DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT

WATER-RESOURCES INVESTIGATIONS
REPORT 89-4092

Ground water is the source of drinking water for 51 percent of the 4.76 million residents in Tennessee. In 1985, public-supply withdrawal of ground water from wells and springs in the nine principal aquifers in the State (fig. 1) averaged about 243 million gallons per day and accounted for 54 percent of the total ground water used in the State (fig. 2). This represents an increase of about 22 percent in the use of ground water for public supply since 1980 when public-supply withdrawals averaged about 200 million gallons per day.

Most of the ground water used for public supply in 1985 was withdrawn by public water-supply systems in West Tennessee. Ground-water withdrawals in West Tennessee averaged 185 million gallons per day and accounted for 76 percent of the ground water used for public supply in the State.

The principal public-supply systems that use ground water in Tennessee are shown in figure 3 and are listed by county in table 1. The county with the largest ground-water withdrawal for public supply in 1985 was Shelby County (Memphis), where withdrawals totaled 141 million gallons per day, or 58 percent of ground water withdrawn for public supply in the State. Thirty-two of the 181 principal public water-supply systems listed in table 1 (multiple public water-supply systems at map numbers 1, 10, 26, 48, and 52 on figure 3) withdraw 1 million gallons per day or more and accounted for 83 percent of the ground water withdrawn for public supply. The sources of ground water withdrawn by public-supply systems in Tennessee also are listed in table 1.

SELECTED REFERENCES

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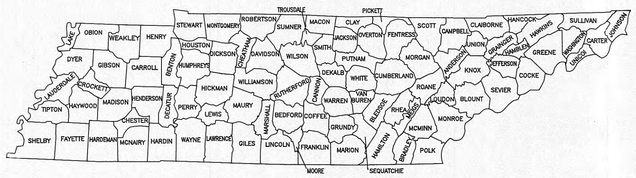
CONVERSION FACTORS

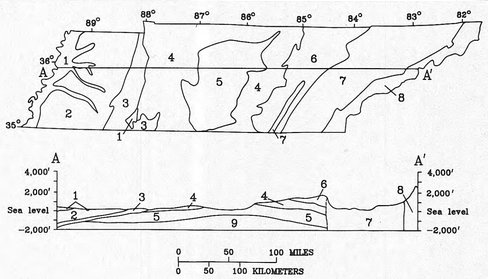
For those readers who may prefer to use metric units (International System) rather than inch-pound units, conversion factors for the terms used in this report are listed below:

Multiply inch-pound	by	To obtain metric units
gallon per minute (gal/min)	0.06309	liter per second (L/s)
million gallons per day (Mgal/d)	0.003785	cubic meters per day (m^3/d)
billon gallons per day (bgd)	3.785	cubic meters per day (m^3/d)

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called "Sea Level Datum of 1929."

LOCATION OF COUNTIES





EXPLANATION

1 ALLUVIAL AQUIFER	5 ORDOVICIAN CARBONATE AQUIFER
2 TERTIARY SAND AQUIFER	6 KNOX AQUIFER
3 CRETACEOUS SAND AQUIFER	7 CAMBRIAN-ORDOVICIAN CARBONATE AQUIFER
6 PENNSYLVANIAN SANDSTONE AQUIFER	8 CRYSTALLINE ROCK AQUIFER
4 MISSISSIPPIAN CARBONATE AQUIFER	A-A' TRACE OF CROSS SECTION

Figure 1.--Geographic distribution of principal aquifers in Tennessee. (From M.W. Bradley and E.F. Hollyday, 1985).

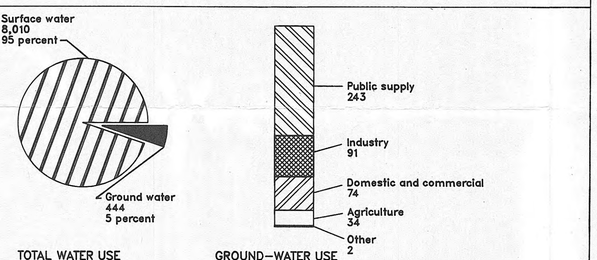


Figure 2.--Estimated total water and ground-water withdrawals, by category of use for Tennessee during 1985, in million gallons per day.

Table 1.--An inventory of community public-supply systems withdrawing at least 50,000 gallons per day of ground water

[Aquifer designations are: 1, Alluvial; 2, Tertiary sand; 3, Cretaceous sand; 6, Pennsylvanian sandstone; 4, Mississippian carbonate; 5, Ordovician carbonate; 9, Knox; 7, Cambrian-Ordovician carbonate; and 8, Crystalline rock. Mgal/d, million gallons per day]

Map No.	County	Public supply	Source name	Aquifer No.	Ground water (Mgal/d)	Surface water (Mgal/d)
1	Shelby	Memphis Light, Gas and Water	Mallory well field	2	21.9	
1	Shelby	Memphis Light, Gas and Water	McCord well field	2	21.1	
1	Shelby	Memphis Light, Gas and Water	Allen well field	2	24.7	
1	Shelby	Memphis Light, Gas and Water	Davis well field	2	11.2	
1	Shelby	Memphis Light, Gas and Water	Lichterman well field	2	21.4	
1	Shelby	Memphis Light, Gas and Water	Sheahan well field	2	20.4	
1	Shelby	Memphis Light, Gas and Water	LNG well field	2	.51	
1	Shelby	Memphis Light, Gas and Water	Morton well field	2	11.3	
2	Shelby	Bartlett-Ellendale Water System	2 wells	2	1.86	
3	Shelby	Germantown Water Department	wells	2	3.15	
4	Shelby	Collierville Water Department	wells	2	1.52	
5	Shelby	Arlington Water System	well	2	.41	
6	Shelby	Millington Water Department	4 wells	2	1.06	
7	Tipton	Munford Water Department	2 wells	2	.31	
8	Tipton	Poplar Grove Utility Department	wells	2	.61	
9	Tipton	Brighton Water System	well	2	.11	
10	Tipton	Covington Water Department	3 wells	2	1.50	
10	Tipton	First Utility District of Tipton County	4 deep wells	2	1.17	
11	Tipton	Mason Water Department	2 deep wells	2	.11	
12	Fayette	Gallaway Water Department	3 wells	2	.22	
13	Fayette	Oakland Water Department	2 wells	2	.12	
14	Fayette	Rossville Water System	2 wells	2	.08	
15	Fayette	Moscow Water Department	1 well	2	.08	
16	Fayette	Somerville Water System	4 wells	2	.63	
17	Shelby	Pine Lake Cooperative, Inc.	2 wells	2	.05	
18	Haywood	Stanton Water System	well	2	.09	
19	Haywood	Brownsville Water District	well	2	1.48	
20	Lauderdale	Fort Pillow State Prison	wells	2	.54	
21	Lauderdale	Henning Water Department	well	2	.10	
22	Lauderdale	Ripley Water System	4 wells	2	1.49	
23	Lauderdale	Lauderdale Water System	4 wells	2	.46	
24	Lauderdale	Gates Water Department	2 wells	2	.06	
25	Lauderdale	Halls Water Department	3 wells	2	.55	
26	Dyer	Dyersburg Sub. Con. Utility District	3 wells	2	.35	
26	Dyer	Dyersburg Water Department	4 wells	2	3.86	
27	Dyer	Newbern Water Department	3 deep wells	2	.71	
28	Dyer	Trimble Water System	2 wells	2	.13	
29	Dyer	Northwest Dyersburg Utility Department	wells	2	.21	
30	Lake	Ridgely Water System	2 wells	2	.18	
31	Lake	Tiptonville Water System	3 wells	2	.68	
32	Lake	Reelfoot Utility District	2 wells	2	.14	
33	Obion	Hornbeak Utility District	3 wells	2	.09	
34	Obion	Elbridge Utility District	2 deep wells	2	.28	
35	Obion	Obion Water Department	2 wells	2	.24	
36	Obion	Kenton Water Department	2 wells	2	.16	
37	Obion	Troy Water System	2 wells	2	.20	
38	Obion	Union City Water Department	wells	2	2.48	
39	Obion	South Fulton Water System	deep wells	2	.44	
40	Weakley	Martin Water Department	4 wells	2	1.42	
41	Weakley	Dresden Water Department	2 wells	2	.50	
42	Weakley	Gleason Water Department	2 wells	2	.23	
43	Weakley	Sharon Water System	wells	2	.24	
44	Weakley	Greenfield Water Department	wells	2	.29	
45	Gibson	Bradford Water System	well	2	.13	
46	Gibson	Rutherford Water System	2 deep wells	2	.15	
47	Gibson	Dyer Water Department	3 wells	2	.35	
48	Gibson	Gibson County Wun. Water	wells	2	.82	
48	Gibson	Trenton Water System	3 wells	2	.68	
49	Gibson	Milan Water Department	3 wells	2	1.38	
50	Gibson	Gibson Water Department	2 wells	2	.10	
51	Gibson	Medina Water Department	2 wells	2	.07	
52	Gibson	Humboldt Water Department	4 wells	2	1.51	
53	Crockett	Crockett Mills Utility District	2 deep wells	2	.05	
54	Crockett	Friendship Water Company	3 wells	2	.09	
55	Crockett	Maury City Water Department	2 wells	2	.10	
56	Crockett	Alamo Water Department	4 wells	2	.30	
56	Crockett	County Wide Utility District	wells	2	1.09	
57	Crockett	Bells Public Utility District	well	2	.17	
58	Madison	Jackson Water System	wells	2	8.85	
59	Hardeman	Toone Water System	3 wells	3	.21	
60	Hardeman	Whiteville Water Department	2 wells	2	.12	
61	Hardeman	Bolivar Water System	well	3	1.30	
62	Hardeman	Middleton Water Department	2 wells	3	.11	
63	Hardeman	Grand Junction Water Department	2 wells	2	.20	
64	McNairy	Michie Water Department	wells	3	.19	
65	McNairy	Selmer Water System	wells	3	1.67	
66	McNairy	Bethel Springs Water System	well	3	.08	
67	Chester	Henderson Water Department	5 wells	3	.71	
68	Henderson	Scotts Hills Water System	2 wells	3	.14	
69	Carroll	Clarksburg Utility District	2 wells	3	.13	
70	Carroll	Cedar Grove Utility District	2 wells	2	.07	
71	Gibson	Milan Arsenal	wells	2	.90	
72	Carroll	Atwood Water System	well	2	.11	
73	Carroll	Trezevant Water System	2 wells	2	.10	
74	Carroll	Huntingdon Water Department	3 wells	2	.59	
75	Carroll	McKenzie Water Department	wells	2	.67	
76	Carroll	Bruceton Water System	well	3	.34	
77	Carroll	Hollow Rock Water Department	2 wells	3	.08	
78	Benton	Big Sandy Water System	well	3	.06	
79	Henry	Henry Water System	2 wells	2	.08	

Table 1.--An inventory of community public-supply systems withdrawing at least 50,000 gallons per day of ground water--Continued

Map No.	County	Public supply	Source name	Aquifer No.	Ground water (Mgal/d)	Surface water (Mgal/d)
80	Henry	Paris Board of Public Utilities	well	3	1.04	
81	Henry	Henry County Water Company	3 wells	3	.24	
82	Henry	West Tennessee Water Company	2 deep wells	3	.11	
83	Henry	Puryear Water System	2 deep wells	2	.07	
84	Houston	Tennessee Ridge Water System	2 wells	4	.16	
85	Humphreys	McEwen Water Department				
86	Humphreys	Waverly Water Plant	2 wells	4	.20	
			2 wells	4	1.00	
87	Decatur	Decaturville Water System	well	5	.12	
88	Hardin	Savannah Public Utility District	6 wells	1	1.55	
89	Wayne	Collinwood Water Department	4 springs	4	.67	
90	Lawrence	St. Joseph Water System	spring	4	.91	
91	Lawrence	Loretto Water Department	Still Horse Spring	4	.18	
92	Lawrence	Leoma Utility District	spring	4	.85	
93	Lawrence	Lawrenceburg Water System	spring	4	3.27	
94	Lawrence	Summertown Water System	Shoal Creek wells	4	.98	
95	Lewis	Hohenwald Water System	Downey Spring wells	4	.31	
96	Dickson	Harpeth Utility District	Baker Spring	4	.14	
97	Dickson	Vanleer Water System	spring	4	.09	
98	Williamson	Fairview Water System	well and spring	4	.43	
99	Williamson	Franklin Water Department	46 springs	4	.37	2.23
100	Williamson	Nolensville Utility District	Harpeth River wells	5	.18	
101	Williamson	College Grove Utility District	well	5	.05	
102	Maury	Mt. Pleasant Water System	5 springs	5	.83	
103	Giles	Ardmore Water System	wells	4	.24	
104	Lincoln	Fayetteville Water System	springs	4	.69	1.78
105	Lincoln	Lincoln County Board of Public Utilities	Elk River wells	4	.70	
106	Bedford	Wartrace Water System	spring	5	.46	
107	Rutherford	Eagleville Water Department	2 wells	5	.05	
108	Rutherford	Murfreesboro Water Department	spring	5	.53	4.64
109	Wilson	Watertown Water System	East fork Stones R. wells	5	.16	
110	Macon	Lafayette	Adams Spring	4	.68	
111	Macon	Red Boiling Springs Water System	Spring Creek springs	4	.44	
112	Dekalb	Dowelltown-Liberty Utility District	wells	5	.09	
113	Cannon	Woodbury Water System	spring	5	.25	
114	Franklin	Estill Springs Water Department	Estill Spring	4	.28	
115	Franklin	Huntland Water System				
116	Franklin	Belvidere Rural Utility District	wells	4	.16	
117	Franklin	Decherd Water Department	well	4	.11	
118	Franklin	Cowan Board of Public Utilities	2 wells	4	.31	
119	Grundy	Tracy City Water System	spring	4	.24	
120	Marion	Jasper Water System	well	6	.32	
121	Marion	Sequatchie Water Works	Blue Spring Sequatchie River	7	.60	.01
122	Hamilton	Walden Ridge Utility District	Blowing Cave Spring	7	.72	
123	Hamilton	Union Fork-Bakewell Utility District	2 wells	7	.46	
124	Hamilton	Sale Creek Utility District	2 wells	7	.16	
125	Hamilton	Soddy-Daisy-Falling Water Utility District	2 wells	7	.23	
126	Hamilton	Hixson Utility District	wells	7	.30	.68
127	Hamilton	Eastside Utility District	Soddy Creek embayment	7	2.98	
128	Hamilton	Savannah Valley Utility District	Cave Springs	7	3.38	
129	Bradley	Cleveland Water Department	wells	7	.65	
			spring	7	1.13	5.10
130	Polk	Ocoee Utility District	Waterville Spring Hiwassee River			
131	Polk	Copperhill Water System	Wildwood Spring	7	.46	
132	Polk	Benton Water System	springs	7	.13	
133	Polk	Cherokee Hills Utility District	springs	7	.17	
134	Monroe	Tellico Plains Water Department	4 springs	7	.84	
135	Monroe	Sweetwater Utility Board	wells	7	.26	
136	McMinn	Athens Utilities Board	Cannon Spring Sweetwater Creek	7	.48	.72
137	Meigs	Decatur Water Department	Ingleside Spring	7	.98	.95
138	Rhea	Graysville Water System	Doaktaula Creek spring	7	.26	
139	Rhea	Spring City Water System	wells	6	.17	
140	Bledsoe	Pikeville Water System	spring Piney River	7	.25	.48
141	Roane	Kingston Water System	3 wells	7	.29	
142	Roane	Cumberland Utility District	spring	7	.20	.43
143	Roane	Oliver Springs Water Board	Watts Bar Lake springs Cumberland River	7	.55	.28
144	Morgan	Plateau Utility District	Little River Bacon Spring wells	7 6	.44 .35	.37
145	Scott	Oneida Water and Sewer Commission	Crooked Fork Creek 2 wells	6	.23	.94
146	Anderson	North Anderson County Utility District	Howard Baker Lake Shatterly Spring	7	.29	.57
147	Anderson	Norris Water Commission	Clinch River			
148	Anderson	First Utility District of Anderson County	Clear Creek Spring springs	7 7	.32 .29	
149	Knox	Hallsdale-Powell Utility District	springs Beaver Creek Melton Hill res.	7	1.29	2.36
150	Knox	First Utility District of Knox County	Walker Springs Tennessee River	7	.04	3.92
151	Loudon	Dixie Lee Utility District	spring	7	.57	
152	Loudon	Loudon Utility District	Robinson Spring Tennessee River	7	.62	4.00
153	Loudon	Piney Utility District	spring	7	.36	
154	Sevier	Gatlinburg Water Department	well W. Prong Little Pigeon River	8	.05	1.50
155	Sevier	Webb Creek Utility District	9 wells	8	.07	
156	Jefferson	White Pine Water System	wells	7	.24	
157	Jefferson	Dandridge Water Department	spring well	7	.31	
158	Jefferson	Jefferson City Water System	Jarnigan Wine	7	1.50	1.39
159	Union	Luttrell Blaine Corryton Utility Dept.	Mossy Creek springs	7	.20	
160	Union	Waynardville Water Department	well and spring	7	.12	
161	Claiborne	Claiborne County Utility District	Ball Creek Spring	6	.65	
162	Claiborne	Lincoln Memorial University	spring	6	.11	
163	Hancock	Sneedville Utility District	Charlie Green Spring	7	.36	.01
164	Hamblen	Morristown Water Department	Brier Creek trib. Havely Spring wells Havely Spring Creek Cherokee Lake	7	1.80	4.20
165	Hawkins	Surgoinsville Utility District	spring	7	.128	
166	Hawkins	First U.D. of Hawkins County	springs	7	1.30	
167	Sullivan	Chinquapin Grove Utility District	springs	7	.14	
168	Sullivan	Bluff City Water System	springs	7	.22	
169	Johnson	Mountain City Water System	Underwood Spring springs	7	.30	.45
170	Carter	Roan Mountain Utility District	spring wells	8	.05	
171	Carter	Hampton Utility District	spring	7	.56	
172	Carter	First Utility District of Carter Co.	Campbell Spring	7	.73	
173	Carter	Elizabethton Water Department	springs	7	7.62	
174	Washington	Johnson City Water Department	Unicoi Springs (3) Watauga River S. Fork Holston River	8	4.35	9.19
175	Washington	Jonesboro Water Department	Sinking Creek Spring Nollichucky River	7	.23	1.73
176	Unicoi	Erwin Utility Board	springs	7	1.22	
177	Morgan	Sunbright Utility District	wells	6	.09	

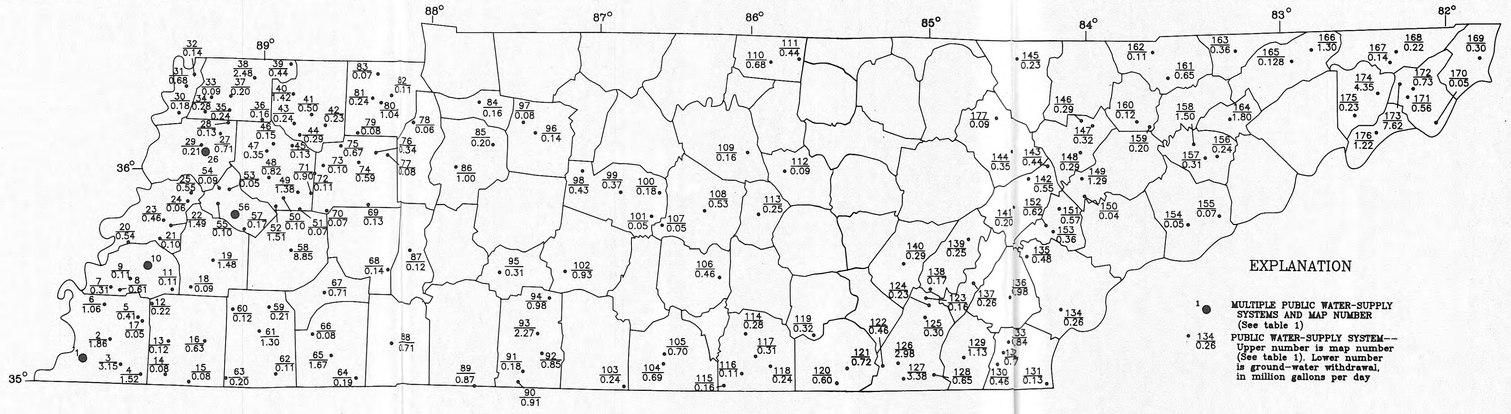


Figure 3.--Location of community public-supply systems in Tennessee with a minimum withdrawal of 0.05 million gallons per day during 1985.

GROUND-WATER USE BY PUBLIC-SUPPLY SYSTEMS IN TENNESSEE IN 1985

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1989

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