MARVIN NICHOLS RESERVOIR

Refocusing the Debate

MARVIN NICHOLS RESERVOIR,

a reservoir project proposed for the Sulphur River in five counties of Northeast Texas, would permanently inundate more than 62,000 acres of forests and family ranches, cost the ratepayers a minimum of $1.7 billion, impose staggering impacts to wildlife habitat, and force thousands of East Texans to sell their land.

Eighty percent of the water from Marvin Nichols Reservoir would be piped to the Dallas/Fort Worth/North Texas area for future water supply. There are numerous options to meet the DFW area's future water demands that would cost less and have much lower impact than building a new reservoir. Water conservation programs could lead to substantial reductions in demand. Several already-existing sources of supply could be tapped for additional supply.

The attached information documents many of the reasons why Marvin Nichols Reservoir is not an appropriate choice as water supply for North Texas.

Presented by:

National Wildlife Federation (NWF)
The Lone Star Chapter of the Sierra Club
Texas Committee on Natural Resources (TCONR)
Friends United for a Safe Environment (FUSE)
The Sulphur River Oversight Society (SOS)
Ward Timber Company

August, 2003
Updated by TCONR, May, 2004

MARVIN NICHOLS RESERVOIR PROJECT SHOULD BE REMOVED FROM THE STATE WATER PLAN

Some North Texas cities use up to a third more water per person than the state average, yet planners project an increase in per capita use over the next few decades.

The Sulphur River Basin Authority (SRBA) is promoting construction of Marvin Nichols Reservoir on the Sulphur River, which would permanently flood more than 62,000 acres of private land in Northeast Texas, much of it quality bottomland hardwood forests very valuable for timber and wildlife habitat. An additional 10,000 acres would be inundated periodically. The cost of the reservoir plus necessary pipelines and pump stations is officially estimated at $1.7 billion. Other estimates put the cost considerably higher.

The water that would be developed in Marvin Nichols is not needed for water supply in Northeast Texas, where private land, timber and wildlife habitat would be lost. Eighty percent of the water would be piped to Dallas, Fort Worth, and the counties north of Dallas /Fort Worth.

NORTH TEXAS WATER NEEDS COULD BE MET AT A LOWER COST

As documented in the attached information, the water needs of the Dallas, Fort Worth, North Texas area could be met more economically by conserving water and by fully utilizing existing sources of supply than by building Marvin Nichols Reservoir. If the large municipal entities in the DFW area were to achieve similar percentages of reduction as the cities of San Antonio and El Paso have achieved, the savings would amount to more than 500,000 acre-feet per year -- a larger amount than the region expects to pipe from Marvin Nichols Reservoir. Cost of the conserved water delivered treated to consumers' homes would be less per acre-foot than Marvin Nichols water.

For any water demand that is not met by conservation alone, there are numerous water supply options superior to the proposed Marvin Nichols dam project. Short-term shortages could be met by temporary water purchase agreements from municipalities that have a surplus over the next thirty years. Potential longer-term supplies include purchasing unallocated water from Lake Texoma, increasing the yield of the Sulphur River Basin by changing the operating rules of Jim Chapman Lake and Lake Wright Patman, and increased use of return flows.

NEGATIVE ECONOMIC IMPACTS WOULD MAKE THE PERMITTING PROCESS FOR MARVIN NICHOLS HIGHLY CONTENTIOUS

Region D has voted to remove its recommendation that Marvin Nichols be built.

Senate Bill 1, the omnibus water resources act passed in 1997 by the Texas Legislature, mandated 16 regional planning areas around the state, with planning groups set up to make recommendation to the Texas Water Development Board regarding which water strategies should be in the Texas Water Plan.

The Northeast Texas Regional Water Planning Group (Region D) originally recommended construction of the Marvin Nichols dam and reservoir, but after careful examination of many factors, including the impacts to the local economy, the Region D Planning Group voted to amend its plan and remove the recommendation that Marvin Nichols be built. The reservoir remains, for now, as a recommended water strategy in the regional water plan for Region C (Dallas, Fort Worth, and North Texas) but, as noted above, there are less expensive sources of water supply for that region.

Strong opposition has arisen to Marvin Nichols Reservoir because the project would have a tremendous negative impact on the Northeast Texas economy and be an expensive water source for Dallas, Fort Worth, and North Texas.

The proposed reservoir would negatively impact business and agriculture, with the timber industry alone, estimating a revenue loss of up to $275 million per year

Xeihuan Xu, Ph.D, Texas Forest Service Principal Economist, estimates a negative impact on the timber industry of from $87 million to $275 million annually and a loss of 400 to 1300 jobs. Landowners and businesses in Northeast Texas would see additional impacts if tens of thousands of acres of agricultural land were taken out of production and hunting leases cancelled.

VAST AMOUNTS OF LAND, HISTORICAL TREASURES, AND NATURAL FEATURES WOULD BE LOST

Landowners in the Sulphur Basin oppose the reservoir because their land would be condemned by eminent domain. Other residents are concerned about taking land out of the county tax base, about increases in taxes and water rates, and about potential increases in costs of infrastructure and maintenance of roads and other services.

More than 60,000 acres of forest and agricultural land would be destroyed.

Many people oppose destroying the bottomland hardwood forests that provide important habitat for migratory waterfowl and resident wildlife. Preliminary estimates by Texas Parks and Wildlife Department and the U.S. Fish and Wildlife Service indicate that from 163,000 to 648,000 acres of wildlife habitat would have to be protected and actively managed to provide mitigation for lost fish and wildlife habitat values. The dedication of land to mitigation could further exacerbate the loss of tax revenues in Northeast Texas.

Archeological sites and wildlife habitat would be lost.

Hundreds of archaeological sites, many dating back 12,000 to 14,000 years and some perhaps much older, would be inundated by Marvin Nichols Reservoir. In addition, historical sites such as homesteads, cemeteries, and Indian sites that reflect the history of Texas and its settlement by Europeans would be lost.

Water flows would be permanently altered.

The Sulphur River itself would suffer heavy impacts if Marvin Nichols were built, since many miles of river would be inundated and the natural flow regimes altered below the dam. Both aquatic and riparian habitat would be destroyed at the lake site and impaired up and downstream. Compared to the stunning loss of rare free-flowing river and bottomland habitat in Texas, the artificial lake habitat that would be created would be a minor benefit added to the almost-two million surface acres already in existing man-made reservoirs in Texas.

CONSERVATION COULD MEET AREA WATER DEMANDS AT A LOWER COST THAN BUILDING MARVIN NICHOLS

Conserving water could supply water needs for the Dallas/Ft. Worth/ North Texas area more cheaply than building Marvin Nichols Reservoir.

As documented below, conserving water in DFW area municipalities could supply water demands more cheaply than building the Marvin Nichols dam project and associated infrastructure.

Because the Region C Planning Group did not include recommendations for advanced municipal water conservation in the first regional water plan, specific cost estimates for those programs in Region C are not available. However, information included in the 2002 State Water Plan for water conservation efforts recommended by other regional groups allows for reasonable cost comparisons.

The estimated cost for water conservation programs in Region L, which includes the greater San Antonio area, is $399 per acre-foot of water saved. Costs for water conservation programs in Region N (Corpus Christi) and Region G (Abilene, Waco) were estimated at $449 and $574 per acre-foot saved, respectively. To make an apples-to-apples comparison with those figures, it is important to recognize that the figures for water conservation represent the costs for making available water that has been fully treated and distributed to municipal customers. Accordingly, for a fair comparison, costs of municipal water conservation savings must be compared to costs of providing fully treated water through the use of other potential water management strategies.

Neither the Region C nor the Region D Water Plan provides an estimate of the cost of providing fully treated water from the Marvin Nichols dam project to final water users. Again, however, it is possible to use information provided in the 2002 State Water Plan to develop such a comparison. The Region D Water Plan estimates that the Marvin Nichols dam project would provide "raw" water at the dam site for $61 per acre-foot. As itemized in the Region C Water Plan, by the time this water is piped to municipalities in the north Texas area, the per acre-foot cost of untreated water rises to a range of $232-447 per acre foot, depending on the water utility supplied.

In order to make a valid comparison of the cost of Marvin Nichols-derived water to that of a municipal conservation program, however, the treatment and distribution costs must be included. Although such costs were not provided in the Region C or D plans, comparable figures are available in the State Water Plan. Table 1 provides cost figures from some other regional water plans with similar large dam and pipeline projects. Column 7 in that Table represents the estimated cost for transmission, treatment, and distribution, which was calculated by taking the total cost for delivered water (Column 6) and subtracting out the cost for raw water delivered at the dam (Column 5).

Table 1 - Examples from 2002 State Water Plan of estimated costs for developing new water supplies based on construction of large dam and long distance pipelines.

(1) Reg.	(2) Dam	(3) Yield (ac-ft/yr)	(4) Dam cost ($mil)	(5) "Raw" water cost at dam ($/ac-ft)	(6) Cost after transmission treatment & distribution ($/ac-ft)	(7) Net cost for trans., treat. & dist. ($/ac-ft)	(8) Receiving municipality & details
K, L	Shaws Bend	51,576	$315	$430	$1178	$748	San Antonio; 125 mi., 60-in. pipeline, 49 MGD plant, Δ elev. +430 ft
L	Sandies Creek	80,836	$311	$273	$865	$592	San Antonio; 74 mi., 64 in. pipeline, 76 MGD plant, Δ elev. +415 ft.
L	Goliad	99,687	$395	$278	$856	$578	San Antonio; 91 mi., 78 in. pipeline, 93 MGD plant, Δ elev. +450ft.
H	**Bedias**	90,700	$132	$111	$547	$436	Conroe, Reg H Plan Table 11, Δ elev. -30 ft.
H	**Allen's**	99,650	$157	$121	$528 - $629	$407 - $508	Rosenberg, Richmond (Houston area); Reg H Plan Table 11, 2.7 MGD Δ elev. -75, -90 ft.
G, H	**Little River**	129,000	$361	$197	$604 - $793	$407 - $596	Rosenberg, Richmond, Alvin (Houston area), Reg H Plan Table 11, 2.8 MGD, Δ elev. -300, -320 ft.

Notes: Col. 2) bold indicates dam recommended in 2002 State Water Plan; Col. 4) all cost are in 1999 dollars from indicated regional water plans; Includes capital, engineering, legal & contingencies (=35% capital); environmental & archaeological studies and mitigation; land acquisition & surveying Col. 5) given in indicated regional water plan for all except Sandies Cr. and Goliad which were calculated as dam cost financed at 6% for 40 years plus operations and maintenance of dam, typically set at 1.5% of construction capital cost. Col. 6) given in indicated Regional plan as final cost for water transmitted through pipeline from dam, then treated and distributed water in receiving municipality. Col. 7) calculated as difference between transmitted, treated, and distributed minus cost at dam Col. 8) MGD = million gallons/ day treatment capacity, positive elev. value indicates uphill from dam to municipality.

The cost of water from the Marvin Nichols dam project would be substantially higher than the average of the costs of water supplied through a municipal water conservation program.

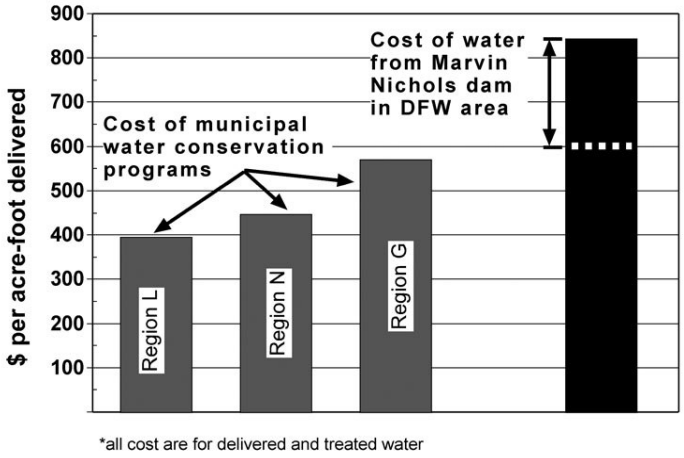
The information in Column 7 of Table 1 indicates that the estimated cost for transmission, treatment, and distribution of municipal water from a large dam/pipeline project ranges from $407 to $748 per acre-foot. Given the long distance that water from the Marvin Nichols dam project would have to be moved, a lower mid-range value of about $550 per ac-ft ($1.69 per 1000 gallons) is used here for comparison purposes.

Using the estimate for transmission, treatment, and distribution cost of $550 per acre-foot, and the previously cited $61 per acre-foot for raw water at the dam, the comparable cost of fully treated and delivered water from the Marvin Nichols dam and reservoir would be about $611 per acre-foot.

For a couple of reasons, this amount may be on the low end of the range of costs for water actually delivered to North Texas area participants. First, the length of transmission pipelines, which affects construction and ongoing pumping costs, from the Marvin Nichols project site to some of the North Texas area project participants, is up to 155 miles, much greater than the length of the other pipelines reflected in Table 1. That would be expected to increase the per-unit cost of water, although those additional costs associated with longer pipelines may be offset to some degree by efficiencies of scale. Second, as discussed in a later section, the estimate of costs for the dam and reservoir appears to be inappropriately low.

Therefore, the cost of municipal water from the Marvin Nichols dam project, after transmission, treatment, and distribution expenses are added, can be conservatively estimated to be in the range of $600 to $850 per acre-foot supplied.

Figure 1 - Comparison of cost for advanced municipal water conservation programs versus developing new municipal supply from Marvin Nichols dam.



As shown in Figure 1, even using the low end of the range, the cost of water from the Marvin Nichols dam project would be substantially higher than the average of the costs of water supplied through a municipal water conservation program.

These comparisons demonstrate a compelling need for a careful analysis of municipal water conservation options.

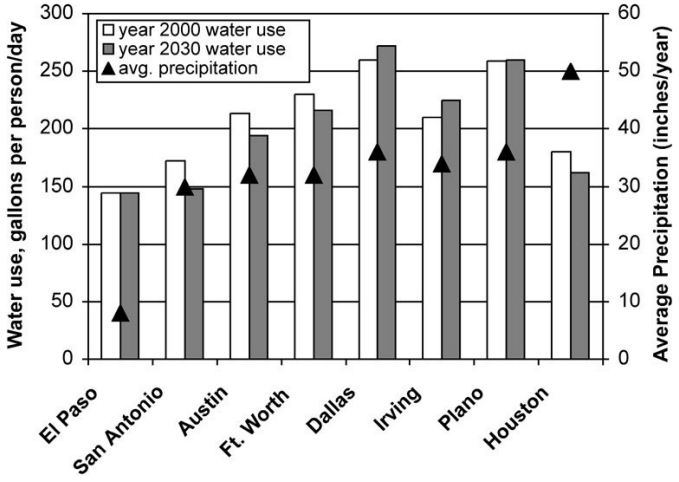
CONSERVATION COULD SUPPLY MORE WATER THAN MARVIN NICHOLS

Conservation comparable to that of San Antonio and El Paso could produce more than 521,000 acre-feet per year for the Dallas/Ft. Worth/ North Texas area.

Not only do municipal water conservation options appear to be cheaper, they also have the potential to supply a huge amount of water.

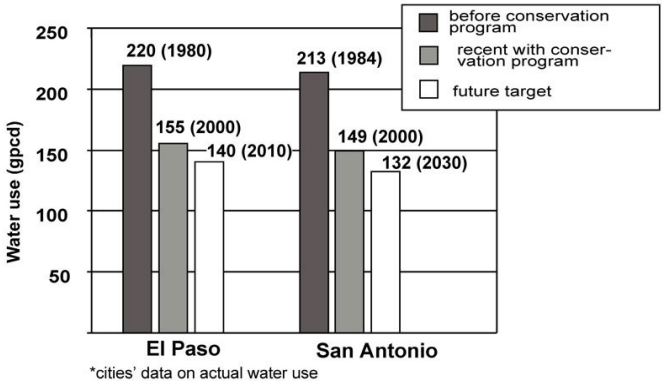
According to the 2002 State Water Plan, cities in the Dallas/Ft. Worth area had the highest per person municipal water use rates in the state. A summary of that information is shown in Figure 2: Although water use rate estimates are currently being revised, the use rates will likely remain among the highest in the state. Those high usage rates indicate the potential for large water savings through conservation. Average annual rainfall data for each city are also shown in Figure 2 to illustrate that variations in rainfall do not explain the disparities in water usage.

Figure 2 - Projected water use rates for major Texas cities from the 2002 State Water Plan are highly variable and not explained by climate.



The National Wildlife Federation analyzed the water savings that could be achieved in the Dallas/Ft. Worth area based on the demonstrated success of the municipal water conservation programs of San Antonio and El Paso. Both of these cities also propose programs to achieve additional savings in the near future. When fully realized, both cities will have reduced per person water use by about 37% as shown in Figure 3.

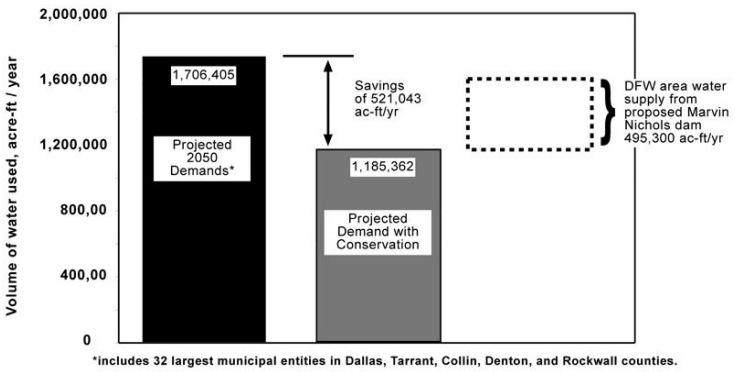
Figure 3 - Examples of actual water savings to date, and target water use rates for the near future for the cities of San Antonio and El Paso.



The National Wildlife Federation analysis[1] found that if the large municipal entities in the DFW area were to achieve similar percent- ages of reduction, the savings would amount to more than 521,000 acre-feet/year. This is more than the volume of water the cities in the Dallas/Ft. Worth metro area propose to divert and pump from the proposed Marvin Nichols Reservoir.

Municipal water conservation has the potential in the Dallas/ Ft. Worth area to offset a substantial portion of the demand for water, eliminating the rationale for costly and environmentally destructive water development projects. The Region C Water Planning Group and water purveyors in the Dallas-Fort Worth area should make conservation the top priority on their list of recommended water strategies.

Figure 4 - Water conserved in Dallas/Fort worth area cities would surpass supply from proposed Marvin Nichols dam.



*includes 32 largest municipal entities in Dallas, Tarrant, Collin, Denton, and Rockwall counties.

[1] *Save Water Rivers and Money: An Analysis of the Potential for Municipal Water Conservation in Texas. National Wildlife Federation, Sept. 2002.*

IF ADDITIONAL WATER IS NEEDED, THERE ARE EXISTING SOURCES OF WATER SUPPLY SUPERIOR TO MARVIN NICHOLS

Lake Texoma has the potential to supply more water to North Texas than Marvin Nichols, and at a lower cost.

For any water demand that is not met by conservation, there are numerous existing water supply options available to the Dallas-Fort Worth area that would be superior to the proposed Marvin Nichols reservoir project. In addition to favorable cost considerations, many of these options can be expected to be far less controversial, and thus more likely to receive permits, than Marvin Nichols.

It is important to recognize that the Region C Water Plan indicates that the overall water supply for the region is sufficient for the near-term. Although some specific communities may face near-term shortages, they could delay the need for additional supplies by immediately initiating better water conservation programs and, if needed, by pursuing temporary water purchase agreements.

Additional longer-term potential water supply sources include bringing water from Lake Texoma or obtaining water from other existing reservoirs such as those in the Sulphur Basin.

According to the *Texas Water Allocation Assessment Report*, prepared by Freese and Nichols for the U.S. Army Corps of Engineers in March 2002, up to 650,000 acre-feet per year could be made available for water supply in Texas from Lake Texoma. An equal amount of water would be available for use in Oklahoma that could, potentially, be available for purchase for use in Texas.

Of the 650,000 acre-feet earmarked for Texas, 145,000 are already allocated for water supply. Congress has authorized the Corps to reallocate an additional 150,000 acre-feet of Texas' portion. The remaining 500,000 acre-feet of the Texas portion is allocated for generating hydroelectric power, a much lower economic use of water. (An acre-foot of water is worth a few dollars for hydropower, but a few hundred dollars for water supply.) Reallocation of all or a portion of the remaining hydropower water would add significantly to Texas' water supply.

Water in Lake Texoma has salinity levels that are slightly above state and federal drinking water standards. As a result, the water would have to be blended with lower salinity water and some of it treated for salt reduction. Desalination would raise the costs over blended water, but desalinated water would still cost significantly less than bringing water from Marvin Nichols Reservoir, because Lake Texoma is so close to DFW.

In short, Lake Texoma is an enormous reservoir that merits priority consideration as part of a comprehensive water management strategy for Dallas, Fort Worth, and North Texas.

ADDITIONAL SOURCES OF SUPPLY

Up to 368,000 additional acre-feet per year could come from the Sulphur Basin without building another reservoir.

There are other alternative water supply sources for Dallas/Ft. Worth and North Texas that would be less expensive, have a much lower environmental impact, and generate a less contentious permitting process than building Marvin Nichols Reservoir.

According to the *Texas Water Allocation Assessment Report*, a significant amount of additional water could be made available from Wright Patman Lake. When Cooper Lake (now known as Jim Chapman Lake) was built upstream of Wright Patman, adding significant flood control capacity to the Sulphur Basin, Congress authorized the Corps to reallocate up to 120,000 acre-feet of Wright Patman's flood control storage to water supply. With that reallocation, more than 100,000 acre-feet per year of water could be added to Patman's available supply, without the necessity of building a new reservoir.

In addition, *System Operation Assessment of Lake Wright Patman and Lake Jim Chapman*, prepared by Freese and Nichols for the U.S. Army Corps of Engineers, Fort Worth District, in January 2003, lists various approaches for increasing the amount of water available from the Sulphur River Basin through the operation of Jim Chapman and Wright Patman Lakes as a system. A presentation made by the Corps based on the study indicates that from 100,000 to 368,000 acre-feet per year of additional water supply could be made available from the Sulphur River Basin, again without the need to build a new reservoir.

THE COST OF THE MARVIN NICHOLS APPEARS TO BE SERIOUSLY UNDERESTIMATED

Comparison with the estimated costs of fifteen other dam proposals indicates that the cost of Marvin Nichols has been seriously underestimated.

Based on a comparison with other major dam projects studied during the development of the 2002 State Water Plan, the cost of developing the Marvin Nichols dam project appears to be seriously underestimated. As shown in Table 2, Column 4, the Region D Water Plan estimates that the Marvin Nichols dam would cost roughly $447 million to build (in 1999 dollars)[1]. After this capital expenditure is amortized and operations and maintenance costs are added, the Region D Planning Group estimated the cost of "raw" water at the dam site to be $61 per acre foot as also shown in Column 7 of Table 2.

Table 2 - Compare estimated cost of building Marvin Nichols dam to other large dams proposed in the 2002 State Water Plan.

(1) Reg.	(2) Dam	(3) Yield capacity (ac-ft)	(4) Dam total cost ($millions)	(5) Annualized cost of Construction ($millions)	(6) O&M annual cost ($millions)	(7) Raw water cost at dam ($/ac-ft)
D	**Marvin Nichols**	550,842	$447	$31.61	$2.19	$61
C	**Lower Bois d'Arc**	123,000	$115	$7.63	$1.25	$72
H	**Bedias**	90,700	$132	$8.77	$1.34	$111
G	South Bend	106,700	$205	$13.90	$1.16	$141
G,H	**Little River**	129,000	$361	$24.18	$1.28	$197
H	Tehuacana	61,100	$169	$11.23	$1.71	$212
G	Little River - small	56,000	$173	$11.49	$0.90	$221
H	Cleveland	65,900	$199	$13.23	$2.02	$231
L	Sandies Creek	80,836	$311	$20.70	$1.40	$273
L	Goliad	99,687	$395	$26.25	$1.45	$278
G	Millican, Panther Cr.	235,200	$1,237	$82.23	$3.87	$366
H	Lower lake Creek	67,200	$340	$22.56	$3.44	$387
K	Tennessee Colony	405,800	$2,061	$136.98	$20.87	$389
K	Fox Crossing	72,589	$448	$29.80	$0.90	$423
K, L	Shaws Bend	51,576	$315	$20.93	$1.25	$430
G	Millican, Bundic	73,800	$552	$36.71	$3.25	$541

Notes: Col. 2) bold indicates dam recommended in 2002 State Water Plan; Col. 4) all costs from indicated regional water plan(s); includes capital, engineering, legal & contingencies (=35% capital); environmental & archeological studies and mitigation; land acquisition & surveying; Col. 8) 0 & M given in Regional Plan or set equal to 1.5% of construction capital cost, the methodology outlined in TWDB cost calculation procedures.

For comparative purposes, details are provided in Table 2 for fifteen other major dam projects that were investigated during the development of the 2002 State Water Plan. These range in size from approximately 52,000 acre-feet to 406,000 acre-feet of yield capacity. ***It is evident that the estimated unit cost of "raw" water from Marvin Nichols is dramatically lower than from any of the other dams investigated outside of Regions C and D.*** Although Marvin Nichols is the largest dam and there are likely some "economies of scale," the estimated cost still appears to be unreasonably low.

The yield of the Tennessee Colony project, for example, is estimated at approximately 75% of that of the Marvin Nichols project, yet its unit cost is over six times as high. The nearest proposed dam project outside of Regions C and D, in terms of unit cost, is Bedias in Region H with a unit cost approximately twice that estimated for Marvin

Nichols. Although there certainly are other factors that could affect unit cost, this wide discrepancy illustrates the need for a careful reassessment of the project cost-estimate.

The current estimate is questionable Much has changed in the world of reservoir construction in the last 15 years. The assumptions that went into the1989 estimate need to be re- examined. That is particularly true for issues related to the "studies, mitigation, and permitting" category. For example, the Region D cost estimate assumes a mitigation expense equal to the cost of land acquisition for project construction. That translates to an assumption that about 73,000 acres of land would be needed for mitigation. However, the Texas Parks and Wildlife Department and U.S. Fish and Wildlife Service have estimated that mitigation requirements for the Marvin Nichols project would range from the acquisition of about 163,500 acres to the acquisition of more than 648,000 acres.[2] In addition, the lower acreage estimate, which still is well over twice the assumed acreage used in preparing the project cost estimate, is based on the expectation that very intensive management efforts would be undertaken to improve wildlife habitat on the acquired land.[3] That management cost which would be quite high, is not reflected in the current project cost estimate.

[1] In the Region C Water Plan the capital cost of the Marvin Nichols project is combined with the transmission pipeline cost to deliver the water to DFW area. No raw water cost at the dam is calculated, but the estimated capital cost for just the dam and its associated costs (e.g. engineering and archaeological studies, land acquisition, and mitigation) are very similar to those of Region D.

[2] Texas Water and Wildlife, at p.54; Texas Parks and Wildlife Department and U.S. Fish and Wildlife Service (May 1990).

[3] Texas Water and Wildlife, at p. 6.

MARVIN NICHOLS WOULD DEVASTATE FORESTS AND WILDLIFE

More than 40 miles of river would suffer heavy impacts - 30,000 acres of valuable bottomland hardwood forest would be lost.

The Sulphur River and its bottomland habitats would suffer heavy impacts if Marvin Nichols were built. More than 40 miles of river would be inundated. Stream flow patterns of the river below the dam would change, altering habitat up and downstream as well. More than 62,000 acres, much of it bottomland, of which at least 30,000 acres is increasingly rare hardwood forest, would disappear forever. An additional area of about 10,000 acres would be flooded periodically. Compared to the stunning loss of free-flowing river and bottomland habitat, the artificial lake habitat that would be created would be a minor benefit when added to the more than a million reservoir surface acres already in existing man-made lakes in Texas.

Bottomland hardwood forests (also referred to as "forested wetlands") are the most productive inland ecosystem, second only to estuaries in the amount of biomass produced per acre. They are replete with wildlife, provide critical support for migratory waterfowl and songbirds, and afford much-needed winter food for upland wildlife species. Like all mature forests, bottomland forests help protect air quality and slow climate change by sequestering carbon.

Originally Texas had 16 million acres of bottomland hardwood forests, with towering canopies of oak, hickory, elm, and gum trees, wild azaleas, and a lush carpet of wildflowers underfoot. Now biologists estimate that 75% of the native bottomland forests are gone, converted to pasture, pine plantations, and other uses. More than a million acres are already under water due to existing reservoirs in East and North Central Texas, with hundreds of thousands of additional acres earmarked for possible inundation.

USFWS officials feel that there is not enough suitable habitat remaining in the Sulphur Basin to compensate for Marvin Nichols.

The negative impact on the environment by Marvin Nichols Reservoir would be so significant that it may not be possible to compensate for it completely within the affected area. In a letter to the Texas Water Development Board dated November 9, 2001, Carlos Mendoza of the Division of Ecological Services of the U.S. Fish and Wildlife Service concluded: "We are concerned that there is not enough additional high valued bottomland hardwood habitat or lands suitable for habitat improvements available in the Sulphur River Basin to compensate for the large amount of habitat that would be lost due to the construction of the Marvin Nichols I Reservoir. Therefore, we recommend that other alternatives rather than reservoir construction be considered for the Dallas/Fort Worth area water supply."

MITIGATION

During the process of assessing mitigation requirements under state and federal law, biologists use habitat evaluation computer models to assess the number of acres and the level of management needed to compensate for the wildlife habitat lost to the project. The first goal for mitigation is to avoid any unnecessary loss of habitat, particularly of wetland habitat, when constructing a project. The second consideration is to minimize unavoidable impacts. The third mitigation action is to compensate for the loss of habitat by setting aside like-kind habitat and managing it to protect and enhance its wildlife values.

When avoidance and minimization efforts have been completed and there are still unavoidable impacts, then compensatory mitigation measures are implemented to replace the lost habitat values. The goal of compensatory mitigation is the replacement

or replication of the aquatic ecosystem's ecological functions, which are lost or degraded by a project's permitted impacts. Compensatory mitigation is defined as the restoration, creation, enhancement, or in exceptional circumstances, preservation of wetlands and/ or other aquatic resources for the purpose of compensating for unavoidable adverse impacts, which remain after all appropriate and practicable avoidance and minimization have been achieved.

The U.S. Fish and Wildlife Service has developed a set of resource category codes to describe the relative importance of habitats:

Resource Category 1 - High value/irreplaceable
Resource Category 2 - High value/becoming scarce
Resource Category 3 - High to medium value/ abundant
Resource Category 4 - Medium to low value

More than 66,500 acres of wildlife habitat would be lost, impacting ecotourism, hunting, fishing and other outdoor-based recreational businesses.

According to *Texas Water and Wildlife* a preliminary joint assessment of the direct impact to wildlife habitat from water development projects conducted by the Texas Parks and Wildlife Department and the U.S. Fish and Wildlife Service in May 1990, construction of Marvin Nichols Reservoir would result in a total of 66,521 acres of wildlife habitat loss. Of this, 30,041 acres is high to medium valued mixed bottomland hardwood forest habitat. This area is also part of the Sulphur River Bottom West/Cuckoo Pond area listed in the May 1984, Department of the Interior, Texas Bottomland Hardwood Preservation Program document. It contains Priority 1 bottomland hardwood habitat and is one of the nation's most important wintering waterfowl and nesting wood duck areas. The Texas Water and Wildlife assessment notes that a minimum of approximately 163,620 acres of intensely managed mitigation land to 648,578 acres of minimally managed mitigation land would be required to compensate for such a loss.

The only lake that has been built in this area since a 1990 Memorandum of Agreement (MOA) between the U.S. Army Corp of Engineers and the Environmental Protection Agency (EPA) established mitigation guidelines is Jim Chapman Lake (formerly Cooper). Chapman is a 19,200-acre lake that flooded 6,000 acres of hardwood bottomland. It took a total 35,500 acres to mitigate the lost wildlife habitat. The mitigated land on this project came from two different locations within the same river basin, 10,000 acres around the lake and 25,500 acres down stream in what is now a state wildlife management area.

The 1990 Memorandum of Agreement states that first the applicant must show that there is no less environmentally damaging practicable alternative to the proposed project. Only minimal conservation measures are advocated in the Region C Water Plan and there has never been a thorough evaluation of effectiveness or potential conservation measures in various Region C cities. Clearly, the terms of the MOA have not been met. The Region C plan merely assumes, without supporting evidence, that the combination of conservation measures and other less damaging sources of new supply will be insufficient to satisfy Region C's future needs. Without a thorough assessment of the potential for water conservation to meet projected needs in Region C, the agreement with the EPA would not be met.

The MOA also states that in most cases mitigation lands should remain as close to the impacted area as possible; however, when suitable mitigation sites are not available near the impacted area, the mitigation should be within the same lake watershed.

REGION D NO LONGER RECOMMENDS MARVIN NICHOLS RESERVOIR

Congressman Max Sandlin and five Texas state legislators supported amending the Region D Plan to remove the recommendation that Marvin Nichols be built.

In 1997 the Texas Legislature created sixteen Regional Water Planning Groups throughout Texas, to review water issues for each region and make recommendation for state water strategies. The North East Texas Regional Water Planning Group, known as Region D, is comprised of approximately 19 counties.

In 2001, Region D, after input from applicable engineering studies, passed an initial regional water plan that included two proposed reservoirs and approximately 14 potential reservoir sites. Shortly after the plan was made public, grassroots opposition to the proposed Marvin Nichols Reservoir began to swell. Area landowners, conservationists, representatives of the timber industry and related businesses, and other concerned citizens initiated opposition that quickly grew to include thousands of people from Region D, the greater Dallas/Ft. Worth Metroplex, and across the state and nation.

More than 5,000 citizens sent letters to Region D's planning committee in opposition to the reservoir.

LEGISLATORS IN OPPOSITION TO THE RESERVOIR

As it became clear what the devastating effects this reservoir would have on citizens, landowners, ranchers, farmers, agriculture, timber and business interests, as well as the permanent destruction to wildlife and habitat, public opposition became vocal and widespread. Public officials in Northeast Texas recognized that the project was not in the region's best interest. U.S. Congressman Max Sandlin, State Senator Kevin Eltife, and State Representatives Bob Glaze, Mark Homer, Tom Ramsay, and Barry Telford, all from Northeast Texas, have publicly stated their opposition to the proposed reservoir. State Representative Lon Burnam of Fort Worth and Terry Hodge of Dallas have also voiced opposition.

In response to the citizen outcry, members of the North East Texas Planning Group proposed an amendment to the State Water Plan, downgrading the status of the reservoir from a "proposed" reservoir to only a potential site. In accordance with the rules set forth by the Texas Water Development Board, a scheduled public hearing was held and further public input sought. Hundreds attended the hearing and more than five thousand people sent letters, faxes and e-mail messages opposing Marvin Nichols. In early December 2002, Region D members voted to remove Marvin Nichols reservoir as a proposed or recommended reservoir from the Region D Water Plan. The final vote was 21 members voting to remove Marvin Nichols as a proposed reservoir, one member abstaining and one member absent.

Despite the widespread opposition, the North Texas Regional Water Planning Group (Region C), which includes Dallas, Fort Worth, and North Texas, still lists Marvin Nichols Reservoir as a recommended water management strategy in its regional water plan.

MARVIN NICHOLS RESERVOIR WOULD HARM THE NORTHEAST TEXAS ECONOMY

The construction of Marvin Nichols Reservoir would permanently inundate 62,000 acres in Northeast Texas and periodically flood about 10,000 additional acres. State and federal laws mandate that additional acreage must be set aside to mitigate the loss of fish and wildlife habitat caused by construction of the reservoir. In a joint assessment made in 1990, Texas Parks and Wildlife Department and the U.S. Fish and Wildlife Service, two of the entities that would be involved in determining the mitigation, concluded that a minimum of 163,000 acres would be required for mitigation. Depending on the management option utilized, the mitigation acreage could be as high as 648,000 acres.

The negative effects of Marvin Nichols would be detrimental to the timber industry, causing them to lose up to $275 million in revenue per year and ending up to 1300 jobs.

The end result is that Northeast Texas is looking at losing from private property land ownership anywhere from 220,000 acres to 700,000 acres if Marvin Nichols is built as proposed.

According to an August, 2002, study entitled *The Economic Impact of the Proposed Marvin Nichols I Reservoir to the Northeast Texas Forestry Industry*by Xeihuan Xu, Ph.D, Principal Economist for the Texas Forest Service, the effect of Marvin Nichols on the forestry industry in Northeast Texas would be extremely detrimental. According to Dr. Xu's report, the negative economic impact would range from $87 million to $275 million annually, depending on the mitigation management options selected. The forestry industry would lose from 400 to 1300 jobs, again depending on the management option selected.

In addition to the losses in the forestry industry, Marvin Nichols would have a negative economic impact on the farming and ranching industries - key elements in the Northeast Texas economy. In addition to those affected directly by loss of their land, subsidiary businesses such as feed and supply stores would be negatively impacted.

Many landowners in the area derive significant income from hunting leases. If private property ownership of this acreage is taken away, the hunting lease income would disappear for those landowners and the overall economy.

Finally, the removal of 220,000 to 700,000 acres from the tax rolls of Northeast Texas would significantly reduce the tax base that is used to fund local governments and schools. The tax burden would therefore increase for the remaining landowners in Northeast Texas.

MARVIN NICHOLS RESERVOIR WOULD DESTROY PRICELESS ARCHEOLOGICAL SITES

The only Caddoan Indian mound in Texas is located in this rich archeological area, with other artifacts dating as far back as 12,500 years ago.

The Sulphur River Basin is rich in prehistoric sites, many of which would be inundated by Marvin Nichols Reservoir. Although extensive scientific studies have not been conducted, collectors and amateur archeologists to date have found more than 65 different point types - which could indicate as many cultures. Because there is very little farming or construction to disturb the soil, the sites are largely undisturbed.

The time frame for Sulphur River sites runs from the late Caddoan Period of 200 years ago to perhaps as far back as 14,000 years or older. The oldest identified points are 12,500 years old. Skeletal remains have been found from 200 years to at least 3,000 years old, probably the oldest ever found in East Texas.

For years archeologists believed that 12,500-year-old Clovis Man was the oldest culture in North America. Now they are beginning to realize that much older cultures reached this continent. The Sulphur Basin could even contain sites comparable to a 35,000-year-old site in nearby Freedom, Oklahoma area, but we may never know if they are inundated prior to discovery.

There are also hundreds of sites important to the history of the settlement of Texas that Marvin Nichols Reservoir would destroy. A number of family and community cemeteries would have to be moved, including one of the first freedmen's cemeteries in the state.

Settler cabins from pioneer days in Texas still stand on multi-generational family ranches in the Sulphur River bottom.

Scientists have not begun to study the prehistoric people who lived in the Sulphur River Basin. Reservoir salvage projects have time to excavate only the largest and most obvious archeological sites. Even if hundreds of thousands of dollars were appropriated for archeological studies, building the reservoir would leave a big gap in the knowledge of the prehistory of this region.

It is estimated that more than 5,000 sites have already been inundated by the approximately 865,000 acres under water impoundments in North Central and Northeast Texas. More than 250 prehistoric sites have already been lost under nearby Wright Patman and Jim Chapman Reservoirs alone. Marvin Nichols Reservoir would drown nearly twice the acreage of these two impoundments together and is potentially a greater scientific loss because it is closer to the center of Caddoan culture. Drowning an additional 500 or more valuable ancient sites under Marvin Nichols would be a tremendous loss to our scientific knowledge base.

Marvin Nichols would inundate 62,000 acres and would cost more than $1.7 billion.

FACTS REGARDING THE PROPOSED MARVIN NICHOLS RESERVOIR

SIZE:
Permanent inundation of 62,000 acres and periodic flooding of an additional 10,000 acres

LOCATION:
On the main stem of the Sulphur River in Red River, Bowie, Franklin, Titus, and Morris Counties (mostly in Red River County), in Northeast Texas

ESTIMATED YIELD:
550,842 acre-feet of water per year

AMOUNT PROMISED TO DALLAS, FORT WORTH, NORTH TEXAS:
440,674 acre-feet per year (80%)

COST:
Estimate stated in "Water for Texas - 2002", the 2002 State Water Plan- $1.7 billion ($345 million for reservoir, rest for pipelines and other elements of the delivery system)

PRIMARY SPONSOR:
Sulphur River Basin Authority

EXPECTED PURCHASERS OF MARVIN NICHOLS WATER:
Outside the basin:

North Texas Municipal Water District - 28%
Tarrant Regional Water District - 27%
City of Dallas - 15%
Upper Trinity Regional Water District - 6%
City of Irving - 4%

In Northeast Texas:

Sulphur River Basin Authority - 20%

PIPELINE DISTANCE TO TRANSPORT WATER TO DFW & NORTH TEXAS:
As much as 140 miles; three-fourths or more of the cost of the project

ENGINEERING FIRMS CONTRACTED TO DESIGN RESERVOIR AND PIPELINES:
Freese and Nichols of Fort Worth, Murray, Thomas and Griffin of Texarkana

ESTIMATED MITIGATION:
From 163,620 to 648,578 acres, depending on intensity of management

DEMAND REDUCTION CAN MEET OUR WATER NEEDS AT LOWER COST

Low-cost or no-cost conservation measures could eliminate the need for building costly new reservoir projects.

Dallas, Ft. Worth, and the cities of North Texas have the potential for significant demand reduction through conservation measures that are more economical than building additional reservoirs. Demand reduction can satisfy our real water needs at a much lower cost - in economic, environmental and human terms - than creating new, unnecessary supplies. Before North Texas considers spending more than $1.7 billion on Marvin Nichols Reservoir and inundating more than 60,000 acres of productive forests and farmlands, the region should implement conservation measures that have been successful in other urban areas.

RESIDENTIAL

One of the single most effective steps that can be taken to conserve water is to replace old toilets with low-flow models. Writing building codes to require low-flow toilets in new construction and remodeling is a first step. Greater efficiency is achieved when there are also incentive programs to cover part or all of the costs of replacing existing low-efficiency toilets. This concept has been extended to incentive programs to replace old washing machines with new high-efficiency models and to programs designed to replace water intensive landscapes with native plants and efficient watering systems. Various cities in Texas and other states have demonstrated that such conservation programs, when combined with conservation pricing structures, are made cost-effective by the resulting long-term water savings.

Conservation rates are based on the fact that water demand decreases as prices increase. In Houston, for example, a resident who puts 25,000 gallons on his lawn will pay $112.47 for the privilege, and an Austin resident will pay $96.60, but a Dallas resident only pays $59.23 for that same amount of water.[1]

EPA DATA:[2]

- Toilets are the greatest water user in the house. Residential 1.6 gallons per flush (gpf) toilets have been shown to reduce toilet water use by 23% to 46% in studies conducted in a number of cities, including Tampa, Phoenix, Austin, and Oakland. High efficiency toilets save an average of 10.5 gallons per person daily.

- Use of high-efficiency toilets and other plumbing products significantly reduces water demand and wastewater generation over time, which, in turn, can reduce or defer the capital investment needed for water supply and wastewater treatment infrastructure.

- Surveys of thousands of 1.6 gpf toilet customers indicate that the great majority are satisfied with their toilet's performance.

U.S. BUREAU OF RECLAMATION DATA:[3]

The U.S. Bureau of Reclamation worked with California water agencies to develop Best Practices for water conservation, one of which is residential toilet retrofit programs. An evaluation of its joint effort with the Los Angeles-area water utility said such programs, which accounted for about 63% of funding and 73% of the water savings, "proved to be a very cost-effective program option".

According to Peter H. Gleick of the Pacific Institute for Studies in Development, Environment and Security,[4] who has worked extensively with the State of California on water conservation, "Improving the productive use of existing water resources, through reducing waste and inefficiency, is a relatively fast and inexpensive way to meet new water needs."

Without any conservation efforts, California toilets would be using 1.2 million acre-feet per year (ac-ft/yr). Toilet replacements required by law have reduced that amount to about 780,000 ac-ft/yr. If everyone in California had a low-flush toilet, this number would be reduced to about 300,000 ac-ft/yr.[5]

Incentive programs such as rebates on low-flow toilets and high-efficiency washing machines have proven to be cost-effective ways of reducing municipal water use.

EXAMPLES OF TOILET REBATE PROGRAMS:

- *New York City:* New York City invested $393 million in a 1.6 gpf toilet rebate program, reduced water demand and wastewater flow by 90.6 million gallons per day (mgd), 7% of the city's total water consumption. Rebates were $150 - $240 per toilet. The rebate program accomplished a net present value savings of $605 million from a twenty-year deferral of water supply and wastewater treatment expansion projects.[6]

- *Los Angeles, San Diego and Southern California:* Since 1988, the Metropolitan Water District of Southern California (MWD) has funded rebates for 1.6 million low-flow toilets, for savings in excess of 18 billion gallons of water per year over the 20-year life span of the toilets. Rebates in Los Angeles ranged from $75 - $120 per toilet, and a special program distributed free toilets to low-income residents. Annual savings amount to 48,000 acre-feet at a cost of less than $200 per acre-foot, a fraction of the cost of water from new reservoirs.[7]

- *Tampa:* By 1999, Tampa had replaced 15,078 high-volume toilets in 11,551 single-family and multi-family residences. Demonstrated water savings was 38 gallons per day (gpd) per household. This represents a total savings of more than 160 million gallons each year and over 3.2 billion gallons over the 20-year life span of the replacement toilets.[8]

- *Santa Monica:* Invested $5.4 million in a toilet rebate program and achieved permanent reductions in water usage and wastewater flows of over 1.9 mgd, representing a 15% reduction in average total water demand and a 20% reduction in average total wastewater flow. Result is a net savings of $6 million in the year 2002 alone from avoided costs of water imports and wastewater treatment.[9]

- *San Antonio:* Offers $75 rebate per toilet replaced and estimates savings of 8,000 - 20,000 gallons per year per toilet.[10]

- *Austin:* Toilets are provided free of charge with $30 rebate for installation, or homeowners are given up to $100 rebate for purchase of qualifying models. Result is 20% reduction in indoor water use from replacement of toilets alone.[11]

- *EI Paso:* Up to $100 rebate on toilets.[12]

WASHING MACHINE REBATE PROGRAMS:

High-efficiency Washing Machine (HEW) rebate programs are identified by the Bureau of Reclamation as one of its "Best Practices".[13] A May 2001 study reported 28 utilities participating in incentive programs for HEWs.

Many programs are aimed at multi-family residences and laundromats. Examples include:

- *San Diego:* Offers a voucher for $125 for purchase of a HEW ($300 for commercial customers).[14] As of May 2002, 12,000 washers had been purchased, saving 470 acre-feet of water.[15] The city projects savings of 5,075 acre-feet over the life of a washer.[16]
- *San Antonio:* $200 rebate on HEWs.[17]
- *EI Paso:* $200 rebate on HEWs.[18]
- *Austin:* $100 rebate on HEWs.[19]
- *Los Angeles:* $150 rebate on HEWs.[2O]
- *Seattle:* $75 rebate on HEWs.[21]

LANDSCAPE INCENTIVE PROGRAMS:

Landscape Incentive Programs are also identified by the Bureau of Reclamation as one of its recommended "Best Practices".[22]

Residential landscape rebate programs usually have a list of qualifying plants and are calculated by the amount of area converted. Examples include:

- *Austin:* Homeowners receive up to $250 for irrigation improvements and up to $500 for planting "water wise" trees and shrubs.[23]
- *San Antonio:* Pays 10 cents per square foot for planning and installing a water saver landscape, with a minimum conversion of 1000 square feet ($100), and a maximum rebate of $500 for 5000 square feet (half credit if over 50% of the whole yard is planted in turf.[24]
- *EI Paso:* Turf rebates of $l/sq. ft. resulted in savings of 23 million gallons in 2002.[25]
- *Albuquerque:* Residential rebates up to $500, commercial rebates up to $700. Minimum qualifying area 500 sq. ft. Sprinkler systems disqualify the area, but drip, soaker, bubbler and hand-watering qualify.[26]

[1] Based on rates posted on city water utility websites, excluding meter and sewer charges

[2] http://www.epa.gov/owm/water-efficiency/toilets.htm

[3] http://www.lc.usbr.gov/scao/conserve.htm

[4] http://www.pacinst.org Gleick is the lead author of The World's Water: The Biennial Report on Freshwater Resources (Island Press), http:/ /www.pacinst.org/book.

[5] http://www.cnr.berkeley.edu/bwwg/gieick.pdf

[6] http://www.epa.gov/owm/water-efficiency /toilets.htm

[7] MWD website, http:// www.mwd.dst.ca.us/mwdh2o/pages/conserv/program01.html
"Efficiency Case Studies from California: The Reservoir that Toilets Built" by Mary Ann Dickinson, California Urban Water Conservation Council,
http://www.damsreport.org/docs/kbase/contrib/opt162.pdf "LADWP Is Flush with Pride" - News Release 11/5/01 from Los Angeles Department of Water and Power
http://www.ladwp.com/whatnew/dwpnews/archive/110501.htm

[8] http://www.tampagov.net/dept_water/conservation_education/pdf/5yr%20Report%20%20CA4-9-28.pdf

[9] http://www.epa.gov/owm/water-efficiency/toilets.htm

[10] San Antonio Water System website, http://www.saws.org/conservation/programs/kickthecan.shtml
Texas Section of the American Water Works Association, http://www.tawwa.org/water_in_texas.htm

[11] Texas Section of the American Water Works Association: http://www.staswa.org/water_in_texas/hwm

[12] http://www.epwu.org/; see also a list of cities which have adopted incentive programs for replacement of toilets, clothes washers and landscaping:
www.massaudubon.org/News_&_Action/Rivers/incentives.html

[13] See footnote 2

[14] http://www.sannet.gov/water/conservation/washer.shtml

[15] San Diego Water County Authority News Release 5/23/02,
http://www.sdcwa.org/news_052302Award.phtml

[16] Grant proposal by the City of San Diego to the State of California for an incentive program to encourage the installation of HEWs: http://www.dpla.water.ca.gov/grants-ioans/urb-psp.html

[17] http://www.saws.org/conservation/programs/washers.shtml

[18] http://www.epwu.org/

[19] http://www.ci.austin.tx.us/watercon/sfwasher.htm

[20] http://www.ladwp.com/water/conserv/washers/index.htm

[21] http://www.ci.seattle.wa.us/util/RESCONS/washwise/default.htm

[22] See footnote 2.

[23] http://www.ci.austin.tx.us/watercon/waterwiseland.htm

[24] http://www.saws.org/conservation/outdoor/lawn.shtml

[25] http://www.epwu.org/ "What's New"

[26] http://www.cabq.gov/waterconservation/xericrebate.html

OPPONENTS OF MARVIN NICHOLS RESERVOIR

(as of May, 2004)

The following supported removing the recommendation that Marvin Nichols be built from the Texas Water Plan or have in other ways publicly expressed their opposition to Marvin Nichols:

Legislators, city councils, newspapers, oil companies, agricultural interests, timber companies, conservation groups, and other citizens have all come together to oppose the Marvin Nichols Reservoir project.

Cass County Commissioners Court
Morris County Commissioners Court
Upshur County Commissioners Court

City of Domino
Douglassville City Council
City of Redwater
City Council of Texarkana

Atlanta ISD
Bloomburg ISD Board of Trustees
Maud ISD Board of Trustees
Queen City ISD Board/Trustees

Texas Forestry Association
Texas Farm Bureau

Atlanta Chamber of Commerce
Atlanta Economic Development Corporation
Cass County Cattlemen's Association
Linden Chamber of Commerce

Clements Oil Corp.
International Paper Co.
Manasseh Timber Co.
Misty Co. USA Oil Co. Union Pacific
Ward Forest Products
Ward Timber Co.
Weston Oil Co., Inc.

The Honorable Max Sandlin, U.S. House of Representatives (Dist.1)
The Honorable Susan Combs, Texas Commissioner of Agriculture
The Honorable Kevin Eltife, Texas Senate (Dist. 1)
The Honorable Terri Hodge, Texas House of Representatives (Dist. 100)
The Honorable Lon Burnam, Texas House of Representatives (Dist. 90)
The Honorable Mark Homer, Texas House of Representatives (Dist. 3)
The Honorable Barry Telford, Texas House of Representatives (Dist. 1)
The Honorable Jesse Oliver, Former Member, Texas House of Representatives
The Honorable Bob Glaze, Former Member, Texas House of Representatives
The Honorable Tom Ramsay, Former Member, Texas House of Representatives
The Honorable Jerry Yost, Former Member, Texas House of Representatives
The Honorable Laura Miller, Mayor of Dallas
The Honorable John Loza, Mayor Pro Tem of Dallas
The Honorable Mitchell Rasansky, Council Member, Dallas
The Honorable James Fantroy, Council Member, Dallas

The Citizens Journal of Atlanta, Texas
Texarkana Gazette

National Wildlife Federation
Environmental Defense
Sierra Club, Lone Star Chapter
Texas Committee on Natural Resources
Citizens for Safe Water
Friends of the Sabine
Friends United for Safe Environment
Sulphur River Oversight Societ