

**TO:** Board Members

**THROUGH:** Darrell Nichols, Assistant Executive Administrator  
Les Trobman, General Counsel  
Jeff Walker, Deputy Executive Administrator,  
Water Supply and Infrastructure

**FROM:** Tom Barnett, Project Manager, Regional Water Planning

**DATE:** May 13, 2016

**SUBJECT:** Minor Amendment to the 2016 Brazos G Regional Water Plan, relating to municipal conservation capital costs

### **ACTION REQUESTED**

Consider approving the adopted minor amendment to the 2016 Brazos G Regional Water Plan; and authorizing the Executive Administrator to develop the corresponding amendment to the 2017 State Water Plan with associated hearing.

### **BACKGROUND**

At the April 6, 2016 meeting of the Brazos G Regional Water Planning Group (planning group), the planning group approved the City of Waco's request for a minor amendment to revise Waco's recommended municipal conservation water management strategy by adding additional project detail and capital cost, and to assign capital costs to all other recommended municipal conservation water management strategies in the 2016 Brazos G Regional Water Plan. The amendment would update municipal conservation strategy information for 89 municipal Water User Groups, affect a total of 95 recommended water management strategies and add \$395 million in total capital costs to the regional water plan. The amendment incorporates additional capital costs but does not change the total strategy supply volume allotted to municipal conservation. The planning group submitted a Minor Amendment Determination Request to Texas Water Development Board (TWDB) April 6, 2016.

The Executive Administrator (EA) made the determination (Attachment A) that these proposed revisions constitute a minor amendment under 31 Texas Administrative Code (TAC) §357.51(c), based on the amendment having met the following criteria:

1. Does not result in over-allocation of an existing or planned source of water.
2. Does not relate to a new reservoir.

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:  
:

3. Does not have a significant effect on instream flows, environmental flows or freshwater flows to bays and estuaries.
4. Does not have a significant substantive impact on water planning or previously adopted management strategies. This amendment simply adds capital costs not previously included in the regional water plan.
5. Does not delete or change any legal requirements of the regional water plan.

The EA provided written responses to the planning group for this minor amendment determination on April 11, 2016 and the planning group adopted the minor amendment at their April 27, 2016 meeting. Following this adoption, a two-week public comment period was held and no public comments were received. No revision to the proposed minor amendment was found to be necessary by the planning group.

### **KEY ISSUES**

1. The Brazos G Regional Water Planning Group submitted the required written documentation of their adopted minor amendment to the TWDB on May 11, 2016, including an addendum to the 2016 Brazos G Regional Water Plan (Attachment B).
2. The Assistant EA has reviewed the adopted amendment and determined that statutory and rule requirements have been met.
3. If approved, an associated amendment to the 2017 State Water Plan will be presented for the Board's consideration following a 30-day notice period and public hearing in accordance with 31 TAC §358.4 (a).

### **RECOMMENDATION**

The Assistant Executive Administrator recommends approval of this item.

This recommendation has been reviewed by legal counsel and complies with applicable statutes and Board rules.

#### Attachments:

- A. April 11, 2016 Executive Administrator Minor Amendment Response Letter
- B. Brazos G minor amendment documentation, including the addendum to the 2016 Brazos G Regional Water Plan

# Texas Water Development Board



P.O. Box 13231, 1700 N. Congress Ave.  
Austin, TX 78711-3231, [www.twdb.texas.gov](http://www.twdb.texas.gov)  
Phone (512) 463-7847, Fax (512) 475-2053

April 11, 2016

Mr. Wayne Wilson, Chair  
Region G Regional Water Planning Group  
7026 East OSR  
Bryan, Texas 77808

Re: Region G's written request, received April 6, 2016, for a determination regarding whether amending the 2016 Region G Regional Water Plan to assign capital costs to all recommended municipal conservation water management strategies would be a minor amendment under 31 TAC §357.51(c).

Dear Mr. Wilson:

I have reviewed Region G's request and, based on the planning group's request and supporting materials, have determined that assigning capital costs to all recommended municipal conservation water management strategies constitutes a minor amendment under 31 TAC §357.51(c).

If Region G adopts the proposed minor amendment, the planning group will need to:

1. Provide the Texas Water Development Board (TWDB) with documentation of the planning group action adopting this water management strategy as a minor amendment;
2. Issue and distribute an addendum to the 2016 Region G Regional Water Plan updating the plan accordingly; and
3. Provide TWDB with updated DB17 data to reflect all the associated changes to the 2016 Region G Regional Water Plan and, eventually, the 2017 State Water Plan.

If Region G makes any substantive changes to the project components or configuration during the minor amendment process, TWDB will need to review the modified proposed amendment to ensure that any other changes still meet all of the criteria under 31 TAC §357.51(c).

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Mr. Wayne Wilson  
April 11, 2016  
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If you have any questions concerning this approval or its associated requirements, please contact Tom Barnett, the Board's designated regional water planning project manager for this region.

Sincerely,



Kevin Patteson  
Executive Administrator

cc: Trey Buzbee, Brazos River Authority  
Tom Barnett, TWDB

# BRAZOS G

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 Milam  
 Nolan  
 Palo Pinto  
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 Stephens  
 Tarrant  
 Throckmorton  
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 Young

BRAZOS RIVER AUTHORITY, Administrative Agent  
 P.O. Box 7555 ◊ Waco, Texas 76714-7555  
 (254) 761-3100 ◊ Fax (254) 761-3204

May 11, 2016

Mr. Kevin Patteson  
 Executive Administrator  
 Texas Water Development Board  
 P.O. Box 13231  
 Austin, TX 78711-3231

**RE:** Amendment of the 2016 Brazos G Regional Water Plan to include capital costs for municipal water conservation

Dear Mr. Patteson:

The Brazos G Regional Water Planning Group appreciates your response to our letter regarding the proposed amendment of the 2016 Brazos G Regional Water Plan (2016 Plan) to include capital costs for all municipal water conservation strategies recommended in the 2016 Plan. As requested in your April 11, 2016 response, I have prepared the following responses to the matters raised in the letter and have attached supporting materials for your review:

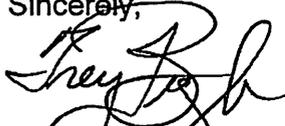
- Provide Texas Water Development Board (TWDB) with documentation of the planning group action adopting this water management strategy as a minor amendment.
  - *On April 27, 2016, the Brazos G Regional Water Planning Group (Group) voted to approve the minor amendment to include capital costs for all municipal water conservation strategies recommended in the 2016 Plan. The meeting resolution adopted by Brazos G regarding the minor amendment is attached.*
- Issue and distribute an addendum to the 2016 Brazos G Regional Water Plan updating the plan accordingly.
  - *Addendum materials are attached to this letter. These materials will be posted on the Brazos G website alongside the documents for the 2016 Brazos G Regional Water Plan.*

- Provide TWDB with corrected DB17 data to reflect all of the associated changes in the 2006 Brazos G Regional Water Plan and State Water Plan.
  - *Brazos G will provide corrected DB07 data that reflect the associated changes in the 2016 Brazos G Regional Water Plan and State Water Plan to the TWDB by the end of May 2016.*

In addition, Brazos G does not anticipate making any substantive changes to the project components or configuration, but will make the TWDB aware if any such changes occur.

If you have any questions with regarding this matter, please feel free to contact me. The Brazos G Regional Water Planning Group appreciates your and the TWDB's assistance.

Sincerely,



TREY BUZBEE  
Administrator  
Brazos G Regional Water Planning Group

Attachments



**2016 Plan  
Amendment –Capital  
Costs for Municipal  
Conservation**  
Agenda Item 6.9.1

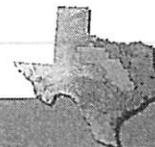
April 27, 2016



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## Background

- 2016 Brazos G Plan does not include capital costs for municipal water conservation strategies
  - 93 municipal WUGs have recommended water conservation strategies
  - Annual costs are included, expressed in dollars per acre-foot saved (2003 GDS report for TWDB)
- Eligibility for SWIFT funding requires a capital cost in the regional and state plans
- Waco has requested an amendment to include capital costs for a meter enhancement program
- HDR suggests capitalizing annual conservation costs for all municipal WUGs
- Will present today:
  - Materials for Waco-specific amendment
  - Materials for general amendment for remaining WUGs
  - Recommendation to adopt plan amendment

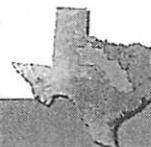


### Estimated Annual Water Savings – Waco Meter Enhancement

	2020	2030	2040	2050	2060	2070
Conservation in 2016 Plan (acft/yr)	1,462	4,033	6,781	9,781	11,940	12,554
Enhanced Metering (acft/yr)	698	2,237	2,346	2,469	2,604	2,740
Other BMPs (acft/yr)	764	1,796	4,435	7,312	9,336	9,814

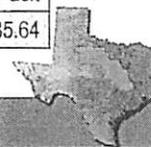
▪ Assumptions:

- Based on 12% target loss factor and 17.9% current loss factor
- Water use based on City of Waco Brazos G demands
- 33% implementation in 2020, 100% implementation in 2030



### Estimated Costs for Waco Enhanced Metering

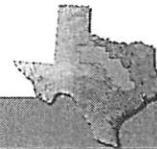
Description	Cost
Capital Cost:	
Meters and Transceivers	\$14,800,000
AMI Infrastructure (Data Collectors)	\$170,000
Consumer Portal Configuration	\$105,000
Leak Detection Infrastructure	\$207,000
<b>Total Capital Cost</b>	<b>\$15,282,000</b>
Debt Service (5.5%, 20 years)	\$1,278,788
Annual Subscription Cost (MDMS / Leak Detection)	\$255,000
<b>Total Annual Cost</b>	<b>\$1,533,788</b>
Water Saved in 2030	2,237 acft
<b>Annual Unit Cost (\$/acft of water saved)</b>	<b>\$685.64</b>



### Capital Costs for Non-Specific Conservation Strategies

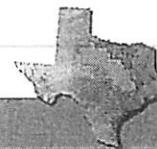
- Depending on BMPs selected, annual costs range from \$53 to \$1,022 per acre-foot of water saved
- 2016 Brazos G Plan assumptions for annual unit costs:
  - Rural: \$496/acft
  - Suburban: \$470/acft
  - Urban: \$474/acft
- Total annual costs determined by multiplying target savings by annual unit costs
- Recommended approach to estimate capital costs for conservation:
  - “Capitalize annual costs by assuming that 70% of annual costs in maximum year are amortized.”
- Example:
 

\$2,335,000	Year 2070 annual cost
\$1,634,500	70% of annual cost
\$19,532,900	Capital Cost assuming 5.5% interest for 20 years



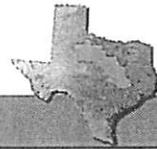
### Explanation of Amendment Materials

- Section 5.38.28 – City of Waco Plan in WWP section
  - Addition of meter enhancement program as a recommended strategy – text and Table 5.38-30
- Section 5.40 – Conservation Recommendations
  - Addition of text in last full paragraph on page 5.40-1
  - Addition of Table 5.40-3 . Capital Costs for Municipal Water Conservation Strategies in the Brazos G Area
- Table of Contents
  - New page number for Waco table in Section 5.38.28
  - New Table 5.40-3



### **Suggested Action**

- "The Brazos G Regional Water Planning Group amends the 2016 Brazos G Regional Water Plan to include capital costs for municipal water conservation for the City of Waco's meter enhancement program and for general municipal water conservation for all WUGs for which water conservation is a recommended water management strategy."
- "The Brazos G Regional Water Planning Group directs the Brazos River Authority and HDR to submit the amendment materials to the Texas Water Development Board and request that the 2017 State Water Plan be amended accordingly."



# BRAZOS G

WATER PLANNING GROUP

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BRAZOS RIVER AUTHORITY, Administrative Agent  
P.O. Box 7555, Waco, Texas 76714-7555  
(254) 761-3168 v Fax (254) 761-3204

May 10, 2016

To: Interested Parties

Re: Amendment to the 2016 Brazos G Regional Water Plan to Include  
Capital Costs for Municipal Water Conservation

The Brazos G Regional Water Planning Group hereby amends the 2016 Brazos G Regional Water Plan as follows:

**1. Include capital costs for the City of Waco's meter enhancement program as a municipal water conservation strategy.**  
The City of Waco is initiating a capital-intensive meter enhancement program to provide increased level of monitoring throughout the City's water distribution system to inform customers regarding their water use on a daily basis and to detect and quickly respond to leaks in the system.

**2. Include capital costs for other municipal water conservation strategies recommended in the 2016 Brazos G Regional Water Plan.**  
Annual costs for recommended municipal water conservation strategies have been capitalized by assuming that 70% of the annual costs for a municipal water conservation program are associated with repayment of debt issued to fund the initial capital expenditures.

This amendment necessitates an update to the water supply plan for the City of Waco (Section 5.38.28), the additional of Table 5.40-3 (Section 5.40) presenting the capital costs for all recommended municipal water conservation strategies, and modification to the table of contents to reflect these changes.

The revised pages in the plan are attached.

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2030. The City has a contract to supply effluent from its wastewater treatment plan to a new generating station owned by Panda Power.

The City of Temple is projected to have supply shortages through 2070. Table 4.3-25 in Chapter 4 includes additional information on contracts and water supplies for the City of Temple.

### Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Temple.

- a. Conservation
  - Cost Source: Volume II, Chapter 2
  - Date to be Implemented: Before 2020
  - Unit Cost: \$474 / acft
- a. Firm up of Supplies through BRA Little River System Strategies-see Section 5.38.2
  - Cost Source: Section 5.38.2
  - Date to be Implemented: 2020
  - Total Project Cost: borne by BRA
  - Unit Cost: already contracted supplies

**Table 5.38-29. Recommended Plan Costs by Decade for the City of Temple**

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	2,223	(2,084)	(4,554)	(8,448)	(11,780)	(13,518)
<b>Conservation(Volume II, Chapter 2)</b>						
Supply From Plan Element (acft/yr)	914	2,740	5,015	7,724	10,771	11,850
Annual Cost (\$/yr)	\$433,105	\$1,298,837	\$2,376,991	\$3,660,947	\$5,105,344	\$5,616,738
<i>Projected Surplus/(Shortage) after Conservation</i>	3,137	656	461	(724)	(1,009)	(1,668)
<b>Firm up of Supplies through BRA Little River System Strategies-see Section 5.38.2</b>						
Supply From Plan Element (acft/yr)	6,563	8,021	7,497	8,221	8,357	6,929
Annual Cost (\$/yr)	\$0	\$0	\$0	\$0	\$0	\$0
Unit Cost ( \$/acft)	\$0	\$0	\$0	\$0	\$0	\$0

### 5.38.28 City of Waco

#### Description of Supply

The City of Waco obtains its surface water supply from Lake Waco, in which it owns water rights, and from Lake Brazos on the Brazos River. The City supplies several neighboring communities and has sufficient water supply to meet its municipal and

regional needs without conservation through 2060. Waco has a projected shortage of 2,730 acft in 2070. Table 4.3-26 in Chapter 4 includes additional information on contracts and water supplies for the City of Waco.

The City has demonstrated a commitment to provide regional water supply in McLennan County, and has plans to extend regional water supplies beyond the 2070 planning horizon by actively pursuing a reuse program. Since the 2011 Brazos G Regional Plan, Waco Metropolitan Area Regional Sewerage System (WMARSS) has constructed the Sandy Creek Energy Associates (SCEA) Project which provides 15,000 acft/yr of treated effluent from the WMARSS Central Wastewater Treatment Plant to the SCEA power plant. WMARSS continues to pursue the development of four wastewater reuse systems to supply reuse water to customers. The Year 2011 effluent from WMARSS was 25,355 acft/yr (22.6 MGD). The Year 2070 estimated effluent available from WMARSS is projected to be 36,370 acft/yr (32.5 MGD), which includes the 15,000 acft/yr of sales to the Sandy Creek Project.

### Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Waco.

a. Conservation – Meter Enhancement Program

The City is implementing a meter enhancement program to reduce water loss through better monitoring of customer water use and pro-active leak detection. The program is anticipated to reach full implementation prior to 2030.

- Cost Source: City of Waco (see Table 5.40-3 from plan amendment)
- Date to be Implemented: Before 2020
- Total Project Cost: \$15,282,000
- Unit Cost: \$686/acft (at full implementation in 2030)

b. Conservation

- Cost Source: Volume II, Chapter 2
- Date to be Implemented: Before 2020
- Unit Cost: \$474 / acft

c. McLennan County ASR

- Cost Source: Volume II, Chapter 10.5
- Date to be Implemented: 2020
- Total Project Cost: \$43,940,000
- Unit Cost: \$677/ acft

**Table 5.38-30. Recommended Plan Costs by Decade for the City of Waco**

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	11,457	8,661	6,144	3,233	312	(2,730)
<b>Conservation – Meter Enhancement Program</b>						
Supply From Plan Element (acft/yr)	698	2,237	2,346	2,469	2,604	2,740
Annual Cost (\$/yr)	\$1,533,788	\$1,533,788	\$ 255,000	\$ 255,000	\$ 255,000	\$ 255,000
<b>Conservation (Volume II, Chapter 2)</b>						
Supply From Plan Element (acft/yr)	764	1,796	4,435	7,312	9,336	9,814
Annual Cost (\$/yr)	\$361,986	\$851,395	\$2,102,233	\$3,465,943	\$4,425,110	\$4,651,788
<i>Projected Surplus/(Shortage) after Conservation</i>	12,919	12,694	12,925	13,014	12,252	9,824
<b>McLennan County ASR (Volume II, Chapter 10.5)</b>						
Supply From Plan Element (acft/yr)	8,000	8,000	8,000	8,000	8,000	8,000
Annual Cost (\$/yr)	\$5,416,000	\$5,416,000	\$1,744,000	\$1,744,000	\$1,744,000	\$1,744,000
Unit Cost (\$/yr)	\$677	\$677	\$218	\$218	\$218	\$218

### Reuse Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to meet water needs for the City of Waco:

- a. WMARSS- Bullhide Creek Reuse
  - Cost Source: Volume II, Chapter 3
  - Date to be Implemented: 2020
  - Total Project Cost: \$4,657,000
  - Unit Cost: \$381/acft
- b. WMARSS- Bellmead/Lacy-Lakeview Reuse
  - Cost Source: Volume II, Chapter 3
  - Date to be Implemented: 2020
  - Total Project Cost: \$ 5,768,000
  - Unit Cost: \$324/acft
- c. WMARSS- Flat Creek Reuse
  - Cost Source: Volume II, Chapter 3
  - Date to be Implemented: 2020
  - Total Project Cost: \$9,371,000
  - Unit Cost: \$205/acft

- d. Alternative: WMARSS- North Reuse
  - Cost Source: Volume II, Chapter 3
  - Date to be Implemented: 2020
  - Total Project Cost: \$21,945,000
  - Unit Cost: \$1,009/acft
- e. Alternative. WMARSS- East Reuse
  - Cost Source: Volume II, Chapter 3
  - Date to be Implemented: 2020
  - Total Project Cost: \$8,970,000
  - Unit Cost: \$869 / acft

**Table 5.38-31. Recommended Plan Costs by Decade for the City of Waco for Reuse Supplies**

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(6,530)	(6,630)	(6,730)	(6,930)	(7,130)	(7,430)
<b>WMARSS-Bullhide Reuse (Volume II, Chapter 3)</b>						
Supply From Plan Element (acft/yr)	1,681	1,671	1,671	1,671	1,671	1,671
Annual Cost (\$/yr)	\$641,000	\$641,000	\$251,000	\$251,000	\$251,000	\$251,000
Unit Cost (\$/yr)	\$381	\$381	\$150	\$150	\$150	\$150
<b>WMARSS-Bellmead/Lacy Lakeview Reuse (Volume II, Chapter 3)</b>						
Supply From Plan Element (acft/yr)	2,240	2,240	2,240	2,240	2,240	2,240
Annual Cost (\$/yr)	\$725,000	\$725,000	\$242,000	\$242,000	\$242,000	\$242,000
Unit Cost (\$/yr)	\$324	\$324	\$108	\$108	\$108	\$108
<b>WMARSS-Flat Creek Reuse (Volume II, Chapter 3)</b>						
Supply From Plan Element (acft/yr)	7,847	7,847	7,847	7,847	7,847	7,847
Annual Cost (\$/yr)	\$1,609,000	\$1,609,000	\$825,000	\$825,000	\$825,000	\$825,000
Unit Cost (\$/yr)	\$205	\$205	\$105	\$105	\$105	\$105
<b>Alternative: WMARSS-North Reuse (Volume II, Chapter 3)</b>						
Supply From Plan Element (acft/yr)	3,360	3,360	3,360	3,360	3,360	3,360
Annual Cost (\$/yr)	\$3,390,000	\$3,390,000	\$1,554,000	\$1,554,000	\$1,554,000	\$1,554,000
Unit Cost (\$/yr)	\$1,009	\$1,009	\$463	\$463	\$463	\$463
<b>Alternative: WMARSS-East Reuse (Volume II, Chapter 3)</b>						
Supply From Plan Element (acft/yr)	208	208	208	208	208	208
Annual Cost (\$/yr)	\$180,752	\$180,752	\$39,728	\$39,728	\$39,728	\$39,728
Unit Cost (\$/yr)	\$869	\$869	\$191	\$191	\$191	\$191

## 5.40 Water Conservation Recommendations

Regional water planning guidelines require each regional water planning group to consider water conservation to meet projected shortages, although funding to implement such water conservation programs is limited. Conservation is shown as a recommended strategy for all water user groups with needs identified during the planning period. The Brazos G RWPG adopted the following water conservation recommendations for the 2016 Plan which are further described in Volume II, Section 2.

- Municipal water user groups with per capita rates exceeding 140 gallons per person per day (gpcd) were recommended to reduce per capita consumption by 1% annually through 2070 until a 140 gpcd rate is attained. This recommendation applies to all municipal water user groups with and without projected water supply needs (shortages). For Water User Groups (WUGs) in Williamson County, an additional advanced conservation goal of 120 gpcd by 2070 was recommended. Annual reduction rates ranging from 0.35% to 1.1% for Williamson County WUGs were applied to bring the gpcd of each WUG to 120 gpcd. Conservation can be achieved through a variety of best management practices, some of which are listed in Section 2.1.2. For municipal entities reporting real losses greater than 15% of water system input volume, an infrastructure replacement program to reduce water loss is summarized in Section 2.1.8.
- Irrigation water user groups with identified needs were recommended to reduce water use by 3% by 2020, 5% by 2030, and 7% from 2040-2070. A list of best management practices prepared by the Water Conservation Implementation Task Force that can be implemented to achieve these goals is included in Section 2.2.2.
- Manufacturing, steam-electric, and mining water user groups with identified needs were recommended to reduce water use by 3% by 2020, 5% by 2030, and 7% from 2040-2070. A list of best management practices prepared by the Water Conservation Implementation Task Force that can be implemented to achieve these goals is included in Section 2.3.2.
- Conservation recommendations were not made for livestock water user groups.

A summary was prepared of common water conservation best management practices (Table 5.40-1) and recommended 5- and 10-year water conservation targets (Table 5.40-2) obtained from local water conservation plans for entities located in Brazos G. The Brazos G RWPG suggests that water user groups in the region review the list and look to identify water user groups at a relevant size with similar water supply type and consider voluntary implementation of those best management practices, if applicable. A summary of capital costs estimated for initial implementation of these water conservation strategies is presented in Table 5.40-3. Capital costs were estimated for each WUG by capitalizing 70 percent of the maximum estimated annual cost. Capital costs for the City of Waco's Meter Enhancement Program were provided by the City of Waco. Capital costs related to the remainder of the conservation water savings for the City of Waco were estimated similar to the other WUGs.

TCEQ has prepared model water conservation plans (WCPs) for municipal public water suppliers, wholesale providers, industrial and mining entities, and agricultural users to provide guidance and suggestions to entities with regard to the preparation of water

conservation plans. Not all items in the model plan will apply to every system's situation, but the overall model plan can be used as a starting point for most entities. For water user groups wishing to develop a new WCP, Brazos G suggests considering best management practices from local water conservation plans for entities similar in size, as discussed previously, in addition to the TCEQ Model WCPs. The TCEQ model water conservation plans can be found in on TCEQ's website at the following link:

[https://www.tceq.texas.gov/permitting/water\\_rights/wr\\_technical-resources/conserves.html](https://www.tceq.texas.gov/permitting/water_rights/wr_technical-resources/conserves.html)

**Table 5.40-1. Summary of Water Conservation BMPs in the Brazos G Area**

Wholesale Water Provider	WCP Available	Date	Best Management Practices							
			Reduce Water Losses/ Unaccounted for Water/Leak Detection	Water Conservation Pricing/Seasonal or Inverted Block Rates	Reuse	Improve Meter Accuracy	Toilet Replacement/ Retrofit Programs	Public/School Education	Landscape Conservation/Xeriscape	Others
Aquilla WSD	Y	2014	√	√		√				√
Bellmead	Y	2010	√	√		√	√	√	√	
Belton	Y	2000	√	√		√		√		√
Bethesda WSC	Y	2009	√	√		√		√	√	√
Block House MUD	Y	2013	√		√	√	√	√	√	√
Blum	Y	2002	√	√		√		√	√	√
Brazos Valley GCD	Y	2012	√			√	√	√	√	√
Bryan	Y	2011	√	√	√	√	√	√	√	√
Buffalo Gap	Y	2010	√			√		√		
Clyde	Y	2010	√	√		√		√		√
Fort Hood	Y	2002	√		√	√	√	√	√	
Gatesville	Y	2000	√	√	√	√	√	√		
Georgetown	Y	2009	√	√	√	√		√	√	√
Harker Heights	Y	2011	√	√	√	√	√	√	√	√
Hico	Y	2013	√	√		√		√		√
Lampasas	Y	2001	√	√	√	√	√	√	√	√
LCRA	Y	2012	√	√		√	√	√	√	√
Manville WSC	Y	2011	√			√		√		
Mexia	Y	2002	√	√		√		√	√	√
Navasota	Y	1999	√			√		√		√
Ranger	Y	2012	√	√		√		√		√
Robinson	Y	2002		√		√	√	√	√	



**Table 5.40-1. Summary of Water Conservation BMPs in the Brazos G Area**

Wholesale Water Provider	WCP Available	Date	Best Management Practices							
			Reduce Water Losses/ Unaccounted for Water/Leak Detection	Water Conservation Pricing/Seasonal or Inverted Block Rates	Reuse	Improve Meter Accuracy	Toilet Replacement/ Retrofit Programs	Public/School Education	Landscape Conservation/Xeriscape	Others
Stamford	Y	2011	√	√		√	√	√		√
Stephens Regional SUD	Y	2014	√	√		√		√		√
Vista Oaks MUD	Y	2012	√			√		√	√	√
West Central Texas MUD	Y	1999	√			√				√
Woodway	Y	2009	√			√	√	√	√	√

**Table 5.40-2. Summary of 5- and 10-Year Water Conservation Goals in the Brazos G Area**

Wholesale Water Provider	5-Year Goal		10-Year Goal	
	GPCD Target	General	GPCD Target	General
Aquilla WSD	151	Not available	150	Not available
Bellmead	118	Not available	113	Not available
Belton	—	Not available	—	5 to 10% reduction
Bethesda WSC	121	Not available	117	Not available
Block House MUD	—	2.5% per capita decrease	—	5% per capita decrease
Blum	NA	1%/year reduction in unaccounted water	—	1%/year reduction in unaccounted water
Brazos Valley GCD	—	Not available	—	Not available
Bryan	167	Not available	137	Not available
Buffalo Gap	51.8	Not available	46.8	Not available
Clyde	82	Not available	77	Not available
Fort Hood	—	Not available	—	Not available
Gatesville	—	Not available	—	Not available
Georgetown	190	12% water loss	180	10% water loss
Harker Heights	143	Reduce water loss to 12%	143	Reduce water loss to 10%
Hico	188	Residential GPCD of 140.20; GPCD reduction of 30; 16.2 % water loss	186	Residential GPCD of 138.94; Water loss GPCD reduction of 29; 15.5 % water loss

**Table 5.40-2. Summary of 5- and 10-Year Water Conservation Goals in the Brazos G Area**

Wholesale Water Provider	5-Year Goal		10-Year Goal	
	GPCD Target	General	GPCD Target	General
Lampasas	—	Not available	—	Not available
LCRA	104	2% decrease in water use	100	6% decrease in water use
Manville WSC	122	2 gpcd reduction in water loss	120	4 gpcd reduction in water loss
Mexia	—	Not available	—	Not available
Navasota	143	Not available	—	Not available
Ranger	137	33% water loss	110	20% water loss
Robinson	128.8	Not available	126.6	Not available
Stamford	154	Not available	152	Not available
Stephens Regional SUD	79.9	GPCD reduction of 13.2, or 21%	77.4	GPCD reduction of 11.7, or 19%
Vista Oaks MUD	—	Reduce GPCD by 3%	—	Reduce GPCD by 6%
West Central Texas MUD	—	Not available	—	Not available
Woodway	175.6	5% or 10.36 GPCD reduction	165.3	10% or 20.72 GPCD reduction

**Table 5.40-3. Capital Costs for Municipal Water Conservation Strategies in the Brazos G Area**

WUG/WWP	Strategy	Capital Cost	Year Implemented
ABILENE	Municipal Water Conservation (Urban)	\$9,243,000	2020
ALBANY	Municipal Water Conservation (Urban)	\$1,059,000	2020
ARMSTRONG WSC	Municipal Water Conservation (Suburban)	\$153,000	2020
ASPERMONT	Municipal Water Conservation (Urban)	\$377,000	2020
BAIRD	Municipal Water Conservation (Rural)	\$25,000	2020
BARTLETT	Additional Advanced Conservation	\$267,000	2050
BARTLETT	Municipal Water Conservation (Suburban)	\$287,000	2020
BELTON	Municipal Water Conservation (Suburban)	\$1,490,000	2020
BETHESDA WSC	Municipal Water Conservation (Suburban)	\$4,997,000	2020
BRECKENRIDGE	Municipal Water Conservation (Rural)	\$212,000	2020
BREMOND	Municipal Water Conservation (Suburban)	\$98,000	2020
BRENHAM	Municipal Water Conservation (Rural)	\$6,444,000	2020
BRUCEVILLE-EDDY	Municipal Water Conservation (Suburban)	\$157,000	2020
BRUSHY CREEK MUD	Additional Advanced Conservation	\$1,691,000	2020



**Table 5.40-3. Capital Costs for Municipal Water Conservation Strategies in the Brazos G Area**

WUG/WWP	Strategy	Capital Cost	Year Implemented
BRUSHY CREEK MUD	Municipal Water Conservation (Suburban)	\$6,381,000	2020
BRYAN	Municipal Water Conservation (Urban)	\$8,497,000	2020
CALDWELL	Municipal Water Conservation (Suburban)	\$967,000	2020
CALVERT	Municipal Water Conservation (Suburban)	\$12,000	2020
CAMERON	Municipal Water Conservation (Rural)	\$1,925,000	2020
CEDAR PARK	Municipal Water Conservation (Suburban)	\$14,602,000	2020
CHISHOLM TRAIL SUD	Additional Advanced Conservation	\$7,734,000	2040
CHISHOLM TRAIL SUD	Municipal Water Conservation (Suburban)	\$6,762,000	2020
CISCO	Municipal Water Conservation (Rural)	\$278,000	2020
CLEBURNE	Municipal Water Conservation (Suburban)	\$3,472,000	2020
CLIFTON	Municipal Water Conservation (Urban)	\$305,000	2020
COLLEGE STATION	Municipal Water Conservation (Urban)	\$19,532,000	2020
COOLIDGE	Municipal Water Conservation (Rural)	\$21,000	2020
CORYELL CITY WSD	Municipal Water Conservation (Suburban)	\$134,000	2020
COUNTY-OTHER, BELL	Municipal Water Conservation (Rural)	\$573,000	2020
COUNTY-OTHER, WILLIAMSON	Additional Advanced Conservation	\$10,199,000	2040
CRAWFORD	Municipal Water Conservation (Suburban)	\$114,000	2020
CROSS COUNTRY WSC	Municipal Water Conservation (Suburban)	\$94,000	2020
CROSS PLAINS	Municipal Water Conservation (Rural)	\$41,000	2020
EASTLAND	Municipal Water Conservation (Rural)	\$12,000	2020
FERN BLUFF MUD	Municipal Water Conservation (Suburban)	\$1,026,000	2020
FORT HOOD	Municipal Water Conservation (Suburban)	\$8,390,000	2020
GATESVILLE	Municipal Water Conservation (Suburban)	\$9,680,000	2020
GEORGETOWN	Additional Advanced Conservation	\$17,315,000	2060
GEORGETOWN	Municipal Water Conservation (Suburban)	\$44,986,000	2020
GIDDINGS	Municipal Water Conservation (Rural)	\$967,000	2020
GLEN ROSE	Municipal Water Conservation (Urban)	\$706,000	2020
GRAHAM	Municipal Water Conservation (Urban)	\$4,996,000	2020
GROESBECK	Municipal Water Conservation (Rural)	\$8,000	2020
HAMILTON	Municipal Water Conservation (Rural)	\$127,000	2020
HAMLIN	Municipal Water Conservation (Suburban)	\$228,000	2020
HARKER HEIGHTS	Municipal Water Conservation (Suburban)	\$7,152,000	2020
HEARNE	Municipal Water Conservation (Suburban)	\$138,000	2020

**Table 5.40-3. Capital Costs for Municipal Water Conservation Strategies in the Brazos G Area**

WUGMWP	Strategy	Capital Cost	Year Implemented
HEWITT	Municipal Water Conservation (Suburban)	\$138,000	2020
HILLSBORO	Municipal Water Conservation (Urban)	\$2,050,000	2020
JAYTON	Municipal Water Conservation (Urban)	\$24,000	2020
KEMPNER	Municipal Water Conservation (Suburban)	\$39,000	2020
KEMPNER WSC	Municipal Water Conservation (Suburban)	\$975,000	2020
KNOX CITY	Municipal Water Conservation (Rural)	\$228,000	2020
LAMPASAS	Municipal Water Conservation (Suburban)	\$106,000	2020
LEXINGTON	Municipal Water Conservation (Rural)	\$108,000	2020
LITTLE RIVER-ACADEMY	Municipal Water Conservation (Suburban)	\$75,000	2020
LOMETA	Municipal Water Conservation (Suburban)	\$114,000	2020
LORENA	Municipal Water Conservation (Suburban)	\$39,000	2020
MARLIN	Municipal Water Conservation (Urban)	\$2,998,000	2020
MART	Municipal Water Conservation (Suburban)	\$4,000	2030
MINERAL WELLS	Municipal Water Conservation (Rural)	\$290,000	2020
MUNDAY	Municipal Water Conservation (Rural)	\$154,000	2020
NAVASOTA	Municipal Water Conservation (Suburban)	\$936,000	2020
NOLANVILLE	Municipal Water Conservation (Suburban)	\$3,943,000	2020
NORTH BOSQUE WSC	Municipal Water Conservation (Suburban)	\$1,777,000	2020
POSSUM KINGDOM WSC	Municipal Water Conservation (Rural)	\$1,701,000	2020
RANGER	Municipal Water Conservation (Rural)	\$191,000	2020
ROBINSON	Municipal Water Conservation (Suburban)	\$2,607,000	2020
ROBY	Municipal Water Conservation (Rural)	\$58,000	2020
ROCKDALE	Municipal Water Conservation (Rural)	\$859,000	2020
ROUND ROCK	Additional Advanced Conservation	\$33,490,000	2040
ROUND ROCK	Municipal Water Conservation (Suburban)	\$2,044,000	2020
SALADO WSC	Municipal Water Conservation (Suburban)	\$4,105,000	2020
SNOOK	Municipal Water Conservation (Rural)	\$378,000	2020
SOMERVILLE	Municipal Water Conservation (Suburban)	\$102,000	2020
SOUTHWEST MILAM WSC	Municipal Water Conservation (Rural)	\$137,000	2020
STAMFORD	Municipal Water Conservation (Suburban)	\$1,352,000	2020
STRAWN	Municipal Water Conservation (Rural)	\$91,000	2020
SWEETWATER	Municipal Water Conservation (Rural)	\$162,000	2020
TAYLOR	Municipal Water Conservation (Suburban)	\$295,000	2020



**Table 5.40-3. Capital Costs for Municipal Water Conservation Strategies in the Brazos G Area**

WUG/WWP	Strategy	Capital Cost	Year Implemented
TEMPLE	Municipal Water Conservation (Urban)	\$46,987,000	2020
TEXAS A & M UNIVERSITY	Municipal Water Conservation (Suburban)	\$10,498,000	2020
THROCKMORTON	Municipal Water Conservation (Urban)	\$178,000	2020
VALLEY MILLS	Municipal Water Conservation (Urban)	\$190,000	2020
VENUS	Municipal Water Conservation (Suburban)	\$613,000	2020
WACO	Meter Enhancement Program	\$15,282,000	2020
WACO	Municipal Water Conservation (Urban)	\$38,913,000	2020
WELLBORN SUD	Municipal Water Conservation (Urban)	\$2,827,000	2020
WEST	Municipal Water Conservation (Suburban)	\$90,000	2020
WHITE BLUFF COMMUNITY WS	Municipal Water Conservation (Rural)	\$523,000	2020
WHITNEY	Municipal Water Conservation (Urban)	\$282,000	2020
WILLIAMSON COUNTY MUD #10	Municipal Water Conservation (Suburban)	\$2,705,000	2020
WILLIAMSON COUNTY MUD #11	Municipal Water Conservation (Suburban)	\$1,282,000	2020
WILLIAMSON COUNTY MUD #9	Municipal Water Conservation (Suburban)	\$1,761,000	2020
WOODWAY	Municipal Water Conservation (Suburban)	\$7,494,000	2020

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***RESOLUTION OF THE BRAZOS G WATER PLANNING GROUP***

“The Brazos G Regional Water Planning Group amends the 2016 Brazos G Regional Water Plan to include capital costs for municipal water conservation for the City of Waco’s meter enhancement program and for general municipal water conservation for all WUGs for which water conservation is a recommended water management strategy.”

“The Brazos G Regional Water Planning Group directs the Brazos River Authority and HDR to submit the amendment materials to the Texas Water Development Board and request that the 2017 State Water Plan be amended accordingly.”

The aforementioned resolution was approved by the Brazos G Water Planning Group on April 27, 2016.