

# Water Supply

No. 13

Obed Watershed Community Association

November 2006

## Water Supply Timeline

- 1930 City of Crossville water utility organized.
- 1939 City builds Meadow Park Lake.
- 1959 City builds Holiday Lake. The City sold the property surrounding the lake to the developer of Holiday Hills but reserved the water rights.
- 1970s: Rural utility districts form to build lines and sell water to rural areas that depended on wells.
- 1994 Catoosa Utility District proposes a dam that would have covered 100 acres on upper part of Clear Creek, but the project was halted, largely due to environmental group resistance.
- 1995 The Rural Water Improvement Plan study was conducted by local and state officials. It predicted that Cumberland County's existing water supply would only meet the needs of current users through 2010 even with the expansion of the city's water treatment capacity to 6 MGD (million gallons a day.)
- 1997 All utility districts signed a letter requesting assistance in finding a new water source. They promised to work together on a regional basis to obtain a long-term water supply solution through 2050.
- County officials ask the state to withdraw the Obed Wild and Scenic River from consideration as an Outstanding National Resource Water, arguing that the designation could undermine the county's efforts to secure a water supply in the future.
- 11/97 City Council votes to seek option for purchase of land to create new water resource.
- 1998 4/98 City hires engineers to conduct a preliminary study on City's Caney Fork Lake  
6/98 Army Corps of Engineers (ACE) begins Preliminary Environmental Review study for a new water source.  
7/98 TN Department of Environment and Conservation (TDEC) and Cumberland County announce a model regional water planning partnership to demonstrate how utility districts can work together to minimize dam building and protect free flowing streams. The six utility districts agreed to the partnership and their willingness to share water resources and infrastructure to address future water supply needs. TDEC put up \$75,000 to match federal funds to pay ACE.  
12/98 ACE completes Preliminary Environmental Review study.
- 1999 3/99 The Meadow Park treatment facility is renovated to expand treatment capacity to 3.5 MGD.  
5/99 County Commission passes resolution to create the Cumberland Plateau Regional Water Authority. (It was passed by the TN General Assembly as a private act in 4/00.) The act calls for the five rural water districts and the Crossville water district to combine financial resources and plan for the long-term water needs of the county and Plateau.  
6/99 TN Water Quality Control Board (TWQCB) designates 45 miles of the Obed River and its tributaries as an Outstanding National Resource Water because of and to protect its free flowing, scenic, and unpolluted condition. The Tier II boundaries are within the Obed Wild and Scenic River National Park. The Obed Wild and Scenic River is visited by 200,000 people a year and is home to eight federally listed protected species.

TWQCB allowed the river to remain classified as Tier II: “If the current search for a regional water supply by the Cumberland Plateau Regional Water Authority results in a determination that it is necessary to utilize the Obed River as its source of drinking water, for that purpose the Obed River will be designated Tier II and any permit issued for that project shall be considered under the requirements for Tier II.” Designation of it as a Tier III stream would have removed the argument that its degradation would be needed in the interest of social and economic development.

- 8/99 The Water Resources Development Act is authorised by Congress. It budgets \$5m for engineering and design, plus funding for various water projects, including one in County.
- 8/99 Crab Orchard Utility District asks Fairfield Glade permission to link into its lakes.
- 12/99 The City offers to take over rural utility districts.
  
- 2000 4/00 Resource Study Act of 2000: Senator Frist sponsored a \$1 million appropriation bill for a study of TN current water supply conditions and projected trends in order to address its future needs. The state in partnership with the ACE would conduct the study to assist local governments find a reliable and affordable existing water supplies.
- 4/00 Frist sponsors The Water Summit on TN’s water supply future
- 6/00 City declines joining the Cumberland Plateau Regional Water Authority, feeling that City would be at a disadvantage by having only one vote against the five rural water districts and County Mayor.
- 9/00 City votes to seek permit to build a dam on the Caney Fork above the Bridgestone Firestone Centennial Wilderness Area.
- 12/00 South Cumberland buys a well that produces 400,000 gallons daily
  
- 2001 9/01 The City engineer reports that the City’s proposed dam on Caney Fork cannot sustain a sizable reservoir for water supply and that water harvesting of the Caney Fork River may not be feasible.
- 12/01 The City pledges cooperation with the Cumberland Plateau Regional Water Authority in the locating and permitting of a new raw water source without being a member of the Authority.
  
- 2002 6/02 The Cumberland Plateau Regional Water Authority commissions Breedlove, Dennis, Young & Associates (BDY) to conduct a water supply study.
  
- 2003 1/03 The City funds an engineering proposal to study expansion of Meadow Park Lake.
  
- 2004 2/04 The State of TN reports that Watts Bar reservoir can be used as a water source.
- 5/04 Cumberland Plateau Regional Water Authority board membership changed from utility district general managers to appointees of County Mayor with approval of County Commission. Its membership was expanded from six to ten members, based on one appointee for every 2,500 customers.
  
- 2005 8/05 The City annexes Catoosa Utility District, circumventing County Mayor’s veto of their merger.
- 11/05 The City signs agreement with Army Corps of Engineers to fund an EIS study of the water supply alternatives identified in the 1998 Regional Water Supply Study and engineering costs of recommended alternative.
  
- 2006 3/06 City approves raising Holiday Lake by nine inches.
- 6/06 South Cumberland Utility District signs contract with Crab Orchard Utility District for water, cutting its purchase of City water by half.

**Water Utility Districts**

	Water Source	Capacity	Customer Groups	Customers
Crossville	Meadow Park Lake Holiday Hills Lake	3.5 MGD 3 MGD	Inside City Within district Rural water districts	14,000
Crab Orchard	Lake Otter	4 MGD	Within district Fairfield Glade	5,000
Catoosa	City of Crossville		Within district	na
South Cumberland	City - 50% Crab Orchard - 50% Well	.4 MGD	Within district	na
Grandview			Within district	na
West Cumberland	Bondcroft District in White Co. (60%), Crossville (40%)		Within district	na

**Water Growth Demand Scenarios**  
5.0 MGD Pumped in 2005 (ACE)  
**Current Capacity - est. 10.3 MGD**

		2010			2030			2050		
		Est.** Pop.	Avg. MGD	Peak MGD	Est. Pop.	Avg. MGD	Peak MGD	Est. Pop.	Avg. MGD	Peak MGD
<b>A C E P E R</b>	Limited	49,413	4.3	6.4	65,727	5.7	8.5	84,265	7.3	11
	Historic	60,430	5.2	7.8	92,595	6.6	12	125,920	10.9	16
	Median	70,889	6.1	9.1				151,335	13.1	19.7
	Unlimited	84,247	7.3	11	257,892	22.3	33	789,454	68.3	102
	BDY*	57,623	6.5	9.5	79,187	11.5	17.2	-	-	-

**ACE PER** - Army Corps of Engineer's Preliminary Environmental Review

\*The BDY study used an average compounded annual growth rate of 2.75% through 2030, the actual rate during the years 1970-2000.

\*\* The ACE study used customer growth projection rather than a population growth projection. The estimated population assumes 2.3 persons per customer, the average Cumberland County household size in 2000.

**Water Consumption**

**Transitioning from Wells to Public Water:** It is typical to find increased water consumption in communities that have transitioned from well water to a public water supply because households no longer need to limit water use. The convenience of an improved water supply encourages more water consumption.

**Upscale Development Increases Water Consumption:** Higher end development results in changing water use patterns in individual households due to larger homes, lawn irrigation, swimming pools, and other water intensive uses. Development also fosters commercial enterprises that provide water-intensive amenities (car washes, landscape irrigation), as well as the expansion of businesses, industries, and institutions to serve the growing population. The increase in water consumption is particularly dramatic during the most rapid stages of population increase and economic development.

**Per Capita Water Consumption  
Gallons Per Day (GPD)**

	Cumberland County	Putnam County	TN	US
1984	53 GPD			
1993	77 GPD			
1995		161 GPD	148 GPD	150 GPD

The BDY study assumed water consumption in Cumberland County would increase to 145 GPD in 2030 (double current use.)

**Peak Demand** is water use that exceeds average daily consumption. The current peak demand in Cumberland County is estimated to be 125% of average daily demand. Peak demand in Cumberland County occurs in July - September during the day due to summer residents, tourists, watering of lawns and gardens. The BDY study set the 2030 peak at 135% of average daily demand.

**Water loss:** The loss of water due to leakage, uncompensated municipal use, and infrastructure maintenance is common among utility providers and accounts for approximately 14% of water produced nationwide. Tennessee estimated average of conveyance losses alone reaches 15%. While a detailed loss estimate for Cumberland County is not available, the BDY study reported that informed engineering estimates of system loss in Cumberland County range as high as 25%.

**Cumberland County Growth**

**County New Housing Growth Rate Ranks 39<sup>th</sup>:** Over the three-year period 2002-2005, Cumberland County ranked 39<sup>th</sup> among the counties in the growth rate for new housing units; the County had a 2.6% growth rate which was below the state average of 4.5%.

**Counties with a Higher New Housing 3-Year Growth Rate than Cumberland County (2002-05)**

**Resources:** Crossville Chronicle: 3/2/95, 4/21/98, 11/12/97, 7/15/98, 7/23/98, 2/5/99, 2/24/99, 3/2/99, 5/26/99, 6/29/99, 8/4/99, 4/12/00, 6/14/00, 6/21/00, 6/30/00, 9/26/00, 12/13/00, 9/4/01, 10/12/01, 6/28/02, 2/18/04, 5/7/04, 8/32/05, 11/29/05, 3/14/06; Knoxville News Sentinel: 7/23/98, 6/27/99, 4/19/00; Annual Estimates of Housing Units for Counties in TN (US Census.)

The Obed Community Association has as its purpose community appreciation and volunteer involvement in ongoing research of the natural and cultural heritage of the Obed River watershed within Cumberland County. Louise Gorenflo, OWCA director, produced this fact sheet. Those wanting to join this membership organization or more information may contact OWCA at 484-2633 or at 185 Hood Drive, Crossville, TN 38555.