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Implementation and Comparison to the 2016 Brazos G Regional Water Plan

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11 Implementation and Comparison to the 2016 Brazos G Regional Water Plan

11.1 Implementation of the 2016 Brazos G Regional Water Plan

A requirement of the regional water plan is to report on the implementation status of water management strategies and projects recommended in the prior regional water plan. The TWDB provided a spreadsheet form requesting various forms of information on the 338 different water management strategies and projects recommended in the 2016 Plan, including such data as the date the governing authority of the project sponsor took affirmative action to begin implementing the project, current level of implementation, and funds expended to date. The information is included separate from the text of this plan as an electronic appendix, Appendix M.

11.2 Comparison to the 2016 Brazos G Regional Water Plan

There are notable differences between the 2016 and 2021 Plans. While the two plans use the same planning horizon, changes to the definitions for WUGs and WWPs, as well natural differences associated with population and demand growth and availability of supplies create noticeable differences in the overall assessment of needs for water user groups in the Brazos G area.

This chapter compares projected water demands, water supplies, needs, and water management strategies between this plan and the 2016 Plan. Population and water demands typically are updated each regional water planning cycle to reflect updated information on population from the latest census or better updated estimates from the Texas State Demographer. Per capita water use changes due to shifting water use patterns with municipal water systems resulting from water conservation efforts, drought measures, and patterns of development. County-aggregated water demands such as irrigation and steam-electric change between planning cycles for similar reasons as the TWDB updates demand estimates for these WUGs.

Groundwater supplies available for current uses and for water management strategies can change due to revisions in estimated available groundwater resulting from newly adopted Modeled Available Groundwater determinations arising out of the Groundwater Management Area process. Surface water supplies available for current uses and water management strategies will change as the Brazos Basin WAM is updated by the TCEQ, new projections of future return flows are developed, projections of reservoir sedimentation are revised, and as the TWDB changes requirements for water availability determination.

11.2.1 Changes to WUGs and WWPs

The TWDB has modified the definition of a municipal WUG and the geographic basis for each WUG's population projections. The previous definition defined a municipal WUG as a city or retail water utility serving a population of 500 people or more or that provided at

least 280 acft/yr of water. Revisons to 31 TAC 357.10(41) changes the definition of a municipal WUG and clarifies the basis of planning to focus on utility service areas rather than geographic census place names. The definition of municipal WUG is now defined as:

- Any retail public utility with retail sales of 100 acft/yr or more;
- Any privately-owned utility averaging sales of 100 acft/yr across all owned systems; and
- County-Other WUGs consist of all of the remaining municipal utilities sales less than 100 acft/yr and other individual users in the counties.

Based on the revised definition for a municipal WUG, a total of 72 new WUGs have been added to the Brazos G RWPA. A few WUGs have also been removed due to consolidation of utilities and application of revised definitions resulting in a total of 284 municipal WUGs included in the 2021 Plan.

The 2016 Plan identified municipal WUGs who also sold more than 1,000 acft/yr of wholesale water as wholesale water provider as WWPs. The 2021 Plan identifies them as WUG/WWP, but treats them as WUGs for planning purposes. Because of this, 13 WUGs identified previously as WWPs in the 2016 Plan are now simply referred to as WUGs in the 2021 Plan. Additionally, 2 new WWPs have been added.

New WUGs and WWPs included in the plan are shown in Table 11-1.

Table 11-1. New WUGs and WWPs in the 2021 Plan

Entity	County
New Water User Groups	
Bell County WCID 2	Bell
Bell County WCID 3	Bell
Central Texas College District	Bell, Coryell
The Grove WSC	Bell, Coryell
Little Elm Valley WSC	Bell, Coryell
Smith Bend WSC	Bosque
Mustang Valley WSC	Bosque, Coryell
HILCO United Services	Bosque, Hill
Highland Park WSC	Bosque, McLennan
Eula WSC	Callahan, Jones, Shackelford, Taylor
Hamby WSC	Callahan, Jones, Shackelford, Taylor
Callahan County WSC	Callahan , Shackelford
Flat WSC	Coryell
Fort Gates WSC	Coryell
Mountain WSC	Coryell
Oglesby	Coryell
Staff WSC	Eastland

Table 11-1. New WUGs and WWPs in the 2021 Plan

Entity	County
Fort Griffin SUD	Eastland, Shackelford, Stephens, Throckmorton
Cego-Durango WSC	Falls
North Milam WSC	Falls, Milam
TDCJ Luther Units	Grimes
TDCJ W. Pack Unit	Grimes
Chatt WSC	Hill
Double Diamond Utilities	Hill, Johnson
Post Oak SUD	Hill, Limestone
Birome WSC	Hill, Limestone, McLennan
Bold Springs WSC	Hill, McLennan
Liapan	Hood
Santo SUD	Hood, Palo Pinto
Red River Authority of Texas	Knox
Baylor WSC	Knox, Throckmorton, Young
Corix Utilities Texas Inc.	Lampasas, Washington
Bistone Municipal WSD	Limestone
Point Enterprise WSC	Limestone
SLC WSC	Limestone
White Rock WSC	Limestone
Prairie Hill WSC	Limestone, McLennan
Axtell WSC	McLennan
Central Bosque WSC	McLennan
East Crawford WSC	McLennan
EOL WSC	McLennan
H&H WSC	McLennan
Hilltop WSC	McLennan
Leroy Tours Gerald WSC	McLennan
Levi WSC	McLennan
McLennan County WCID 2	McLennan
Ross WSC	McLennan
Spring Valley WSC	McLennan
Texas State Technical College	McLennan
Windsor Water	McLennan
Salem Elm Ridge WSC	Milam

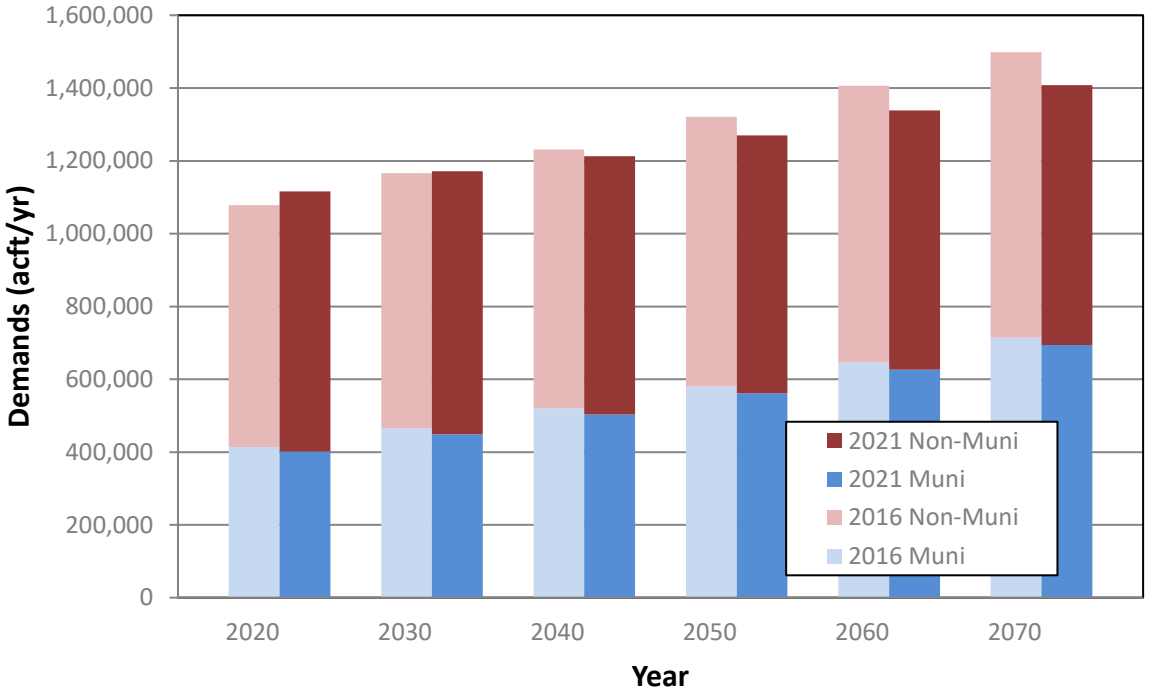
Table 11-1. New WUGs and WWPs in the 2021 Plan

Entity	County
Gordon	Palo Pinto
Lake Palo Pinto Area WSC	Palo Pinto
North Rural WSC	Palo Pinto
Palo Pinto WSC	Palo Pinto
Parker County SUD	Palo Pinto
Sportsman World MUD	Palo Pinto
Sturdivant Progress WSC	Palo Pinto
Bethany Hearne WSC	Robertson
Twin Creek WSC	Robertson
Somervell County Water District	Somervell
Lawn	Taylor
North Runnels WSC	Taylor
View Caps WSC	Taylor
Central Washington County WSC	Washington
Chappell Hill WSC	Washington
West End WSC	Washington
Paloma Lake MUD 1	Williamson
Paloma Lake MUD 2	Williamson
Sonterra MUD	Williamson
Walsh Ranch MUD	Williamson
Williamson County WSID 3	Williamson
New Wholesale Water Providers	
FHLM WSC	Falls, Hill, Limestone. Milam
Salt Fork Water Quality Corporation (SFWQC)	Kent, Stonewall

11.2.2 Water Demand Projections

Overall, water demand projections for the planning area are less in the 2021 Plan than in the 2016 Plan, as illustrated in Figure 11-1. Municipal water demand projections are slightly lower in the 2021 Plan for each decade, increasing to only 694,285 acft/yr by the 2070 decade. For the 2021 Plan, non-municipal demands are larger for the 2020 decade than those in the 2016 plan; however, the projected growth rate of demand is smaller. Because of this, the 2021 non-municipal demands are surpassed by those in the 2016 plan in decade 2040 and ultimately are projected to only reach 713,801 acft/yr by the 2070 decade.

Figure 11-1. Water Demand Projections in the 2016 and 2021 Brazos G Plans



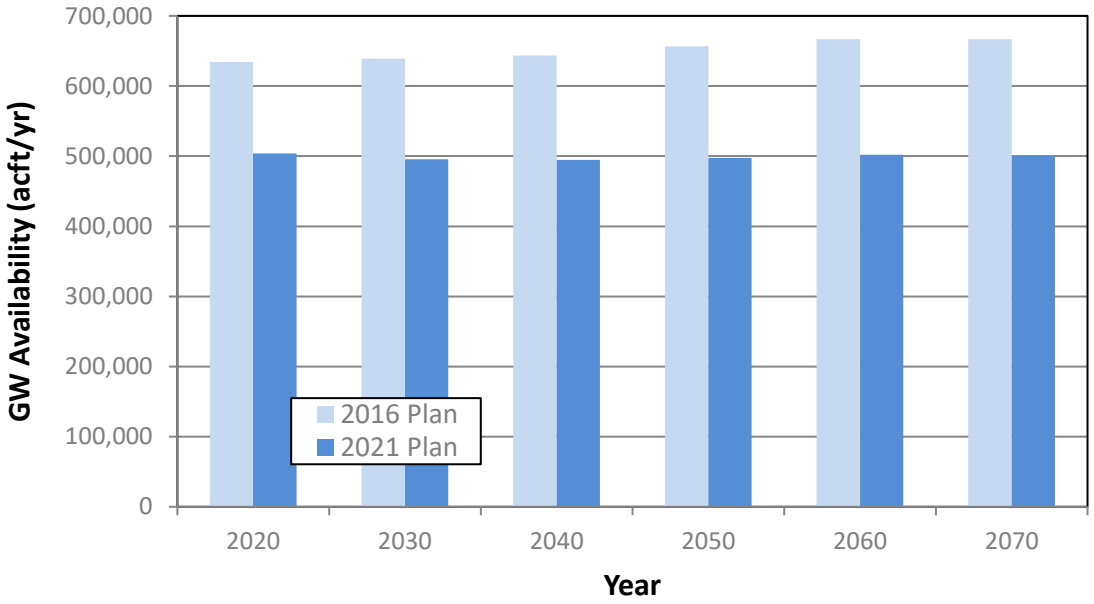
11.2.3 Water Supply Assumptions

For the 2016 Plan, the Modeled Available Groundwater (MAG) determined for each aquifer system in the Brazos G Area was used. For those aquifers without MAGs, the Brazos G RWPG adopted availability estimates based on those used in the 2011 Plan.

The same approach was generally applied for the 2021 Plan. The MAG estimates provided by the Groundwater Management Areas (GMA) for the aquifers for which they have established Desired Future Conditions (DFCs) were used, with one exception. The MAG estimate for the Carrizo-Wilcox Aquifer in Brazos County relies on a MAG Peak Factor to establish availability. Refer to Chapter 3 for additional information regarding how this factor is applied. In the event no MAG was provided by a GMA for a given aquifer, the estimate of availability is based on previous modeling and data referenced in the 2016 Plan or on updated modeling used to establish the MAG for other aquifers.

Chapter 3 and Appendix B provide greater discussion on estimates for specific aquifers. Total groundwater availability in the Brazos G Area is compared for the 2016 and 2021 Plans in Figure **11-2**. Groundwater supplies in both plans were then allocated to individual WUGs and WWPs based upon installed well capacities and records of recent groundwater withdrawals, prorated downward so that the total supply from an aquifer in a county did not exceed the estimated available groundwater.

Figure 11-2. Groundwater Availability in the Brazos G Area



For surface water availability, both plans utilized the TCEQ Brazos WAM as the base model; this model has been supplemented with certain assumptions and is referred to as the Brazos G WAM.

Similar modifications were made to the model in both plans for determining water available to existing water rights. The primary differences in how surface water availability is determined between the 2021 and 2016 Plans is that the BRA's System Operations Permit is now included in the model, and a set of estimated naturalized flows for the entire basin for the years 1998 through 2015 were used to extend the period of record. This period includes a potentially more severe drought than the drought of the 1950's and therefore provides a more conservative estimate of water available to existing water rights.

Assumptions for determining groundwater and surface water availability in both plans are compared in Table 11-2.

Table 11-2. Assumptions for Determining Water Available to Current Supplies and Water Management Strategies

2016 Brazos G Plan	2021 Brazos G Plan
Groundwater availability based on Modeled Available Groundwater where determined, and 2011 estimates elsewhere.	Groundwater availability based on Modeled Available Groundwater where determined, and 2016 estimates and/or modeling to support development of Modeled Available Groundwater for other aquifers. MAG Peak Factor applied to the Carrizo-Wilcox Aquifer in Brazos County.
Existing surface water supply based on estimated 2020 and 2070 wastewater effluent discharges adjusted for reuse assumptions.	Existing surface water supply based on estimated 2020 and 2070 wastewater effluent discharges adjusted for reuse assumptions.
Existing surface water supply to irrigation rights based on minimum annual supply from minimum monthly diversions.	Existing surface water supply to irrigation rights based on minimum annual supply from minimum monthly diversions.

Table 11-2. Assumptions for Determining Water Available to Current Supplies and Water Management Strategies

2016 Brazos G Plan	2021 Brazos G Plan
Surface water management strategies exclude wastewater effluent discharges (TCEQ Run 3 assumptions), except where effluent is part of the supply for the strategy.	Surface water management strategies exclude wastewater effluent discharges (TCEQ Run 3 assumptions), except where effluent is part of the supply for the strategy.
Surface water management strategies subject to TCEQ Environmental Flow Standards.	Surface water management strategies subject to TCEQ Environmental Flow Standards.
	BRA System Operations Permit included in the TCEQ Brazos WAM.

11.2.4 Existing Water Supplies

Water supplies available to WUGs and WWPs in the Brazos G Area have changed significantly since the last planning cycle. Municipal supplies have decreased slightly, but supplies to non-municipal WUGs have increased substantially. Groundwater supplies, surface water supplies, and total supplies are compared in Figure 11-3, Figure 11-4 and Figure **11-5**, respectively, for municipal and non-municipal WUGs.

Figure 11-3. Groundwater Supplies Available to WUGs in the 2016 and 2021 Brazos G Plans

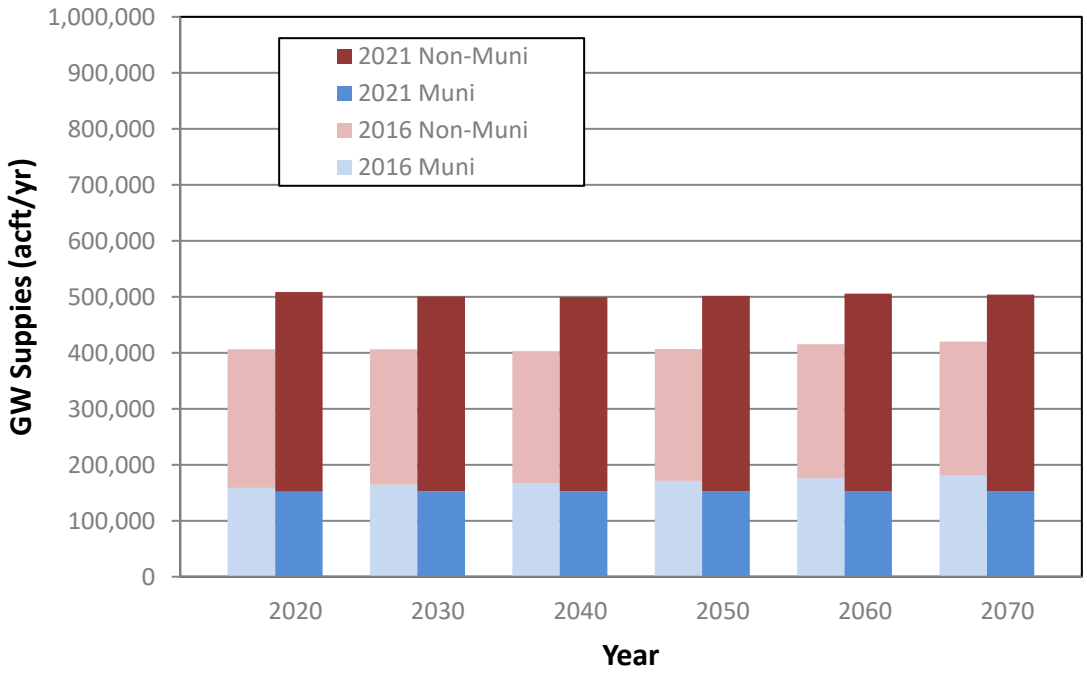


Figure 11-4. Surface Water Supplies Available to WUGs in the 2016 and 2021 Brazos G Plans

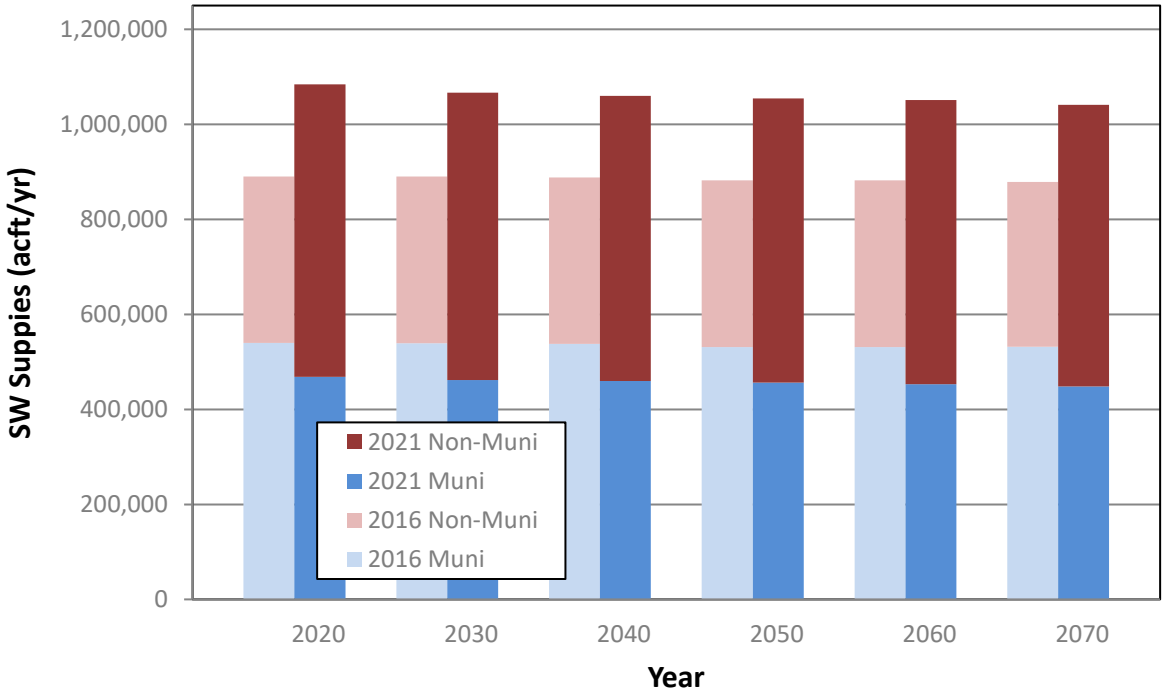
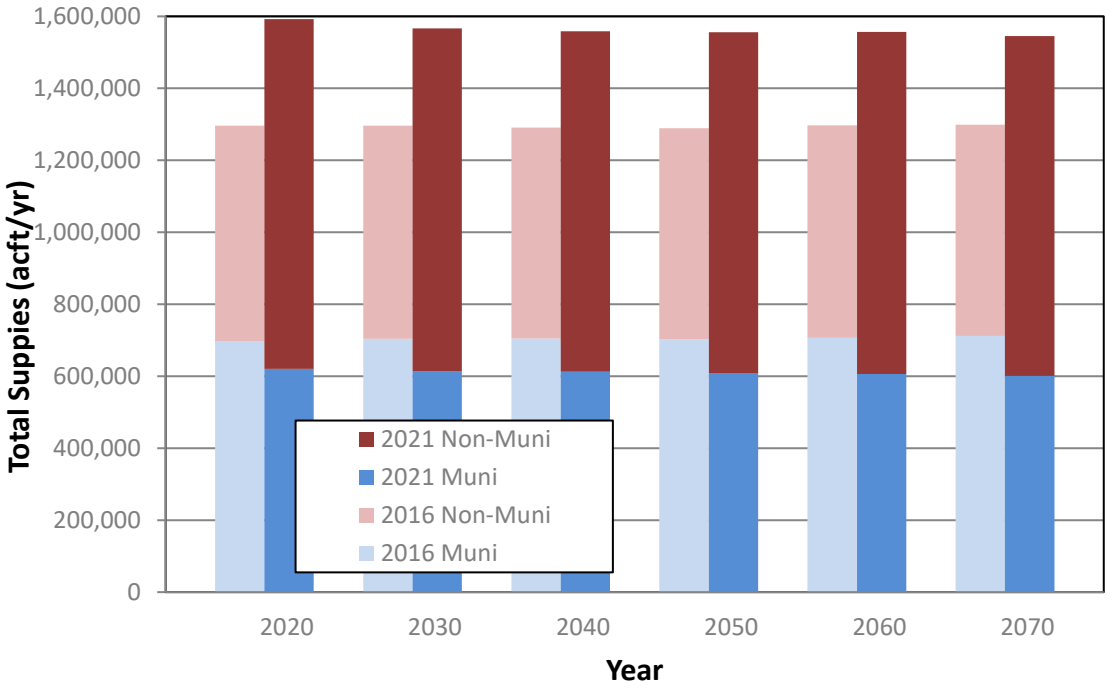


Figure 11-5. Total Water Supplies Available to WUGs in the 2016 and 2021 Brazos G Plans



11.2.5 Needs

Municipal needs (shortages) generally increase across the planning period and municipal surpluses decrease across the planning period for both the 2016 Plan and the 2021 Plan. The quantity of municipal surpluses available at the beginning of the 2016 Plan is substantially greater than that in the 2021 Plan. The difference in municipal shortages is not as significant between the two plans; the 2016 Plan shows municipal shortages at the beginning of the planning period, and the rate of increase across the planning period exceeds that for the 2021 Plan. Total municipal needs (shortages) and total municipal surpluses for both plans are shown in Figure 11-6. When total needs and total surpluses are compared for both plans in Figure 11-7, both total surpluses and needs in the 2021 Plan are less than the 2016 Plan.

Figure 11-6. Municipal Surpluses and Needs (Shortages) in the 2016 and 2021 Brazos G Plans

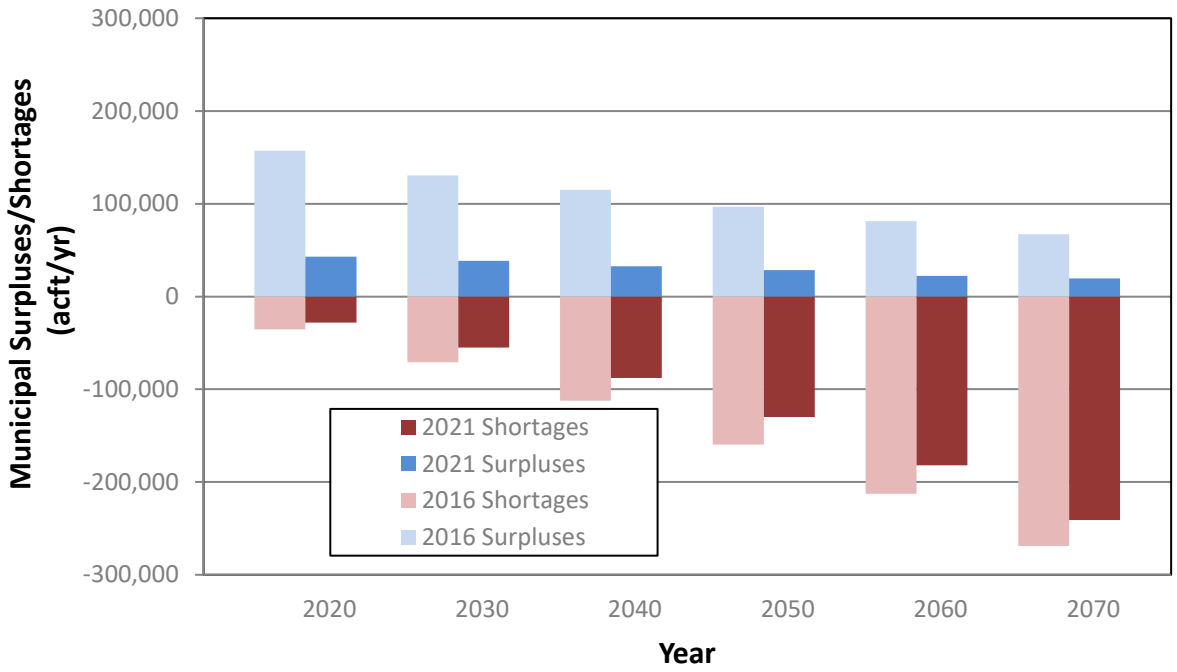
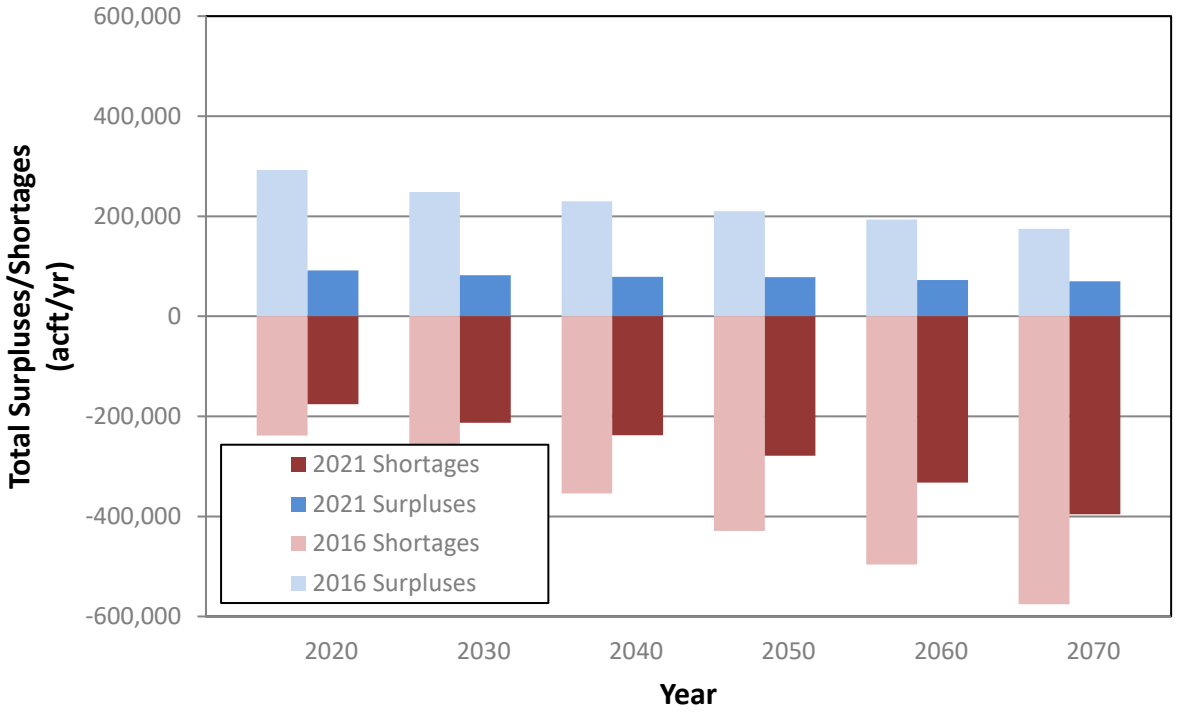


Figure 11-7. Total Surpluses and Needs (Shortages) in the 2016 and 2021 Brazos G Plans



11.2.6 Water Management Strategies and Projects

As expected, many of the water management strategies and projects recommended in the 2016 Plan are again recommended in the 2021 Plan. Although needs across each decade in the 2021 Plan are less than those projected in the 2016 Plan, the corresponding decadal surpluses in the 2021 Plan are also smaller creating a general supply shortage for WUGs of equal magnitude across the two plans. This section generally identifies differences in water management strategies and projects between the 2016 and 2021 Plans.

In the 2016 Plan, conservation is recommended for all municipal water user groups with per capita water use greater than 140 GPCD, regardless of projected needs or surplus. Additionally, conservation targets for some municipal entities in Williamson County are more aggressively recommended to achieve per capita water use of 120 GPCD by 2070. The 2021 Plan uses the same methodology and assumptions for municipal water conservation as was used on the 2016 Plan. Total municipal conservation savings in the 2070 decade in the 2016 Plan was 190,607 acft/yr versus 111,339 acft/yr in the 2021 Plan.

Reuse is a key water management strategy in both the 2016 and 2021 Plans. In the 2016 Plan, water management strategies and associated projects involving reuse total 47,983 acft/yr, versus 46,662 acft/yr in the 2016 Plan.

Supplies from Other Regions

The 2016 Plan in the 2060 decade includes roughly 105,000 acft/yr of water to be supplied from outside the Brazos G Area, while the 2016 Plan includes almost 108,000 acft/yr of out-of-region supplies. These supplies in both plans are concentrated in the Brushy Creek

Regional Utility Authority project for supplies from Region K for the cities of Cedar Park, Leander, and Round Rock, and in supplies from Region C for entities in Johnson County.

New Reservoirs

The 2016 Plan recommended construction of Groesbeck Off-Channel Reservoir, Coryell County Off-Channel Reservoir, Cedar Ridge Reservoir, Turkey Peak Reservoir, Little River Off-Channel Reservoir, Brushy Creek Reservoir, Throckmorton Reservoir, and Lake Creek Reservoir. The 2021 Plan recommends those same reservoirs with the exception of the Little River Off-Channel Reservoir.

BRA System Operations

The BRA System Operations Permit (Sys Ops Permit) was a recommended water management strategy in the 2016 Plan. Since adoption of the 2016 Plan, the Sys Ops Permit has been issued by the TCEQ. The supplies generated by Sys Ops are assumed available in the BRA's Main Stem/Lower Basin System and total 138,475 acft/yr in 2020 increasing to 159,075 acft/yr in 2070. The Sys Ops supplies are used to firm up existing contractual commitments in the BRA's Main Stem/Lower Basin System, and to generate supplies for new contracts. The BRA has entered into multiple contracts totaling 94,999 acft/yr of supply generated by the Sys Ops Permit (79,785 acft/yr in Region H and 15,211 acft/yr in Brazos G). The Brazos G total includes a few pending contracts. Region H is treating these new contracts as an existing supply source, as the contractual customers already have sufficient infrastructure to utilize the supply. Brazos G is treating these contracts as supplies for new water management strategies due to the pending nature of a few of the contracts and the fact that two of the contractual entities require infrastructure projects to utilize the new supply.

Additional Groundwater Development

The 2021 Plan recommends a slightly smaller level of groundwater development (60,000 acft/yr) than does the 2016 Plan (65,000 acft/yr). Some miscellaneous groundwater projects carried in the 2016 Plan are no longer recommended due to insufficient MAG being available.

Aquifer Storage and Recovery (ASR)

The 2021 Plan includes five recommended ASR projects for College Station, Bryan, Waco (McLennan County ASR), the BRA (Lake Granger ASR), and Georgetown (Lake Georgetown ASR). All of these projects were recommended in the 2016 Plan with the exception of the recently identified Lake Georgetown ASR project.

Unmet Needs

In the 2016 Plan, increased county-aggregated demands such as irrigation demands in Robertson County and decreased supplies due to abandonment of the 75/75 convention for surface water irrigation supply substantially increased many county-aggregated needs with few economically reasonable strategies to supply those uses. The Brazos G Regional Water Planning Group opted to not recommend strategies to meet those needs when no economically or practically viable strategies are identified. Those needs, therefore, remain

unmet in the 2016 Plan, totaling approximately 85,000 acft/yr of mostly irrigation and mining demands.

In the 2021 Plan, needs left unmet total a maximum of 148,167 acft/yr in 2030 for irrigation, mining and steam-electric uses. This increase over the 2016 Plan is primarily due to unmet steam-electric demands in select counties; these needs are being left unmet as there are no practical or economical supplies which can be developed to meet these needs and/or it is believed that the likelihood is low that the projected demands that cause these needs will materialize.

Alternative Water Management Strategies and Projects

Both the 2016 Plan and the 2021 Plan identify alternative water management strategies for certain WUGs and WWPs that can replace one or more recommended strategies should the recommended strategies prove to be unfeasible in the future. Examples of such alternative strategies include the Williamson County Groundwater Supply project and Alcoa Property Supply project.

11.3 Progress of the Regional Water Plan in Encouraging Cooperation and Regionalization

The regional water planning process is a prime vehicle for encouraging cooperation and regionalization. The process ensures that planning is performed within a common framework of population and water demand projections, and a common methodology for establishing the availability of supplies. The public meetings held regularly by Brazos G provide the opportunity for transfer of information between entities across a vast, diverse planning area and have helped eliminate the “silos” that many entities tend to operate in when planning for water. Brazos G includes representation from five Groundwater Management Areas extending across the entire Brazos G Area, and these members bring a unique perspective to the planning group, lending their expertise and insight into issues concerning how best to manage our valuable groundwater resources. Brazos G views management of groundwater resources as a regional issue requiring strong participation from local partners.

The 2021 Brazos G Plan recommends multiple projects that can be considered “regional”, including allocations of the Brazos River Authority’s System Operations supplies, and multiple solutions to supply the significant water needs in Williamson, Bell, and Coryell Counties. Many of the water management strategies and projects recommended in the 2021 Brazos G Plan are intended to supply multiple entities and are truly regional solutions to the problem of water scarcity in the Brazos River Basin. Brazos G cooperates with adjacent regional water planning areas, and shares supplies and strategies with Regions O, B, C, F, L, K, and H.

Brazos G provides a valuable forum for active participation and discussion of water supply issues across the 37-county area and has encouraged viewing water supply issues in the larger context of regional solutions.