

POPULATION AND WATER USE PROJECTIONS
TEXAS STATE SENATE BILL 1
REGION B

2.1 Region B Overview

The eleven North Central Texas counties of Region B contain only one city larger than 100,000, which is Wichita Falls. The other communities are smaller and more rural in nature with incomes that are dependent on agriculture and, to a lesser extent, the oil industry. Consequently, the population for the region is projected to have only a moderate increase for the next fifty years from 201,984 people in 1996 to 216,914 in 2050, or 7.5 percent. Tables A-1 through A-3, in Attachment 2-1 summarize all of the population projections for the region through the year 2050. These projections were made by using the 1996 through 1998 population information as provided by the Texas State Data Center in conjunction with questionnaires mailed to every water provider in the Region. Attachment 1 details the population projection procedure.

Per capita municipal water use is predicted to gradually decline over the planning period from 187 gallons per capita per day (gpcd) in 2000 to 161 gpcd in 2050 based on water use and population projections shown in Attachment 2-1. According to the 1997 amended Texas Water Plan published by the Texas Water Development Board, the use for the entire state was shown to be 168 gpcd in 1990 with an increase to 181 gpcd in 2000. In 2050 the statewide use is predicted to decline to 157 gpcd. Region B's water use is currently in-line with the statewide average and is expected to decline in the future as predicted with the average. Since a large majority of the region is rural in nature, the percentage of conservation savings for the state as a whole will probably not be realized to the same extent in this area. In the more densely populated areas where new construction is progressing at a faster pace, more water conserving measures can be implemented by requiring the newer plumbing fixtures and maintaining tighter controls on overall water use. Tables A-4 through A-8, in Attachment 2-1, summarize the projected water demands through the year 2050.

2.2 Population Growth

The Region B projected total population growth is shown in Figure 2-1. The projections were determined by:

- Using the latest information published by the State Data Center for city populations;
- Surveying the cities, smaller communities, rural water supply corporations, municipal utility districts, and river authorities to determine population based on existing meter counts;
- Using growth trends derived from the surveys based on populations and meter counts from 1990 to 1998.

Figure 2-1
Projected Population for Region B per Attachment 2-1

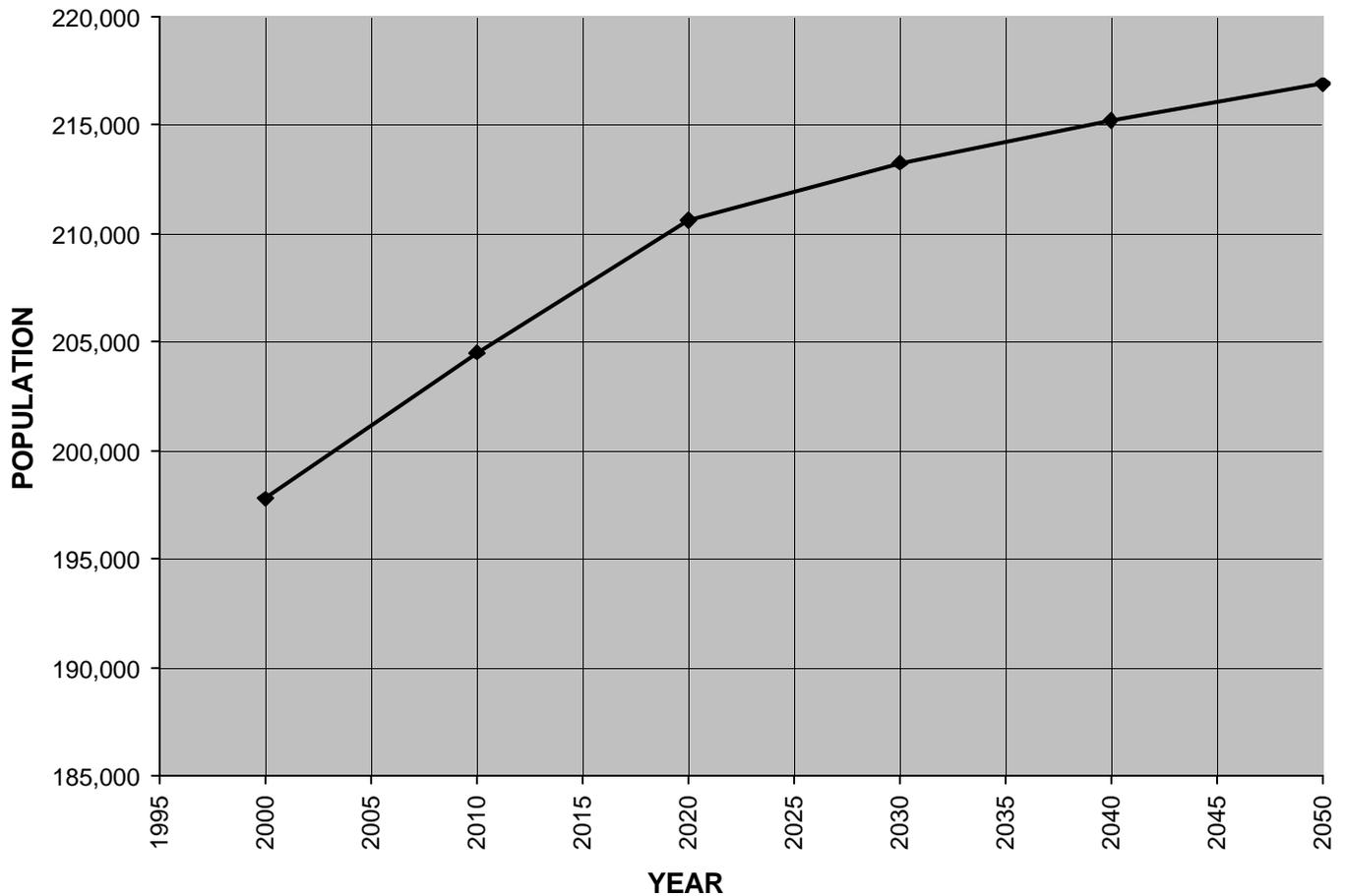


Table 2-1 - Projected Population Data Points per Attachment 2-1

YEAR	2000	2010	2020	2030	2040	2050
POPULATION	197,793	204,521	210,634	213,261	215,196	216,914

The city with the highest projected growth rate is Wichita Falls. It is expected to grow by slightly over 20 percent in the next fifty years for many reasons. Recently the city annexed additional property north and west of town. The Allred Prison has a construction project in progress to double the size of the facility, Midwestern State University student population has increased in recent years, and Sheppard Air Force Base continues to expand its training facilities. Other towns that may experience some growth include Lakeside City, Henrietta, Burkburnett, Iowa Park, and Vernon.

2.3 Water Uses

2.3.1 Total Region B Use

The water use for Region B has been divided into several categories for analysis purposes. The various uses analyzed include water for municipal use (MUN), industrial or manufacturing (MFG), power cooling (PWR), mining (MIN), agricultural irrigation (IRR), and livestock watering (STK). Figure 2-2 shows the amounts of water predicted to be required for these categories through the year 2050. The water use is shown in acre-feet (Ac-Ft) units with one acre-foot being equivalent to 325,851 gallons of water.

Figure 2-2
Projected Water Use for Region B per Attachment 2-1

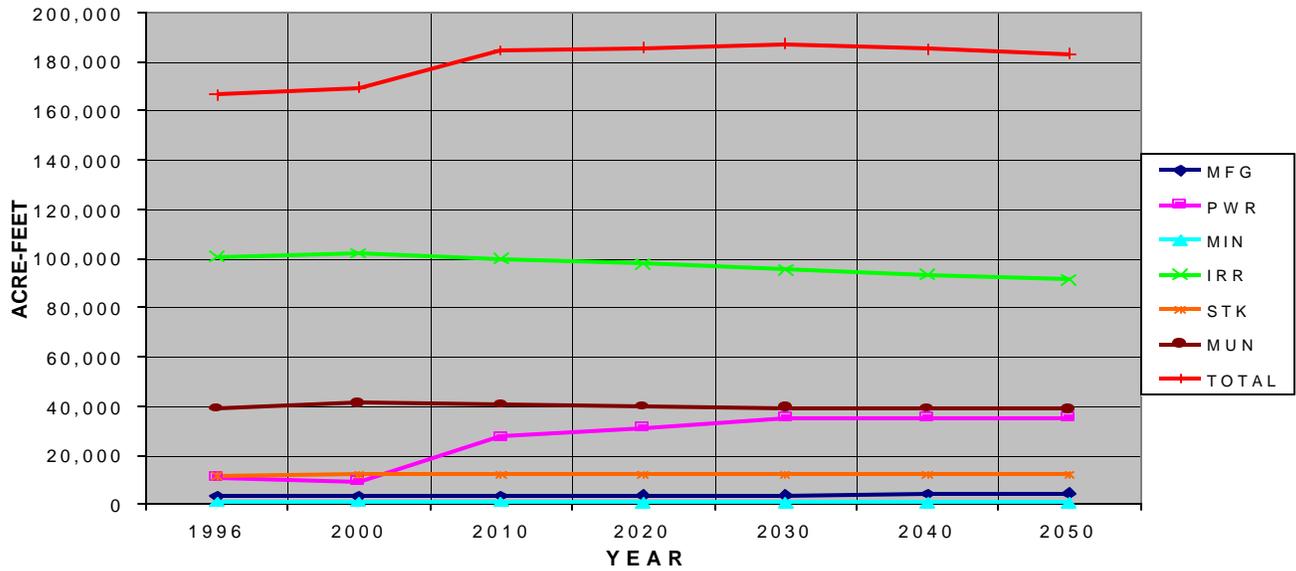


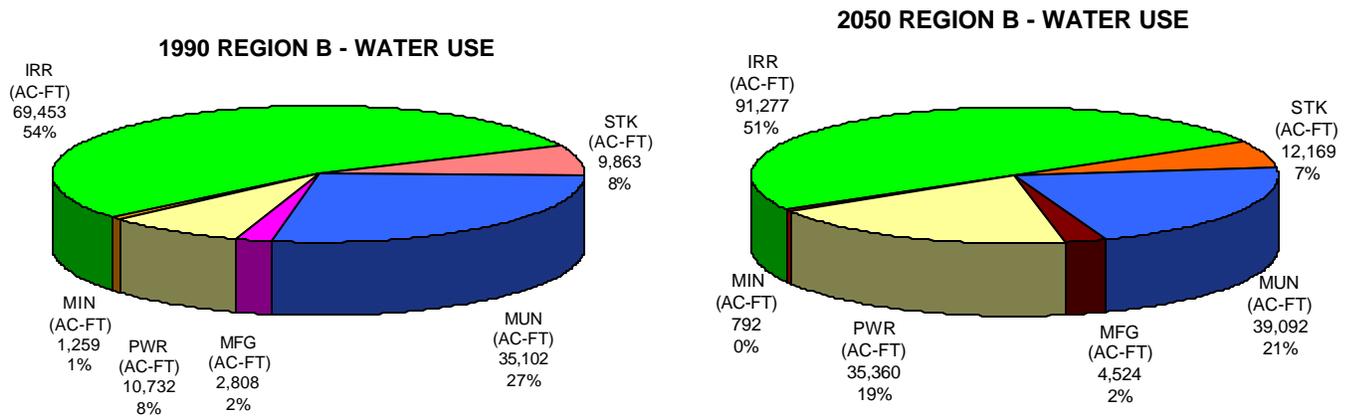
Table 2-2 - Projected Water Use Data Points (Acre-Feet)

YEAR	1996	2000	2010	2020	2030	2040	2050
MFG	3,230	3,266	3,547	3,755	3,968	4,260	4,524
PWR	11,116	9,460	27,360	31,360	35,360	35,360	35,360
MIN	1,192	1,176	909	845	811	785	792
IRR	100,564	102,106	99,880	97,687	95,522	93,385	91,277
STK	11,574	12,169	12,169	12,169	12,169	12,169	12,169
MUN	38,976	41,395	40,715	39,820	39,373	39,068	39,092
TOTAL	166,652	169,572	184,580	185,636	187,203	185,027	183,214

Total water consumption for the region is predicted to increase approximately 10 percent from 1996 to 2050. Figure 2-3 compares the water uses of 1990 to the projected water uses for 2050.

The two scenarios in Figure 2-3 show that the composition of water use for this region is not anticipated to change much. However, a proposed new power plant in Archer County will contribute to the more than doubling of the amount of water required for that category.

Figure 2-3
Composition of Past and Projected Region B Water Use



2.3.2 Municipal Water Use

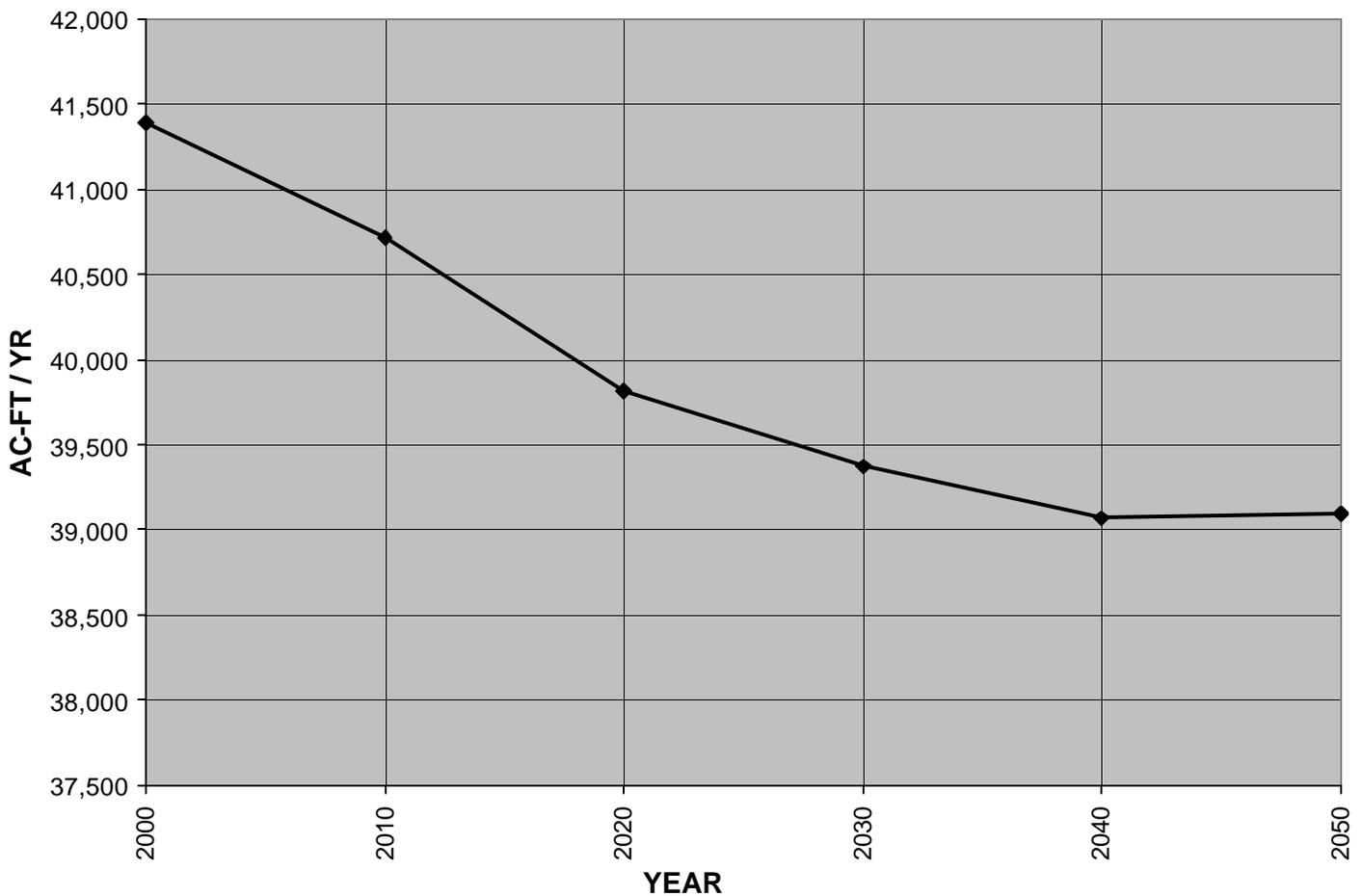
Municipal water use is defined by the TWDB as residential and commercial water use. Residential use includes single and multi-family household water use. Commercial use includes water used by business establishments, public offices, and institutions, but does not include industrial water use. Residential and commercial water uses are categorized together because they are similar types of uses, for example, each category uses water primarily for drinking, cleaning, sanitation, cooling and landscape watering.

The total municipal water use for Region B is shown to decline from 41,395 Ac-Ft in the year 2000 to 39,092 Ac-Ft in 2050 in spite of a population increase of over 10 percent. The decrease is anticipated because, as previously mentioned, the per capita water use is expected to decrease over the next fifty years. Decreases in water use are expected due to water conservation measures implemented by the cities and individual users including more efficient plumbing

fixtures, better lawn watering procedures, and tighter controls on water losses by the water providers and other conservation measures.

The graph of the municipal water use line shown in Figure 2-4 indicates the declining water use trend from the year 2000 through 2050.

Figure 2-4
Total Municipal Water Use in Region B per Attachment 2-1



Since weather has a significant impact on municipal water use, all projections for the future have been based on a below average rainfall year. Water use data was accumulated for the water users of the region through research of records at the TWDB, the TNRCC, and through questionnaires sent to the sellers of municipal water. Many of the estimates of future use have been based on

the water sold in 1996 as it was a particularly dry period in the North Texas region, and total water use peaked.

2.3.3 Manufacturing Water Use

Manufacturing, or industrial, water use has been defined as water used in the production process of manufactured products, including water used by employees for drinking and sanitation purposes. Water use for manufacturing products (MFG) in Region B is a small percentage, less than 5 percent, of the overall water use in this region.

The majority of the MFG water use is in Wichita County by the industrial facilities in and around Wichita Falls. Over 62 percent of the MFG water for the region is consumed in Wichita County. Wilbarger, Hardeman, and Montague Counties also have facilities that require water in the MFG category. The top six MFG facilities in Wichita County used slightly over 78 percent of the water in 1998, and they include: Vetrotex America, PPG Industries, Stanley Proto Tools, Howmet Corporation, Wichita Falls Castings, and Tranter Inc. Wilbarger County has Rhodia Inc. and Wright Brand Foods as the major industrial users for that area. There are numerous other small industrial users in Region B.

Based on the increasing trend of water required for MFG in Region B, an increase from 3,266 Ac-Ft in 2000 to 4,524 Ac-Ft in 2050 has been projected. While the percentage increase for the category is 38 percent, the amount of the increase of MFG water, as considered in the overall regional plan, is much smaller at 9 percent. Figure 2-5 shows the projections for manufacturing water use in Region B.

Region B will probably have some growth in the number of industrial facilities that locate in that area. That growth will be attributed to reasonable land prices, a good labor market, and above average power and water resources.

Figure 2-5
Projected Industrial Water Use for Region B per Attachment 2-1

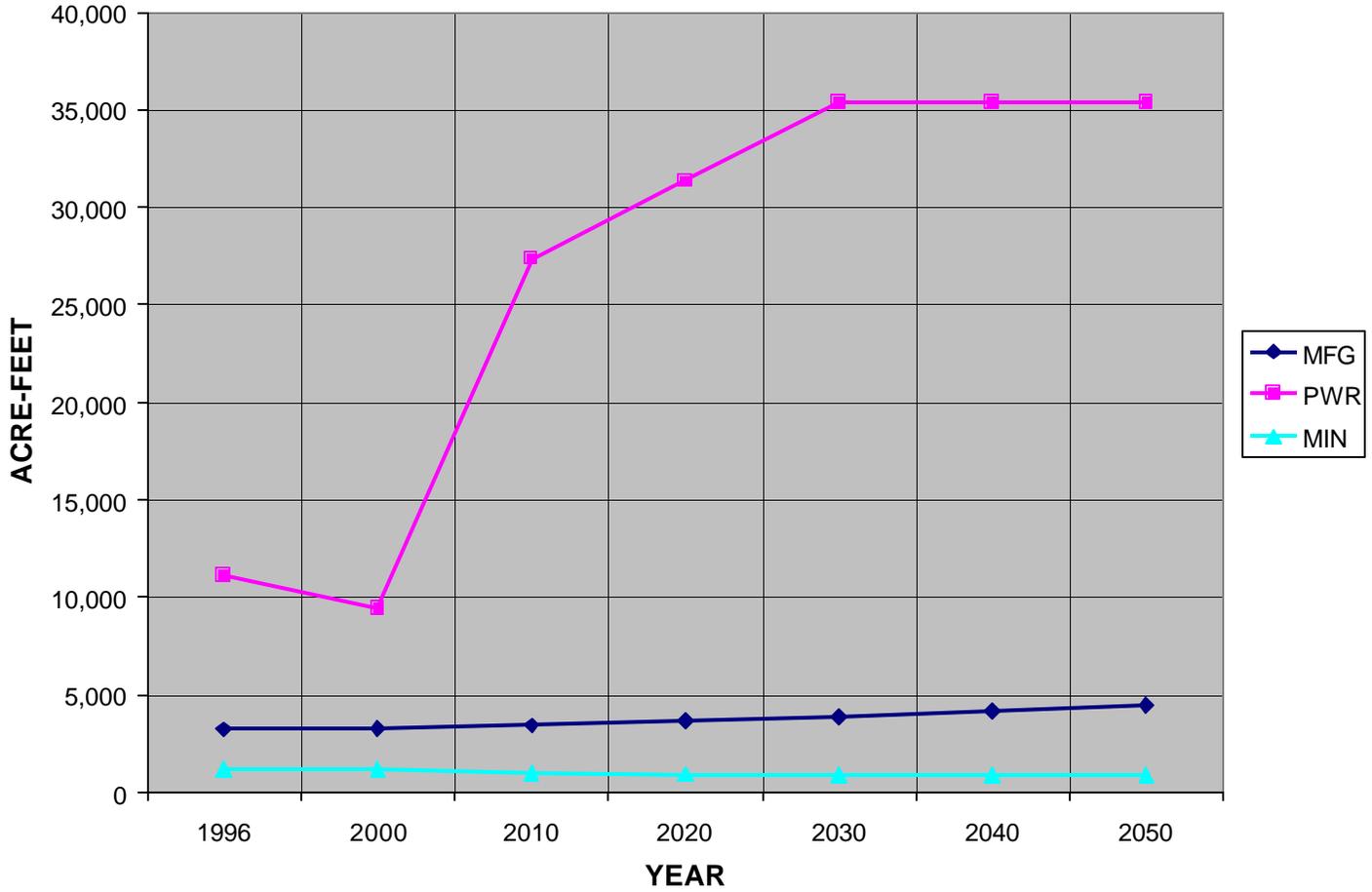


Table 2-3 - Projected Industrial Water Use Data Points per Attachment 2-1

YEAR	1996	2000	2010	2020	2030	2040	2050
MFG	3,230	3,266	3,547	3,755	3,968	4,260	4,524
PWR	11,116	9,460	27,360	31,360	35,360	35,360	35,360
MIN	1,192	1,176	909	845	811	785	792

2.3.4 Steam-Electric Power Generation

The total water use required for steam-electric power generation for Region B is projected to be 9,460 Ac-Ft in the year 2000 and grow to 35,360 Ac-Ft in the year 2050. West Texas Utility Company (WTU) currently has power producing plants in Wilbarger and Hardeman Counties and there is a small cogeneration plant in Wichita Falls associated with the Vetrotex America manufacturing facility. On April 1, 1999 it was announced that Panda Energy International will break ground in the fall of 1999 on a new 1,000 megawatt electric generating plant in Archer County. Construction is expected to be complete by 2001. The City of Wichita Falls and the Wichita County Water Improvement District (WCWID) will deliver water for the new plant from Lake Diversion. With the new plant and possible future expansion of the WTU facilities, the water used in this category will be increased substantially over the fifty year planning period. The percentage of water used for power generation in Region B will increase from 8 percent in 1990 to 19 percent in 2050. The projections for water use for steam-electric power generation are also shown in Figure 2-5.

2.3.5 Mining Water Use

The oil and gas industry has played a large role in the history and development of the North Central Texas area and is essentially the only "mining" activity in the region. Fresh water has been used in the past to drill wells and in some cases to water flood oil fields. However, as the fields in this area are mature and will not see much more development, water required for production will decline as well. If oil prices remain below the \$18 to \$20 per barrel level, production will decrease even more. Based on current status of the oil industry and recent trends in water required for mining in this region, a decrease from 1,176 Ac-Ft required in the year 2000 to 792 Ac-Ft in the year 2050 is projected and is shown in Figure 2-5.

2.3.6 Agricultural Irrigation Water Use

The largest water use in Region B is irrigated agriculture. Irrigated crops in the region include cotton, wheat, peanuts, alfalfa, hay-pasture, vegetables, orchards, and others. The total acreage irrigated varies from year to year depending on weather, crop price, government programs, and other factors. Agricultural use accounted for approximately 54 percent of the water used in 1990

and is projected to be 50 percent of all the water used in 2050. Figure 2-6 shows the projected agricultural water use.

A portion of the water used for irrigation in Region B is from groundwater, but the majority of the water used is surface water. In 1996, 63,511 Ac-Ft of the total 99,764 Ac-Ft was delivered through the unlined ditches of the WCWID. However, due to the age and construction of the canal system, approximately 44 percent of water released into the canal system was lost due to evaporation, seepage, and leaks. A study was prepared for the WCWID to determine the costs for installing pipelines in the canals to prevent the losses, and it was shown to be cost

Figure 2-6
Projected Agricultural Water Use for Region B per Attachment 2-1

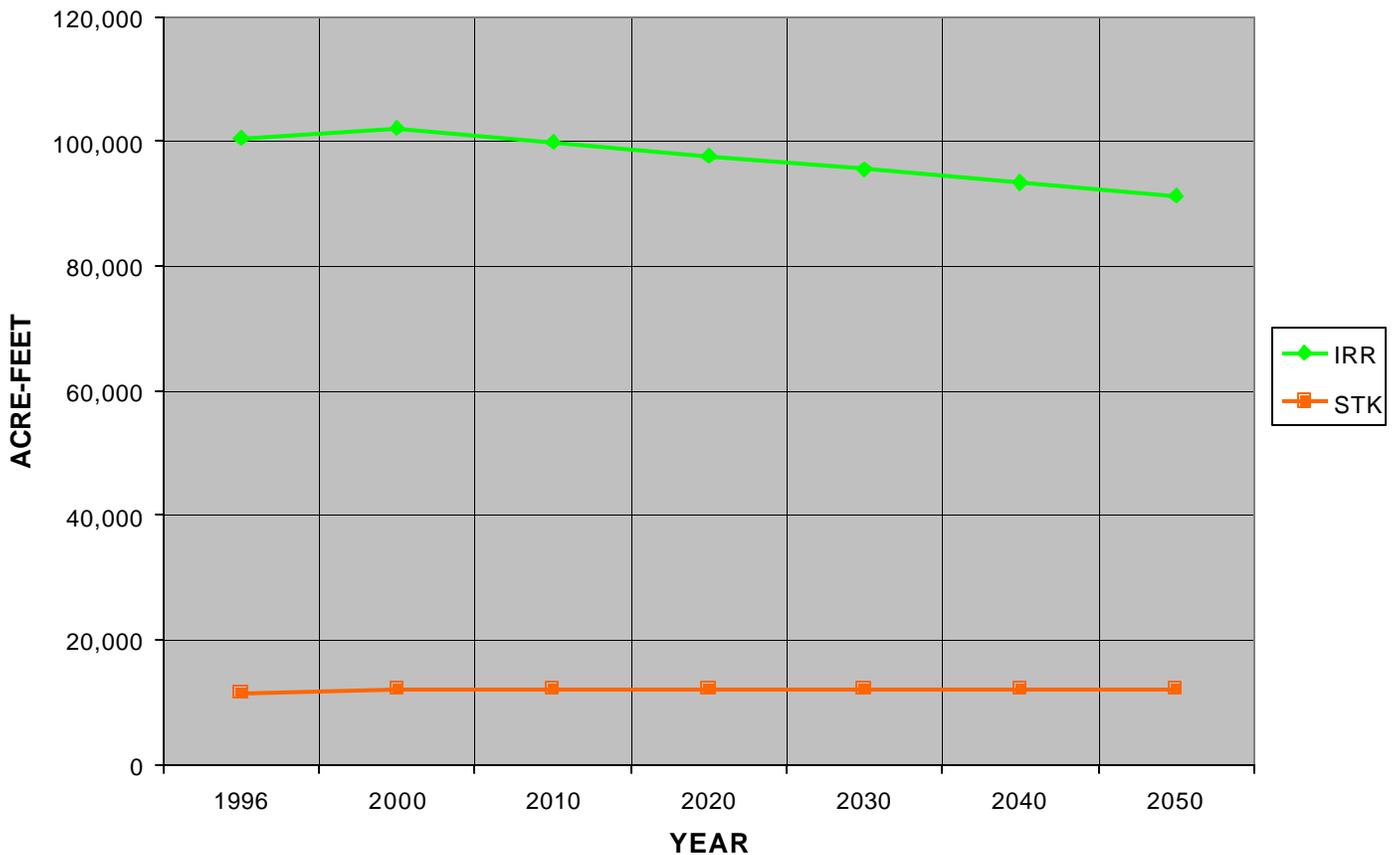


Table 2-4 - Projected Agricultural Water Use Data Points per Attachment 2-1

YEAR	1996	2000	2010	2020	2030	2040	2050
IRR	100,564	102,106	99,880	97,687	95,522	93,385	91,277
STK	11,574	12,169	12,169	12,169	12,169	12,169	12,169

prohibitive, approximately \$25,000,000. Note that all surface water diversion losses are included in the water required for irrigation. Some reduction in underground water loss is anticipated due to the use of more efficient irrigation systems and improved irrigation management practices. If the chlorides are reduced in the Lake Kemp/Lake Diversion system, irrigated property by the WCWID may actually increase.

2.3.7 Livestock Watering

Livestock production is an important part of the economy in Region B. In 1996, the total water used in the region for livestock was 11,574 Ac-Ft, and the use is projected to have a small increase to 12,169 Ac-Ft in the year 2000 and then remain level from 2000 to 2050. This represents about 7 percent of the water used in the region. The livestock water use projections are shown in Figure 2-6.

2.4 Region B Amendments to 1997 Water Plan

This report has been prepared in accordance with the requirements of Texas State Senate Bill 1 (SB1). Subsequent to the passage of SB1 "Guidelines and Data Requirements for Addressing Revisions of the Consensus - Based Population and Water Demand Projections Senate Bill 1" were published by the Texas Water Development Board.

The rules promulgated for implementing Senate Bill 1 direct the Regional Water Planning Groups to use the consensus-based population and water use projections that were developed for and used in preparing the 1997 State Water Plan. Specifically, the rules state:

Section 357.5 Guidelines for Development of Regional Water Plans.

- (d) *Use of population and water demands. In developing regional water plans, regional water planning groups shall use:*
- (1) *state population and water demand projections contained in the state water plan or adopted by the board after consultation with the Texas Natural Resource Conservation Commission and the Texas Parks and Wildlife Department in preparation for revision of the state water plan; or*
 - (2) *in lieu of paragraph (1) of this subsection, population and water demand projection revisions that have been adopted by the board, after coordination with the Texas Natural Resource Conservation Commission and the Texas Parks and Wildlife Department, based on changed conditions and availability of new information. Within 45 days of receipt of a request from a regional planning group for revision of population or water demand projections, the executive administrator shall consult with the requesting regional water planning group and respond to their request.*

The RWPG for Region B presented a request to the TWDB for several changes to the 1997 State Water Plan projections in population and water. All requests were documented as required by the guidelines and the requests were approved by the TWDB. Attachment 2-1 contains the documentation for the proposed revisions to the population and water use projections. As previously mentioned, the results of those changes are the basis for this report.