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Implementation and
Comparison to the 2011
Brazos G Regional Water
Plan



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11.1 Implementation of the 2011 Brazos G Regional Water Plan

A survey was sent to Brazos G WUGs and WWPs regarding the status of recommended strategies presented in the 2011 Brazos G Regional Water Plan and the survey results compiled. The survey includes information regarding the project description and infrastructure type. Survey participants were asked to update the regional water planning group on the level of implementation currently achieved, the initial volume of water provided, the funds expended to date, project cost, funding source and year the project went online. If the project is a phased project, the survey participants were asked about the ultimate volume of water to be supplied, project cost, and year that the project will reach maximum capacity. If the project has not been implemented, the WUGs and WWPs were asked to comment on why that was the case.

The survey was sent to 89 WUGs and WWPs regarding 202 projects. Of those 89 entities, 18 responded to the survey, providing information regarding a total of 36 projects. A summary of the survey results received is shown in Table 11-1 and full Survey results will be presented in Appendix N. Table 11-1 shows that approximately 31 percent of the projects for which we collected responses are completed, 36 percent are ongoing and 28 percent have not been implemented. For those projects which were classified as “not implemented”, 43% of respondents listed that it was too soon for the project to begin, 13 percent stated that financing is still in progress and 13 percent of the projects are experiencing permit constraints.

11.2 Comparison to the 2011 Brazos G Regional Water Plan

There are several notable differences between the 2011 and 2016 Plans. For example, the planning horizons for the two plans are different; the 2011 Plan covered the period from 2010 to 2060, while the 2016 Plan covers the period from 2020 to 2070. Other differences between the two plans are due to differences in water demands, supplies, needs, and water management strategies recommended to meet needs. New municipal WUGs have been added and some have been combined with County-Other WUGs due to population growth and decline. Additionally, several new WWPs have been added since the 2011 Plan.

Table 11-1. Summary of Implementation Survey

Sponsor	Recommended Water Management Strategy	At what level of implementation is the project?	If not implemented, why?	Year the Project is Online?	Is this a phased project?	Year project reaches maximum capacity?	What is the project funding source(s)?	Included in the 2016 Plan?
ABILENE	Cedar Ridge Reservoir	Permit Application Submitted/Pending			No	2060	Other	Yes
ABILENE	Increase treatment capacity	Not Implemented	Too soon		No	2060	Other	Yes
ABILENE	Municipal water conservation	Currently Operating			Yes	2020	Self (cash)	Yes
ABILENE	Wastewater reuse	Currently Operating		2012	No	2012	Self (cash)	No
AQUA WSC	Additional Carrizo Aquifer development (includes overdrafting)							No
BAIRD	Municipal water conservation	Not Implemented	Too soon					
BRA	Belton to Stillhouse pipeline	Feasibility Study Ongoing	Other		No	2020	Other	Yes
BRA	Coryell County Reservoir (BRA System)							
BRA	Groundwater/ surface water conjunctive use (Lake Granger Augmentation)	Under Construction			Yes	2050	Other	Yes
BRA	Stonewall, Kent, and Garza chloride control project	Feasibility Study Ongoing	Too soon	2016	Yes	2030	Other	Yes
BRA	Storage reallocation of federal reservoirs - Lake Aquilla	Feasibility Study Ongoing	Too soon		No	2035	Other	Yes
BRUSHY CREEK MUD	Municipal water conservation	Implemented and Ongoing		2012	Yes	2019	NA	Yes
BRUSHY CREEK MUD	Rehabilitate existing wells	Complete		2012, 2015	Yes	2015	Operating Revenues	No
CEDAR PARK	Municipal water conservation	Currently Operating			Yes	2040	TWDB	Yes
CEDAR PARK	Regional surface waters supply to Williamson County from Lake Travis	Currently Operating		2012	No	2030	Other	Yes
GATESVILLE	Coryell County Reservoir (BRA System)	Not Implemented	Too soon		Yes	2060	Local (market issue)	No
GEORGETOWN	Increase treatment capacity	Feasibility Study Ongoing	Too soon		No	2060	Self (cash)	No
GEORGETOWN	Municipal water conservation	Currently Operating		2014	No	2060	Self (cash)	No
GROESBECK	City of Groesbeck off-channel reservoir	Not Implemented	Financing	2016	No	2018	Self (cash)	No
JARRELL-SCHWERTNER WSC	BRA supply through the East Williamson County Regional Water Treatment System	Sponsor Has Taken Action to Initiate			No		TWDB	Yes
JARRELL-SCHWERTNER WSC	Municipal water conservation	Currently Operating		2013	No		Self (cash)	Yes
JARRELL-SCHWERTNER WSC	Voluntary redistribution	Not Implemented	Too soon					
MINERAL WELLS	Municipal water conservation	Not Implemented	Financing					
MINERAL WELLS	Turkey Peak Reservoir	Permit Application Submitted/Pending	Permit constraints		No	2020	TWDB	Yes
NCTMWA	Millers Creek augmentation	Feasibility Study Ongoing	Permit constraints	2016	Yes	2035	TWDB	Yes
PPMWD #1	New water treatment plant	Not Implemented	Too soon					
PPMWD #2	Turkey Peak Reservoir	Permit Application Submitted/Pending	Permit constraints	2016	No	2020	TWDB	Yes
STRAWN	Municipal water conservation	Acquisition and Design Phase	Financing	2016	No		TWDB	
STRAWN	Voluntary redistribution	Not Implemented	Too soon					
SWEETWATER	Conjunctive management of Champion well field and Oak Creek Reservoir with subordination agreement	Currently Operating			Yes	2030	Self (cash)	Yes
SWEETWATER	Expansion of Champion well field	Currently Operating		2015	No	2015	Self (cash)	No
SWEETWATER	Municipal water conservation	Currently Operating			Yes	2020	Self (cash)	Yes
SWEETWATER	Oak Creek Reservoir with subordination agreement	Not Implemented	Other		No	2030	Self (cash)	No
TEMPLE	Increase treatment capacity	Sponsor Has Taken Action to Initiate		2016	Yes	2060	Local (market issue)	Yes
THROCKMORTON	Midway pipeline project (West Central Brazos distribution system)	Not Implemented	Too soon					
THROCKMORTON	Municipal water conservation	Currently Operating						



This chapter compares projected water demands, water supplies, needs, and water management strategies between this plan and the 2011 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 (such as no longer allowing the 75/75 convention for irrigation supply).

11.2.1 Changes to WUGs and WWP

Changes to WUGs and WWP included in the plan are shown in Table 11-2.

Table 11-2. Changes to WUGs and WWP in the 2016 Plan

Entity	County	Comments
New WUGs		
Armstrong WSC	Bell	Population increase
Buckholts	Milam	Population increase
Coryell City WSD	Coryell, McLennan	Population increase
Crowley	Johnson	Population increase
Deanville WSC	Burleson	Population increase
Dobbin-Plantersville WSC	Grimes	Population increase
Fort Worth	Johnson	Population increase
G & W WSC	Grimes	Population increase
Golinda	Falls, McLennan	Population increase
Hill County WSC	Hill	Population increase
Multi-County WSC	Coryell, Hamilton	Population increase
Pflugerville	Williamson	Population increase
Possum Kingdom WSC	Palo Pinto, Stephens	Population increase
Texas A & M University	Brazos	Split from College Station
Williamson County MUD #9	Williamson	Population increase
Williamson County MUD #10	Williamson	Population increase

Table 11-2. Changes to WUGs and WVPs in the 2016 Plan

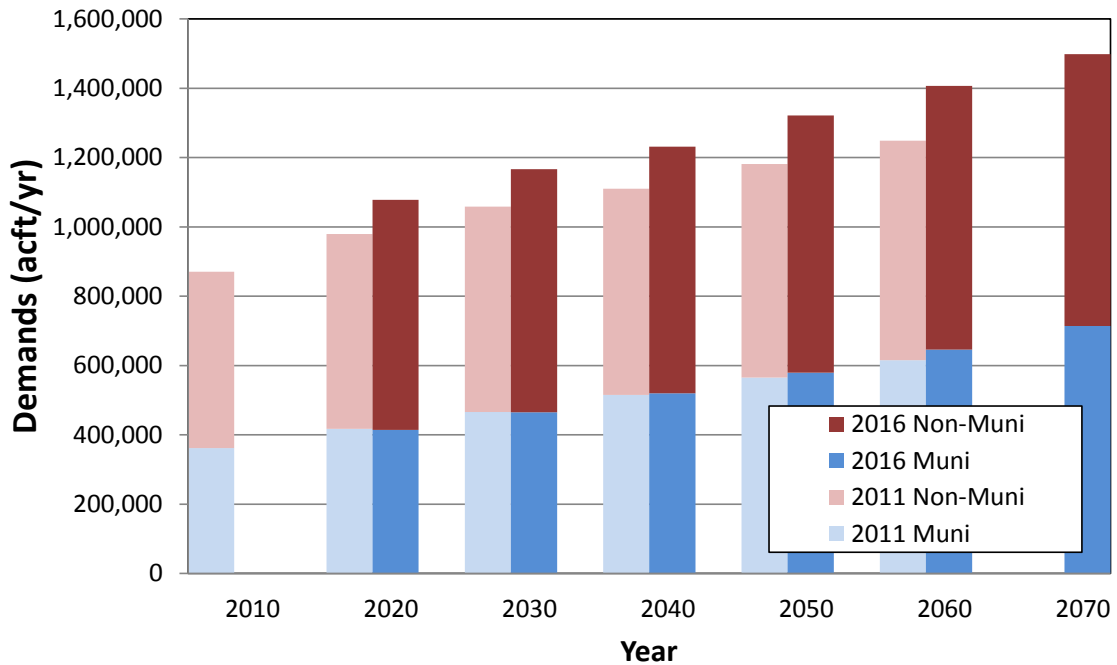
Entity	County	Comments
Williamson County MUD #11	Williamson	Population increase
New WVPs		
City of Anson	Jones	Projected sales > 1,000 acft/yr
City of Cleburne	Johnson	Projected sales > 1,000 acft/yr
City of Gatesville	Coryell	Projected sales > 1,000 acft/yr
City of Graham	Young	Projected sales > 1,000 acft/yr
City of Mineral Wells	Palo Pinto	Projected sales > 1,000 acft/yr
Heart of Texas	Williamson	Projected sales > 1,000 acft/yr
Johnson County SUD	Johnson	Projected sales > 1,000 acft/yr
Kempner WSC	Bell, Coryell, Lampasas	Projected sales > 1,000 acft/yr
WUGs Now Included with County-Other		
Bistone MWSD	Limestone	Below WUG size
Decordova	Hood	Below WUG size
Fort Gates WSC	Coryell	Below WUG size
Kosse	Limestone	Below WUG size
Lake Whitney Water Company	Bosque, Hill	Below WUG size
Lipan	Hood	Below WUG size
Morgan	Bosque	Below WUG size
Weir	Williamson	Below WUG size
Wells Branch MUD	Williamson	Below WUG size

11.2.2 Water Demand Projections

Overall, water demand projections for the region are greater in the 2016 Plan than in the 2011 Plan, as illustrated in Figure 11-1. Municipal water demand projections are slightly higher in the 2016 Plan for each decade, increasing to 714,086 acft/yr by the 2070 decade. Non-Municipal demands are substantially greater in the 2016 Plan than in the 2011 Plan in all decades.



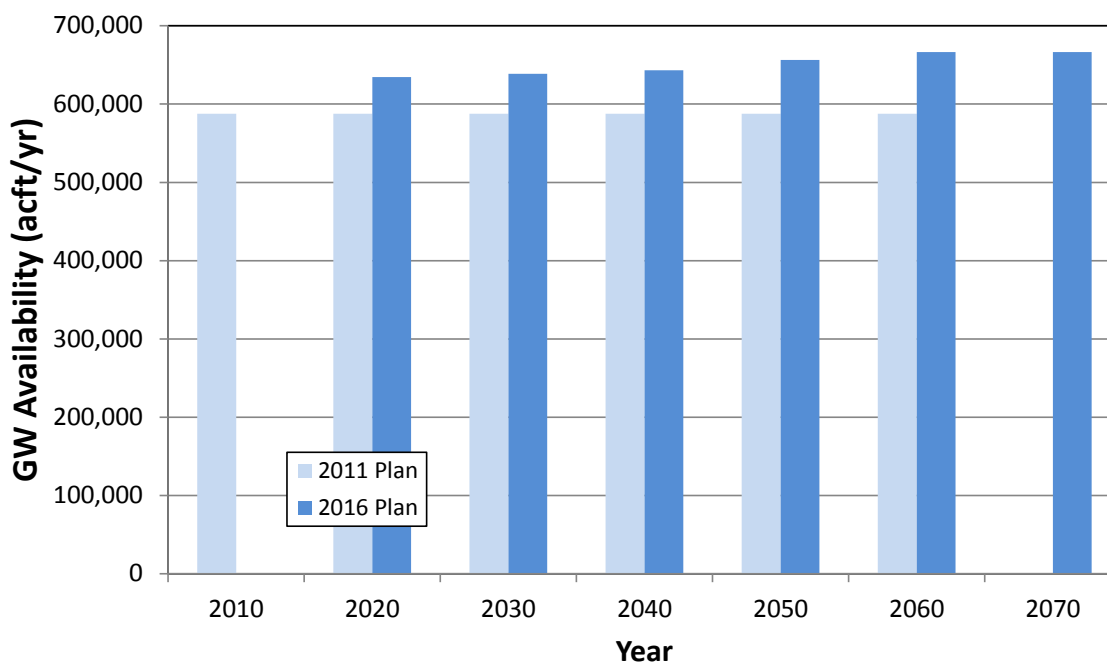
Figure 11-1. Water Demand Projections in the 2011 and 2016 Brazos G Plans



11.2.3 Water Supply Assumptions

For the 2011 Plan, the Groundwater Management Area process was not yet complete for most aquifers in the Brazos G Area. However, the process was sufficiently complete in some areas for an estimate of the expected Managed Available Groundwater (MAG, now “Modeled Available Groundwater”) to be used in the 2011 Brazos G Plan. For other areas, groundwater availability was estimated using the detailed analyses completed for the 2006 Plan. For the 2016 Plan, the MAGs determined for aquifer systems in the Brazos G Area were used. For those aquifers without MAGs, the Brazos G RWPG adopted availability estimates based on those used in the 2011 Plan. 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 2011 and 2016 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, supplemented with the Brazos G Mini-WAM for reservoirs in the upper Brazos Basin. Similar modifications were made to the model in both plans for determining water available to existing water rights. The single most significant difference between the surface water availability analyses in the two plans concerned the methodology for determining reliable supplies to run-of-river irrigation rights. In the 2011 Plan, the 75/75 convention was used, as explained in Chapter 3. In the 2016 Plan, minimum annual supply based on minimum monthly diversions was used. This substantially decreased the estimated irrigation supplies from surface water rights.

Assumptions for determining groundwater and surface water availability in both plans are compared in Table 11-3.

Table 11-3. Assumptions for Determining Water Available to Current Supplies and Water Management Strategies

2011 Brazos G Plan	2016 Brazos G Plan
Groundwater availability based on expected MAG results , and 2006 estimates elsewhere	Groundwater availability based on Modeled Available Groundwater where determined, and 2011 estimates elsewhere
Existing surface water supply based on estimated 2010 and 2060 Effluent Discharges adjusted for reuse assumptions	Existing surface water supply based on estimated 2020 and 2070 Effluent Discharges adjusted for reuse assumptions
Existing surface water supply to irrigation rights based on 75/75 convention ¹	Existing surface water supply to irrigation rights based on minimum annual supply from minimum monthly diversions



Table 11-3. Assumptions for Determining Water Available to Current Supplies and Water Management Strategies

2011 Brazos G Plan	2016 Brazos G Plan
Surface water management strategies include Effluent Discharges adjusted for reuse assumptions	Surface water management strategies exclude Effluent Discharges (TCEQ Run 3 assumptions), except where effluent is part of the supply from the strategy
Surface water management strategies subject to Consensus Criteria for Environmental Flow Needs	Surface water management strategies subject to TCEQ Environmental Flow Standards

1. See Chapter 3 Supplies, Section 3.2.4 for a detailed description of the 75/75 convention.

11.2.4 Existing Water Supplies

Water supplies available to WUGs and WWP in the Brazos G Area have changed significantly since the last planning cycle. Municipal supplies have increased slightly, but supplies to non-municipal WUGs have decreased 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 2011 and 2016 Brazos G Plans

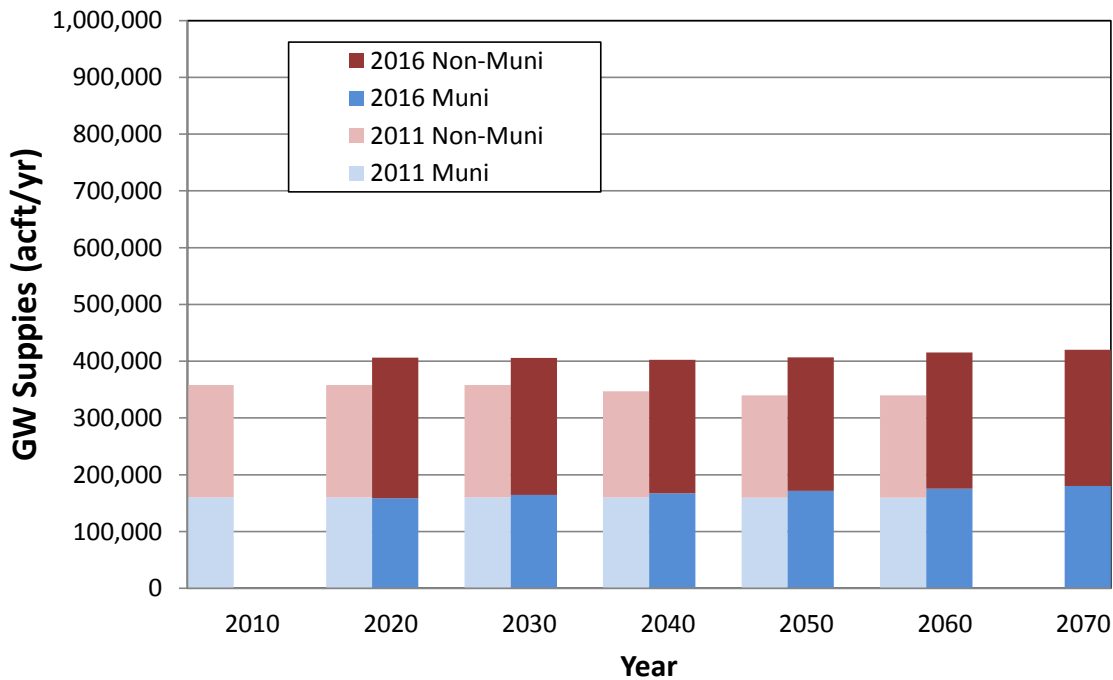


Figure 11-4. Surface Water Supplies Available to WUGs in the 2011 and 2016 Brazos G Plans

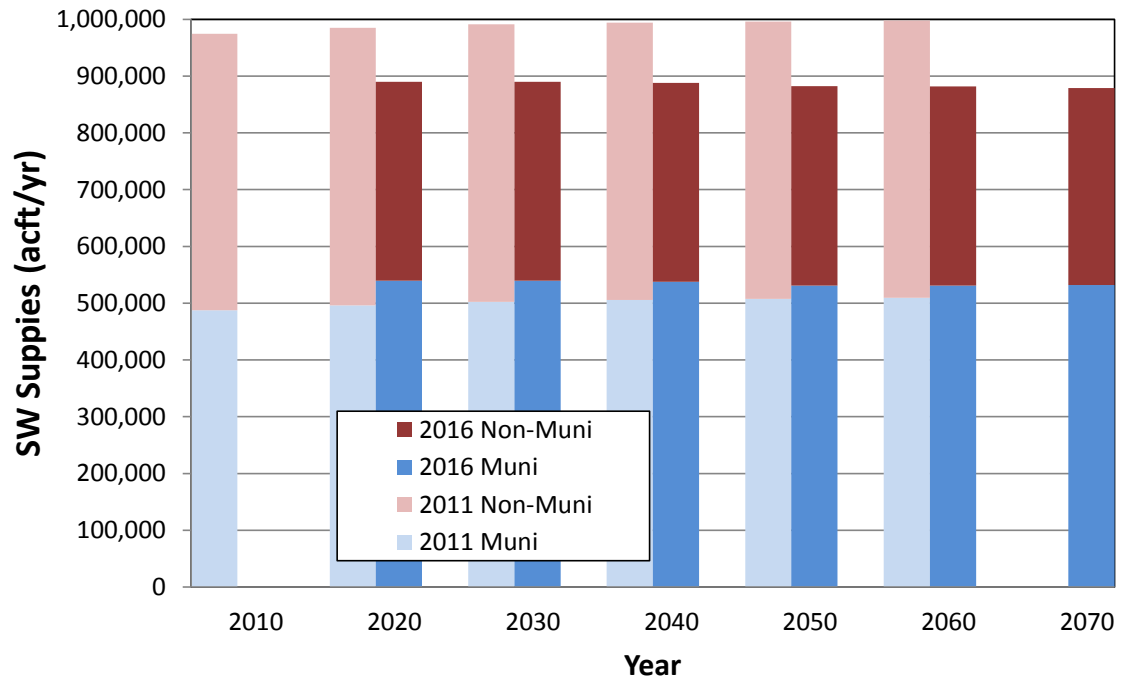
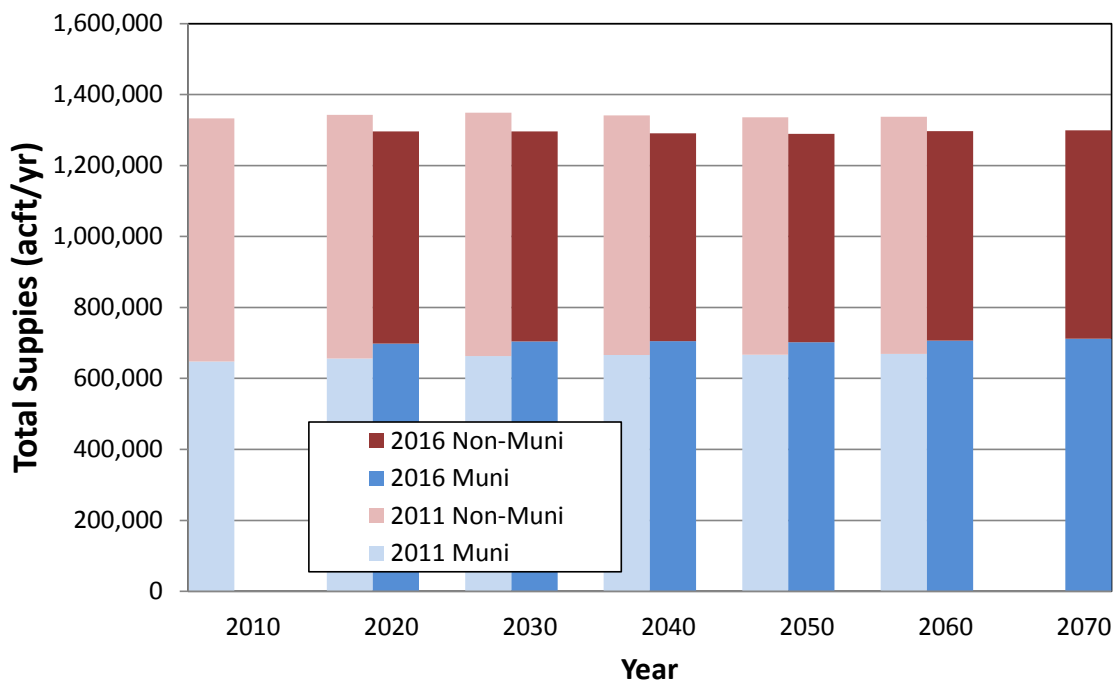


Figure 11-5. Total Water Supplies Available to WUGs in the 2011 and 2016 Brazos G Plans



11.2.5 Needs

Municipal need projections increase for each decade in both the 2011 and 2016 Plans, however, the municipal needs are less in the 2011 Plan than in the 2016 Plan during the 2020 and 2030 decades, but by the 2050 decade municipal needs are greater in the 2016 Plan. For municipal WUGs with surpluses, however, the total surpluses are always greater in the 2016 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, total surpluses are less and total needs are greater in the 2016 Plan, caused by reduced supplies available to non-municipal WUGs.

Figure 11-6. Municipal Surpluses and Needs (Shortages) in the 2011 and 2016 Brazos G Plans

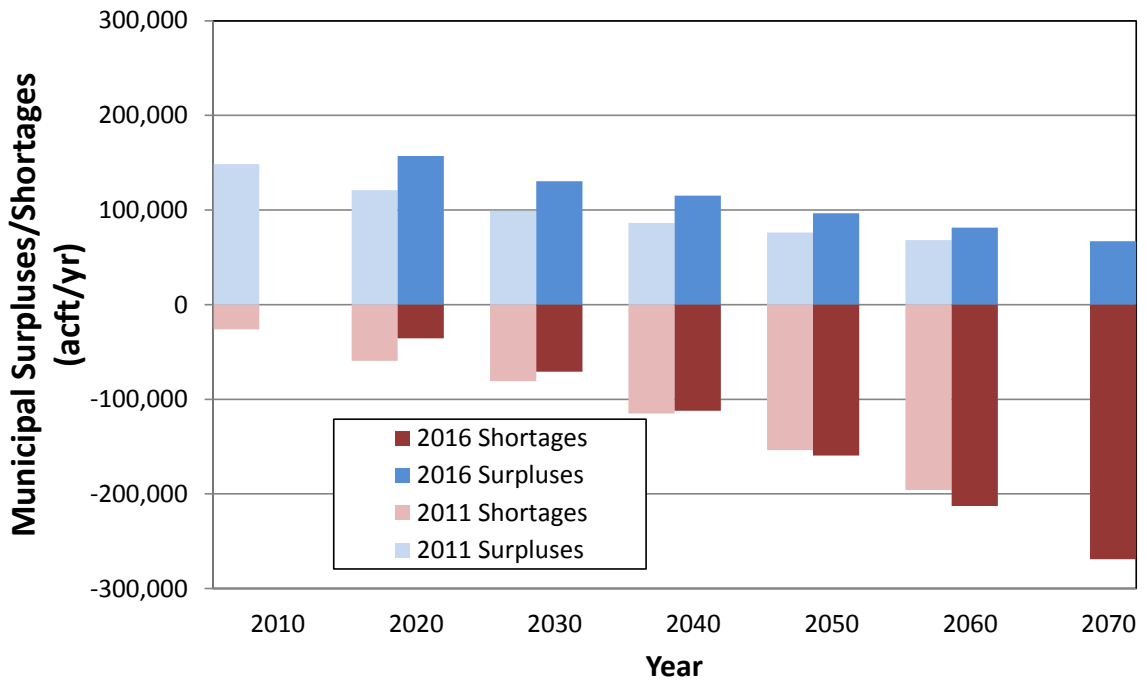
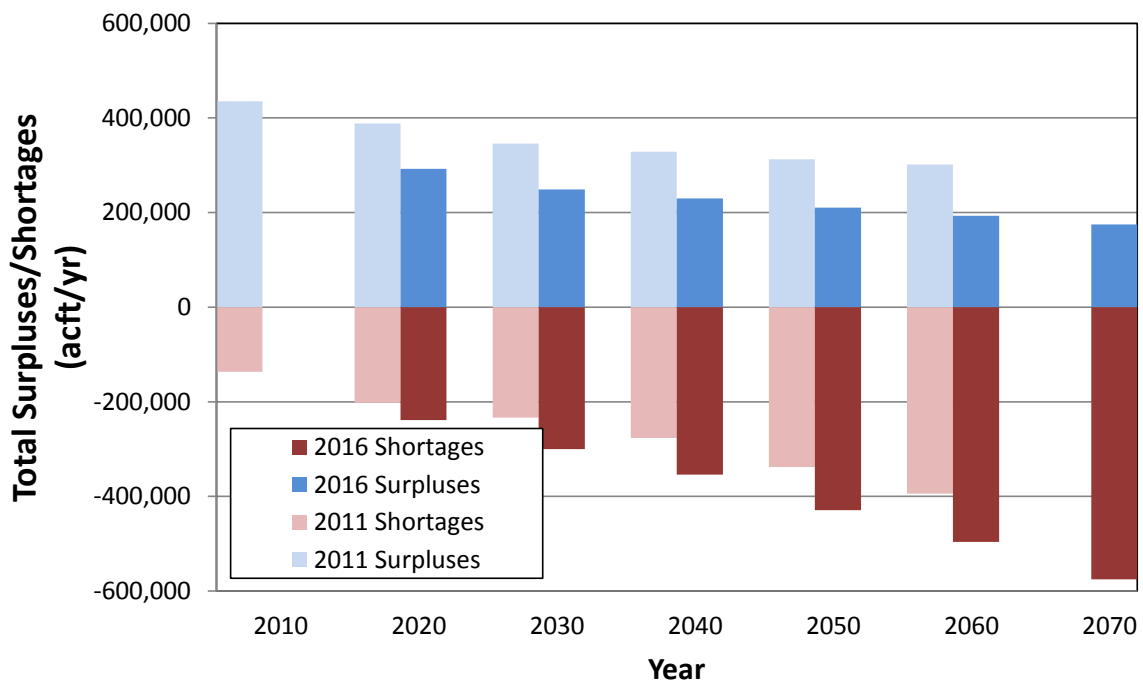


Figure 11-7. Total Surpluses and Needs (Shortages) in the 2011 and 2016 Brazos G Plans



11.2.6 Water Management Strategies

As expected, many of the water management strategies recommended in the 2011 Plan are again recommended in the 2016 Plan; however, the greater needs in the 2016 Plan necessitate additional strategies in the 2016 Plan. This section generally identifies differences in water management strategies between the 2011 and 2016 Plans.

Conservation and Reuse

Conservation in the 2016 Plan is much more aggressively considered than in the 2011 Plan. In the 2011 Plan, conservation as a water management strategy was recommended for all municipal water user groups with needs and per capita water use greater than 140 GPCD, and all other non-municipal water user groups with needs. 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. In addition, conservation targets for some municipal entities in Williamson County are more aggressively recommended to achieve per capita water use of 120 GPCD by 2070. Total municipal conservation savings in the 2060 decade in the 2011 Plan was 21,366 acft/yr versus 99,573 acft/yr in the 2016 Plan.

Reuse is a key water management strategy in both the 2011 and 2016 Plans. In the 2016 Plan, water management strategies involving reuse total 46,662 acft/yr, versus 71,767 acft/yr in the 2011 Plan. This decrease is due in large part to some reuse projects being implemented since the 2011 Plan, including Steam-Electric supplies in Bell County and reuse supplies for the City of Round Rock.

Supplies from Other Regions

The 2011 Plan in the 2060 decade includes roughly 64,000 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, Round Rock (and Chisholm Trail SUD in 2011), and in supplies from Region C for entities in Johnson County. The greater supplies to Johnson County entities from out-of-region suppliers in the 2016 Plan reflects greater demands for those entities that receive supplies from Region C entities.

New Reservoirs

The 2011 Plan recommended construction of the Groesbeck Off-Channel, Coryell County, Cedar Ridge, Little River OCR, and Brushy Creek Reservoir. The 2016 Plan recommends those same reservoirs, plus Throckmorton Reservoir and Lake Creek Reservoir, which replaces the Millers Creek Augmentation Project as the recommended strategy to increase supplies for the North Central Texas Municipal Water Authority.

During the Brazos G regional water planning process, water management strategies such as additional development of Carrizo-Wilcox Aquifer groundwater and the Lake Granger Augmentation Project were preferred options to include in the 2016 Brazos G Regional Water Plan. When confronted by the Modeled Available Groundwater (MAG) limitations of these two options, the BGRWPG has little alternative but to make the Little River Off-Channel Reservoir a recommended strategy.

BRA System Operations

Supplies to meet new WUG demands from the pending BRA System Operations Permit are similar in the 2011 and 2016 Plans, and are dominated by about 76,000 acft/yr to be supplied to meet steam-electric needs in Somervell County. Much of the rest of the supply from the BRA System Operations Permit would be used to firm up existing contractual commitments of the BRA.

Additional Groundwater Development

The 2016 Plan recommends substantially greater levels of groundwater development (65,000 acft/yr) than does the 2011 Plan (20,902 acft/yr), largely due to the greater needs projected for many of the county-aggregated WUGs such as irrigation, mining and manufacturing.

Aquifer Storage and Recovery (ASR)

The 2016 Plan includes four recommended ASR projects for College Station, Bryan, Waco (McLennan County ASR) and the BRA (Lake Granger ASR) that are not included in the 2011 Plan. In addition, the 2016 Plan includes an ASR project as an alternative strategy for Johnson County SUD.

Unmet Needs

The 2011 Plan contained sufficient recommended water management strategies that there were no needs unmet in the plan. In the 2016 Plan, however, 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 has substantially increased many county-aggregated needs with few economically reasonable strategies to supply those uses. The Brazos G Regional Water Planning Group opts 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.

Alternative Water Management Strategies

Both the 2011 Plan and the 2016 Plan identify alternative water management strategies for certain WUGs and WWP 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 Lake Palo Pinto Off-Channel Reservoir project as an alternative to the recommended Turkey Peak Dam – Lake Palo Pinto Enlargement Project for the Palo Pinto County MWD No. 1, and supplies from the BRA's System Operation Permit as an alternative supply for several entities.