



2 February 2007

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Sharron Nabors
1822 East Polk
Paris, TX 75460

Re: Lake Wright Patman

Sharron Nabors,

Thanks for sharing the fly-over Sulphur River Basin DVD with us – it's helpful for us in Austin to get this perspective. As you know, TPWD does not always support the construction of new reservoirs and we have voiced our concerns regarding the proposed Marvin Nichols Reservoir in the Region C plan. We share your interest in alternative strategies such as raising the level of Lake Wright Patman, which we discussed at the TWDB Board meeting on November 14, 2006.

There are two numbers to consider when evaluating the potential enlargement of an existing reservoir. The first is the additional storage capacity provided by the increased level. This can be calculated simply by multiplying the proposed increase in elevation by the average surface area of the reservoir over that increase. As has been noted in the presentation entitled "Why does Texas need Marvin Nichols as a water source ??", for a 16' increase in Lake Wright Patman and an approximate average surface area of 60,000 acres, this equals 960,000 acre-feet. The second number that is important is the additional firm yield made available by the increase in elevation. The firm yield of a reservoir is the amount of water that can reliably be supplied each year through a simulated repeat of the worst drought ever recorded (i.e., the so-called "drought of record"). This may be visualized as the amount of water that can be continuously pumped (in units of acre-feet/year) such that the reservoir goes dry the day before the storms come to break the drought and refill the reservoir. Thus, the storage capacity is not equal to the firm yield and it is the firm yield that is of primary interest to water suppliers. Estimating the firm yield is generally a computer calculation that must be based on long-term hydrological records, Texas water law, reservoir shape and size, and other considerations.



Take a kid
hunting or fishing



Visit a state park
or historic site

Freese and Nichols, Inc. (FNI), who are also the consultants for Region C, recently estimated the firm yield of Lake Wright Patman for the US Army Corps of Engineers (USACE). The final report can be downloaded at this website:

http://www.swf.usace.army.mil/pubdata/notices/waterallocationpdf/system_assessment/system_assessment.asp

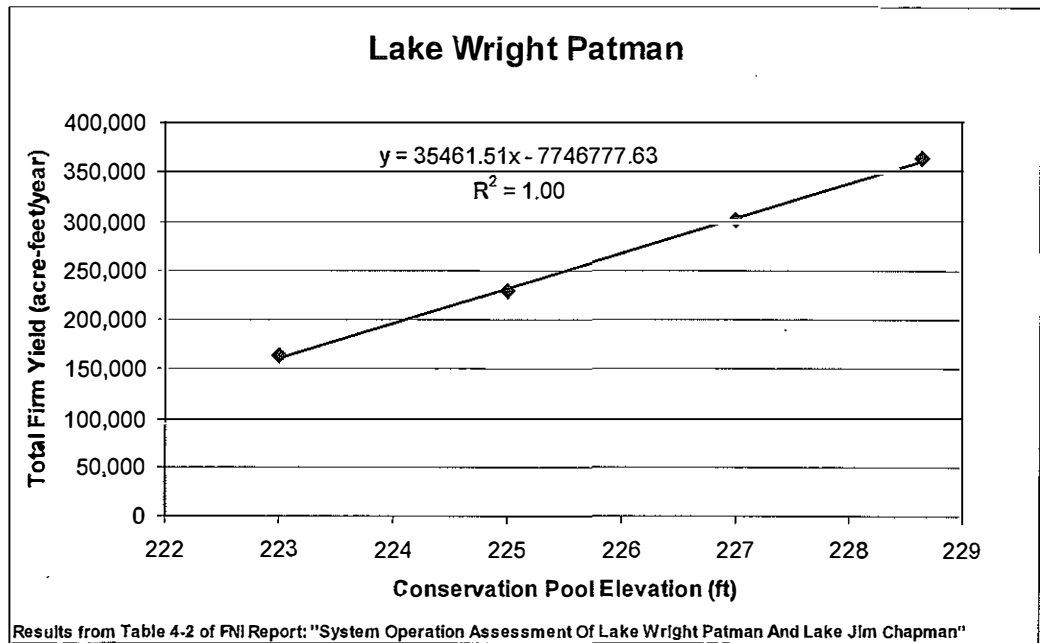
They used a computer model to estimate the increase in firm yield under various combinations of raising the conservation pool elevation of Lake Wright Patman, lowering the pool minimum elevation, and operating Lake Wright Patman as a system with Lake Jim Chapman. The highest elevation that they considered was setting the conservation pool to a constant level at 228.64 feet. This, combined with lowering the minimum pool elevation, increased the firm yield of Lake Wright Patman from approximately 180,000 acre-feet/yr to 363,717 acre-feet/year, for an additional firm yield supply of about 180,000 acre-feet/year.

By comparison, Marvin Nichols Reservoir is estimated to provide a firm yield of 612,300 acre-feet/year, of which 489,840 acre-feet/year (80%) is planned to be made available to Region C.

Thus, by the calculations of the Region C consultant on behalf of the USACE and Region C, raising the conservation pool elevation of Lake Wright Patman to 228.64 feet would provide approximately 37% of the water that Region C is expecting to obtain from Marvin Nichols.

There are two additional strategies that FNI identified to move water from Lake Wright Patman to Region C: (1) purchase of 100,000 acre-feet/year from the City of Texarkana, and (2) system operations with Lake Jim Chapman. Collectively, these three strategies (increased lake levels, purchase from Texarkana, and system operations) were estimated to provide 390,000 acre-feet/year, or about 80% of the water that Region C is expecting to obtain from Marvin Nichols.

FNI did not consider any conservation pool elevations above 228.64 ft, but the presentation you provided us proposed an elevation of 236 ft. Thus, the FNI report cannot directly provide an indication of the additional firm yield at an elevation of 236 ft. However, a plot of the total firm yield of Lake Wright Patman as a function of conservation pool elevation (below) may be used to roughly estimate such additional firm yield.



If this trend is extrapolated to a conservation pool elevation of 236, it results in about 620,000 acre-feet/year in total firm yield, for an increase over the existing firm yield (180,000) of 440,000 acre-feet/year. This is about 90% of the water that Region C is expecting to obtain from Marvin Nichols. This value is of course very approximate because of the extrapolation required. It would be much preferable to run an appropriate computer model to generate the value more accurately.

Finally, since the Region C plan recommended 112,100 acre-feet/year from raising Lake Wright Patman, in addition to Marvin Nichols Reservoir, the additional water for Region C would be closer to $440,000 - 112,100 = 330,000$ acre-feet/year (approximately), or about 70% of the water that Region C is expecting from Marvin Nichols. This amount, combined with the other two strategies for Lake Wright Patman, could come close to the total amount of water that Region C is expecting from Marvin Nichols, thus offsetting the perceived need for Marvin Nichols but probably not the other Region C proposed reservoirs.

This discussion is for illustrative purposes only. I am not aware of TPWD's opinion of raising Lake Wright Patman above 228 ft. As you know, John Jones and the other caretakers of the White Oak WMA may have significant concerns with increases in Lake Wright Patman above 228 ft. They of course already have very significant concerns with Marvin Nichols.

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I hope that this discussion has been helpful. We at TPWD are not currently engaged in any water supply studies related to Lake Wright Patman, nor do we plan to be. The information in this letter is simply a brief summary of work already published by other authors. Should you have any questions on the contents of this letter, please do not hesitate to call me at 512-912-7034.

Sincerely,

A handwritten signature in black ink, appearing to read "Dan Opdyke". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Dan Opdyke