



# TEXAS WATER DEVELOPMENT BOARD



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**TO:** Board Members

**THROUGH:** Carolyn L. Brittin, Deputy Executive Administrator, Water Resources Planning and Information

**FROM:** Dan Hardin, Division Director, Water Resources Planning  
Stuart D. Norvell, Manager, Water Planning Research and Analysis

**DATE:** August 12, 2009

**SUBJECT:** Consider approval by minute order of revised population and water demand projections for the Lower Colorado (Region K) and Lavaca (Region P) regions, and revised water demand projections for the Panhandle (Region A) and Coastal Bend (Region N) regions.

## **ACTION REQUESTED**

Approve revised population and water demand projections for Regions A, K, N and P.

## **BACKGROUND**

Population and water demand projections from the 2006 regional water plans are serving as default projections for the current planning cycle. However, the Texas Water Development Board (TWDB) may consider requests to amend 2006 projections if economic and demographic conditions in a region have changed significantly. Reviews of revised population and water demand projections are coordinated with representatives from the Texas Commission on Environmental Quality, the Texas Parks and Wildlife Department, and the Texas Department of Agriculture. TWDB staff and representatives of coordinating agencies have reviewed these requests and have determined that the changes are consistent with criteria for demand revisions specified in administrative rules, and are hereby recommended for Board approval (staff agency review memorandums are included in Attachments A through D).

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**REGION A**

Region A’s request to revise agricultural water demands is based on a special study generated under contract with the TWDB as part of Phase I of the 2011 regional water planning cycle. Demand reductions for livestock result primarily from: 1) a decrease in projected hog inventories due to the cancellation of a new meat packing plant in the region, and 2) lower estimated water requirements for dairy operations. With the requested changes, projected regional livestock demands decline by about 40 percent (Table 1). Attachment A provides additional supporting data and revisions at the county level.

Proposed irrigation demands in Region A are roughly 15 percent lower than 2006 projections. Some of the decrease is attributed to higher energy costs in recent years and declining water tables. However, most of the difference is due to a data collection error that occurred when developing the 2006 Region A plan, which led to the double counting of irrigated wheat acreage in several counties.

Increased mining water demands in the region are primarily associated with drilling water requirements for new natural gas wells in northeastern counties of the region. With the requested changes, Region A’s mining demands would rise by almost 100 percent in 2010 and 30 percent in 2060.

Table 1: Proposed Changes to Projected Livestock, Irrigation and Mining Water Demands for the 2011 Panhandle (Region A) Water Plan (acre-feet per year)						
	2010	2020	2030	2040	2050	2060
<b>Livestock</b>						
2006	61,236	79,986	82,097	84,333	86,757	89,267
2011	37,668	43,345	45,487	47,842	50,436	53,285
Change	-23,568	-36,641	-36,610	-36,491	-36,321	-35,982
% Change	-38.5%	-45.8%	-44.6%	-43.3%	-41.9%	-40.3%
<b>Irrigation</b>						
2006	1,652,230	1,609,429	1,525,102	1,357,728	1,190,357	1,106,034
2011	1,429,990	1,311,372	1,271,548	1,203,332	1,066,736	936,929
Change	-222,240	-298,057	-253,554	-154,396	-123,621	-169,105
% Change	-13.5%	-18.5%	-16.6%	-11.4%	-10.4%	-15.3%
<b>Mining</b>						
2006	7,115	7,162	7,199	7,237	7,275	7,310
2011	14,012	14,165	13,218	11,696	10,495	9,542
Change	+6,897	+7,003	+6,019	+4,459	+3,220	+2,232
% Change	+96.9%	+97.8%	+83.6%	+61.6%	+44.3%	-30.5%

**REGION K**

Recent data published by the Texas State Demographer indicate that in 2007 population levels in Region K exceeded levels predicted for the 2006 Region K plan by about 2.5 percent. To account for this faster than expected growth, Region K has requested population increases ranging from almost four percent in 2010 to 5.5 percent in 2050 (Table 2). Attachment B provides additional supporting data and revisions for individual cities and water providers. For cities or utilities with changes in population, corresponding municipal water demands were adjusted by multiplying revised populations by per capita use values from the 2006 plan. Projected municipal water demand increases range from 5.7 percent to 7.7 percent over the planning period.

Table 2: Proposed Changes to Population Projections for the Lower Colorado (Region K) Water Plan						
	2010	2020	2030	2040	2050	2060
Population Projections						
2006	1,359,677	1,657,025	1,936,324	2,181,851	2,447,058	2,713,905
2011	1,412,834	1,714,281	2,008,141	2,295,627	2,580,534	2,831,937
Change	+53,157	+57,256	+71,817	+113,776	+133,476	+118,032
% Change	+3.9%	+3.5%	+3.7%	+5.2%	+5.5%	+4.4%
Municipal Water Demand Projections						
2006	252,637	304,735	352,737	394,101	439,049	484,170
2011	268,643	321,972	373,430	423,051	472,778	516,348
Change	+16,006	+17,237	+20,693	+28,950	+33,729	+32,178
% Change	+6.3%	+5.7%	+5.9%	+7.4%	+7.7%	+6.7%

**REGION N**

Region N has proposed increasing irrigation demands for Bee and San Patricio counties. Recent historical (2003-2007) water use estimates of the TWDB are not only higher than projected 2010 values for both counties, but historical data and evidence presented by local water managers and producers indicate that there are increasing trends in both irrigated acreage and irrigation water use in the counties. With the requested changes, projected irrigation demands in Region N would rise by nearly 29 percent in 2010 and 122 percent in 2060 (Table 3). Attachment C provides additional supporting data and revisions at the county level.

Table 3: Proposed Changes to Projected Irrigation Water Demands for the Coastal Bend (Region N) Water Plan (acre-feet per year)						
	2010	2020	2030	2040	2050	2060
2006	20,072	18,611	17,077	15,703	14,470	13,365
2011	25,884	26,152	26,671	27,433	28,450	29,726
Change	+5,812	+7,541	+9,594	+11,730	+13,980	+16,361
% Change	+29.0%	+41.0%	+56.2%	+75.0%	+97.0%	+122.4%

**REGION P**

Revised irrigation demands in Region P are based on a special study report generated under contract with Region P as part of Phase I of the 2011 regional water planning cycle. Primary factors contributing to the increase are slightly higher estimated water application rates for crops, and changes in the estimated numbers of irrigated acres in the region. Based on study data collected from the Farm Services Agency and newly available data from the Coastal Bend Groundwater Conservation District, estimated rice acreage in the portion of Wharton County allocated to Region P is roughly 35 percent higher than previously thought. In contrast, study data showed that rice acreage in Jackson County is 25 percent lower than previously determined and in Lavaca County it is 25 percent lower. The study also concluded that there is no clear indication of either an increasing or decreasing trend in irrigation demands in the region, and Region P requested that projections remain constant over the planning horizon. With the requested changes, irrigation demands are about two percent higher in 2010 and 10 percent higher in 2060 (Table 4). Attachment D provides additional supporting data and revisions at the county level.

Table 4: Proposed Changes to Projected Irrigation Water Demands for the Lavaca (Region P) Water Plan (acre-feet per year)						
	2010	2020	2030	2040	2050	2060
2006	213,638	209,646	205,806	202,120	198,568	195,251
2011	217,846	217,846	217,846	217,846	217,846	217,846
Change	+4,208	+8,200	+12,040	+15,726	+19,278	+22,595
% Change	+1.9%	+3.8%	+5.5%	+7.2%	+8.8%	+10.4%

Region P has also requested an increase in the population of the City of Hallettsville, but because there was not a sufficient justification to raise regional population totals, increases in Hallettsville were offset by reducing population in communities where growth is slower than predicted. As a result, there is no net increase in county or regional totals.

## REVISED STATE TOTALS

The requested revisions would decrease state-level livestock projections by about seven percent in 2010 and nine percent in 2060, and would lower irrigation projections by about two percent in each decade. Mining demand projections would increase about one to three percent depending on the decade. Including the population projection increases previously approved for the Brazos G region (at the May 2009 Board meeting), total population projections in the state would increase by less than one percent.

Table 5: Changes to State Level Projections with Requested Revisions						
	2010	2020	2030	2040	2050	2060
Livestock Water Demand Projections						
2006	344,495	374,724	381,241	388,243	395,945	404,397
2011	320,927	338,083	344,631	351,752	359,624	368,415
Change	-23,568	-36,641	-36,610	-36,491	-36,321	-35,982
% Change	-6.8%	-9.8%	-9.6%	-9.4%	-9.2%	-8.9%
Irrigation Water Demand Projections						
2006	10,345,131	9,980,301	9,585,833	9,206,620	8,843,094	8,556,224
2011	10,132,911	9,697,985	9,353,913	9,079,680	8,752,731	8,426,075
Change	-212,220	-282,316	-231,920	-126,940	-90,363	-130,149
% Change	-2.1%	-2.8%	-2.4%	-1.4%	-1.0%	-1.5%
Mining Water Demand Projections						
2006	270,845	280,815	285,964	276,054	276,931	285,573
2011	277,742	287,818	291,983	280,513	280,151	287,805
Change	+6,897	+7,003	+6,019	+4,459	+3,220	+2,232
% Change	+2.5%	+2.5%	+2.1%	+1.6%	+1.2%	+0.8%
Population Projections						
2006	24,990,259	29,227,098	33,171,214	37,026,932	41,201,388	45,675,061
2011	25,043,416	29,284,354	33,243,031	37,140,708	41,334,864	45,793,093
Change	+53,157	+57,256	+71,817	+113,776	+133,476	+118,032
% Change	+0.2%	+0.2%	+0.2%	+0.3%	+0.3%	+0.3%
Municipal Water Demand Projections						
2006	4,784,531	5,504,162	6,141,663	6,763,431	7,473,647	8,278,943
2011	4,800,537	5,521,399	6,162,356	6,792,381	7,507,376	8,311,121
Change	+16,006	+17,237	+20,693	+28,950	+33,729	+32,178
% Change	+0.3%	+0.3%	+0.3%	+0.4%	+0.5%	+0.4%

**ANTICIPATED OPPOSITION**

None at this time.

**RECOMMENDATION**

Approve revised population and water demand projections for planning regions A, K, N and P as shown in Tables 1 through 5 of this memorandum.

This recommendation has been reviewed by legal counsel and is in compliance with applicable statutes and Board rules.

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Ken Peterson  
General Counsel

**Attachments**

- Attachment A: Staff Review of the Proposed Projections in Region A and Staff Recommendations to the Executive Administrator
- Attachment B: Staff Review of the Proposed Projections in Region K and Staff Recommendations to the Executive Administrator
- Attachment C: Staff Review of the Proposed Projections in Region N and Staff Recommendations to the Executive Administrator
- Attachment D: Staff Review of the Proposed Projections in Region P and Staff Recommendations to the Executive Administrator



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To: Kevin Ward, Executive Administrator

Through: Carolyn L. Brittin, Deputy Executive Administrator, Water Resources Planning and Information and Dan Hardin, Director, Water Resources Planning

From: Stuart D. Norvell, Texas Water Development Board  
 Steve Densmore, Texas Commission on Environmental Quality  
 Cindy Loeffler, Texas Parks and Wildlife Department  
 Kelly Stripling, Texas Department of Agriculture

Date: July 16, 2009

Re: Revised agricultural and mining water demand projections for the Panhandle (Region A) Regional Water Planning Area (2007-2012 planning cycle).

## Background

Population and water demand projections from 2006 regional water plans are serving as the basis for projections in the current planning cycle. However, the Texas Water Development Board (TWDB) may consider requests to amend 2006 population and water demand projections if conditions in a planning region have changed significantly.

As specified in Section 357.5 (d)(2), Title 31 of the Texas Administrative Code (TAC), entities wishing to revise projections address their requests through their respective regional water planning group. If a planning group concurs, they submit requests to the Executive Administrator of the TWDB.

TWDB staff coordinates reviews of each request with the Texas Commission on Environmental Quality, the Texas Parks and Wildlife Department, and the Texas Department of Agriculture. Designated representatives from each agency must recommend each revision. The Board is responsible for approving and adopting population and water demand projections as specified in (§357.5 (d)(1), 31 TAC).

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## **Requested Revisions to Agricultural Water Demands**

Region A's request for revisions to agricultural water demands is based on a special study generated under contract with the TWDB as part of Phase I of the 2011 regional water planning cycle.<sup>1</sup> The study, conducted by researchers at the Texas AgriLife Research and Extension Center in Amarillo with the assistance of advisory committees consisting of industry representatives and experts, recommended reductions in both livestock and irrigation demands.

### *Livestock*

Demand reductions in the livestock sector are due to changes in projected livestock inventories and lower estimated water requirements per animal for some livestock species.

For the current round of planning, ending (2060) inventories of fed beef are expected to be almost 200,000 lower than in the 2006 regional plan, while dairy cows are roughly 70,000 higher (Table A-1). However, the most significant change is in the swine industry. The 2006 plan projected a large increase in hog inventories based on the expected construction of a packing plant that did not materialize. As a result, ending inventories for hogs are reduced by more than 4,500,000 head.

Water use requirements per animal are lower for several species (Table A-2). Although inventories for dairy cows are still expected to increase over the planning horizon, their estimated water requirements per head have been reduced from 65 gallons per day to 50 gallons. This figure is based on reported improvements by West Texas dairies to use operational wastewater more efficiently, which has led to most new dairies requesting TCEQ permits at 50 gallons per day. After reviewing recent research, study advisory committees also recommended reducing water use coefficients for fed beef, summer stockers and winter stockers.

With requested changes, livestock demands for the region would be about 40 percent less than in the 2006 plan (Table A-3). State level projections would be nearly seven percent lower in 2010 and nine percent lower in 2060.

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<sup>1</sup> Marek, T., Amosson, S., Bretz, F., Guerro, B., and Kotara, R. "2011 Panhandle Regional Water Plan Task 2 Report: Agricultural Water Demand Projections." A report submitted by the Texas A&M University System AgriLife Research and Extension Center, Amarillo, Texas to Freese and Nichols, Inc. and the Panhandle Regional Water Planning Group. April 2009.



Species	2006 Plan	2011 Plan	Change	2006 Plan	2011 Plan	Change
	Beginning Inventories (2010)			Ending Inventories (2060)		
Beef Cows	237,000	251,000	+14,000	237,000	251,000	+14,000
Fed Beef	1,414,145	1,312,739	-101,406	2,052,513	1,854,972	-197,541
Summer Stockers	391,080	368,921	-22,159	501,844	368,921	-132,923
Winter Stockers	680,031	467,971	-212,060	872,633	530,198	-342,435
Dairy Cattle	50,662	49,137	-1,525	92,425	162,490	+70,065
Equine	27,402	16,882	-10,520	45,006	26,372	-18,634
Poultry	21,000	21,000	0	2,516,000	7,014,000	+4,498,000
Swine	3,449,057	1,182,371	-2,266,686	5,611,617	1,093,971	-4,517,646

Species	2006 (gallons per day per animal)	2011 (gallons per day per animal)	Change
Beef Cows	20.0	20.0	0.0
Fed Beef	15.0	12.5	-2.5
Summer Stockers	12.0	10.0	-2.0
Winter Stockers	12.0	8.0	-4.0
Dairy Cattle	65.0	55.0	-10.0
Equine	12.0	12.0	0.0
Poultry	0.1	0.1	0.0
Swine	5.0	2.5 – 8.5	varies

**Table A-3: Proposed Changes to Livestock Water Demands for the 2011 Panhandle Regional Water Plan (acre-feet per year)**

	2010	2020	2030	2040	2050	2060
<b>Armstrong County</b>						
2006	612	645	673	703	734	768
2011	566	670	673	677	681	685
Change	-46	25	0	-26	-53	-83
<b>Carson County</b>						
2006	1,016	1,074	1,120	1,168	1,219	1,272
2011	607	711	716	720	725	730
Change	-409	-363	-404	-448	-494	-542
<b>Childress County</b>						
2006	292	348	353	359	366	372
2011	368	470	472	473	475	477
Change	+76	+122	+119	+114	+109	+105
<b>Collingsworth County</b>						
2006	592	656	672	688	705	723
2011	461	564	566	569	571	574
Change	-131	-92	-106	-119	-134	-149
<b>Dallam County</b>						
2006	12,287	18,390	18,614	18,851	19,102	19,369
2011	3,509	4,654	4,996	5,373	5,788	6,246
Change	-8,778	-13,736	-13,618	-13,478	-13,314	-13,123
<b>Donley County</b>						
2006	1,206	1,283	1,332	1,385	1,440	1,500
2011	1,267	1,268	1,270	1,271	1,273	1,275
Change	+61	-15	-62	-114	-167	-225
<b>Gray County</b>						
2006	2,183	2,485	2,589	2,700	2,871	2,942
2011	1,348	1,451	1,474	1,499	1,527	1,557
Change	-835	-1,034	-1,115	-1,201	-1,344	-1,385
<b>Hall County</b>						
2006	300	302	305	309	311	316
2011	329	330	331	332	334	335
Change	+29	+28	+26	+23	+23	+19
<b>Hansford</b>						
2006	4,744	5,218	5,509	5,817	6,144	6,490
2011	3,683	3,956	4,256	4,586	4,948	5,346
Change	-1,061	-1,262	-1,253	-1,231	-1,196	-1,144
<b>Hartley</b>						
2006	7,088	10,236	10,506	10,792	11,096	11,418
2011	5,106	7,103	7,731	8,422	9,184	10,024
Change	-1,982	-3,133	-2,775	-2,370	-1,912	-1,394

**Table A-3: Proposed Changes to Livestock Water Demands for the 2011 Panhandle Regional Water Plan (acre-feet per year)**

Hemphill						
2006	1,635	1,811	1,889	1,972	2,061	2,155
2011	1,276	1,281	1,285	1,290	1,296	1,301
Change	-359	-530	-604	-682	-765	-854
Hutchinson						
2006	814	1,018	1,051	1,086	1,123	1,163
2011	685	689	698	708	720	732
Change	-129	-329	-353	-378	-403	-431
Lipscomb						
2006	831	958	976	996	1,016	1,037
2011	1,005	1,007	1,028	1,051	1,076	1,104
Change	+174	+49	+52	+55	+60	+67
Moore						
2006	4,172	5,379	5,575	5,783	6,004	6,283
2011	2,831	3,605	3,931	4,290	4,685	5,120
Change	-1,341	-1,774	-1,644	-1,493	-1,319	-1,163
Ochiltree						
2006	4,538	4,787	4,938	5,098	5,268	5,450
2011	3,367	3,463	3,605	3,761	3,932	4,119
Change	-1,171	-1,324	-1,333	-1,337	-1,336	-1,331
Oldham						
2006	2,116	2,258	2,358	2,460	2,569	2,685
2011	1,154	1,257	1,259	1,262	1,265	1,267
Change	-962	-1,001	-1,099	-1,198	-1,304	-1,418
Potter						
2006	503	527	550	574	599	626
2011	502	504	505	507	509	511
Change	-1	-23	-45	-67	-90	-115
Randall						
2006	3,173	3,489	3,683	3,888	4,106	4,338
2011	2,732	2,741	2,756	2,772	2,789	2,808
Change	-441	-748	-927	-1,116	-1,317	-1,530
Roberts						
2006	609	628	649	671	694	718
2011	385	385	386	387	388	388
Change	-224	-243	-263	-284	-306	-330
Sherman						
2006	10,880	16,701	16,903	17,118	17,347	17,589
2011	4,933	5,579	5,889	6,230	6,606	7,019
Change	-5,947	-11,122	-11,014	-10,888	-10,741	-10,570
Wheeler						
2006	1,645	1,793	1,852	1,915	1,982	2,053
2011	1,554	1,657	1,660	1,662	1,664	1,667
Change	-91	-136	-192	-253	-318	-386

<b>Table A-3: Proposed Changes to Livestock Water Demands for the 2011 Panhandle Regional Water Plan (acre-feet per year)</b>						
Impact to Regional Level Projections						
2006	61,236	79,986	82,097	84,333	86,757	89,267
2011	37,668	43,345	45,487	47,842	50,436	53,285
Change	-23,568	-36,641	-36,610	-36,491	-36,321	-35,982
% Change	-38.49%	-45.81%	-44.59%	-43.27%	-41.87%	-40.31%
Impact to State Level Projections						
2006	344,495	374,724	381,241	388,243	395,945	404,397
2011	320,927	338,083	344,631	351,752	359,624	368,415
% Change	-6.84%	-9.78%	-9.60%	-9.40%	-9.17%	-8.90%

### *Irrigation*

Proposed irrigation demands are significantly lower than 2006 projections. Estimates of planted irrigated acreage in the region decreased by 216,759 acres (Table A-4). Region A anticipated some of the decline given higher energy costs in recent years and declining water tables. However, the majority of the difference is apparently due to data collection errors that occurred when developing projections for the 2006 plan, which led to an overestimate for irrigated wheat in several counties. Changes in irrigated wheat accounted for about 80 percent of the total reduction in irrigated acreage. At the county level, the largest declines in wheat were in the counties of Sherman (54,903 acres), Carson (42,873 acres) and Ochiltree (40,517 acres).

At the regional level, proposed irrigation demands for the current plan are roughly 15 percent lower and state-level projections are reduced by around two to three percent depending upon the decade (Table A-5). As was the case in the 2006 plan, Region A expects that further declines in available water supplies from the Ogallala aquifer are inevitable, and irrigation water use will decline over the long-term.

**Table A-4: Baseline Estimates of Planted Irrigated Acreage in Region A, 2006 Region A Plan and Proposed Changes for the 2011 Plan**

Crop	2006 Plan	2011 Plan	Change
Alfalfa*	0	25,963	+25,963
Corn	568,850	478,686	-90,164
Cotton	37,163	121,053	+83,890
Hay	12,840	0	-12,840
Pasture and Other	40,195	28,905	-11,296
Peanuts	25,285	16,986	-8,299
Sorghum	94,048	84,226	-9,822
Forage sorghum*	0	18,815	+18,815
Soybeans	56,781	9,228	-47,553
Sunflowers*	0	11,650	+11,650
Wheat	600,261	423,158	-177,103
Region A	1,435,423	1,218,670	-216,749

\* Alfalfa, forage sorghum and sunflowers were included in an aggregate category referred to as "other crops" in the 2006 plan, and estimates are not available for 2006.

**Table A-5: Proposed Changes to Irrigation Water Demands for the 2011 Panhandle Regional Water Plan (acre-feet per year)**

	2010	2020	2030	2040	2050	2060
<b>Armstrong County</b>						
2006	10,280	10,017	9,490	8,435	7,381	6,854
2011	5,118	4,688	4,544	4,305	3,827	3,349
Change	-5,162	-5,329	-4,946	-4,130	-3,554	-3,505
<b>Carson County</b>						
2006	94,912	92,478	87,611	77,876	68,142	63,274
2011	58,775	49,230	47,982	45,457	36,368	35,355
Change	-36,137	-43,248	-39,629	-32,419	-31,774	-27,919
<b>Childress County</b>						
2006	10,046	9,789	9,273	8,243	7,213	6,698
2011	7,418	5,519	5,350	5,068	4,505	3,942
Change	-2,628	-4,270	-3,923	-3,175	-2,708	-2,756
<b>Collingsworth County</b>						
2006	24,967	24,327	23,046	20,486	17,925	16,645
2011	28,693	21,907	21,236	20,118	17,883	15,648
Change	+3,726	-2,420	-1,810	-368	-42	-997

**Table A-5: Proposed Changes to Irrigation Water Demands for the 2011 Panhandle Regional Water Plan  
(acre-feet per year)**

Dallam County						
2006	312,463	304,452	288,428	256,380	224,333	208,309
2011	292,031	283,315	274,642	260,187	231,278	202,368
Change	-20,432	-21,137	-13,786	3,807	6,945	-5,941
Donley County						
2006	20,493	19,968	18,917	16,815	14,713	13,662
2011	32,000	29,676	28,771	27,257	24,228	21,200
Change	+11,507	+9,708	+9,854	+10,442	+9,515	+7,538
Gray County						
2006	24,862	24,224	22,949	20,399	17,850	16,576
2011	22,705	20,410	19,785	18,744	16,661	14,578
Change	-2,157	-3,814	-3,164	-1,655	-1,189	-1,998
Hall County						
2006	20,269	19,749	18,710	16,631	14,552	13,513
2011	16,719	10,731	10,403	9,855	8,760	7,665
Change	-3,550	-9,018	-8,307	-6,776	-5,792	-5,848
Hansford County						
2006	134,929	131,470	124,550	110,711	96,872	89,953
2011	130,694	115,027	111,506	105,637	93,899	82,162
Change	-4,235	-16,443	-13,044	-5,074	-2,973	-7,791
Hartley County						
2006	281,783	274,557	260,107	231,206	202,306	187,855
2011	294,932	281,648	273,026	258,657	229,917	201,177
Change	+13,149	+7,091	+12,919	+27,451	+27,611	+13,322
Hemphill County						
2006	3,637	3,496	3,354	3,212	3,070	2,929
2011	1,825	1,705	1,653	1,566	1,392	1,218
Change	-1,812	-1,791	-1,701	-1,646	-1,678	-1,711
Hutchinson County						
2006	61,628	60,048	56,887	50,567	44,246	41,085
2011	43,104	39,971	38,748	36,708	32,630	28,551
Change	-18,524	-20,077	-18,139	-13,859	-11,616	-12,534
Lipscomb County						
2006	14,419	14,049	13,310	11,831	10,352	9,613
2011	16,956	15,546	15,070	14,277	12,690	11,104
Change	+2,537	+1,497	+1,760	+2,446	+2,338	+1,491
Moore County						
2006	176,079	171,564	162,535	144,475	126,416	117,386
2011	147,471	135,001	130,869	123,981	110,205	96,430
Change	-28,608	-36,563	-31,666	-20,494	-16,211	-20,956
Ochiltree County						
2006	101,615	99,009	93,798	83,376	72,954	67,743
2011	60,844	51,839	50,252	47,607	42,317	37,028
Change	-40,771	-47,170	-43,546	-35,769	-30,637	-30,715
Oldham County						

**Table A-5: Proposed Changes to Irrigation Water Demands for the 2011 Panhandle Regional Water Plan  
(acre-feet per year)**

2006	5,092	4,962	4,700	4,178	3,656	3,395
2011	4,235	3,914	3,794	3,594	3,195	2,795
Change	-857	-1,048	-906	-584	-461	-600
<b>Potter County</b>						
2006	7,809	7,608	7,208	6,407	5,606	5,206
2011	6,226	5,697	5,525	5,234	4,652	4,071
Change	-1,583	-1,911	-1,683	-1,173	-954	-1,135
<b>Randall County</b>						
2006	29,166	28,029	26,893	25,757	24,620	23,484
2011	22,477	19,900	19,291	18,275	16,245	14,214
Change	-6,689	-8,129	-7,602	-7,482	-8,375	-9,270
<b>Roberts County</b>						
2006	22,318	21,746	20,601	18,312	16,023	14,879
2011	6,084	5,639	5,466	5,179	4,603	4,028
Change	-16,234	-16,107	-15,135	-13,133	-11,420	-10,851
<b>Sherman County</b>						
2006	287,336	279,968	265,233	235,763	206,292	191,557
2011	220,372	200,521	194,437	182,913	163,736	143,269
Change	-66,964	-79,447	-70,796	-52,850	-42,556	-48,288
<b>Wheeler County</b>						
2006	8,127	7,919	7,502	6,668	5,835	5,418
2011	11,311	9,488	9,198	8,713	7,745	6,777
Change	+3,184	+1,569	+1,696	+2,045	+1,910	+1,359
<b>Impact to Regional Level Projections</b>						
2006	1,652,230	1,609,429	1,525,102	1,357,728	1,190,357	1,106,034
2011	1,429,990	1,311,372	1,271,548	1,203,332	1,066,736	936,929
Change	-222,240	-298,057	-253,554	-154,396	-123,621	-169,105
% Change	-13.5%	-18.5%	-16.6%	-11.4%	-10.4%	-15.3%
<b>Impact to State Level Projections</b>						
2006	10,345,131	9,980,301	9,585,833	9,206,620	8,843,094	8,556,224
2011	10,122,891	9,682,244	9,332,279	9,052,224	8,719,473	8,387,119
Change	-222,240	-298,057	-253,554	-154,396	-123,621	-169,105
% Change	-2.1%	-3.0%	-2.6%	-1.7%	-1.4%	-2.0%

## Requested Revisions to Mining Demands

Since the development of the 2006 plan in Region A there have been notable increases in oil and gas activities in the region. Based on analysis of well data from the Texas Railroad Commission, and discussions with the Hemphill Underground Water Conservation District and local producers, most of this activity is associated with natural gas exploration and development in northeastern portions of Region A using hydraulic fracturing methods.<sup>2</sup> At the regional level, proposed mining demands for the current plan are about double when compared to the 2006 plan in 2010, and about roughly 40 percent higher in 2060 (Table A-6). With the changes, state-level projected demand would increase by around three percent in 2010 and less than one percent in 2060.

<b>Table A-6: Proposed Changes to Mining Water Demands for the 2011 Panhandle Regional Water Plan (acre-feet per year)</b>						
	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>
<b>Hemphill County</b>						
2006	0	0	0	0	0	0
2011	2,575	2,575	2,314	1,844	1,479	1,183
Change	+2,575	+2,575	+2,314	+1,844	+1,479	+1,183
<b>Lipscomb County</b>						
2006	6	6	6	6	6	6
2011	1,235	1,235	1,114	887	713	574
Change	+1,229	+1,229	+1,108	+881	+707	+568
<b>Moore County</b>						
2006	1,733	1,716	1,709	1,703	1,697	1,689
2011	700	700	630	567	510	459
Change	-1,033	-1,016	-1,079	-1,136	-1,187	-1,230
<b>Ochiltree County</b>						
2006	198	213	220	226	232	240
2011	1,148	1,248	1,027	818	661	522
Change	+950	+1,035	+807	+592	+429	+282
<b>Roberts County</b>						
2006	6	6	6	6	6	6
2011	1,270	1,270	1,148	922	731	592
Change	+1,264	+1,264	+1,142	+916	+725	+586
<b>Wheeler County</b>						
2006	89	85	83	82	81	79
2011	2,001	2,001	1,810	1,444	1,148	922
Change	+1,264	+1,264	+1,142	+916	+725	+586

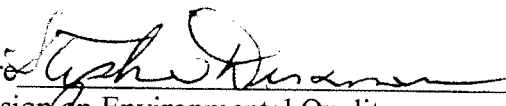
<sup>2</sup> Kiel, Simone. "Review of Mining Demands." Technical memorandum submitted by Freese and Nichols, Inc. to the Panhandle Water Planning Group. File PPC07480. April, 23 2009.

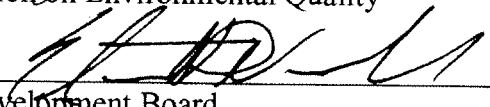


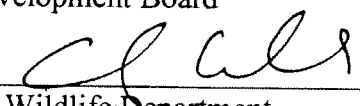
**Table A-6: Proposed Changes to Mining Water Demands for the 2011 Panhandle Regional Water Plan  
(acre-feet per year)**


Impact to Regional Level Projections						
2006	7,115	7,162	7,199	7,237	7,275	7,310
2011	14,012	14,165	13,218	11,696	10,495	9,542
Change	+6,897	+7,003	+6,019	+4,459	+3,220	+2,232
% Change	+96.9%	+97.8%	+83.6%	+61.6%	+44.3%	+30.5%

After satisfying required public notice and public hearing requirements, Region A has requested that the Executive Administrator of the TWDB review and approve this amendment. TWDB staff and representatives of coordinating agencies have reviewed the requested amendment and have determined that the recommended changes are in compliance with the criteria for demand revisions as specified in administrative rules and the TWDB's *Guidelines for Regional Water Plan Development (2007-2012)*.

Steve Densmore  Date July 29 2009  
Texas Commission on Environmental Quality

Stuart Norvell  Date 21 July 2009  
Texas Water Development Board

Cindy Loeffler  Date 7/29/09  
Texas Parks and Wildlife Department

Kelly Stripling  Date 8/03/09  
Texas Department of Agriculture



# TEXAS WATER DEVELOPMENT BOARD



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To: Kevin Ward, Executive Administrator

Through: Carolyn L. Brittin, Deputy Executive Administrator, Water Resources Planning and Information and Dan Hardin, Director, Water Resources Planning

From: Stuart D. Norvell, Texas Water Development Board  
 Steve Densmore, Texas Commission on Environmental Quality  
 Cindy Loeffler, Texas Parks and Wildlife Department  
 Kelly Stripling, Texas Department of Agriculture

Date: July 17, 2009

Re: Revised population and water demand projections for the Lower Colorado (Region K) Regional Water Planning Area (2007-2012 planning cycle).

## **Background**

Population and water demand projections from the 2006 regional water plans are serving as the basis for projections in the current planning cycle. However, the Texas Water Development Board (TWDB) may consider requests to amend 2006 population and water demand projections if conditions in a planning region have changed significantly.

As specified in Section 357.5 (d)(2), Title 31 of the Texas Administrative Code (TAC), entities wishing to revise projections address their requests through their respective regional water planning group. If a planning group concurs, they submit requests to the Executive Administrator of the TWDB.

TWDB staff coordinates reviews of each request with the Texas Commission on Environmental Quality, the Texas Parks and Wildlife Department, and the Texas Department of Agriculture. Designated representatives from each agency must recommend each revision. The Board is responsible for approving and adopting population and water demand projections as specified in (§357.5 (d)(1), 31 TAC).

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## **Requested Revisions to Population and Municipal Water Demands**

Several political subdivisions have requested that the Region K planning group revise 2006 population and corresponding municipal water demand projections. At a public meeting held on May 5, 2009 the group reviewed and approved the request, and have asked the Board to examine and subsequently reject or approve the revisions.

Prior to submittal to the Board, reviewing agencies (the TWDB, TCEQ, TDA and TPWD) examined requested changes. To ensure consistency and to maintain public credibility in Board projections, population estimates published by the Texas State Data Center served as the primary benchmark for assessing the accuracy of requests. The base year for TWDB projections in the 2002-2007 planning cycle was 2000, which is the same year that the U.S. Department of Commerce released results of the U.S. Census. In years in between census releases, the State Data Center generates annual estimates for each county in Texas. Using these estimates, requested changes were evaluated using the following standards:

- 1) if State Data Center population estimates for 2007 exceed TWDB projected values for the same year, increases in regional totals in an amount comparable to the difference were considered justifiable (Table A-1); and
- 2) if State Data Center estimates were less than TWDB projections, requested increases to regional level totals were not considered valid; however, in some cases localized sub-regional adjustments and redistributions of projected populations were considered reasonable as long as regional totals did not increase.

To maintain county and regional level totals, planning groups offset increases by redistributing population at the sub-county level. For example, if increased projections for a given county were not justified, increases for a city could be offset by reducing "county-other" populations.

In addition, some planning groups included new water user groups (WUGs) previously included in the category of county-other. To qualify as a new WUG, a city must now have a population of at least 500 and non-city WUGs such as utilities and water supply corporations must provide on average 250,000 gallons per day to residential, commercial or institutional customers (i.e., municipal water use).

On average, across all regions TSDC estimates exceed TWDB projections by around 1.2 percent. For Region K, TWDB projections were low by 2.49 percent, and thus a regional level increase for Region K is warranted (Table A-1). To account for faster than expected growth in some communities, Region K has requested population increases in future decades ranging from 3.5 percent to 5.5 percent - an additional 53,157 people in 2010 and 118,032 in 2060 (Table A-2). With the changes, state level estimates would rise by less than one percent.

For cities or utilities with changes in population, corresponding municipal water demands were adjusted by multiplying revised populations by per capita use values from the 2006 plan. At the regional level, demand increases would range from 5.7 percent to 7.7 percent over the planning period, and state-level demands would rise by less than one percent (Table A-3).

**Table A-1: Comparison of Texas State Data Center Population Estimates and TWDB Population Projections for (Region K)**

County	U.S. Census Population (2000)	Texas State Data Center Population Estimates (2007)	TWDB Projected Population (2007)*	Difference between TWDB (2007) and State Data Center (2007)
Bastrop	57,733	72,859	69,649	-4.41%
Blanco	8,418	9,378	9,449	+0.76%
Burnet	34,147	41,219	39,396	-4.42%
Colorado	20,390	21,925	20,870	-4.81%
Fayette	21,804	24,132	23,844	-1.19%
Gillespie	20,814	24,343	23,025	-5.41%
Llano	17,044	19,136	17,257	-9.82%
Matagorda	37,957	36,930	39,678	+7.44%
Mills	5,151	5,211	5,142	-1.32%
San Saba	6,186	6,066	6,322	+4.22%
Travis	812,280	943,726	918,711	-2.65%
Wharton (all)	41,188	42,262	42,789	+1.25%
Region K	1,083,112	1,247,187	1,216,132	-2.49

\*TWDB projections based on year 2000 Census data.

**Table A-3 Requested Population Revisions for Region K (2011 Regional Water Plan)**

Water User Group	Projections	2010	2020	2030	2040	2050	2060
<b>Bastrop County</b>							
Aqua WSC	2006	36,138	44,618	54,593	65,914	80,250	98,194
	2011	37,503	54,835	66,989	88,380	105,849	127,246
	Difference	+1,365	+10,217	+12,396	+22,466	+25,599	+29,052
Bastrop	2006	6,515	7,994	9,734	11,708	14,208	17,337
	2011	8,890	12,475	15,920	21,003	25,155	30,240
	Difference	+2,375	+4,481	+6,186	+9,295	+10,947	+12,903
County-Other	2006	17,770	26,787	37,395	49,433	64,677	83,760
	2011	18,441	25,812	32,940	43,459	52,049	62,570
	Difference	671	-975	-4,455	-5,974	-12,628	-21,190
Creedmoor WSC	2006	181	232	292	361	448	557
	2011	181	263	336	443	530	637
	Difference	0	+31	+44	+82	+82	+80

**Table A-3 Requested Population Revisions for Region K (2011 Regional Water Plan)**

Elgin	2006	6,411	7,348	8,450	9,701	11,285	13,267
	2011	9,997	14,028	17,902	23,619	28,287	34,005
	Difference	+3,586	+6,680	+9,452	+13,918	+17,002	+20,738
Lee County WSC	2006	860	1,096	1,374	1,689	2,088	2,587
	2011	860	1,249	1,594	2,103	2,519	3,028
	Difference	0	+153	+220	+414	+431	+441
Smithville	2006	4,540	5,344	6,290	7,364	8,724	10,426
	2011	5,606	7,866	10,039	13,244	15,863	19,070
	Difference	+1,066	+2,522	+3,749	+5,880	+7,139	+8,644
County Total	2006	75,386	97,601	123,734	153,392	190,949	237,958
	2011	84,449	120,739	151,364	199,548	239,589	288,683
	Difference	+9,063	+23,138	+27,630	+46,156	+48,640	+50,725
<b>Blanco County</b>							
Blanco	2006	1,672	1,870	2,059	2,224	2,403	2,611
	2011	2,430	2,872	3,295	3,665	3,990	4,372
	Difference	+758	+1,002	+1,236	+1,441	+1,587	+1,761
County-Other	2006	5,667	6,575	7,444	8,205	9,027	9,982
	2011	4,646	5,208	5,745	6,215	6,849	7,578
	Difference	-1,021	-1,367	-1,699	-1,990	-2,178	-2,404
Johnson City	2006	1,353	1,545	1,728	1,888	2,062	2,264
	2011	1,616	1,910	2,191	2,437	2,653	2,907
	Difference	+263	+365	+463	+549	+591	+643
County Total	2006	9,946	11,756	13,487	15,002	16,641	18,544
	2011	9,946	11,756	13,487	15,002	16,641	18,544
	Difference	0	0	0	0	0	0
<b>Burnet County</b>							
Bertram	2006	1,307	1,524	1,746	1,958	2,189	2,458
	2011	1,430	1,859	2,327	2,781	3,048	3,342
	Difference	+123	+335	+581	+823	+859	+884
Burnet	2006	5,625	6,668	7,736	8,753	9,864	11,154
	2011	6,358	8,263	10,341	12,360	13,549	14,856
	Difference	+733	+1,595	+2,605	+3,607	+3,685	+3,702
Cottonwood Shores	2006	1,100	1,362	1,630	1,885	2,164	2,488
	2011	1,229	2,585	4,105	5,830	7,812	10,114
	Difference	+129	+1,223	+2,475	+3,945	+5,648	+7,626
County-Other	2006	21,733	26,913	32,218	37,265	42,781	49,189
	2011	23,033	29,002	37,148	44,943	48,931	51,705
	Difference	+1,300	+2,089	+4,930	+7,678	+6,150	+2,516
Granite Shoals	2006	2,489	3,015	3,554	4,067	4,627	5,278
	2011	2,738	3,559	4,454	5,324	5,836	6,399
	Difference	+249	+544	900	1,257	1,209	1,121
Marble Falls	2006	5,604	6,361	7,136	7,874	8,680	9,616
	2011	7,796	10,132	12,679	15,155	16,613	18,216
	Difference	+2,192	+3,771	+5,543	+7,281	+7,933	+8,600
Meadowlakes	2006	1,821	2,440	3,074	3,678	4,337	5,103
	2011	2,331	3,030	3,791	4,532	4,967	5,447
	Difference	+510	+590	+717	+854	+630	+344
County Total	2006	41,924	51,044	60,382	69,271	78,981	90,263
	2011	47,160	61,191	78,133	94,716	105,095	115,056
	Difference	+5,236	+10,147	+17,751	+25,445	+26,114	+24,793
<b>Colorado County</b>							
Columbus	2006	4,053	4,231	4,331	4,371	4,379	4,333
	2011	4,053	4,398	4,578	4,580	4,763	4,986
	Difference	0	+167	+247	+209	+384	+653

**Table A-3 Requested Population Revisions for Region K (2011 Regional Water Plan)**

Eagle Lake	2006	3,792	3,959	4,052	4,090	4,097	4,054
	2011	3,792	4,116	4,284	4,285	4,456	4,665
	Difference	0	+157	+232	+195	+359	+611
Weimar	2006	2,050	2,140	2,190	2,212	2,215	2,192
	2011	2,188	2,375	2,472	2,472	2,571	2,691
	Difference	+138	+235	+282	+260	+356	+499
County Total	2006	21,101	22,032	22,550	22,760	22,801	22,561
	2011	21,239	22,591	23,311	23,424	23,900	24,324
	Difference	+138	+559	+761	+664	+1,099	+1,763
<b>Gillespie County</b>							
Fredericksburg	2006	10,313	11,778	12,349	12,349	12,349	12,349
	2011	11,482	13,385	14,365	14,365	14,365	14,365
	Difference	+1,169	+1,607	+2,016	+2,016	+2,016	+2,016
County Total	2006	24,089	27,510	28,845	28,845	28,845	28,845
	2011	25,258	29,117	30,861	30,861	30,861	30,861
	Difference	+1,169	+1,607	+2,016	+2,016	+2,016	+2,016
<b>Hays County</b>							
Buda	2006	8,042	13,971	17,341	20,728	24,797	27,997
	2011	9,338	13,971	17,341	20,728	24,797	27,997
	Difference	+1,296	0	0	0	0	0
County-other	2006	24,018	33,658	43,641	53,675	65,729	75,207
	2011	22,722	33,658	43,641	53,675	65,729	75,207
	Difference	-1,296	0	0	0	0	0
County Total	2006	46,143	69,377	88,887	108,495	132,051	150,574
	2011	46,143	69,377	88,887	108,495	132,051	150,574
	Difference	0	0	0	0	0	0
<b>Llano County</b>							
County-Other	2006	4,745	4,745	4,745	4,745	4,745	4,745
	2011	5,902	6,380	6,508	6,636	6,764	6,891
	Difference	+1,157	+1,635	+1,763	+1,891	+2,019	+2,146
Kingsland WSC	2006	3,692	3,692	3,692	3,692	3,692	3,692
	2011	4,592	4,964	5,064	5,163	5,263	5,363
	Difference	+900	+1,272	+1,372	+1,471	+1,571	+1,671
Lake LBJ MUD	2006	4,819	4,819	4,819	4,819	4,819	4,819
	2011	5,994	6,479	6,610	6,740	6,869	7,000
	Difference	+1,175	+1,660	+1,791	+1,921	+2,050	+2,181
Llano	2006	3,387	3,387	3,387	3,387	3,387	3,387
	2011	3,967	4,288	4,375	4,461	4,547	4,633
	Difference	+580	+901	+988	+1,074	+1,160	+1,246
Sunrise Beach Village	2006	717	717	717	717	717	717
	2011	829	896	914	932	950	968
	Difference	+112	+179	+197	+215	+233	+251
County Total	2006	17,360	17,360	17,360	17,360	17,360	17,360
	2011	21,284	23,007	23,471	23,932	24,393	24,855
	Difference	+3,924	+5,647	+6,111	+6,572	+7,033	+7,495
<b>Matagorda County</b>							
Bay City	2006	19,921	21,292	22,126	22,586	22,521	22,316
	2011	19,921	21,292	22,126	22,586	22,586	22,586
	Difference	0	0	0	0	+46	+193
County-other	2006	14,340	15,328	15,929	16,258	16,212	16,065
	2011	14,340	15,328	15,929	16,258	16,258	16,258
	Difference	0	0	0	0	+46	+193
Palacios	2006	5,499	5,878	6,108	6,235	6,217	6,160

**Table A-3 Requested Population Revisions for Region K (2011 Regional Water Plan)**

	2011	5,499	5,878	6,108	6,235	6,235	6,235
	Difference	0	0	0	0	+18	+75
Southwest Utilities	2006	720	770	800	817	814	807
	2011	720	770	800	817	817	817
	Difference	0	0	0	0	+3	+10
County Total	2006	40,506	43,295	44,991	45,925	45,793	45,377
	2011	40,506	43,295	44,991	45,925	45,925	45,925
	Difference	0	0	0	0	+178	+741
<b>Mills County</b>							
County-Other	2006	3,299	3,506	3,553	3,599	3,569	3,494
	2011	3,628	3,782	4,029	3,851	4,251	4,421
	Difference	+329	+276	+476	+252	+682	+927
Goldthwaite	2006	1,799	1,863	1,877	1,891	1,882	1,859
	2011	1,799	1,988	2,032	2,032	2,032	2,032
	Difference	0	+125	+155	+141	+150	+173
County Total	2006	5,137	5,414	5,476	5,537	5,497	5,397
	2011	5,466	5,815	6,107	5,930	6,329	6,497
	Difference	+329	+401	+631	+393	+832	+1,100
<b>Travis County</b>							
Aqua WSC	2006	7,251	8,523	9,698	10,432	11,208	12,007
	2011	9,470	11,131	12,666	13,625	14,639	15,683
	Difference	+2,219	+2,608	+2,968	+3,193	+3,431	+3,676
Austin	2006	770,529	946,974	1,111,996	1,258,580	1,409,808	1,548,275
	2011	770,529	928,151	1,101,052	1,258,580	1,424,691	1,548,275
	Difference	0	-18,823	-10,944	0	14,883	0
Bee Cave Village	2006	948	1,339	1,700	1,926	2,165	2,411
	2011	2,264	2,727	3,181	3,592	3,891	4,191
	Difference	+1,316	+1,388	+1,481	+1,666	+1,726	+1,780
Briarcliff Village	2006	1,289	1,817	2,305	2,609	2,931	3,263
	2011	1,289	1,553	1,811	2,045	2,215	2,386
	Difference	0	-264	-494	-564	-716	-877
County-Other	2006	33,665	27,853	23,127	17,213	12,127	12,636
	2011	27,000	25,500	18,400	13,813	12,127	12,636
	Difference	-6,665	-2,353	-4,727	-3,400	0	0
Elgin	2006	56	87	116	134	153	173
	2011	87	105	123	139	150	162
	Difference	+31	+18	+7	+5	-3	-11
Jonestown	2006	1,985	2,391	2,766	3,000	3,248	3,503
	2011	3,309	3,985	4,648	5,249	5,686	6,123
	Difference	+1,324	+1,594	+1,882	+2,249	+2,438	+2,620
Lago Vista	2006	6,132	8,307	10,316	11,571	12,898	14,265
	2011	6,907	8,320	9,703	10,959	11,871	12,784
	Difference	+775	+13	-613	-612	-1,027	-1,481
Lakeway	2006	10,789	14,519	17,965	20,117	22,394	24,738
	2011	14,522	17,493	20,400	23,040	24,957	26,877
	Difference	+3,733	+2,974	+2,435	+2,923	+2,563	+2,139
Manor	2006	1,319	1,473	1,615	1,704	1,798	1,895
	2011	6,275	7,558	8,815	9,955	10,784	11,613
	Difference	+4,956	+6,085	+7,200	+8,251	+8,986	+9,718
Pflugerville	2006	24,709	35,916	46,268	52,733	59,572	66,614
	2011	39,480	47,557	55,460	62,638	67,850	73,069
	Difference	+14,771	+11,641	+9,192	+9,905	+8,278	+6,455
San Leanna	2006	0	0	0	0	0	0

**Table A-3 Requested Population Revisions for Region K (2011 Regional Water Plan)**

	2011	546	659	766	868	938	1,009
	Difference	+546	+659	+766	868	938	1,009
Travis County WD 17	2006	15,838	22,283	28,236	31,954	35,887	39,936
	2011	26,130	32,500	36,000	40,000	42,000	44,500
	Difference	+10,292	+10,217	+7,764	+8,046	+6,113	+4,564
County Total	2006	969,955	1,185,499	1,385,236	1,550,538	1,722,737	1,888,543
	2011	1,003,253	1,201,256	1,402,153	1,583,068	1,770,347	1,918,135
	Difference	+33,298	+15,757	+16,917	+32,530	+47,610	+29,592
<b>Wharton County</b>							
County-Other	2006	18,491	19,545	20,226	20,616	20,626	20,406
	2011	16,063	16,978	17,570	17,909	17,918	17,726
	Difference	-2,428	-2,567	-2,656	-2,707	-2,708	-2,680
East Bernard	2006	0	0	0	0	0	0
	2011	2,428	2,567	2,656	2,707	2,708	2,680
	Difference	+2,428	+2,567	+2,656	+2,707	+2,708	+2,680
County Total	2006	28,260	29,872	30,911	31,508	31,523	31,188
	2011	28,260	29,872	30,911	31,508	31,523	31,188
	Difference	0	0	0	0	0	0
<b>Williamson County</b>							
Anderson Mill MUD	2006	8,831	8,831	8,831	8,831	8,831	8,831
	2011	0	0	0	0	0	0
	Difference	-8,831	-8,831	-8,831	-8,831	-8,831	-8,831
Austin	2006	20,486	30,775	43,008	56,310	70,782	86,303
	2011	29,317	39,606	51,839	65,141	79,613	95,134
	Difference	+8,831	+8,831	+8,831	+8,831	+8,831	+8,831
County Total	2006	48,657	60,711	75,043	90,627	107,582	125,766
	2011	48,657	60,711	75,043	90,627	107,582	125,766
	Difference	0	0	0	0	0	0
<b>Impact to Regional Level Projections</b>							
Region K	2006	1,359,677	1,657,025	1,936,324	2,181,851	2,447,058	2,713,905
	2011	1,412,834	1,714,281	2,008,141	2,295,627	2,580,534	2,831,937
	Difference	+53,157	+57,256	+71,817	+113,776	+133,476	+118,032
	% Difference	+3.91%	+3.46%	+3.71%	+5.21%	+5.45%	+4.35%

**Table A-3 Corresponding Changes to Region K Municipal Water Demand Projections**

Water User Group	Projections	2010	2020	2030	2040	2050	2060
<b>Bastrop County</b>							
Aqua WSC	2006	5,424	6,547	7,827	9,377	11,326	13,859
	2011	5,629	8,046	9,604	12,573	14,939	17,959
	Difference	+205	+1,499	+1,777	+3,196	+3,613	+4,100
Bastrop	2006	1,460	1,755	2,115	2,518	3,040	3,709
	2011	1,992	2,739	3,459	4,517	5,382	6,469
	Difference	+532	+984	+1,344	+1,999	+2,342	+2,760
County-Other	2006	2,429	3,660	5,068	6,700	8,766	11,353
	2011	2,521	3,527	4,464	5,890	7,054	8,481



**Table A-3 Corresponding Changes to Region K Municipal Water Demand Projections**

	Difference	+92	-133	-604	-810	-1,712	-2,872
Creedmoor-Maha WSC	2006	19	23	29	35	43	54
	2011	19	26	33	43	51	62
	Difference	0	+3	+4	+8	+8	+8
Elgin	2006	1,063	1,193	1,344	1,521	1,757	2,066
	2011	1,658	2,278	2,847	3,703	4,404	5,295
	Difference	+595	+1,085	+1,503	+2,182	+2,647	+3,229
Lee County WSC	2006	126	156	192	235	287	356
	2011	126	178	223	293	346	417
	Difference	0	+22	+31	+58	+59	+61
Smithville	2006	732	838	972	1,122	1,319	1,577
	2011	904	1,233	1,551	2,018	2,398	2,884
	Difference	+172	+395	+579	+896	+1,079	+1,307
County Total	2006	11,679	14,762	18,327	22,505	27,818	34,610
	2011	13,275	18,620	22,964	30,040	35,860	43,208
	Difference	+1,596	+3,858	+4,637	+7,535	+8,042	+8,598
<b>Blanco County</b>							
Blanco	2006	303	331	360	381	409	445
	2011	440	508	576	628	679	745
	Difference	+137	+177	+216	+247	270	+300
County-Other	2006	558	626	692	744	809	894
	2011	457	496	534	564	614	679
	Difference	-101	-130	-158	-180	-195	-215
Johnson City	2006	320	360	397	429	467	512
	2011	382	445	503	554	601	657
	Difference	+62	+85	+106	+125	+134	+145
County Total	2006	1,369	1,580	1,783	1,951	2,151	2,396
	2011	1,467	1,712	1,947	2,143	2,360	2,626
	Difference	+98	+132	+164	+192	+209	+230
<b>Burnet County</b>							
Bertram	2006	258	295	334	371	412	463
	2011	282	360	445	527	574	630
	Difference	+24	+65	+111	+156	+162	+167
Burnet	2006	983	1,143	1,300	1,461	1,635	1,849
	2011	1,111	1,416	1,738	2,063	2,246	2,463
	Difference	+128	+273	+438	+602	+611	+614
Cottonwood Shores	2006	147	177	208	239	271	312
	2011	164	336	524	739	978	1,268
	Difference	+17	+159	+316	+500	+707	+956
County-Other	2006	1,947	2,352	2,743	3,131	3,546	4,078
	2011	3,025	3,697	4,525	5,338	5,818	6,248
	Difference	+1,078	+1,345	+1,782	+2,207	+2,272	+2,170
Granite Shoals	2006	385	453	525	592	669	763
	2011	424	535	658	775	844	925
	Difference	+39	+82	+133	+183	+175	+162
Marble Falls	2006	1,795	2,016	2,238	2,452	2,693	2,984
	2011	2,497	3,211	3,976	4,719	5,154	5,653
	Difference	+702	+1,195	+1,738	+2,267	+2,461	+2,669
Meadowlakes	2006	687	916	1,150	1,372	1,618	1,903
	2011	879	1,137	1,418	1,691	1,853	2,031
	Difference	+192	+221	+268	+319	+235	+128
County Total	2006	6,810	8,097	9,380	10,633	12,003	13,684
	2011	8,990	11,437	14,166	16,867	18,626	20,550

**Table A-3 Corresponding Changes to Region K Municipal Water Demand Projections**

	Difference	+2,180	+3,340	+4,786	+6,234	+6,623	+6,866
<b>Colorado County</b>							
Columbus	2006	1,026	1,057	1,067	1,062	1,060	1,048
	2011	1,026	1,099	1,128	1,113	1,153	1,206
	Difference	0	+42	+61	+51	+93	+158
Eagle Lake	2006	573	581	581	572	569	563
	2011	573	604	614	599	619	648
	Difference	0	+23	+33	+27	+50	+85
Weimar	2006	340	345	346	342	340	337
	2011	363	383	391	382	395	414
	Difference	+23	+38	+45	+40	+55	+77
County Total	2006	3,132	3,189	3,189	3,141	3,122	3,089
	2011	3,155	3,292	3,328	3,259	3,320	3,409
	Difference	+23	+103	+139	+118	+198	+320
<b>Gillespie County</b>							
Fredericksburg	2006	2,796	3,153	3,265	3,237	3,223	3,223
	2011	3,113	3,583	3,798	3,765	3,749	3,749
	Difference	+317	+430	+533	+528	+526	+526
County Total	2006	4,432	4,968	5,113	5,048	5,015	5,015
	2011	4,749	5,398	5,646	5,576	5,541	5,541
	Difference	+317	+430	+533	+528	+526	+526
<b>Hays</b>							
Buda	2006	1,252	2,128	2,603	3,088	3,666	4,140
	2011	1,454	2,128	2,603	3,088	3,666	4,140
	Difference	+202	0	0	0	0	0
County-other	2006	3,551	4,864	6,208	7,576	9,277	10,615
	2011	3,359	4,864	6,208	7,576	9,277	10,615
	Difference	-192	0	0	0	0	0
County Total	2006	7,192	10,656	13,446	16,266	19,744	22,498
	2011	7,202	10,656	13,446	16,266	19,742	22,498
	Difference	10	0	0	0	0	0
<b>Llano County</b>							
County-Other	2006	983	978	978	973	967	967
	2011	1,991	2,243	2,428	2,608	2,784	2,970
	Difference	+1,008	+1,265	+1,450	+1,635	+1,817	+2,003
Kingsland WSC	2006	554	546	533	521	517	517
	2011	689	734	731	729	737	751
	Difference	+135	+188	+198	+208	+220	+234
Lake LBJ MUD	2006	1,339	1,328	1,312	1,296	1,290	1,290
	2011	1,665	1,785	1,800	1,813	1,839	1,874
	Difference	+326	+457	+488	+517	+549	+584
Llano	2006	1,005	994	983	971	964	964
	2011	1,177	1,258	1,270	1,279	1,294	1,319
	Difference	+172	+264	+287	+308	+330	+355
Sunrise Beach Village	2006	173	172	170	168	167	167
	2011	200	215	217	218	221	225
	Difference	+27	+43	+47	+50	+54	+58
County Total	2006	4,054	4,018	3,976	3,929	3,905	3,905
	2011	5,722	6,235	6,446	6,647	6,875	7,139
	Difference	+1,668	+2,217	+2,470	+2,718	+2,970	+3,234
<b>Matagorda County</b>							
Bay City	2006	3,236	3,387	3,445	3,441	3,406	3,375
	2011	3,236	3,387	3,445	3,441	3,416	3,416

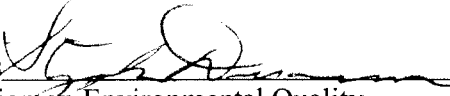
**Table A-3 Corresponding Changes to Region K Municipal Water Demand Projections**

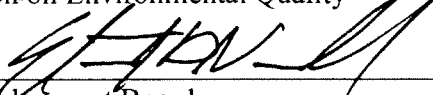
	Difference	0	0	0	0	+10	+41
County-other	2006	1,526	1,580	1,587	1,566	1,543	1,529
	2011	1,526	1,580	1,587	1,566	1,547	1,547
	Difference	0	0	0	0	+4	+18
Palacios	2006	745	777	787	789	780	773
	2011	745	777	787	789	782	782
	Difference	0	0	0	0	+2	+9
Southwest Utilities	2006	81	84	85	85	84	83
	2011	81	84	85	85	84	84
	Difference	0	0	0	0	0	+1
County Total	2006	5,590	5,830	5,906	5,883	5,815	5,762
	2011	5,590	5,830	5,906	5,883	5,831	5,831
	Difference	0	0	0	0	+16	+69
<b>Mills County</b>							
County-Other	2006	395	409	402	395	387	380
	2011	434	441	456	423	461	481
	Difference	+39	+32	+54	+28	+74	+101
Goldthwaite	2006	569	582	581	579	571	564
	2011	569	621	629	622	617	616
	Difference	0	+39	+48	+43	+46	+52
County Total	2006	971	999	991	982	966	951
	2011	1,010	1,070	1,093	1,053	1,086	1,104
	Difference	+39	+71	+102	+71	+120	+153
<b>Travis County</b>							
Aqua WSC	2006	1,088	1,251	1,390	1,484	1,582	1,695
	2011	1,421	1,634	1,815	1,938	2,066	2,214
	Difference	+333	+383	+425	+454	+484	+519
Austin	2006	150,180	183,509	214,242	241,074	268,462	293,095
	2011	150,180	179,861	212,133	241,074	271,296	293,095
	Difference	0	-3,648	-2,109	0	+2,834	0
Bee Cave Village	2006	493	694	880	995	1,118	1,245
	2011	1,177	1,413	1,647	1,856	2,009	2,164
	Difference	+684	+719	+767	+861	+891	+919
Briarcliff Village	2006	254	350	439	494	552	614
	2011	254	299	345	387	417	449
	Difference	0	-51	-94	-107	-135	-165
County-Other	2006	6,561	5,397	4,455	3,297	2,309	2,392
	2011	8,344	8,663	7,908	7,649	7,953	8,676
	Difference	+1,783	+3,266	+3,453	+4,352	+5,644	+6,284
Elgin	2006	9	14	18	21	24	27
	2011	14	17	19	22	24	25
	Difference	+5	+3	+1	+1	0	-2
Jonestown	2006	280	329	372	400	429	463
	2011	467	548	625	700	751	809
	Difference	+187	+219	+253	+300	+322	+346
Lago Vista	2006	2,006	2,698	3,340	3,733	4,161	4,602
	2011	2,260	2,702	3,142	3,536	3,830	4,124
	Difference	+254	+4	-198	-197	-331	-478
Lakeway	2006	3,529	4,716	5,796	6,467	7,199	7,953
	2011	4,750	5,682	6,582	7,407	8,023	8,641
	Difference	+1,221	+966	+786	+940	+824	+688
Manor	2006	285	312	336	351	369	388
	2011	1,356	1,601	1,834	2,051	2,213	2,378

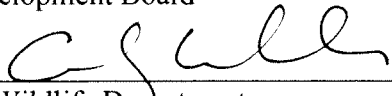
**Table A-3 Corresponding Changes to Region K Municipal Water Demand Projections**

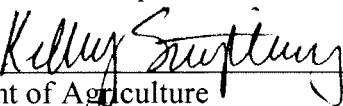
	Difference	+1,071	+1,289	+1,498	+1,700	+1,844	+1,990
Pflugerville	2006	4,318	6,196	7,930	8,978	10,143	11,342
	2011	6,899	8,204	9,505	10,664	11,552	12,441
	Difference	+2,581	+2,008	+1,575	+1,686	+1,409	+1,099
San Leanna	2006	0	0	0	0	0	0
	2011	100	120	140	158	171	184
	Difference	+100	+120	+140	+158	+171	+184
Travis County WD #17	2006	2,856	3,944	4,966	5,584	6,271	6,979
	2011	4,712	5,752	6,331	6,990	7,339	7,777
	Difference	+1,856	+1,808	+1,365	+1,406	+1,068	+798
County Total	2006	189,602	229,928	266,748	296,675	327,840	357,541
	2011	199,677	237,014	274,610	308,229	342,865	369,723
	Difference	+10,075	+7,086	+7,862	+11,554	+15,025	+12,182
<b>Wharton County</b>							
County-Other	2006	2,113	2,168	2,175	2,147	2,126	2,103
	2011	1,836	1,883	1,889	1,865	1,847	1,827
	Difference	-277	-285	-286	-282	-279	-276
East Bernard	2006	0	0	0	0	0	0
	2011	277	285	286	282	279	276
	Difference	+277	+285	+286	+282	+279	+276
County Total	2006	3,776	3,880	3,910	3,880	3,847	3,806
	2011	3,776	3,880	3,910	3,880	3,847	3,806
	Difference	0	0	0	0	0	0
<b>Williamson County</b>							
Anderson Mill MUD	2006	1,464	1,434	1,405	1,375	1,355	1,355
	2011	0	0	0	0	0	0
	Difference	-1,464	-1,434	-1,405	-1,375	-1,355	-1,355
Austin	2006	3,993	5,964	8,286	10,786	13,479	16,338
	2011	5,457	7,398	9,691	12,161	14,834	17,693
	Difference	+1,464	+1,434	+1,405	+1,375	+1,355	+1,355
County Total	2006	8,841	11,095	13,761	16,625	19,743	23,082
	2011	8,841	11,095	13,761	16,625	19,743	23,082
	Difference	0	0	0	0	0	0
<b>Impact to Regional Level Projections</b>							
Region K	2006	252,637	304,735	352,737	394,101	439,049	484,170
	2011	268,643	321,972	373,430	423,051	472,778	516,348
	Difference	+16,006	+17,237	+20,693	+28,950	+33,729	+32,178
	% Difference	+6.34%	+5.66%	+5.87%	+7.35%	+7.68%	+6.65%

After satisfying required public notice and public hearing requirements, Region P has requested that the Executive Administrator of the TWDB review and approve this amendment. TWDB staff and representatives of coordinating agencies have reviewed the requested amendment and have determined that the recommended changes are in compliance with the criteria for demand revisions as specified in administrative rules and the TWDB's *Guidelines for Regional Water Plan Development* (2007-2012).

Steve Densmore  Date July 29, 2009  
Texas Commission on Environmental Quality

Stuart Norvell  Date 21 July 2009  
Texas Water Development Board

Cindy Loeffler  Date 24 July 2009  
Texas Parks and Wildlife Department

Kelly Stripling  Date 8/03/09  
Texas Department of Agriculture



# TEXAS WATER DEVELOPMENT BOARD



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To: Kevin Ward, Executive Administrator

Through: Carolyn L. Brittin, Deputy Executive Administrator, Water Resources Planning and Information and Dan Hardin, Director, Water Resources Planning

From: Stuart D. Norvell, Texas Water Development Board  
 Steve Densmore, Texas Commission on Environmental Quality  
 Cindy Loeffler, Texas Parks and Wildlife Department  
 Kelly Stripling, Texas Department of Agriculture

Date: July 16, 2009

Re: Revised water demand projections for the Coastal Bend (Region N) Regional Water Planning Area (2007-2012 planning cycle).

## **Background**

Population and water demand projections from 2006 regional water plans are serving as the basis for projections in the current planning cycle. However, the Texas Water Development Board (TWDB) may consider requests to amend 2006 population and water demand projections if conditions in a planning region have changed significantly.

As specified in Section 357.5 (d)(2), Title 31 of the Texas Administrative Code (TAC), entities wishing to revise projections address their requests through their respective regional water planning group. If a planning group concurs, they submit requests to the Executive Administrator of the TWDB.

TWDB staff coordinates reviews of each request with the Texas Commission on Environmental Quality, the Texas Parks and Wildlife Department, and the Texas Department of Agriculture. Designated representatives from each agency must recommend each revision. The Board is responsible for approving and adopting population and water demand projections as specified in (§357.5 (d)(1), 31 TAC).

### ***Our Mission***

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## Requested Revisions to Irrigation Water Demands

Political subdivisions in Region N have requested changes to irrigation water demands for Bee and San Patricio counties. Recent historical water use estimates of the TWDB are higher than year 2010 projections from the region's previous water plan (Tables A-1 and A-2). In Bee County, from 2003 to 2007 farmers irrigated an average of 6,379 acres with 3,743 acre-feet of water, and in San Patricio County, the five-year average is 13,288 acres and 8,613 acre-feet. In contrast, according to the 2006 Region N plan projected irrigation demands in 2010 total 2,455 acre-feet for Bee County and 4,601 acre-feet for San Patricio County.

Year	Bee County		San Patricio County	
	Acres	Water use (acre-feet)	Acres	Water use (acre-feet)
2003	5,205	3,020	11,765	8,019
2004	5,548	3,458	12,770	9,159
2005	6,792	4,147	13,467	9,613
2006	5,967	5,311	13,477	9,968
2007*	7,166	2,781	14,963	6,395
5-year average	6,379	3,743	13,288	8,631
Projected 2010	NA	2,455	NA	4,601

"NA" = not available. \*In 2007, rainfall in the area was well above average, and thus demands are considerably lower than previous years. Source: Texas Water Development Board Water Resources Planning Division.

Projections from Region N's 2006 plan show a downward trend in irrigation demands and the region has requested that this assumption be reassessed based on historical data and evidence presented by local water managers and producers.<sup>1</sup> In Bee County, reports from the Bee Groundwater Conservation District (GCD) show that irrigation use in the county currently totals about 3,800 acre-feet per year, and officials report that demands are increasing at annual rate of roughly one percent per year.

According to representatives of Groundwater Management Area 16 and the San Patricio County GCD, irrigation demands in the county peaked in 1958 at 20,785 acre-feet per year when vegetables were the predominant irrigated crop. When farmers in the area began to shift more

<sup>1</sup> Bledsoe, S., Drawe, L., Mengers, T., and Stewart, L. "Letter of Support for Revisions to Bee and San Patricio Counties Irrigation Water Demands Based on Coastal Bend Regional Water Planning (RWPG) Group Recommendations." Letter addressed to Mr. Stuart Norvell, Manager of Water Research Planning and Analysis, Texas Water Development Board dated June 26, 2009.

toward field crops such as cotton, corn and sorghum, irrigation declined through the 1980s until to the advent of center pivot irrigation technology brought back demands for irrigation. Costs of pivot systems relative to furrow irrigation are lower, and the San Patricio County GCD is expecting to see increases in pivot systems in the near future.

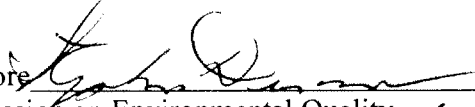
Although, it is uncertain whether irrigation demands will increase relative to today’s levels in Bee and San Patricio counties, TWDB staff believes it is a reasonable and justifiable assumption based evidence presented by Region N.

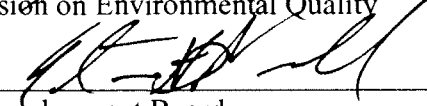
With the requested changes, projected irrigation demands for the region would rise by about 29 percent in 2010, and 122 percent in 2060. Impacts to state level projections are small – increases of less than one percent.


<b>Table A-2: Requested Changes to Board Approved Irrigation Water Demand Projections for Region N (acre feet per year)</b>						
	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>
<b>Bee County Irrigation</b>						
2006	2,455	2,153	1,889	1,657	1,453	1,274
2011	3,796	4,193	4,632	5,116	5,652	6,243
Change	+1,341	+2,040	+2,743	+3,459	+4,199	+4,969
<b>San Patricio County Irrigation</b>						
2006	4,160	4,033	3,680	3,362	3,069	2,803
2011	8,631	9,534	10,531	11,633	12,850	14,195
Change	+4,471	+5,501	+6,851	+8,271	+9,781	+11,392
<b>Impact to Regional Level Projections</b>						
2006	20,072	18,611	17,077	15,703	14,470	13,365
2011	25,884	26,152	26,671	27,433	28,450	29,726
Change	+5,812	+7,541	+9,594	+11,730	+13,980	+16,361
% Change	+28.96%	+40.52%	+56.18%	+74.70%	+96.61%	+122.42%
<b>Impact to State Level Projections</b>						
2006	10,345,131	9,980,301	9,585,833	9,206,620	8,843,094	8,556,224
2011	10,350,943	9,987,842	9,595,427	9,218,350	8,857,074	8,572,585
% Change	+0.06%	+0.08%	+0.10%	+0.13%	+0.16%	+0.19%

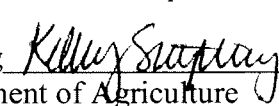


After satisfying required public notice and public hearing requirements, Region P has requested that the Executive Administrator of the TWDB review and approve this amendment. TWDB staff and representatives of coordinating agencies have reviewed the requested amendment and have determined that the recommended changes are in compliance with the criteria for demand revisions as specified in administrative rules and the TWDB's *Guidelines for Regional Water Plan Development* (2007-2012).

Steve Densmore  Date July 24 2009  
Texas Commission on Environmental Quality

Stuart Norvell  Date 21 July 2009  
Texas Water Development Board

Cindy Loeffler  Date 7/24/09  
Texas Parks and Wildlife Department

Kelly Stripling  Date 8/03/09  
Texas Department of Agriculture



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To: Kevin Ward, Executive Administrator

Through: Carolyn L. Brittin, Deputy Executive Administrator, Water Resources Planning and Information and Dr. Dan Hardin, Director, Water Resources Planning

From: Stuart D. Norvell, Texas Water Development Board  
 Steve Densmore, Texas Commission on Environmental Quality  
 Dan Opdyke, Texas Parks and Wildlife Department  
 Gary Walker, Texas Department of Agriculture

Date: June 16, 2009

Re: Revised population and water demand projections for the Lavaca (Region P) Regional Water Planning Area (2007-2012 planning cycle).

### **Background**

Population and water demand projections from 2006 regional water plans are serving as the basis for projections in the current planning cycle. However, the Texas Water Development Board (TWDB) may consider requests to amend 2006 population and water demand projections if conditions in a planning region have changed significantly.

As specified in Section 357.5 (d)(2), Title 31 of the Texas Administrative Code (TAC), entities wishing to revise projections address their requests through their respective regional water planning group. If a planning group concurs, they submit requests to the Executive Administrator of the TWDB.

TWDB staff coordinates reviews of each request with the Texas Commission on Environmental Quality, the Texas Parks and Wildlife Department, and the Texas Department of Agriculture. Designated representatives from each agency must recommend each revision. The Board is responsible for approving and adopting population and water demand projections as specified in (§357.5 (d)(1), 31 TAC).

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## **Requested Revisions to Population and Municipal Water Demands**

Representatives of several political subdivisions have requested that the Region P planning group revise 2006 population and corresponding municipal water demand projections. At a public meeting held on April 20, 2009 the group reviewed and approved the request, and have asked the Board to examine and subsequently reject or approve the revisions.

Prior to submittal to the Board, reviewing agencies (the TWDB, TCEQ, TDA and TPWD) examined requested changes. To ensure consistency and to maintain public credibility in Board projections, population estimates published by the Texas State Data Center served as the primary benchmark for assessing the accuracy of requests. The base year for TWDB projections in the 2002-2007 planning cycle was 2000, which is the same year that the U.S. Department of Commerce released results of the U.S. Census. In years in between census releases, the State Data Center generates annual estimates for each county in Texas. Using these estimates, requested changes were evaluated using the following standards:

- 1) if State Data Center population estimates for 2007 exceed TWDB projected values for the same year, increases in regional totals in an amount comparable to the difference were considered justifiable (Table A-1); and
- 2) if State Data Center estimates were less than TWDB projections, requested increases to regional level totals were not considered valid; however, in some cases localized sub-regional adjustments and redistributions of projected populations were considered reasonable as long as regional totals did not increase.

To maintain county and regional level totals, planning groups offset increases by redistributing population at the sub-county level. For example, if increased projections for a given county were not justified, increases for a city could be offset by reducing “county-other” populations.

In addition, some planning groups included “new” Water User Groups (WUGs) previously included in the category of county-other. To qualify as new WUGs, a city must now have a population of at least 500 and non-city WUGs (e.g., utilities, water supply corporations) must provide on average 250,000 gallons per day to residential, commercial or institutional customers (i.e., municipal water use).

On average, across all regions TSDC estimates exceed TWDB projections by around 1.2 percent. For Region P, TWDB projections were slightly high by a factor of only 0.06 percent, and thus a regional level increase for Region P does not appear warranted (Table A-1). Region P has requested an increase in the population of the City of Hallettsville, but because there is not a sufficient basis to increase regional totals, increases in Hallettsville were offset by a reduction in County-other (Table A-2). As a result, there is no net increase in county, regional or state population totals.

For cities or utilities with changes in population, the TWDB adjusted corresponding water demands by multiplying revised populations by per capita use values from the 2007 State Water Plan. For

Region P, there is a slight increase in projected water demands at the county and regional level. At the state level, the impact is negligible (Table A-3).

<b>Table A-1: Comparison of Texas State Data Center Population Estimates and TWDB Population Projections for (Region P)</b>				
<b>County</b>	<b>U.S. Census Population (2000)</b>	<b>Texas State Data Center Population Estimates (2007)</b>	<b>TWDB Projected Population (2007)*</b>	<b>Difference between TWDB (2007) and State Data Center (2007)</b>
Jackson	14,391	14,598	15,100	+3.4%
Lavaca	19,210	19,382	18,900	-2.5%
Wharton	41,188	42,262	42,789	+1.3%
Region P	74,789	76,242	76,789	+0.06%
*TWDB projections based on year 2000 Census data.				

<b>Table A-2: Requested Changes to Population Projections (Region P)</b>						
	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>
<b>City of Hallettsville, Lavaca County</b>						
2006	2,289	2,287	2,224	2,114	1,985	1,839
2011	2,603	2,614	2,901	3,409	3,998	4,673
Change	+314	+327	+677	+1,295	+2,013	+2,834
<b>County-other, Lavaca County</b>						
2006	10,012	10,002	9,728	9,244	8,684	8,041
2011	9,698	9,675	9,051	7,949	6,671	5,207
Change	-314	-327	-677	-1,295	-2,013	-2,834
Net Change in County, Regional and State Projections	0	0	0	0	0	0

<b>Table A-3: Corresponding Changes to Municipal Water Demand Projections (Region P)</b>						
	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>
<b>City of Hallettsville, Lavaca County</b>						
2006	551	543	521	488	454	420
2011	627	621	680	787	914	1,067
Change	+76	+78	+159	+299	+460	+647
<b>County-other, Lavaca County</b>						
2006	1,177	1,143	1,079	994	914	847
2011	1,145	1,110	1,009	858	705	551
Change	-32	-33	-70	-136	-209	-296
<b>Impact to County and Regional Totals</b>						
Net Change in County, Regional and State Projections	+44	+45	+89	+163	+251	+351
% Change in County Level Projections	+1.5%	+1.6%	+3.3%	+6.4%	+10.7%	+16.2%
% Change in Regional Level Projections	+0.6%	+0.6%	+1.2%	+2.3%	+3.7%	+5.4%

### **Requested Revisions to Irrigation Water Demands**

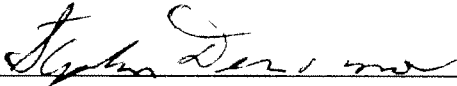
Region P has also requested changes to irrigation water demands for Jackson, Lavaca, and Wharton counties (Table A-4). Revised irrigation demands are based on a special study report generated under contract with Region P as part of Phase I of the 2011 regional water planning cycle.<sup>2</sup>

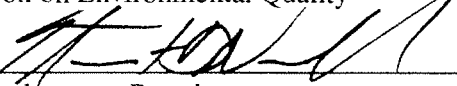
Primary factors associated with the changes are slighter higher estimated water application rates for rice, corn, cotton, sorghum, beans and turf grass, and changes in planted and harvested acreage. Based on study data collected from the Farm Services Agency and the Coastal Bend Groundwater Conservation District, estimated rice acreage in the portion of Wharton County allocated to Region P is 35 percent higher than previously determined. Estimates for non-rice acreage in the portion of Wharton County allocated to Region P are also significantly higher than figures used in developing 2006 projections. In contrast, study data show that the amount of rice acreage in Jackson County is 25 percent lower than amounts used in developing the 2006 projections. In Lavaca County, rice acreage is 25 percent lower.

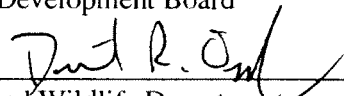
<sup>2</sup> Afinowicz, J.D., and Reedy, M.V. "Agricultural Water Demand Analysis for the Lavaca Regional Water Planning Group." TWDB Report 60028580, December 2008.

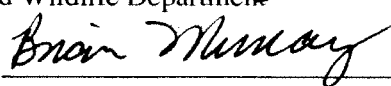
<b>Table A-4: Requested Changes to Board Approved Irrigation Water Demand Projections for Region P (acre feet)</b>						
	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>
<b>Jackson County Irrigation</b>						
2006	88,749	88,793	88,841	88,901	88,959	89,019
2011	59,801	59,801	59,801	59,801	59,801	59,801
Change	-28,948	-28,992	-29,040	-29,100	-29,158	-29,218
<b>Lavaca County Irrigation</b>						
2006	11,511	11,529	11,552	11,577	11,602	11,629
2011	8,357	8,357	8,357	8,357	8,357	8,357
Change	-3,154	-3,172	-3,195	-3,220	-3,245	-3,272
<b>Wharton County Irrigation</b>						
2006	113,378	109,324	105,413	101,642	98,007	94,603
2011	149,688	149,688	149,688	149,688	149,688	149,688
Change	+36,310	+40,364	+44,275	+48,046	+51,681	+55,085
<b>Impact to Regional Level Projections</b>						
2006	213,638	209,646	205,806	202,120	198,568	195,251
2011	217,846	217,846	217,846	217,846	217,846	217,846
Change	+4,208	+8,200	+12,040	+15,726	+19,278	+22,595
% Change	+1.9%	+3.8%	+5.5%	+7.2%	+8.8%	+10.4%
<b>Impact to State Level Projections</b>						
2006	10,345,131	9,980,301	9,585,833	9,206,620	8,843,094	8,556,224
2011	10,349,339	9,988,501	9,597,873	9,222,346	8,862,372	8,578,819
Change	+4,208	+8,200	+12,040	+15,726	+19,278	+22,595
% Change	+0.04%	+0.08%	+0.13%	+0.17%	+0.22%	0.26%

After satisfying required public notice and public hearing requirements, Region P has requested that the Executive Administrator of the TWDB review and approve this amendment. TWDB staff and representatives of coordinating agencies have reviewed the requested amendment and have determined that the recommended changes are in compliance with the criteria for demand revisions as specified in administrative rules and the TWDB's *Guidelines for Regional Water Plan Development* (2007-2012).

Steve Densmore  Date 07/10/2009  
 Texas Commission on Environmental Quality

Stuart Norvell  Date 06/25/2009  
 Texas Water Development Board

Dan Opdyke  Date 6/25/09  
 Texas Parks and Wildlife Department

Gary Walker  Date 6/26/2009  
 Texas Department of Agriculture