U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared in cooperation with the
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION,
DIVISION OF WATER SUPPLY

OPEN-FILE REPORT 03-47
Webbers, Ank, 2003, Ground-water use by public water-supply systems in Tennessee, 2000

GROUND-WATER USE BY PUBLIC WATER-SUPPLY SYSTEMS IN TENNESSEE, 2000

By
Ank Webbers
2003

Ground water provided about 321 million gallons per day (Mgal/d) of public water supplies in Tennessee during 2000. A total of 256 public water-supply systems provided these supplies to 72 of Tennessee's 95 counties. Ground water provided approximately 36 percent of the total public water supplies used in Tennessee.

The U.S. Geological Survey, in cooperation with the Tennessee Department of Environment and Conservation (TDEC), Division of Water Supply, has prepared several reports on ground-water use by public water-supply systems in Tennessee (Hutson, 1989, 1991, 1995, and 1998). This report, prepared in cooperation with TDEC, presents ground-water withdrawals by public water-supply systems in Tennessee for 2000 and provides a brief discussion on reported values of ground-water use in Tennessee during previous years.

Public Water-Supply Systems

A total of 256 public water-supply systems provided ground water for drinking water and other purposes to residents in 72 of the 95 Tennessee counties in 2000 (fig. 1). A total of 117 public water-supply systems were located in West Tennessee, 46 systems were located in Middle Tennessee, and 93 systems were located in East Tennessee. Sixty of the 257 systems produced less than 0.02 million gallons per day (Mgal/d). Thirty-eight public water-supply systems withdrew 1 Mgal/d or more of ground water during 2000. Memphis Light, Gas and Water, a public water-supply system located in Shelby County (West Tennessee) reported the largest ground-water withdrawal (167 Mgal/d) for a single system. Public water-supply systems in Tennessee reporting ground-water withdrawals of at least 0.02 Mgal/d in 2000 are listed in table 1 with the withdrawal rate, ground-water source (well or spring), principal aquifer, and whether the ground-water supply is supplemented with surface water or purchased water.

Ground-Water Resources in Tennessee

Ground water provided 36 percent of Tennessee's public water supplies in 2000 (fig. 2). Ground water was withdrawn from drilled wells and natural springs that flow from aquifer outcrops or exposed rock fractures at land surface. The principal aquifers in Tennessee (fig. 3) are the alluvial aquifer, Tertiary sand aquifers, Cretaceous sand aquifer, Mississippian carbonate aquifer, Ordovician carbonate aquifer, Pennsylvanian sandstone aquifer, Cambrian-Ordovician carbonate aquifer, and crystalline rock aquifer (Bradley and Hollyday, 1985). The Knox aquifer in Middle Tennessee is not currently being used for public water supply because of the aquifer depth and typically high sulfate concentrations, but it is used locally for domestic water supplies (Brahana and Bradley, 1985). Ground-water withdrawals from the principal aquifers during 2000 ranged from less than 1 Mgal/d (0.1 percent) from the Pennsylvanian sandstone aquifer to 188 Mgal/d (about 58 percent) from the Memphis aquifer of the Tertiary sand aquifers (figs. 3 and 4).

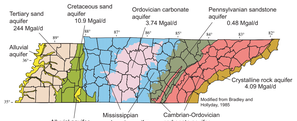

Figure 3. Principal aquifers in Tennessee and rate of water withdrawal, in million gallons per day, 2000.

West Tennessee

In West Tennessee, ground-water supplies are produced from the thick (greater than 2,500 feet) sequence of unconsolidated sands, gravels, and clays of Quaternary alluvium deposits, the Tertiary sand aquifer that includes the Cockfield and Cook Mountain Formations, the Memphis Sand, and the Fort Pillow Sand. The Cretaceous sand aquifer includes the McNairy Sand, Coffee Sand, and Eutaw, Tuscaloosa, and Ripley Formations. To better define ground-water use in West Tennessee and because of their regional importance, the major aquifers in the Tertiary sand aquifers, the Memphis aquifer, and the Fort Pillow aquifer are identified where possible.

Approximately 244 Mgal/d were produced from the Tertiary sand aquifers in 15 counties of West Tennessee in 2000. This quantity represents approximately 75 percent of the total public supply ground-water withdrawals from all aquifers in the State (fig. 4). The combined ground-water withdrawal from the Memphis aquifer and the Fort Pillow aquifer was approximately 192 Mgal/d (fig. 4) with the Memphis aquifer supplying approximately 188 Mgal/d. The Cretaceous and the Quaternary (alluvial deposits) aquifer systems in 2000 provided ground-water supplies of approximately 11 and 2 Mgal/d, respectively (figs. 3 and 4). The largest ground-water withdrawals occurred in Shelby County (188 Mgal/d) and Madison County (15 Mgal/d) from the Tertiary sand aquifer (table 1).

Middle and East Tennessee

Ground-water withdrawals in Middle and East Tennessee are primarily from natural springs or from wells drilled into Precambrian-, Cambrian-, Ordovician-, Mississippian-, and Pennsylvanian-age rocks. In 2000, public water-supply systems in these two sections of the State withdrew about 63 Mgal/d.

In Middle Tennessee, ground water generally is withdrawn from solution cavities of the Ordovician and Mississippian carbonate aquifers. Well depths commonly range from less than 50 to about 200 feet. Well yields generally vary from about 5 gal/min to greater than 50 gal/min and may exceed 400 gal/min in some areas (Bradley and Hollyday, 1985). During 2000, aquifers in Middle Tennessee counties with approximately 21 Mgal/d. The average ground-water withdrawal for 48 public water-supply systems in Middle Tennessee was less than 1 Mgal/d (0.31 Mgal/d). The largest ground-water withdrawal (4.42 Mgal/d) by one water system in Middle Tennessee occurred in Montgomery County.

In East Tennessee, ground water is present in interconnected fractures and openings of the Pennsylvanian sandstone aquifer of the Cumberland Plateau, in fractures and solution openings in the Cambrian-Ordovician carbonate aquifer and in the fractured crystalline rock aquifer. The Cambrian-Ordovician carbonate aquifer also can be extensively faulted or structurally deformed.

Drilled wells range from less than 50 to 350 feet deep (Brahana, Macy, and others, 1986), and well yields ranged from 5 gal/min to about 50 gal/min in the Pennsylvanian sandstone and crystalline rock aquifers, and to about 200 gal/min in the Cambrian-Ordovician carbonate aquifer. Wells completed in large interconnected solution openings of the Cambrian-Ordovician carbonate aquifer may yield more than 2,000 gal/min (Bradley and Hollyday, 1985). The aquifer systems of East Tennessee supplied approximately 44 Mgal/d of ground water to 93 public water-supply systems in 31 counties. The highest ground-water withdrawals for public supply were in Hamilton County, 10.44 Mgal/d, and Carter County, 7.52 Mgal/d (fig. 1).

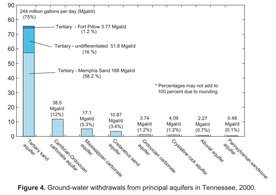

Figure 4. Ground-water withdrawals from principal aquifers in Tennessee, 2000.

Springs as Public Water Supplies

Springs were used as water sources by 46 public water-supply systems in 28 counties of Middle and East Tennessee during 2000 (fig. 1). The springs provided about 40 Mgal/d, approximately 12 percent of the total ground-water withdrawals for Tennessee in 2000 (fig. 2). Most of the spring use by public water-supply systems was in East Tennessee where about 27 Mgal/d were produced from the Cambrian-Ordovician carbonate aquifer. The largest use of spring water for public water supply, by county, occurred in Montgomery County (4.42 Mgal/d), Carter County (6.29 Mgal/d), Washington County (3.72 Mgal/d), and Bradley County (2.56 Mgal/d).

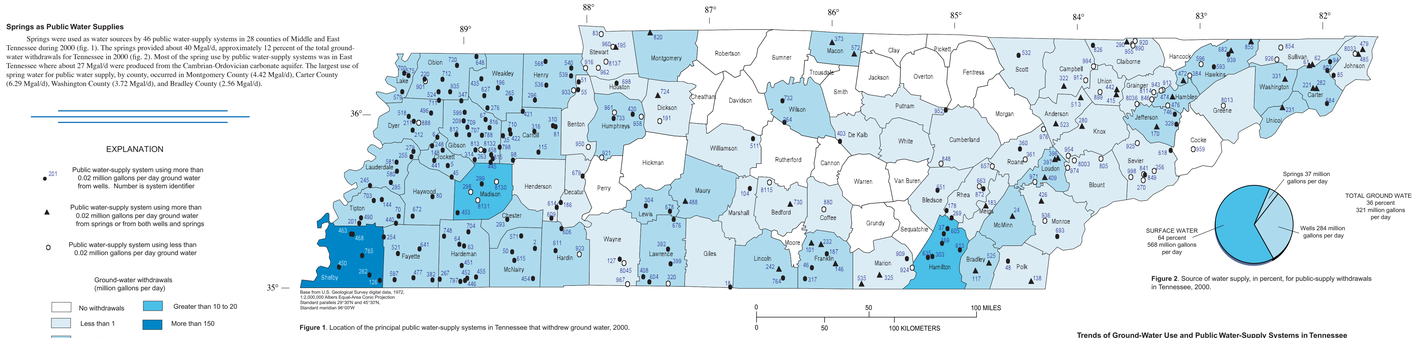

Figure 1. Location of the principal public water-supply systems in Tennessee that withdrew ground water, 2000.

Figure 2. Source of water supply, in percent, for public-supply withdrawals in Tennessee, 2000.

Table 1. Public water-supply systems withdrawing at least 0.02 million gallons of ground water per day in Tennessee, 2000

[PWSID: Public water-supply identification number; An asterisk (*) denotes the water system supplements its water supply with surface (s) and/or purchased (p) water; Mgal/d; million gallons per day; Principal aquifers are: ALVM, Alluvial; CMBR, Cambrian-Ordovician carbonate; CRCS, Cretaceous sand; MSSP, Mississippian carbonate; ODVC, Ordovician carbonate; CRYST, Crystalline rock; PSLV, Pennsylvanian sandstone; TRUN, Tertiary undifferentiated; TRMS, Tertiary Memphis; TRFP, Tertiary Fort Pillow]

County	PWSID	Public water-supply system	Source	Principal aquifer	Annual average ground-water withdrawal (Mgal/d)
Anderson	*0000513 p	Norris Water Commission	spring	CMBR	0.30
Anderson	*0000523 p	Oliver Springs Water Board	spring	CMBR	0.66
Bedford	0000730	Wartrace Water System	spring	ODVC	0.83
Benton	0000051	Big Sandy Water Department	3 wells	CRCS	0.12
Benton	0000055	Harbor Utility District	3 wells	CRCS	0.04
Bledsoe	0000551	Pikeville Water System	4 wells	CMBR	0.39
Bradley	*0000117 sp	Cleveland Utilities	spring	CMBR	1.23
Bradley	*0000525 p	Ocoee Utility District	springs	CMBR	1.33
Campbell	*0000322 sp	Caryville-Jacksboro Utility District	spring	CMBR	0.50
Carroll	0000035	Atwood Water System	3 wells	TRUN	0.13
Carroll	0000081	Bruceton Water System	6 wells	CRCS	0.21
Carroll	0000098	Cedar Grove Utility District	2 wells	TRUN	0.05
Carroll	0000115	Clarksburg Utility District	3 wells	CRCS	0.12
Carroll	0000310	Hollow Rock Water Department	3 wells	CRCS	0.24
Carroll	0000316	Huntingdon Water Department	2 wells	TRUN	0.62
Carroll	0000421	McKenzie Water Department	3 wells	TRUN	1.22
Carroll	0000422	McLemoresville Water Department	3 wells	TRMS	0.13
Carroll	0000510	Trezevant Water System	2 wells	TRMS	0.08
Carter	0000094	First Utility District of Carter Co.	2 wells	CMBR	1.12
Carter	*0000221 p	Elizabethton Water Department	3 springs	CMBR	5.39
Carter	0000282	Hampton Utility District	spring	CMBR	0.90
Carter	0000384	Roan Mountain Utility District	5 wells	CRYST	0.11
Chester	0000293	Henderson Water Department	5 wells	CRCS	1.15
Claiborne	0000290	Lincoln Memorial University	spring	CMBR	0.21
Claiborne	0000826	Clear Fork Utility District	2 wells	PSLV	0.10
Crockett	0000005	Alamo Water Department	4 wells	TRMS	0.31
Crockett	0000006	Crockett Utility District	2 wells	TRFP	1.01
Crockett	0000045	Bells Public Utility District	2 wells	TRMS	0.25
Crockett	0000148	Crockett Mills Utility District	2 wells	TRMS	0.10
Crockett	0000548	Friendship Water Company	2 wells	TRUN	0.11
Crockett	0000441	Maury City Water Department	2 wells	TRMS	0.08
Decatur	0000186	Decaturville Water System	3 wells	ODVC	0.20
Decatur	0000679	Wooden Shoes Water Works	2 wells	CRCS	0.02
DeKalb	0000403	Dowelltown-Liberty Utility District	2 wells	ODVC	0.08
Dickson	0000124	Dunbar Water System	spring	MSSP	0.22
Dyer	0000211	Dyersburg Water Department	7 wells	TRMS	4.00
Dyer	0000212	Dyersburg Suburban Consolidated Utility District	3 wells	TRMS	0.78
Dyer	0000213	Newbern Water Department	4 wells	TRMS	0.94
Dyer	*0000518 p	Northwest Dyersburg Utility District	2 wells	TRMS	0.36
Dyer	0000711	Trimble Water System	3 wells	TRUN	0.12
Fayette	0000254	Gallaway Water Department	3 wells	TRMS	0.23
Fayette	0000282	La Grange Water Department	2 wells	TRMS	0.03
Fayette	0000477	Moscow Water Department	2 wells	TRMS	0.07
Fayette	0000521	Oakland Water Department	3 wells	TRMS	0.54
Fayette	0000597	Rossville Water System	2 wells	TRMS	0.06
Fayette	0000641	Somerville Water System	5 wells	TRMS	0.62
Franklin	0000546	Belvidere Water Utility District	wells	MSSP	0.19
Franklin	0000101	Center Grove-Winchester Springs	spring	MSSP	0.48
Franklin	0000146	Cowan Board of Public Utilities	spring	MSSP	0.19
Franklin	*0000187 p	Decherd Water Department	2 wells	MSSP	0.46
Franklin	0000232	Estill Springs Water Department	spring	MSSP	0.47
Franklin	0000317	Huntland Water System	4 wells	MSSP	0.19
Franklin	0000367	Bradford Water System	2 wells	TRMS	0.12
Gibson	0000209	Dyer Water Department	3 wells	TRMS	0.31
Gibson	0000363	Gibson Water Department	2 wells	TRMS	0.04
Gibson	0000314	Humboldt Utilities-Water Department	4 wells	TRMS	2.37
Gibson	0000445	Medina Water Department	2 wells	TRMS	0.11
Gibson	0000458	Milan Water Department	4 wells	TRMS	1.33
Gibson	0000599	Rutherford Water System	2 wells	TRMS	0.17
Gibson	0000707	Trenton Water System	3 wells	TRMS	0.66
Gibson	0000709	Gibson Co. Municipal Water District #1	well	TRMS	0.38
Gibson	0000788	Gibson Co. Municipal Water District #2	wells	TRMS	0.15
Gibson	0000798	Milan Arsenal #1	3 wells	TRMS	0.46
Gibson	0000812	Gibson Co. Municipal Water District #3	wells	TRMS	0.26
Gibson	0000813	Gibson Co. Municipal Water District #4	wells	TRMS	0.35
Gibson	0000815	Gibson Co. Municipal Water District #5	wells	TRMS	0.14
Gibson	0000816	Gibson Co. Municipal Water District #6	wells	TRMS	0.06
Giles	0000018	Ardmore Water System	3 wells	MSSP	0.28
Hamblen	*0000434 s	Morristown Water System	spring	CMBR	1.03
Hamilton	*0000037 p	Union Fork-Bakewell Utility District	3 wells	CMBR	0.30
Hamilton	*0000169 s	Soddy Daisy-Falling Water Utility District	well	CMBR	0.62
Hamilton	0000303	Hixson Utility District	wells	CMBR	6.70
Hamilton	*0000605 p	Sale Creek Utility District	3 wells	CMBR	0.26
Hamilton	0000613	Savannah Valley Utility District	wells	CMBR	1.66
Hamilton	0000635	Walden Ridge Utility District	3 wells	CMBR	0.90
Hardeman	0000063	Bolivar Water System	4 wells	CRCS	1.28
Hardeman	0000064	Western Mental Health Institute	2 wells	TRFP	0.08
Hardeman	0000267	Grand Junction Water Department	2 wells	TRMS	0.21
Hardeman	0000446	Woodrun Lakes Subdivision	2 wells	CRCS	0.03
Hardeman	0000451	Grand Valley Lake Owners Assoc.	1 well	TRUN	0.08
Hardeman	0000452	Rogers Springs Property Owners Assoc.	2 wells	TRUN	0.02
Hardeman	0000455	Middleton Water Department	2 wells	CRCS	0.19
Hardeman	0000704	Toone Water System	3 wells	TRFP	0.14
Hardeman	0000748	Whiteville Water Department	5 wells	TRMS	0.56
Hardeman	0000797	Riviera Utilities of Tenn.	2 wells	TRUN	0.05
Hardin	0000606	Saltillo Utility District	3 wells	CRCS	0.13
Hardin	0000611	Savannah Utility Dept.	8 wells	ALVM	2.27
Hawkins	0000472	Mooresburg Utility District	spring	CMBR	0.10
Hawkins	*0000593 s	Rogersville Water System	well	CMBR	0.07
Hawkins	*0000682 p	Surgoinsville Utility District	spring	CMBR	0.22
Hawkins	0000855	First Utility District of Hawkins Co #2	2 springs	CMBR	0.59
Hawkins	*0000939 p	Mid Hawkins Co. Utility District	well	CMBR	0.22
Haywood	0000080	Brownsville Water Department	6 wells	TRMS	1.77
Haywood	0000672	Stanton Water System	2 wells	TRMS	0.12
Henderson	0000609	Sardis Water System	4 wells	CRCS	0.07
Henderson	0000614	Scotts Hill Water System	11 wells	CRCS	0.29
Henry	0000296	Henry Water System	2 wells	TRFP	0.08
Henry	0000536	Paris Board of Public Utilities	3 wells	CRCS	2.57
Henry	0000539	Antioch Water Company	1 well	CRCS	0.03
Henry	0000540	NE Henry Co. Utility District	3 wells	CRCS	0.36
Henry	0000568	Puryear Water System	2 wells	TRFP	0.09
Houston	*0000698 p	Tennessee Ridge Water System	3 wells	MSSP	0.16
Humphreys	0000420	McEwen Water Department	2 wells	MSSP	0.29
Humphreys	*0000733 s	Waverly Water System	3 wells	MSSP	0.89
Jefferson	*0000170 p	Dandridge Water Department	1 well & 2 springs	CMBR	0.19
Jefferson	0000329	Baneberry Utility District	4 wells	CMBR	0.04
Jefferson	0000746	White Pine Water System	3 wells	CMBR	0.38
Johnson	0000085	Cardenview Utility District	2 wells	CMBR	0.05
Johnson	*0000679 s	Mountain City Water Department	springs	CMBR	0.83
Johnson	0000455	Cold Springs Utility District	spring	CMBR	0.05
Knox	*0000280 p	Hallsdale-Powell Utility District	springs	CMBR	0.93
Lake	0000575	Reelfoot Utility District	3 wells	TRUN	0.20
Lake	0000579	Ridgely Water System	2 wells	TRUN	0.24
Lake	0000700	Tiptonville Water System	4 wells	TRUN	0.83
Lauderdale	0000245	West Tenn. State Penitentiary	3 wells	TRUN	0.30
Lauderdale	0000255	Gates Water Department	2 wells	TRUN	0.09
Lauderdale	0000279	Halls Water System	3 wells	TRMS/TRFP	0.62
Lauderdale	0000295	Henning Water Department	2 wells	TRMS	0.15
Lauderdale	0000297	Ripley Water System	3 wells	TRMS	2.03
Lauderdale	*0000581 p	Lauderdale Co. Water System	4 wells	TRMS	0.73
Lawrence	*0000392 s	Lawrenceburg Water System	spring	MSSP	1.27
Lawrence	0000399	Leoma Utility District	well	MSSP	0.19
Lawrence	*0000408 p	Loretto Water Department	spring	MSSP	0.45
Lawrence	0000604	St. Joseph Water System	spring	MSSP	0.26
Lawrence	0000676	Summertown Water System	4 wells	MSSP	0.18
Lewis	0000304	Hohenwald Water System	3 wells	MSSP	1.48
Lewis	0000678	The Farm Water System	2 wells	MSSP	0.03
Lincoln	*0000242 s	Fayetteville Water System	spring	MSSP	0.53
Lincoln	*0000764 p	Lincoln Co. Board of Public Utilities #1	wells	MSSP	1.68
Loudon	*0000396 s	Lenoir City Utility Board	spring	CMBR	0.81
Loudon	*0000397 p	Dixie Lee Utility District	spring	CMBR	0.86
Loudon	*0000409 s	Loudon Utilities Board	spring	CMBR	0.39
Macon	*0000373 s	Lafayette Water System	2 springs	MSSP	1.48
Macon	0000572	Red Boiling Springs Water System	2 springs	MSSP	0.76
Madison	0000299	Jackson Water System	North well field	TRMS	11.65
Madison	0000299	Jackson Water System	South well field	TRFP	3.38
Madison	0000453	Jackson Water System-Mercer Plant	2 wells	TRMS	0.02
Marion	*0000325 s	Jasper Water Department	spring	CMBR	0.71
Marion	0000535	Orme Water System	2 springs	CMBR	0.03
Marion	0000909	Suck Creek Utility District	3 wells	MSSP	0.05
Marshall	*0000104 p	Chapel Hill Water System	well	ODVC	0.15
Maury	0000488	Mount Pleasant Water System #1	spring	ODVC	1.03
McMinn	*0000028 p	Athens Utilities Board	2 springs	CMBR	1.36
McMinn	*0000024 p	Athens Utilities Board	2 wells	CMBR	1.25
McNairy	0000002	Adamsville Water System	3 wells	CRCS	0.79
McNairy	0000050	Bethel Springs Water System	3 wells	CRCS	0.08
McNairy	0000454	Michie Water Department	3 wells	CRCS	0.25
McNairy	0000571	Ramer Water Department	1 well	CRCS	0.06
McNairy	0000615	Selmer Water System	3 wells	CRCS	2.24
Meigs	0000183	Decatur Water Department	spring	CMBR	0.27
Meigs	0000183	Decatur Water Department	well	CMBR	0.32
Monroe	0000426	Howasee College	spring	CMBR	0.06
Monroe	0000693	Tellico Plains Water Department	8 wells	CMBR	0.50
Montgomery	0000820	Fort Campbell Water System	spring	MSSP	4.42
Obion	0000220	Elbridge Water Association	3 wells	TRUN	0.48
Obion	*0000347 p	Kenton Water Department	2 wells	TRMS	0.13
Obion	0000524	Obion Water Department	3 wells	TRUN	0.30
Obion	0000648	South Fulton Water System	2 wells	TRMS	0.50
Obion	0000712	Troy Water System	3 wells	TRMS/TRFP	0.26
Obion	0000720	Union City Water Department	5 wells	TRMS	3.96
Obion	0000955	Mason Hall Development Corp.	3 wells	TRUN	0.02
Polk	0000048	Benton Water System	well	CMBR	0.38
Polk	0000138	Cherokee Hills Utility District	4 springs	CMBR	0.05
Putnam	0000952	Heritage Academy	1 well	PSLV	0.02
Rhea	*0000178 p	Laurelbrook School	well	PSLV	0.02
Rhea	0000269	Graysville Water Department	4 wells	PSLV	0.19
Rhea	0000872	Watts Bar Utility District	wells	CMBR	0.57
Roane	*0000360 s	Kingston Water System	spring	CMBR	0.19
Roane	*0000532 sp	Oswoda Water and Sewer Commission	well	PSLV	0.10
Sevier	0000618	East Sevier Co. Utility District	2 wells	CRYST	0.16
Sevier	*0000849 p	Chalet Village North	well	CRYST	0.03
Shelby	0000126	Collierville Water Department	wells	TRMS	5.82
Shelby	*0000262 p	Germantown Water Department	wells	TRMS	7.28
Shelby	0000450	Memphis Light, Gas and Water	Allen station	TRMS	24.13
Shelby	0000450	Memphis Light, Gas and Water	Davis station	TRMS	14.73
Shelby	0000450	Memphis Light, Gas and Water	Lichterman station	TRMS	22.96
Shelby	0000450	Memphis Light, Gas and Water	LNG station	TRMS	0.36
Shelby	0000450	Memphis Light, Gas and Water	Mallory station	TRMS	17.65
Shelby	0000450	Memphis Light, Gas and Water	McCord station	TRMS	17.47
Shelby	0000450	Memphis Light, Gas and Water	Morton station	TRMS	19.73
Shelby	0000450	Memphis Light, Gas and Water	Palmer station	TRMS	5.05
Shelby	0000450	Memphis Light, Gas and Water	Shaw station	TRMS/TRFP	22.89
Shelby	0000450	Memphis Light, Gas and Water	Sheahan station	TRMS/TRFP	21.77
Shelby	0000463	Millington Water Department	6 wells	TRMS/TRFP	1.09
Shelby	0000468	Naval Support Activity - Midsouth	5 wells	TRMS/TRFP	0.93
Shelby	0000765	Bartlett Water System	3 wells	TRMS	5.99
Stewart	*0000195 sp	North Stewart Utility District	spring	MSSP	0.22
Stewart	*0000195 sp	North Stewart Utility District	2 wells	MSSP	0.12
Sullivan	*0000061 p	Bluff City Water Department	spring	CMBR	0.24
Sullivan	*0000062 p	Chinquapin Grove Utility District	spring	CMBR	0.10
Tipton	*0000070 p	Brighton Water System	3 wells	TRMS	0.07
Tipton	0000144	Covington Water Department	4 wells	TRMS	2.23
Tipton	*0000201 p	Poplar Grove Utility District	3 Wells	TRMS	1.76
Tipton	0000440	Mason Water Department	3 wells	TRMS	0.24
Tipton	0000490	Munford Water Department	4 wells	TRMS	1.05
Tipton	0000703	First Utility District of Tipton Co.	4 wells	TRMS	0.88
Unicoi	0000231	Erwin Utilities	3 wells	CMBR	1.91
Unicoi	0000231	Erwin Utilities	spring	CMBR	0.30
Union	*0000415 p	Luttrell-Blaine-Corryton Utility District	2 springs	CMBR	0.27
Union	*0000482 p	Maynardville Water Department	2 springs	CMBR	0.30
Washington	*0000331 s	Johnson City Water Department	spring	CRYST	3.72
Wayne	0000127	Collinwood Water Department	well	MSSP	0.20
Weakley	0000196	Dresden Water Department	3 wells	TRMS	0.42
Weakley	0000265	Gleason Water Department	2 wells	TRMS	0.26
Weakley	0000276	Greenfield Water Department	2 wells	TRMS	0.24
Weakley	0000435	Martin Water Department	5 wells	TRMS	1.50
Weakley	0000627	Sharon Water System	3 wells	TRMS	0.12
Williamson	*0000511 p	Nolensville-College Grove Utility District	3 wells	ODVC	0.18
Wilson	*0000264 p	Gladeville Utility District #1	2 wells	ODVC	1.06
Wilson	0000732	Watertown Water System	3 wells	ODVC	0.20

Trends of Ground-Water Use and Public Water-Supply Systems in Tennessee

The population of Tennessee increased from 3.29 million in 1950 to 5.68 million in 2000 (U.S. Census Bureau, 2002). In 1950, ground-water withdrawals for public water supply in Tennessee were 85 Mgal/d (MacKichan, 1957), and by 1980 withdrawals had reached 210 Mgal/d (fig. 5). From 1985 to 1988, ground-water withdrawals by public water-supply systems increased from 243 to 262 Mgal/d (Hutson, 1990; Hutson and Morris, 1992), and by 1995 withdrawals reached 279 Mgal/d (Hutson, 1999). However, the ratio of ground water to surface water use by public systems had begun to decrease slightly in 1985, and in 2000, ground water provided only 36 percent of public water supplies in Tennessee.

The number of public water-supply systems providing ground water in the State has also increased from 181 systems in 1985 (Hutson, 1989) to 256 systems in 2000. In addition, the data for 2000 indicate more public water-supply systems used ground water (256 systems) than surface water (142 systems) as their primary source of water. The use of ground water by public water-supply systems as a primary source is mainly in West Tennessee where ground-water withdrawals have increased approximately 40 percent, from about 185 Mgal/d in 1985 to 257 Mgal/d in 2000. In Middle and East Tennessee public water-supply systems supplement customer demands with surface water or may not use ground water.

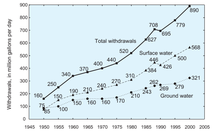

Figure 5. Trends in public water-supply withdrawals by source of supply in Tennessee, 1950-2000.

Selected References

Bradley, M.W., and Hollyday, E.F., 1985, Tennessee ground-water resources, in National Water Summary 1984—Hydrologic events, selected water-quality trends, and ground-water resources: U.S. Geological Survey Water-Supply Paper 2275, p. 391-396.

Brahana, J.V., and Bradley, M.W., 1985, Delineation and description of the regional aquifers of Tennessee—the Knox aquifer in Central and West Tennessee: U.S. Geological Survey Water-Resources Investigations Report 83-4012, 32 p.

Brahana, J.V., Macy, J.A., Moldenhi, Dolores, and Zerno, Dawn, 1986, Preliminary delineation and description of the regional aquifers of Tennessee—Cumberland Plateau aquifer system: U.S. Geological Survey Water-Resources Investigations Report 82-338, 24 p.

Brahana, J.V., Moldenhik, Dolores, Macy, J.A., and Bradley, M.W., 1986, Preliminary delineation and description of the regional aquifers of Tennessee—The East Tennessee aquifer system: U.S. Geological Survey Water-Resources Investigations Report 82-4091, 30 p.

Hutson, S.S., 1989, Ground-water use by public-supply systems in Tennessee in 1985: U.S. Geological Survey Water-Resources Investigations Report 89-4092, 1 sheet.

——1990, Tennessee water supply and use, in National Water Summary 1987—Hydrologic events and water supply and use: U.S. Geological Survey Water-Supply Paper 2350, p. 467-474.

——1991, Ground-water use by public-supply systems in Tennessee in 1988: U.S. Geological Survey Open-File Report 91-176, 1 sheet.

——1995, Ground-water use by public-supply systems in Tennessee, 1990: U.S. Geological Survey Water-Resources Investigations Report 94-483, 1 sheet.

——1998, Ground-water use by public-supply systems in Tennessee, 1995: U.S. Geological Survey Open-File Report 98-85, 1 sheet.

——1999, Public water-supply systems and associated water use in Tennessee, 1995: U.S. Geological Survey Water-Resources Investigations Report 99-4052, 91 p.

Hutson, S.S., and Morris, A.L., 1992, Public water-supply systems and water use in Tennessee, 1988: U.S. Geological Survey Water-Resources Investigations Report 91-4195, 74 p.

MacKichan, K.A., 1957, Estimated use of water in the United States, 1955: U.S. Geological Survey Circular 398, 18 p.

U.S. Census Bureau, 2002, State and county quickfacts—Tennessee, accessed August 9, 2002 at http://quickfacts.census.gov/qfd/states/47000.html

Conversion Factors and Datum

Multiply	By	To obtain
gallon (gal)	3.785	liter (L)
gallon (gal)	0.003785	cubic meter (m^3)
million gallons (Mgal)	3,785	cubic meter (m^3)
cubic foot (ft^3)	0.02832	cubic meter (m^3)
acre-foot (acre-ft)	1,233	cubic meter (m^3)
gallon per minute (gal/min)	0.06309	liter per second (L/s)

Horizontal coordinate information is referenced to the North American Datum of 1927 (NAD 27).

For additional information write to:

District Chief
U.S. Geological Survey
640 Grassmere Park, Suite 100
Nashville, Tennessee 37211

Copies of this report may be purchased from:

U.S. Geological Survey
Branch of Information Services
Box 25286
Denver, Colorado 80225-0286