

Brazos G Regional Water Plan

Executive Summary

Background

Since 1957, the Texas Water Development Board (TWDB) has been charged with preparing a comprehensive and flexible long-term plan for the development, conservation, and management of the state's water resources. The current state water plan, *Water for Texas, January 2002*, was produced by the TWDB and based on approved regional water plans pursuant to requirements of Senate Bill 1 (SB1), enacted in 1997 by the 75th Legislature. As stated in SB1, the purpose of the regional water planning effort is to:

“Provide for the orderly development, management, and conservation of water resources and preparation for and response to drought conditions in order that sufficient water will be available at a reasonable cost to ensure public health, safety, and welfare; further economic development; and protect the agricultural and natural resources of that particular region.”

SB1 also provides that future regulatory and financing decisions of the Texas Commission on Environmental Quality (TCEQ) and the TWDB be consistent with approved regional plans.

The TWDB is the state agency designated to coordinate the overall statewide planning effort. The Brazos G Area, which is comprised of all or portions of 37 counties (Figure ES-1), is one of the State's 16 planning regions established by the TWDB. The TWDB appointed members to the regional planning groups, who serve without pay. The Brazos G Regional Water Planning Group (BGRWPG) was originally appointed by the TWDB to represent a wide range of stakeholder interests and act as the steering and decision-making body of the regional planning effort. As member terms expire, new members are appointed by the BGRWPG itself through solicitation of nominations. The BGRWPG adopted bylaws to govern its operations and, in accordance with its bylaws, designated the Brazos River Authority (BRA) as the administrative agency and principal contractor to receive a grant from the TWDB to develop the water plan. Ms. Teresa Clark serves as the Regional Planning Project Manager for the BRA, assisted by Julie Andress. The BGRWPG selected HDR Engineering, Inc. as prime consultant for the planning and engineering tasks necessary for plan development.

The BGRWPG consists of 19 voting members who represent the following 12 interests: the public, counties, municipalities, industries, agriculture, the environment, small businesses,

electric-generating utilities, river authorities, water districts, water utilities and groundwater conservation districts. The BGRWPG also includes several non-voting members who participate in the deliberations of the BGRWPG, and contribute excellent knowledge and insight to the group. Table ES-1 lists the voting and non-voting members and interest groups represented on the BGRWPG who contributed to the development of the 2006 Brazos G Regional Water Plan (both current and recently retired).

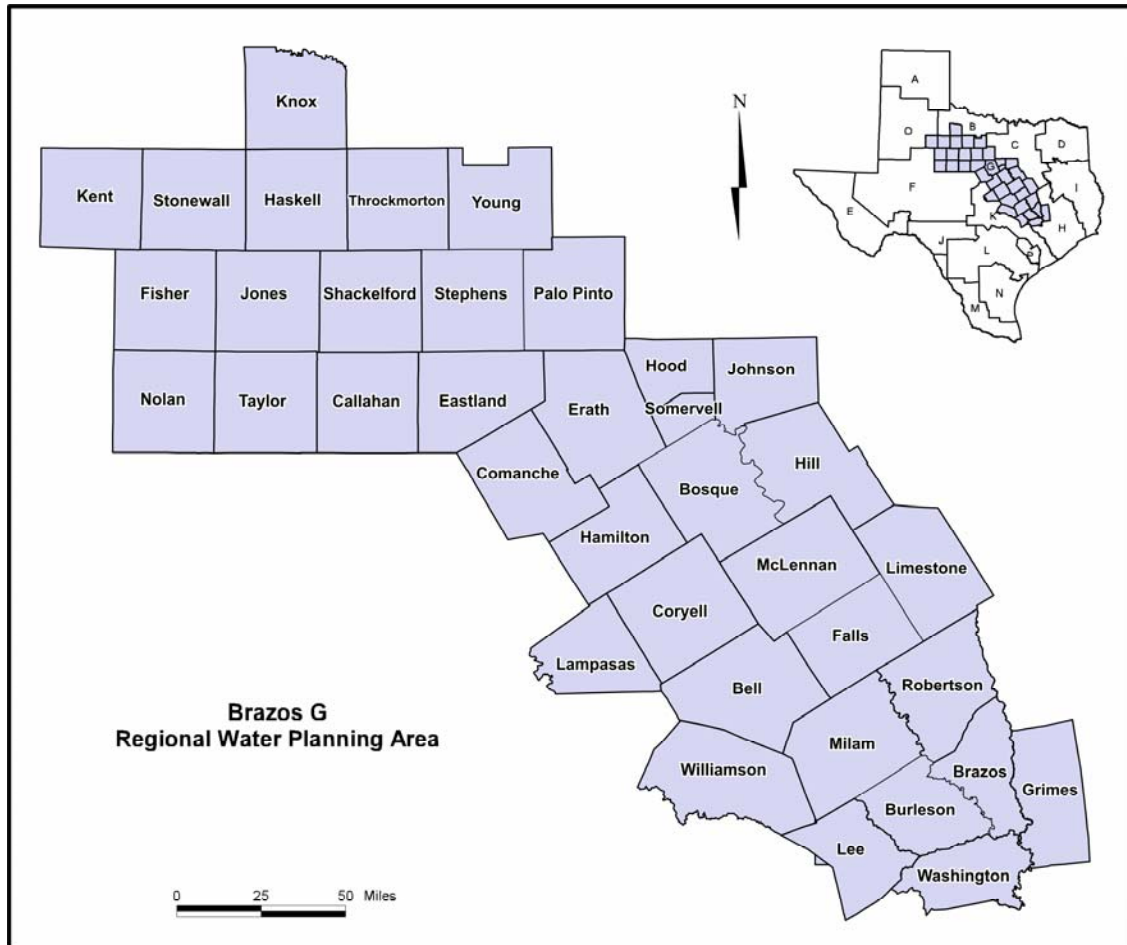


Figure ES-1. Brazos G Regional Water Planning Area

The planning horizon to be used is the 60-year period from 2000 to 2060. This planning period allows for long-term forecast of the prospective water situation, sufficiently in advance of needs, to allow for appropriate management measures to be implemented. As required in Senate Bill 1, the TWDB specified planning rules and guidelines (31 TAC 357.7 and 357.12) to focus the efforts and to provide for general consistency among the regions so that the regional plans can then be aggregated into an overall State Water Plan.

**Table ES-1.
Current and Recent Brazos G RWPG Voting Members
(as of June 2005)**

Interest Group	Name	Entity
Voting Members		
Agricultural	Dale Spurgin (6/04 to present) Wayne Wilson (12/04 to present) Steve Sanford (resigned 11/03) Chaunce Thompson (retired 12/04)	Judge, Jones County Rancher Farmer/Rancher Cattlemen
Counties	Judge Tim Fambrough Judge Jon Burrows Judge Mike Sutherland (12/04 to present) Tony Jones (retired 12/04) Judge David Purdue (resigned 3/02)	Nolan County Bell County Burleson County Brazos County Commissioners Court Knox County
Electric Generating Utilities	Scott Diermann Ken Smith (resigned 11/02)	TXU Electric TXU Electric
Environmental	Stephen L. Stark	Texas A&M University
Industry	Randy Waclawczyk (12/04 to present) Mark Bryson (retired 12/04)	Alcoa Alcoa
Municipalities	Mike Morrison (Chairman) Wiley Stem III Tom Clark Alva D. Cox (12/04 to present) Truman O. Blum (retired 12/04) James Nuse (retired 11/03)	City of Abilene City of Waco City of Round Rock City of Granbury Former mayor, City of Clifton City of Round Rock
Public	Scott Mack, DDS	Dentist
River Authorities	Phil Ford	Brazos River Authority
Small Business	Horace R. Grace	AMG Enterprises, Inc.
Water Districts	Terry Kelley Kathleen Webster (12/04 to present) A.V. Jones, Jr. (retired 12/04)	Johnson County SUD West Central Texas MWD West Central Texas MWD
Groundwater Districts	Mike McGuire (12/04 to present)	Rolling Plains GCD
Water Utilities	Kent Watson	Wickson Creek Special Utility District
Non-Voting Members		
Region H RWPG Liaison	John Baker	Brazos River Authority
LCRA Representative	James Clarno	Lower Colorado River Authority
Region F RWPG Liaison & CRMWD Representative	John Grant	Chair, Region F & GM of Colorado River Municipal Water District
Llano Estacado (O) RWPG Liaison	Terry Lopas	Brazos River Authority
Lower Colorado (K) RWPG Liaison	Mark Jordan	Lower Colorado River Authority
TWDB Project Manager	David Meesey	Texas Water Development Board
TPWD	Mellisa Mullins	Texas Parks and Wildlife Department
TDA	E.W. Wesley	Texas Department of Agriculture
Region C RWPG Liaison	Paul Zweiacker	Texas Utilities

Pursuant to Regional and State Water Planning Guidelines (Texas Administrative Code, Title 31, Part 10, Chapters 357 and 358), the BGRWPG developed the 2001 Brazos G Regional Water Plan, which was then integrated into the State Water Plan “Water for Texas – 2002” by the TWDB. The 2006 Brazos G Regional Water Plan, of which this Executive Summary is a part, represents the first update of the regional water plan as presently required to occur on a 5-year cycle. The TWDB will integrate this Regional Water Plan into a State Water Plan to be issued in 2007.

The structure of the 2006 Regional Water Plan is organized in accordance with TWDB guidelines and summarized by section title as follows.

- 1) Description of the Brazos G Region (Volume I)
- 2) Projected Population and Water Demands (Volume I)
- 3) Evaluation of Water Supplies in the Region (Volume I)
- 4) Identification, Evaluation and Selection of Water Management Strategies Based on Needs
 - 4A) Comparison of Demand to Supply (Volume I)
 - 4B.1) Identification, Evaluation and Selection of Water Management Strategies (Volumes I and II)
 - 4B.2) Technical Evaluations of Water Management Strategies (Volume II)
 - 4C) Water Supply Plans (Volume I)
- 5) Impacts of Recommended Water Management Strategies on Key Parameters of Water Quality and Moving Water from Rural and Agricultural Areas (Volume I)
- 6) Water Conservation and Drought Management Recommendations (Volume I)
- 7) Consistency with Long-Term Protection of the State’s Water, Agricultural, and Natural Resources (Volume I)
- 8) Recommendations for Unique Stream Segments, Unique Reservoir Sites and Other Legislative Recommendations (Volume I)
- 9) Report to the Legislature on Water Infrastructure Funding Recommendations (Volume I)
- 10) Adoption of Plan (Volume I)

Description of the Region

The Brazos G Region can be described by a single word—**diverse**. From the piney woods of Brazos and Grimes Counties to the rolling plains of Nolan County; from sparsely populated Stonewall County to Williamson County, often listed as the fastest growing county in the nation; from the prodigious Carrizo-Wilcox Aquifer in the southeast to the meager dribbles from windmills in Shackelford County; from 44 inches of annual rainfall in the east to 24 inches

annually in the west (in a good year); from the Chisholm Trail through Stephens County to the NAFTA trail known as Interstate Highway (IH) 35; these diverse characteristics make for a wide variation in water supplies, demands, and availability of affordable options to meet needs.

Population and Water Demand Projections

In December 2002, the TWDB published population and water demand projections for each county in the state. In the Brazos G Area, population projections were developed for 184 municipal water user groups, which are defined as cities with a population greater than 500 in 2000, and water supply corporations and utilities using water volumes of 280 acft or more in 2000. To account for people living outside the cities, projections were also developed for a 'county-other' category of municipal water use for each of the 37 counties in the region. Requests for revisions to the population and municipal water demand projections were forwarded to the TWDB and in many cases were adopted.

Water Demand Projections

Figure ES-2 illustrates population growth in the entire Brazos G Regional Water Planning Area (BGRWPA) for 1900 to 2000 and projected growth for 2010 to 2060.

Population trends may be further understood by dividing the planning region into three subregions: the northwestern Rolling Plains, the central IH-35 Corridor, and the southeastern Lower Basin. Figure ES-3 illustrates historical population growth in the three sub-regions from 1900 to 2000 and projected growth from 2010 to 2060. Projected growth is greatest in the IH-35 Corridor.

Water Demand Projections

Water demand projections have been compiled for six categories of water use: (1) Municipal, (2) Manufacturing, (3) Steam-Electric Cooling, (4) Mining, (5) Irrigation, and (6) Livestock. Each of the non-municipal uses is aggregated on a county basis, and is defined as a separate water user group (WUG) within each county. The TWDB has developed water demand projections for each of the five non-municipal WUGs in each of the 37 counties in Region G.

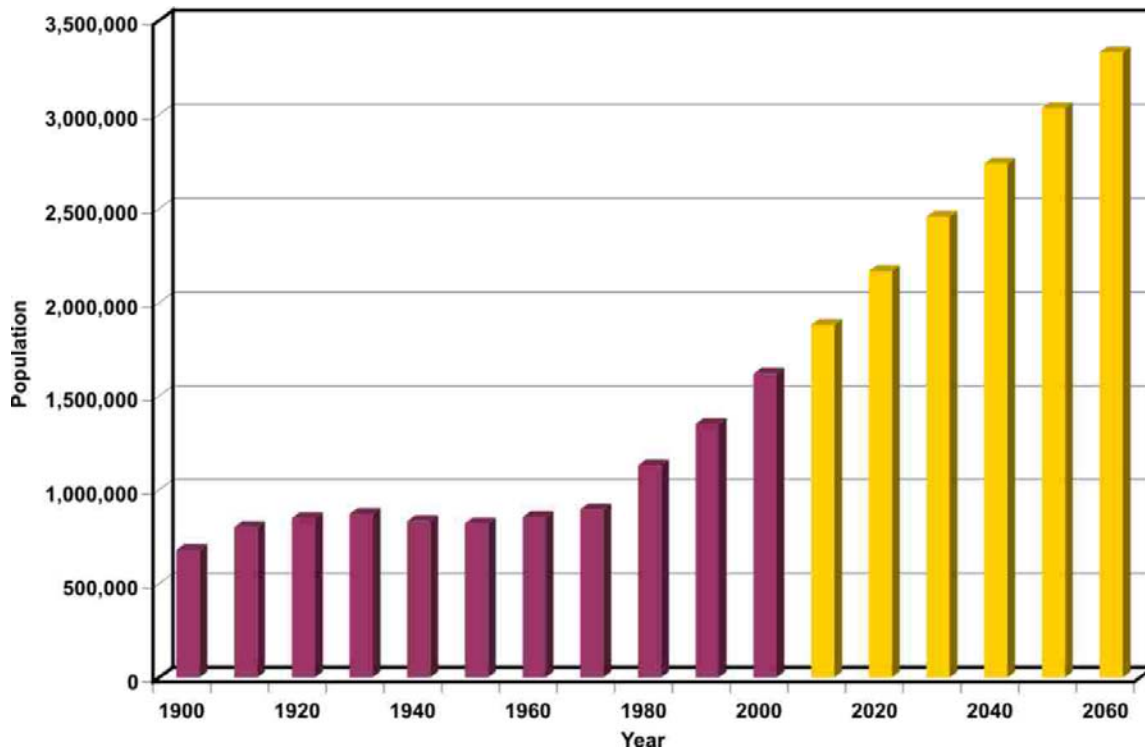


Figure ES-2. Historical and Projected BGRWPA Population

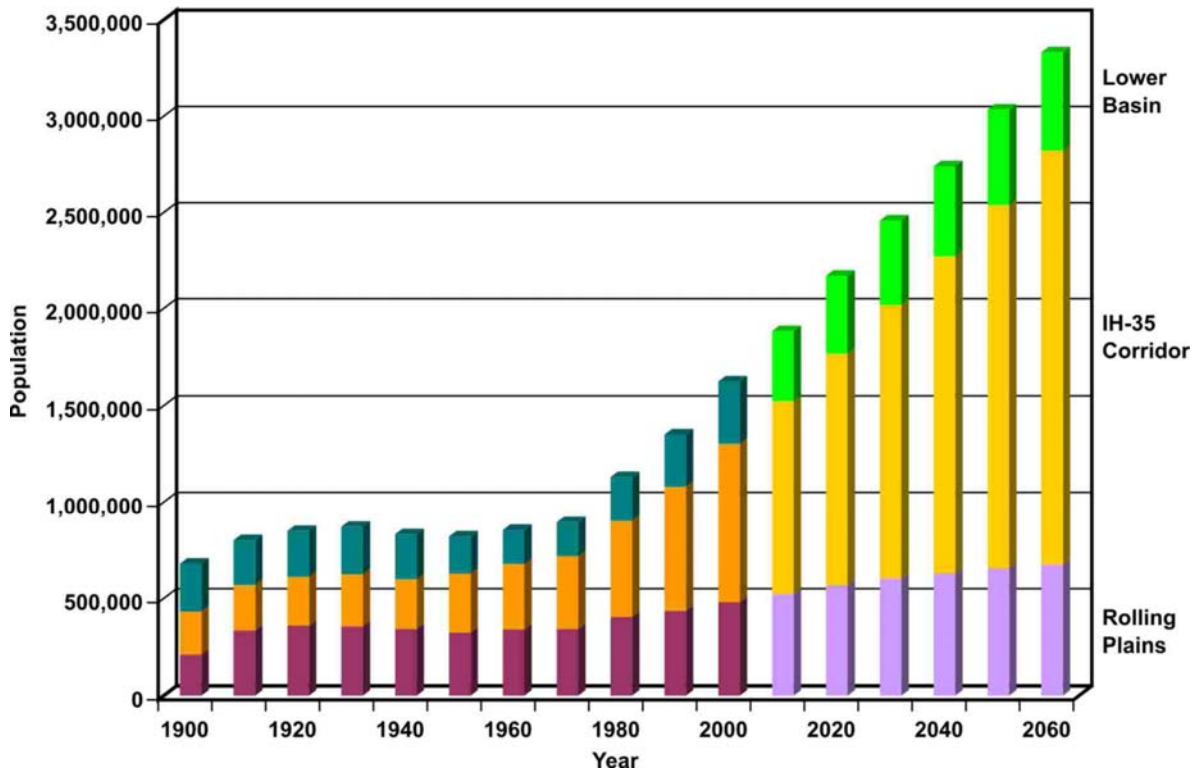


Figure ES-3. Historical and Projected Population by Sub-Region

Total water use for the region is projected to increase from 795,183 acft in 2000 to 1,150,973 acft in 2060, a 45 percent increase, as shown in Figure ES-4. The six types of water use as percentages of total water use are shown for 2000 and 2060 in Figure ES-5. Municipal, manufacturing, and steam-electric water use as percentages of the total water use are projected to increase from 2000 to 2060, while mining, irrigation, and livestock water use are projected to decrease as percentages of the total.

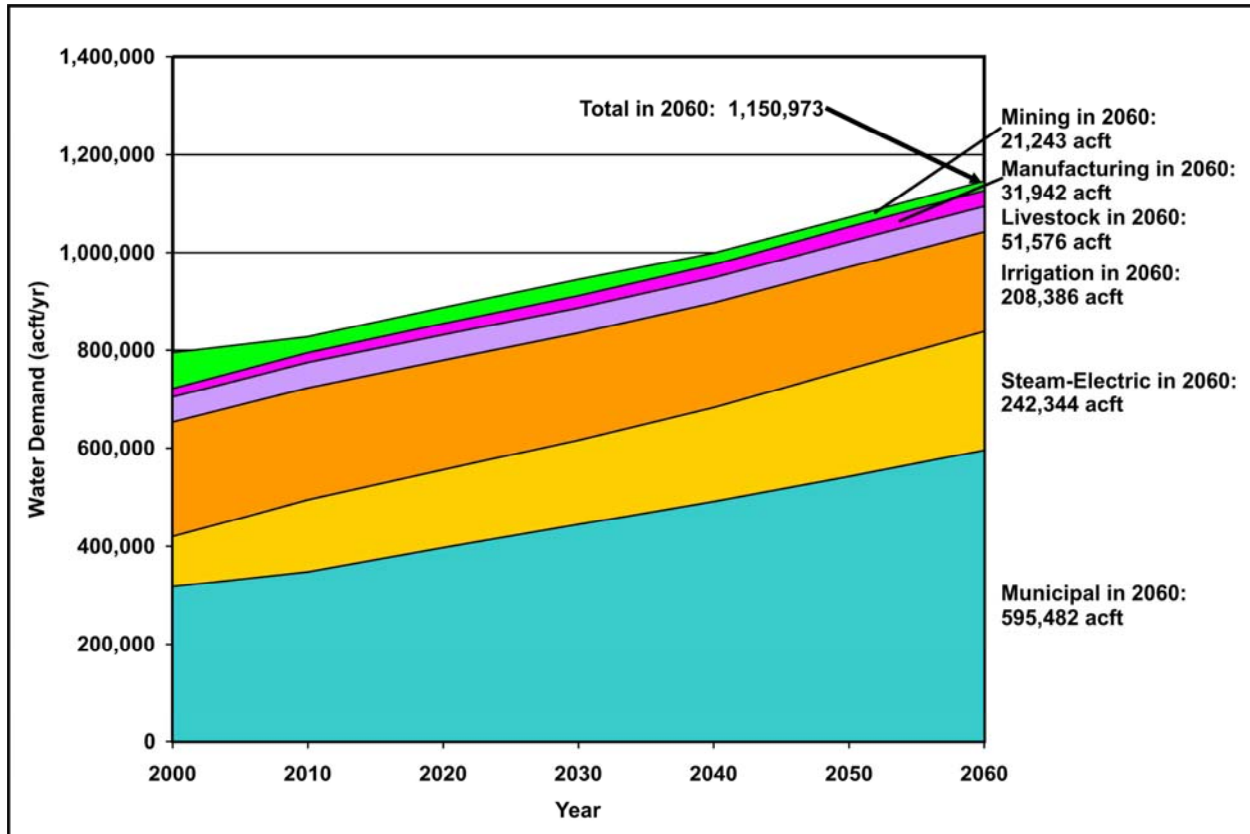


Figure ES-4. Projected Total Water Demand

Water Supply

Surface Water Supplies

Streamflow in the Brazos River and its tributaries, along with reservoirs in the Brazos River Basin, comprise a vast supply of surface water in the Brazos G Area. Diversions and use of this surface water occurs throughout the entire region with over 1,000 water rights currently issued. However, the supply of surface water varies greatly through the region due to the large variation in rainfall and a correspondingly large variation in evaporation rates. The

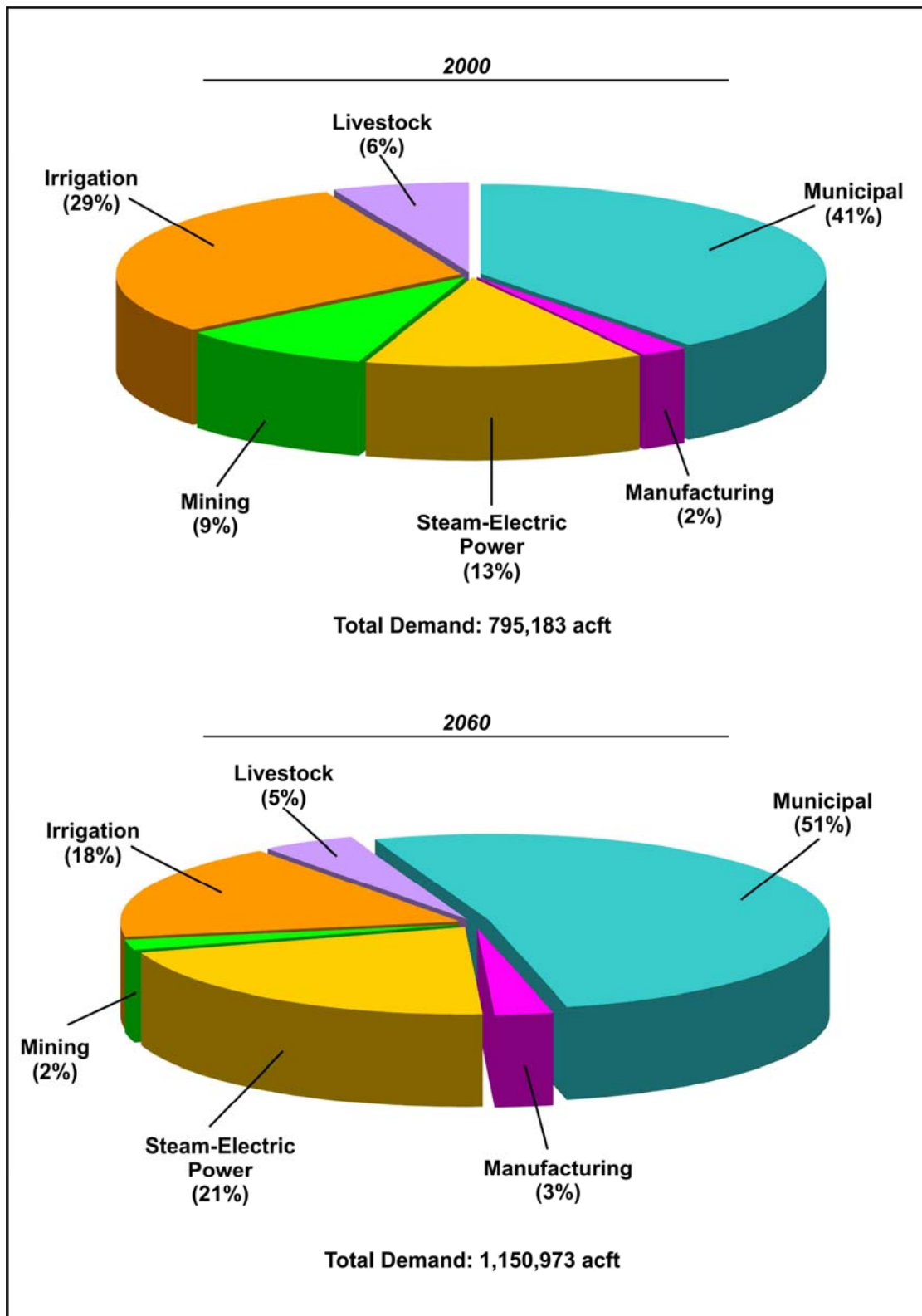


Figure ES-5. Total Water Demand

principal tributaries to the Brazos River in the planning area are the Clear Fork, the Double Mountain Fork, the Salt Fork, Bosque River, Little River, Navasota River, Little Brazos River and Yegua Creek. Major water supply reservoirs are owned by the BRA (three in the planning region), U.S. Army Corps of Engineers (nine in the region), West Central Texas MWD, the City of Abilene, and Texas Utilities. The western part of the region is heavily dependent on surface water sources, partly due to the absence of large quantities of potable-quality groundwater.

The State of Texas owns the surface water resources of the State, and issues water rights to utilize surface water. A total of 1,123 water rights currently exist in the Brazos River Basin, with a total authorized diversion of 2,664,000 acft/yr, of which 1,412,102 are located in the BGRWPA. Those rights located in the BGRWPA contribute a total firm supply of 695,479 acft/yr through a repeat of the drought of record. This supply number is less than total surface water availability in the region of 866,372 acft/yr, because supply to irrigation was calculated on a 75 percent available, 75 percent of the time basis, which increases the estimated supply available for irrigation by assuming that irrigation does not require a firm supply year in and year out. It is important to note that a small percentage of the water rights make up a large percentage of the authorized diversion volume. In the Brazos River Basin, 39 water rights (3.4 percent) make up 2,372,000 acft/yr (89 percent) of the authorized diversion volume. The remaining 1,084 water rights primarily consist of small irrigation rights distributed throughout the river basin. Figure ES-6 shows a comparison of significant water rights in the Brazos River Basin by number of rights and diversion volume.

Groundwater Supplies

Fifteen aquifers underlie parts of the Brazos G Area and, if developed fully, can provide a combined reliable supply of about 533,520 acft/yr. As currently developed, a total groundwater supply of 318,630 acft/yr exists in the region. The Seymour Aquifer supplies significant quantities of water in the western part of the region. Other aquifers that are depended on in the western part of the region are the Dockum and the Edwards-Trinity. The Trinity and Edwards-BFZ (Northern Segment) are heavily relied upon in the IH-35 corridor and to the west. Both of these aquifers are being pumped in excess of their estimated sustainable yield in some counties. In the eastern part of the region, the Carrizo-Wilcox is a prolific water supply with lesser amounts pumped from the Queen City, Sparta, and Brazos River Alluvium.

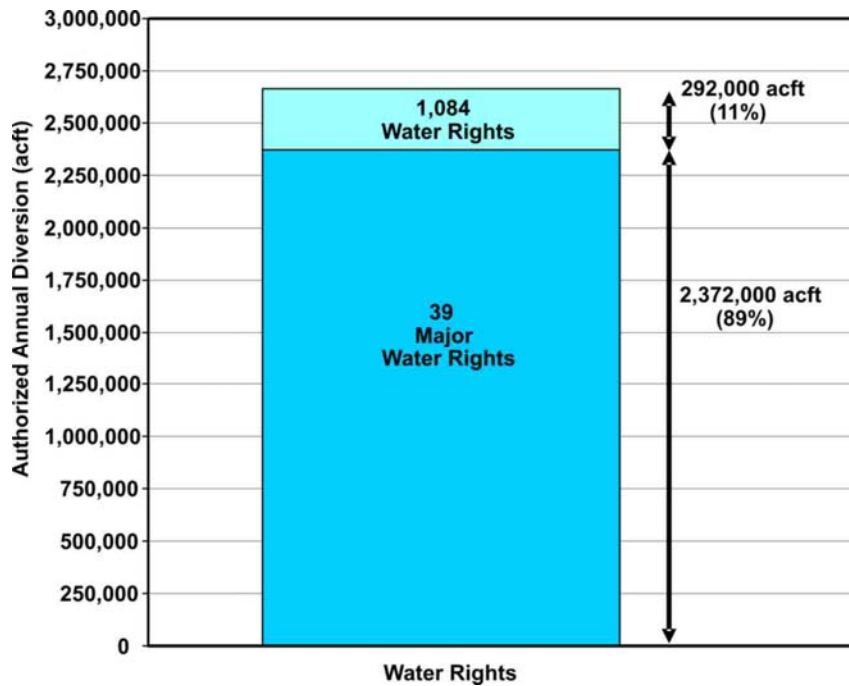


Figure ES-6. Comparison of Water Rights in the Brazos River Basin

Water Quality

Natural salt pollution has been recognized as a serious and widespread water quality problem in the Brazos River Basin. No other pollution source, man-made or natural, has had the impact of the natural salt sources located in the upper basin. Due to these water quality issues, some sources of water—particularly from Lake Whitney, Lake Granbury, and Possum Kingdom Reservoir—may limit their suitability for some uses and require higher cost, advanced treatment (desalination). As the Brazos River flows to the Gulf, inflows from tributaries decrease the concentration of dissolved minerals, which in turn improves the quality of water.

Supply and Demand Comparison

A comparison of total supplies available in the region (developed groundwater supplies and firm surface water) with demand for all use categories in the region shows a surplus past the year 2050. These mask shortages that are projected to occur to individual water supply entities and water user groups. Figure ES-7 illustrates this issue by summarizing demands and supplies for the Brazos G Area, and for Williamson County. Shortages are projected for Williamson County starting at about the year 2030, while overall regional supplies are projected to exceed

regional demands until past the year 2050. Even within most counties that have projected overall surpluses, there are individual entities that do not have sufficient supply to meet projected needs. Only five of the 37 counties in the Brazos G Area have no projected shortages for all water user groups: Comanche, Hamilton, Jones, Stonewall, and Young.

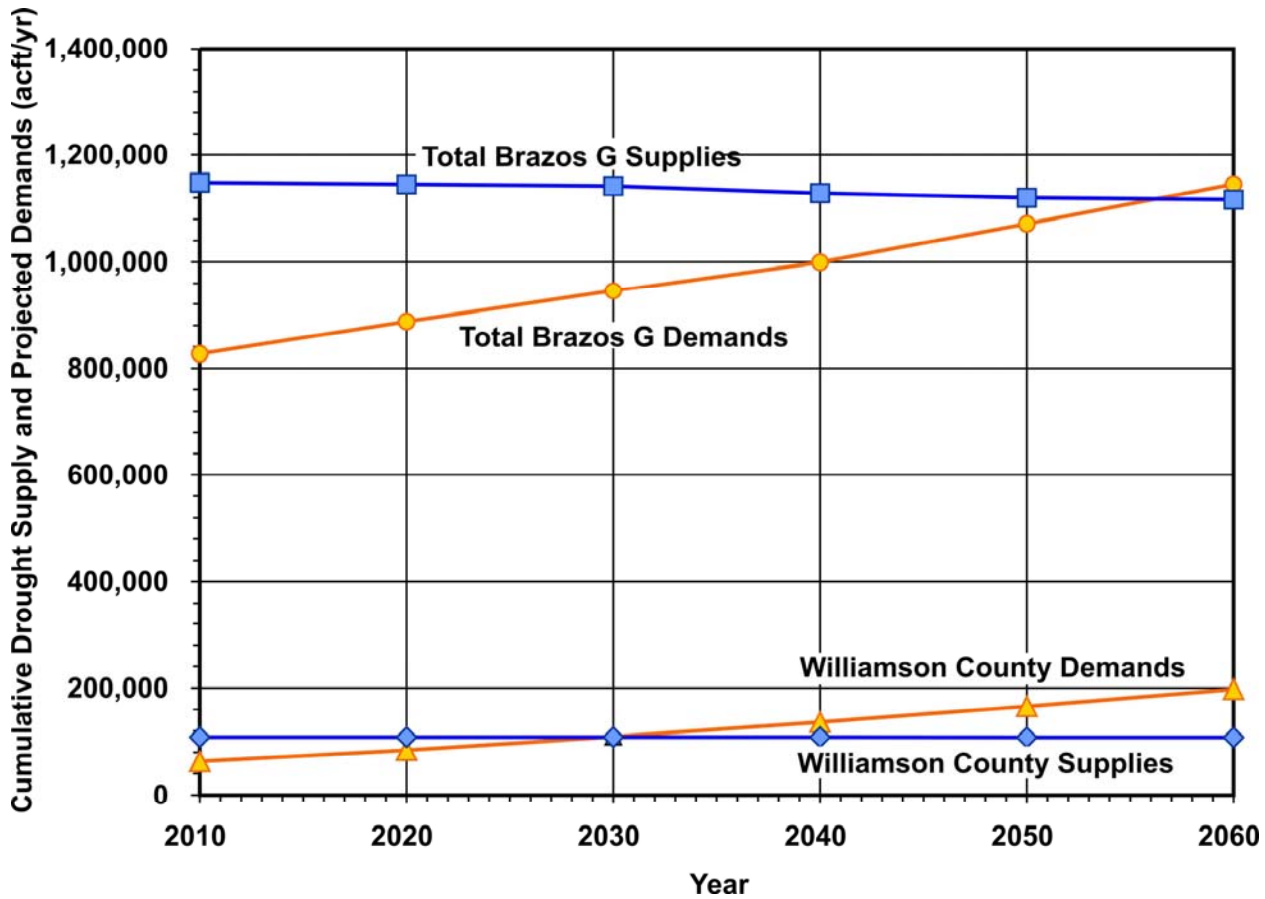


Figure ES-7. Comparison of Supplies and Demands for Brazos G Region and Williamson County

Water Supply Strategies to Meet Needs

The water management strategies in Table ES-2 were identified by the BGRWPG as potentially feasible to meet shortages. These strategies were evaluated by the consultant team and compared to criteria adopted by the BGRWPG. Section 4B in Volume 2 contains subsections discussing each of these possible strategies.

**Table ES-2.
Water Management Strategies Identified as Potentially Feasible to Meet Shortages**

Water Management Strategies	
Report Section (Volume II)	Water Management Strategy and Description
4B.2	Advanced Water Conservation (implement accelerated use of various water conservation techniques to achieve water savings above what is already included in the TWDB water demand projections)
4B.3	Wastewater Reuse (use highly treated wastewater treatment plant effluent to meet non-potable water needs, including landscape irrigation and industrial use)
4B.4	System Operation of Brazos River Authority Reservoirs (coordinated operation of the BRA reservoir system will increase supplies, maximize use of existing facilities and delay the need for new reservoir construction)
4B.5	Groundwater/Surface Water Conjunctive Use (Lake Granger Augmentation) (utilize groundwater to firm up interruptible (non-firm) supplies greater than the firm yield of the reservoir)
4B.6	Desalination (treatment of brackish water to remove minerals with resulting potable water) <ul style="list-style-type: none"> • Lake Granbury supplies to Johnson County • Brackish groundwater to N.E. Johnson County
4B.7	Millers Creek Reservoir Augmentation (supplement yield of a reservoir by diverting flows from an adjacent stream into the reservoir)
4B.8	Aquifer Storage and Recovery (Inject or percolate excess surface water into groundwater aquifers, storing for future use) <ul style="list-style-type: none"> • Seymour Aquifer • Trinity Aquifer (Johnson County)
4B.9	Brush Control and Range Management (increase deep percolation and discharge to streams by removing unwanted brush)
4B.10	Weather Modification (cloud seeding to increase precipitation frequency and intensity)
4B.11	Interregional Water Management Strategies (provide water supplies into the Brazos G Region from adjacent regions) <ul style="list-style-type: none"> • TRA Reuse through Joe Pool Reservoir (Region C) • Regional Surface Water Supply to Williamson County from Lake Travis (Region K)
4B.12	New Reservoirs (new or updated evaluations of the following proposed new reservoirs) <ul style="list-style-type: none"> • Breckenridge Reservoir (Cedar Ridge Site) • South Bend Reservoir • Throckmorton Reservoir • Double Mountain Fork Reservoir (Sites No. 1 & 2) • Turkey Peak Reservoir • Millican Reservoir
4B.13	Off-Channel Reservoirs (construction of smaller reservoirs on tributary streams with lower environmental impact, lower cost dam, and usually with pump-over of supplies from a larger stream). Possible projects include: <ul style="list-style-type: none"> • Wheeler Branch Off-Channel Reservoir • City of Groesbeck Off-Channel Reservoir • Peach Creek Lake • Little River Off-Channel Reservoir • Lake Palo Pinto Off-Channel Reservoir
4B.14	Interconnection of Regional and Community Systems (use larger cities' systems or other facilities more fully and assist smaller communities to meet their needs). Possible projects include: <ul style="list-style-type: none"> • Bosque County Regional Project • Midway Pipeline Project (West Central Brazos Distribution System) • Interconnection from Abilene to Sweetwater • Interconnection of City of Waco System with Neighboring Communities • Interconnection of Central Texas WSC with Salado WSC
4B.15	Carrizo-Wilcox Aquifer Development (further develop and utilize the Carrizo-Wilcox Aquifer) <ul style="list-style-type: none"> • Additional Development of Carrizo-Wilcox Aquifer for Brazos County Needs • Carrizo-Wilcox Water Supply for Williamson County • Lake Granger Augmentation (Section 4B.5)
4B.16	Voluntary Redistribution (the purchase or lease of water supply from an entity that has water supply in excess of long-term or interim needs)

Water Plan Findings

Table ES-3 summarizes the recommended water management strategies in the plan that develop or import new sources of supply into the Brazos G Area. Strategies that utilize existing water resources without increasing or augmenting those supplies are not listed.

Total new supplies of water into the Brazos G Area total 590,231 acft/yr, comprised of newly developed groundwater, supply transferred from other regions, newly developed surface water supplies, or supplies made available through conservation or augmentation of existing facilities. These totals do not reflect water trades between users of existing supplies in Region G, but represent entirely new supplies to the Brazos G Area. Total project costs for these new supplies exceed \$1 billion.

The 2006 Brazos G Regional Water Plan includes recommendations for 21,393 acft/yr of municipal conservation savings and another 43,377 acft/yr for wastewater reuse. The conservation savings are on top of those already included in the TWDB demand projections, and the recommended reuse strategies are in excess of existing reuse supplies in the basin.

System operation of the Brazos River Authority's reservoirs can increase supplies in the Brazos G Area by more than 265,000 acft/yr (assuming interruptible supplies can be firmed up through conjunctive operation with other sources), with additional supplies available to the Region H Area in the lower basin. This strategy would more efficiently utilize the existing resources of the Brazos River Authority by expanding the supply that can be developed from the BRA's existing reservoirs, thus delaying the need for new reservoirs to meet growing needs in the basin. As shown by analysis of the Lake Granger Augmentation strategy, the interruptible supply proposed by the BRA can be firmed up with groundwater resources, further extending existing resources in the basin.

The West Central Brazos System Optimization Plan proposed by the City of Abilene and the West Central Texas Municipal Water District (WCTMWD) is an example of regional cooperation between the City of Abilene, the WCTMWD and the Brazos River Authority to ensure adequate supplies in the arid western portion of the Brazos G Area. Through a mix of existing supplies, new supplies and priority calls agreements with the BRA, the plan would develop an additional firm supply of almost 60,000 acft/yr. This system plan will provide the Abilene area with supplies that will insure against future droughts worse than the current drought of record.

Implementation of the 2006 Brazos G Regional Water Plan will result in the development of new water supplies that will be reliable in the event of a repeat of the most severe drought on record. It is evident that implementation of all recommended water management strategies is not likely to be necessary in order to meet projected needs within the planning period. The BGRWPG explicitly recognizes the difference between additional supplies and projected needs as System Management Supplies and has recommended the associated water management strategies in the Regional Water Plan for the following reasons:

- So that water management strategies are identified to replace any planned strategies that may fail to develop, through legal, economic or other reasons;
- To serve as additional supplies in the event that rules, regulations, or other restrictions limit use of any planned strategies;
- To facilitate development of specific projects being pursued by local entities for reasons that may not be captured in the supply and demand projections used to identify future supply shortages; and/or
- To ensure adequate supplies in the event of a drought more severe than that which occurred historically.

Other Aspects of the 2006 Brazos G Regional Water Plan

In addition to providing a roadmap for development of supplies to meet future water needs in the basin, the 2006 Brazos G Regional Water Plan includes other elements of value and interest to water supply managers and others in the Brazos G Area.

- The plan provides a concise summary of physiographic, hydrologic and natural resources in the Brazos G Area,
- The plan provides a comprehensive understanding of how water supplies have been developed and are managed in the region,
- The plan provides examples of drought management and water conservation plans that may assist water managers with developing plans for their systems, and
- The plan includes recommendations to the TWDB and the Texas Legislature regarding key water policy issues and the direction of water supply management in Texas.

**Table ES-3.
Summary of Recommended Water Management Strategies Involving
New Sources of Supply in the 2006 Brazos G Regional Water Plan**

Strategy	WUG or WWP	New Supply by 2060 (acft/yr)	Total Project Cost (2nd Quarter 2002 Prices)
Conservation Strategies			
Municipal	38 WUGs	21,393	N/D ¹
Manufacturing	18 Counties	1,430	N/D
Steam-Electric	9 Counties	13,281	N/D
Mining	10 Counties	1,074	N/D
Irrigation	6 Counties	8,027	N/D
Total Conservation		45,205	N/D
Reuse Strategies			
Reuse	Steam-Electric – Nolan County	560	\$2,115,000
	City of Round Rock	7,443	\$6,369,000
	City of Bryan	605	\$6,485,000
	City of College Station	137	\$2,358,000
	City of Cleburne	2,853	\$1,048,000
	Steam-Electric – McLennan County (City of Waco)	16,000	\$2,995,000
	City of Waco	15,779	N/D
Total Reuse		43,377	\$27,855,000
Water Supply from other Regions			
LCRA/BRA Alliance	Chisolm Trail SUD	3,472	\$18,518,000
	City of Round Rock	20,928	\$101,336,000
LCRA Highland Lakes	Cedar Park	25,000	\$81,748,000
TRA Reuse through Joe Pool Reservoir	Johnson County SUD	20,000	\$79,257,000
Total from Other Regions		69,400	\$280,859,000
Augmentation of Existing Surface Water Supplies			
Lake Palo Pinto Off-Channel Reservoir	Palo Pinto County MWD No. 1	3,110	\$19,314,000
Millers Creek Reservoir Augmentation	North Central Texas Municipal Water District	4,870	\$18,222,000
Raise Level of Gibbons Creek Reservoir	Steam-Electric – Grimes County	3,870	\$8,003,000
BRA System Operation (Lake Granger Augmentation)	Chisholm Trail SUD	26,127 ²	\$303,288,000
	City of Georgetown		
	Jarrell-Schwertner WSC		
	City of Round Rock		
	Williamson County – Other		
Manufacturing – Williamson County			
Total Augmentation of Existing Surface Water Supplies		37,977	\$348,827,000

Page 1 of 3

Table ES-3.
Summary of Recommended Water Management Strategies Involving
New Sources of Supply in the 2006 Brazos G Regional Water Plan (continued)

Strategy	WUG or WWP	New Supply by 2060 (acft/yr)	Total Project Cost (2nd Quarter 2002 Prices)
New Reservoirs			
Wheeler Branch Off-Channel Reservoir	Somervell County - Other	1,800	\$27,195,000
Brushy Creek Reservoir	City of Marlin	2,000	\$6,301,610
Total New Reservoirs		3,800	\$33,496,610
Systems Approaches			
West Central Brazos System Optimization Plan	City of Abilene	59,150	\$198,055,000
	West Central Texas Municipal Water District		
	Irrigation – Throckmorton County		
BRA System Operation (Excluding Lake Granger Augmentation)	Bell County WCID #1	3,500	\$0
	Bosque County – Other	475	
	Manufacturing – Bosque County	1,300	\$25,492,000
	Steam-Electric – Bosque County	8,225	
	Brandon-Irene WSC	100	
	City of Hillsboro	100	
	White Bluff Community WS	700	\$36,151,000
	Woodrow-Osceola WSC	200	
	Manufacturing – Hill County	100	
	Steam-Electric – Limestone County	16,000	ND
Other Needs to be Met from BRA System Operation ³	234,373	ND	
Total from Systems Approaches		324,223	> \$259,698,000
Groundwater Development			
Brackish Groundwater	Mining - Nolan County	200	\$268,188
Champion Well Field Phases 1 & 2	City of Sweetwater	736	\$17,060,471
Carrizo-Wilcox Aquifer – Lee and Milam Counties [BRA System Operation (Lake Granger Augmentation)]	Williamson County entities, see BRA System Operation (Lake Granger Augmentation) (above)	28,263 ²	–
Carrizo-Wilcox Aquifer – Brazos County	City of Bryan	15,300	\$33,380,000
	City of College Station		
	Wickson Creek SUD		
	Brazos County – Manufacturing		
Carrizo-Wilcox Aquifer – Burleson County	Manufacturing – Burleson County	150	\$124,624 (Annual)
	Irrigation – Burleson County	5,000	\$8,718,000

Page 2 of 3

Table ES-3.
Summary of Recommended Water Management Strategies Involving
New Sources of Supply in the 2006 Brazos G Regional Water Plan (concluded)

Strategy	WUG or WWP	New Supply by 2060 (acft/yr)	Total Project Cost (2nd Quarter 2002 Prices)
Carrizo-Wilcox Aquifer – Falls County	Falls County – Other	300	\$1,376,000
Carrizo-Wilcox Aquifer – Lee County	Aqua WSC	300	\$1,047,000
	City of Giddings	400	\$2,099,000
	Lee County WSC	750	\$1,762,000
	City of Hutto	1,680	\$1,927,000 (Annual)
Carrizo-Wilcox Aquifer – Limestone County	City of Groesbeck	100	\$566,000
	Manufacturing – Limestone County	100	\$566,000
Carrizo-Wilcox Aquifer – Milam County	Southwest Milam WSC	600	\$2,079,000
	Steam-Electric – Milam County	8,200	\$3,923,000
	City of Hutto	1,680	\$1,927,000 (Annual)
Carrizo-Wilcox Aquifer – Robertson County	Robertson County (Manufacturing)	85	\$707,000
Trinity Aquifer – Coryell County	Coryell County – Other	1,200	\$4,821,000
Trinity Aquifer – Erath County	Manufacturing – Erath County	50	\$198,000
Trinity Aquifer – Lampasas County	Lampasas County – Other	850	\$2,576,000
Trinity Aquifer – Williamson County	City of Florence	250	\$803,500
Gulf Coast Aquifer – Grimes County	Manufacturing – Grimes County	250	\$312,000
Total Groundwater Development		66,444	> \$86,116,159
Total New Supplies		590,426	> \$1,030,366,769
<ol style="list-style-type: none"> 1. Not Determined. 2. The Lake Granger Augmentation includes development of an average annual supply of groundwater from the Carrizo-Wilcox Aquifer of 28,263 acft/yr to develop the total new supply of 54,390 acft/yr (Volume II, Section 4B.5). 3. Includes additional BRA contractual commitments not specifically identified in Section 4B.4. Does not include Region H supplies, but does include minor increases to Region C. 			

Page 3 of 3

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