 7,367 2,429	300	134	$10,600,000
Lawrence	Fall River Road Utility District Iron City Utility District Lawrenceburg Water System Leoma Utility District Loretto Water Department Northeast Lawrence UD New Prospect Utility District St. Joseph Water System Summertown Water System West Point Utility District	2,322 635 16,968 2,376 3,482 1,178 1,876 1,242 2,931 271	3059	526	$32,000,000
Lewis	Hohenwald Water System	8,578	1500	288	$19,600,000
Lincoln	Fayetteville Water System Lincoln County Board of PU Petersburg Water System	9,880 17,006 902	2023	422	$42,900,000
Loudon	Lenoir City Utility Board Loudon Utilities Board Martel Utility District Tellico Village POA	16,686 10,297 3,267 6,294	500	128	$10,400,000
Macon	Lafayette Water System Red Boiling Springs Water System	13,690 4,891	500	300	$26,000,000
Madison	Jackson Water System Jackson UD-Mercer Plant	78,916 149	3000	300	$23,700,000
Marion	Foster Falls Utility District Griffith Creek Utility District Jasper Water Department Orme Water System South Pittsburg Water System Suck Creek Water System Whitwell Water Department	587 1,185 8,411 87 6,300 473 7,505	525	61	$9,200,000

COUNTY	SYSTEM NAME	POP. SERVED	APPROX. # OF RESIDENCES WITHOUT SERVICE	APPROX. MILES OF WATER LINES NEEDED	COST ESTIMATE
Marshall	Chapel Hill Water System Cornersville Water Department Lewisburg Water System Marshall Co Board of PU	1,170 1,175 13,414 6,021	2441	424	$63,800,000
Maury	Columbia Water System Maury Co Water System Mount Pleasant Water System Spring Hill Water Department	46,879 13,682 6,220 12,092	525	192	$20,500,000
McMinn	Athens Utilities Board Calhoun-Charleston UD Englewood Water Department Etowah Utilities Niota Water System Riceville Utility District	17,336 1,953 2,974 9,538 2,450 2,489	2314	210	$21,500,000
McNairy	Adamsville Water System Bethel Springs Water System Michie Water Department Eastview Utility District Ramer Water Department Selmer Water System	7,490 1,007 2,415 1,817 588 17,276	300	272	$21,500,000
Meigs	Decatur Water Department	4,753	270	34	$2,800,000
Monroe	Madisonville Water Department Sweetwater Utility Board Tellico Plains Water Department Tellico Area Services System	9,483 9,912 5,107 7,091	1450	400	$36,000,000
Montgomery	Clarksville Water Department Cumberland Heights UD Cunningham East Mont WTP Cunningham Utility District Fort Campbell Water System Woodlawn Utility District	115,425 3,089 25 11,456 40,000 8,408	59	26	$1,900,000
Moore	Lynchburg Water Department	3,560	418	130	$10,500,000

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Morgan	Brushy Mountain Prison Plateau Utility District Sunbright Utility District	500 4,804 4,592	175	40	$4,000,000
Obion	Elbridge Water Association Hornbeak Utility District Kenton Water Department Mason Hall Development Corp. Obion Water Department Reelfoot Water Association Samburg Utility District South Fulton Water System Troy Water System Union City Water Department	3,056 1,258 1,452 194 1,888 726 748 4,262 1,948 16,287	2000	460	$36,400,000
Overton	East Fork Utility District Livingston Water Department North Overton Utility District West Overton Utility District	2,165 10,578 3,393 6,246	139	65	$6,000,000
Perry	Linden Water Department Lobelville Water Department	4,548 1,921	900	266	$17,500,000
Pickett	Byrdstown Water Department	4,893	22	46	$4,000,000
Polk	Benton Water System Copper Basin Utility District Copperhill Water Department Cherokee Hills Utility District Hiwassee Water Co-Op	2,399 2266 773 290 1,028	226	47	$4,000,000
Putnam	Algood Water System Bangham Utility District Baxter Water Department Cookeville Water Department Cookeville Boat Dock Road UD Double Springs UD Monterey Water Department Old Gainsboro Road UD	5,873 5,971 4,282 29,604 5,390 5,160 4,200 4,850	1000	46	$4,200,000

COUNTY	SYSTEM NAME	POP. SERVED	APPROX. # OF RESIDENCES WITHOUT SERVICE	APPROX. MILES OF WATER LINES NEEDED	COST ESTIMATE
Rhea	Dayton Water Department Grandview Utility District Graysville Water Department North UD of Rhea County Spring City Water System Watts Bar Utility District	17,569 1,387 1,752 1,611 2,413 8,145	307	34	$4,000,000
Roane	Cumberland Utility District Harriman Utility Board Kingston Water System Oliver Springs Water Board Roane Central Utility District Rockwood Water System Watts Bar UD East	10,108 11,093 8,332 5,183 3,933 8,809 1,396	310	74	$7,400,000
Robertson	Adams-Cedar Hill Water System Greenbrier Water & Sewer Dept Springfield Water System	4,513 5,940 28,155	130	47	$3,600,000
Rutherford	Consolidated UD of Rutherford LaVergne Water System Murfreesboro Water Department Smyrna Water System	78,175 21,227 62,426 27,308	286	141	$18,000,000
Scott	Huntsville Utility District Oneida Water & Sewer	11,042 10,284	10	3	$300,000
Sequatchie	Cagle-Fredonia Utility District Dunlap Water System Lone Oak Utility District	1,552 5,367 390	198	30	$4,700,000
Sevier	Chalet Village North East Sevier County UD Gatlinburg Water Department Great Smoky Mtns Nat Park Hqtrs Pigeon Forge Water Department Sevierville Water System Webb Creek Utility District	1,290 791 8,360 4,700 9,238 19,096 1,503	4270	238	$31,000,000
Shelby	Bartlett Water System Collierville Water Department Germantown Water Department Memphis light, Gas & Water Millington Water Department NSA – Midsouth	44,174 35,240 40,200 654,267 7,244 6,300	131	46	$6,000.000

COUNTY	SYSTEM NAME	POP. SERVED	APPROX. # OF RESIDENCES WITHOUT SERVICE	APPROX. MILES OF WATER LINES NEEDED	COST ESTIMATE
Smith	Carthage Water system Cordell Hull Utility District Smith Utility District South Side Utility District Twenty Five Utility District	2,540 2,057 5,840 3,465 1,608	1000	85	$7,800,000
Stewart	Cumberland City Water Department Dover Water Department Leatherwood Water District, Inc. North Stewart Utility District	682 3,018 316 4,096	764	208	$16,500,000
Sullivan	Bloomingdale Utility District Blountville Utility District Bluff City Water Department Bristol Department of Utilities Bristol-Bluff City D Chinquapin Grove UD Holston Utility District Intermont Utility District Kingsport Water Department South Bristol-Weaver Pike UD Tri-Cities/Sullivan UD	11,741 8,782 2,282 27,420 4,755 2,034 2,351 1,071 83,907 5,001 3,124	1603	133	$24,100,000
Sumner	Castalian Springs – Bethpage UD Gallatin Water Department Hendersonville UD Portland Water System Westmoreland Water System White House Utility District	8,382 28,309 37,811 14,712 3,815 69,965	1110	244	$18,200,000
Tipton	Atoka Water System Brighton Water System Covington Water Department First UD of Tipton County Mason Water Department Munford Water Department Poplar Grove Utility District	4,893 3,014 11,085 8,284 2,344 7,184 15,412	500	200	$15,800,000
Trousdale	Hartsville Water Department	6,653	177	56	$4,350,000
Unicoi	Erwin Utilities Unicoi Utility District	11,566 3,929	510	34	$5,500,000
Union	Luttrell-Blaine-Corryton UD Maynardville Water Department	6,039 4,840	550	91	$9,100,000
Van Buren	Fall Creek Falls UD Spencer Water System	3,429 4,094	155	85	$8,000,000

COUNTY	SYSTEM NAME	POP. SERVED	APPROX. # OF RESIDENCES WITHOUT SERVICE	APPROX. MILES OF WATER LINES NEEDED	COST ESTIMATE
Warren	McMinnville Water Department Warren County Utility District West Warren-Viola UD	15,420 18,731 9,293	500	76	$7,000,000
Washington	Johnson City Water Department Jonesborough Water Department	81,652 20,802	2850	175	$25,900,000
Wayne	Clifton Water Department Collinwood water Department Waynesboro Water System West Lauderdale Water Authority	2,963 1,811 3,517 91	4706	715	$80,000,000
Weakley	Dresden Water Department Gleason Water Department Greenfield Water Department Martin Water Department Sharon Water System	3,749 1,709 2,363 9,658 1,261	4500	740	$59,000,000
White	Bon De Croft Utility District De White Utility District Prices Switch Water Company O'Connor Utility District Quebeck Walling UD Sparta Water System	2,717 5,681 183 6,546 3,493 7,904	200	36	$3,600,000
Williamson	Brentwood Water Department Fairview Water System Franklin Water Department H.B. & T.S. Utility District Mallory Valley UD Milcrofton Utility District Nolensville-College Grove UD	20,499 6,899 41,532 13,067 10,947 9,102 9,633	1705	182	$15,500,000
Wilson	Gladeville Utility District Laguardo Utility District Lebanon Water System Watertown Water System West Wilson Utility District Wilson Co. Water & Wastewater	12,594 6,159 23,483 1,629 38,181 14,060	1160	109	$9,000,000
Other small water systems		121,948			
TOTAL		**5,355,536**	**112,134**	**18,470**	**$1,701,050,000**