5.23 Limestone County Water Supply Plan

Table 5.23-1 lists each water user group in Limestone County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of the water user groups and the plan for the selected water user are presented in the following subsections.

Table 5.23-1. Limestone County Surplus/(Shortage)

Water User Group	Surplus/(Shortage)		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Birome WSC			See Hill County
Bistone MWSD	28	28	Projected surplus
City of Coolidge	209	141	Projected surplus
City of Groesbeck	(667)	(665)	Projected shortage - see plan below.
City of Mart			See McLennan County
City of Mexia	284	(182)	Projected shortage - see plan below.
Point Enterprise WSC	15	0	Projected surplus
Post Oak SUD			See Hill County
Prairie Hill WSC	137	105	Projected surplus
SLC WSC	15	6	Projected surplus
Tri-County SUD	1,168	1,169	Projected surplus
White Rock WSC	536	517	Projected surplus
County-Other	243	236	Projected surplus
Manufacturing	(314)	(313)	Projected shortage - see plan below.
Steam-Electric	(388)	(388)	Projected shortage - see plan below.
Mining	(6,707)	(8,267)	Projected shortage - see plan below.
Irrigation	28	28	Projected surplus
Livestock	0	0	No projected surplus or shortage

5.23.1 Bistone Municipal Water Supply District

Description of Supply

Bistone Municipal Water Supply District obtains its water supply through groundwater production from the Carrizo-Wilcox Aquifer, through diversions of surface water from Lake Mexia under water rights held by the District, and through purchases of treated surface water under contract with the City of Mexia. Available groundwater supplies from the Carrizo-Wilcox Aquifer are projected at a constant 2,067 acft/yr through the planning period, and available supply through treated water purchases from the City of Mexia is projected at 28 acft/yr. Water supply obtained through surface water diversions by the

District is projected to have an availability of 1,100 acft/yr at the beginning of the planning period, which will decrease to 600 acft/yr by 2070.

Bistone Municipal Water Supply District also provides sales of treated surface water under contract with the City of Coolidge, White Rock WSC, and Mexia State School which is grouped within the Limestone County-Other WUG. Additionally, the Bistone Municipal Water Supply District provides sales of Carrizo-Wilcox groundwater produced by the District to the City of Mexia. No shortages in water supply are projected for Bistone Municipal Water Supply District though the planning period, however, with additional demands projected from its wholesale customers, Bistone will need to develop additional supplies in 2060 and 2070.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended to for the Bistone Municipal Water Supply District. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: maximum of $58,240
- Unit Cost: $560/acft

b. Carrizo-Wilcox Aquifer Development

- Cost Source: Volume II
- Date to be Implemented: before 2060
- Project Cost: $1,772,000
- Unit Cost: $358.70/acft

Table 5.23-2. Recommended Plan Costs by Decade for Bistone Municipal Water Supply District

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*116*	*28*	*28*	*28*	*28*	*28*
Conservation						
Supply From Plan Element (acft/yr)	—	20	40	62	83	104
Annual Cost ($/yr)	—	$11,200	$22,400	$34,720	$46,480	$58,240
Projected Surplus/(Shortage) after Conservation (acft/yr)	*116*	*48*	*68*	*90*	*111*	*132*
Additional Demands from Recommended Strategies from Others						
Increase Groundwater Supply to City of Mexia (includes supplies to Wortham (Region C)) (acft/yr)	—	—	—	—	(186)	(363)

Table 5.23-2. Recommended Plan Costs by Decade for Bistone Municipal Water Supply District

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr) Including Recommended Strategies	*106*	*31*	*47*	*65*	*(75)*	*(231)*
Groundwater Development – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	—	—	—	—	274	97
Annual Cost ($/yr)	—	—	—	—	$98,400	$34,800
Unit Cost ($/acft)	—	—	—	—	$359	$359

5.23.2 City of Coolidge

Description of Supply

The City of Coolidge obtains its water supply through purchases of treated surface water under contracts with the Bistone Municipal Water Supply District and Post Oak SUD; water provided by Post Oak SUD is sourced within Region C. Total treated water supplies available to the City are projected to range between 392 to 430 acft/yr. No shortages are projected for the City of Coolidge during the planning period and no change is recommended to water supply.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, and in coordination with Region C, the following water management strategies are recommended for the City of Coolidge. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: maximum of $2,240
- Unit Cost: $560/acft

Table 5.23-3. Recommended Plan Costs by Decade for City of Coolidge

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*197*	*198*	*209*	*190*	*169*	*141*
Conservation						
Supply From Plan Element (acft/yr)	—	4	—	—	—	—
Annual Cost ($/yr)	—	$2,240	—	—	—	—
Projected Surplus/(Shortage) after Conservation (acft/yr)	*197*	*202*	*209*	*190*	*169*	*141*

5.23.3 City of Groesbeck

Description of Supply

The City of Groesbeck obtains its water supply through diversions from the Navasota River; however, no surface water supplies are projected as being available to the City during the planning period. The City owns senior water rights (priority date of 1921) on the Navasota River and has limited storage available from Springfield Lake. The City has purchased a quarry to temporarily store water supply to manage the most recent drought. However; until a permanent solution is identified, the City of Groesbeck is projected to have shortages.

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 the projected water shortage for the City of Groesbeck. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd. Needs remain unmet in 2020. These needs will only occur during a drought equivalent or worse than the drought of record. While not a strategy recommended by the Brazos G RWPG, the impacts of the unmet needs can be mitigated through demand management in the event of a serious drought prior to the recommended strategies coming online.

a. Groesbeck Off-Channel Reservoir

- Cost Source: Volume II
- Date to be Implemented: 2030
- Project Cost: $23,599,000
- Unit Cost: maximum of $1,056/acft

Table 5.23-4. Recommended Plan Costs by Decade for City of Groesbeck

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*(688)*	*(677)*	*(667)*	*(665)*	*(668)*	*(665)*
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost ($/yr)	—	—	—	—	—	—
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(688)*	*(677)*	*(667)*	*(665)*	*(668)*	*(665))*
Groesbeck OCR						
Supply From Plan Element (acft/yr)	—	1,755	1,755	1,755	1,755	1,755
Annual Cost ($/yr)	—	$1,853,000	$1,853,000	$750,000	$379,000	$379,000
Unit Cost ($/acft)	—	$1,056	$1,056	$427	$216	$216

5.23.4 City of Mexia

Description of Supply

The City of Mexia obtains its water supply through contracted purchases of Carrizo-Wilcox groundwater produced by the Bistone Municipal Water Supply District, which is projected to provide 2,067 acft/yr of available supply at the beginning of the planning period and decreasing to 1,615 acft/yr in 2070. The City also provides sales of treated water to the Bistone Municipal Water Supply District, White Rock WSC, Manufacturing entities in Limestone County, and the City of Wortham (Region C). Additionally, the City sells Carrizo-Wilcox groundwater purchased from the Bistone Municipal Water District to County-Other users in Limestone County, including the City of Shiloh and the 84 West WSC. Shortages in available water supply for the City are projected to occur in 2060.

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 the projected water shortage for the City of Mexia. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

a. Obtain additional groundwater from Bistone Municipal Water Supply District

- Cost Source: Volume II, Chapter 14
    - Project requires Bistone Municipal Water Supply District to develop additional Carrizo-Wilcox groundwater supply.
- Date to be Implemented: before 2060
- Annual Cost: maximum of $130,680
- Unit Cost: $359/acft

Table 5.23-5. Recommended Plan Costs by Decade for City of Mexia

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*530*	*443*	*284*	*115*	*(43)*	*(182)*
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost ($/yr)	—	—	—	—	—	—
Projected Surplus/(Shortage) after Conservation (acft/yr)	*530*	*443*	*284*	*115*	*(43)*	*(182)*
Additional Demands from Recommended Strategies from Others						
Increase sales to Wortham (Region C) (acft/yr)	(10)	(17)	(21)	(25)	(143)	(181)
Projected Surplus/(Shortage) (acft/yr) Including Recommended Strategies	*520*	*426*	*263*	*90*	*(186)*	*(363)*

Table 5.23-5. Recommended Plan Costs by Decade for City of Mexia

Plan Element	2020	2030	2040	2050	2060	2070
Purchase additional Groundwater from Bistone Municipal Water Supply District (includes supply to Wortham)						
Supply From Plan Element (acft/yr)	—	—	—	—	186	363
Annual Cost ($/yr)	—	—	—	—	$66,960	$130,680
Unit Cost ($/acft)	—	—	—	—	$360	$360

5.23.5 Point Enterprise WSC

Point Enterprise WSC's service area includes portions of Limestone and Freestone Counties (Region C). This section addresses only the supply, demands and strategies that are within the Brazos G Area. Point Enterprise WSC obtains water supply through groundwater production from the Carrizo-Wilcox Aquifer. No supply shortages are projected during the planning period and no change in water supply is recommended. Conservation was considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.23.6 Prairie Hill WSC

Description of Supply

Prairie Hill WSC obtains its water supply solely through groundwater production from the Carrizo-Wilcox Aquifer, which is projected to provide a constant 395 acft/yr of supply through the planning period. No shortages are projected for Prairie Hill WSC and no change in water supply is recommended.

Various entities are dealing with elevated levels of arsenic in groundwater supplies and have been pursuing water management strategies through the FHLM WSC. Through a TWDB sponsored study coordinated by FHLM WSC, these entities have considered a regional brackish RO WTP in Limestone County, Carrizo-Wilcox Regional Groundwater in Limestone County, Tehuacana Reservoir, and supplies from City of Marlin (Brushy Creek Reservoir), and City of Waco. The recommended strategy is to provide for arsenic treatment for individual entities. This strategy does not provide new supply.

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 the projected water shortage for Prairie Hill WSC. Conservation is recommended to reduce usage to a goal of 140 gpcd.

a. Conservation
   - Cost Source: Volume II
   - Date to be Implemented: before 2030
   - Annual Cost: maximum of $3,360 in 2030
   - Unit Cost: $560/acft

b. Upgrade Treatment for Arsenic

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Project Cost: $1,408,000
- Unit Cost: maximum of $1,000/acft

Table 5.23-6. Recommended Plan Costs by Decade for Prairie Hill WSC

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*154*	*145*	*137*	*126*	*114*	*105*
Conservation						
Supply From Plan Element (acft/yr)	—	4	1	—	—	—
Annual Cost ($/yr)	—	$2,240	$560	—	—	—
Projected Surplus/(Shortage) after Conservation	*154*	*149*	*138*	*126*	*114*	*105*
Upgrade Treatment for Arsenic						
Supply From Plan Element (acft/yr)	268	268	268	268	268	268
Annual Cost ($/yr)	$268,000	$268,000	$286,000	$169,000	$169,000	$169,000
Unit Cost ($/acft)	$1,000	$1,000	$631	$631	$631	$631

5.23.7 SLC WSC

SLC WSC obtains its water supply through groundwater production from the Carrizo-Wilcox Aquifer and through purchases of raw surface water under contract from the Brazos River Authority. Local groundwater production is projected to provide 123 acft/yr of supply through the planning period, while surface water purchases are projected to provide a constant 200 acft/yr. No shortages in water supply are projected for SLC WSC through the planning period and no change in supply is recommended. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.23.8 Tri-County SUD

Tri-County SUD obtains its water supply through groundwater production from the Trinity and Carrizo-Wilcox Aquifers in Falls County and from the Carrizo-Wilcox Aquifer in Robertson County. Total groundwater supply available for production by the SUD is projected to range between 1,420 to 1,430 acft/yr during the planning period. No water supply shortages are projected and no change in supply is recommended for Tri-County SUD. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.23.9 White Rock WSC

White Rock WSC obtains its water supply through purchases of treated water under contracts with the Bistone Municipal Water Supply District and the City of Mexia. These contracts are projected to provide a constant 761 acft/yr of supply through the planning

period. No shortages in water supply are projected for White Rock WSC during the planning period and no change in water supply is recommended. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.23.10 County-Other

Description of Supply

Entities in County-Other obtain water supply through local groundwater production from the Carrizo-Wilcox and Trinity Aquifers, though purchases of groundwater from the City of Mexia by 84 West WSC and the City of Shiloh, and through purchases of treated surface water from the Bistone Municipal Water Supply District by the Mexia State School. Groundwater supplies available for local production are projected at a constant 5 acft/yr; purchases of groundwater and treated surface water are projected to provide 534 acft/yr through the planning period. No supply shortages are projected and no change in water supply is recommended. Conservation was also considered; however, the entity's usage is below the selected goal of 140 gpcd.

5.23.11 Manufacturing

Description of Supply

Limestone County Manufacturing obtains its water supply through purchases of treated water from the City of Mexia and City of Groesbeck and through purchases of groundwater from the City of Coolidge. Manufacturing in the County is projected to experience water supply shortages throughout the planning period.

Recommended Strategy

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Limestone County-Manufacturing. Conservation is recommended.

a. Conservation
    - Cost Source: Volume II
    - Date to be Implemented: before 2030
    - Annual Cost: not determined

b. Carrizo-Wicox Aquifer Development
    - Cost Source: Volume II
    - Date to be Implemented: before 2030
    - Project Cost: $1,767,000
    - Unit Cost: maximum of $525/acft

Table 5.23-7. Recommended Plan Costs by Decade for the Limestone County – Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*(259)*	*(314)*	*(314)*	*(314)*	*(313)*	*(313)*
Conservation						
Supply From Plan Element (acft/yr)	10	19	26	26	26	26
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation	*(249)*	*(295)*	*(288)*	*(314)*	*(314)*	*(313)*
Groundwater Development – Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	314	314	314	314	314	314
Annual Cost ($/yr)	$165,000	$165,000	$41,000	$41,000	$41,000	$41,000
Unit Cost ($/acft)	$525	$525	$131	$131	$131	$131

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.

5.23.12 Steam-Electric

Description of Supply

Steam-Electric water demand in Limestone County is associated with the NRG (formerly Reliant Energy) power plant located at Lake Limestone. NRG has contracted with the Brazos River Authority for up to 21,837 acft/yr of raw water supply through purchases of raw water from Lake Limestone. Additionally, NRG utilizes local groundwater produced from the Carrizo-Wilcox Aquifer; this supply is projected to provide an additional 711 acre-feet of annual supply. Limestone County Steam-Electric is projected to have shortages from 2030 through the year 2070.

Recommended Strategy

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 Limestone County-Mining. The Brazos G RWPG does not recommend conservation for Steam-Electric use.

a. Carrizo-Wicox Aquifer Development

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Project Cost: $1,709,000
- Unit Cost: maximum of $363//acft

Table 5.23-8. Recommended Plan Costs by Decade for Limestone County – Steam-Electric

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*(388)*	*(388)*	*(388)*	*(388)*	*(388)*	*(388)*
Groundwater Development - Carrizo-Wilcox Aquifer						
Supply From Plan Element (acft/yr)	388	388	388	388	388	388
Annual Cost ($/yr)	$141,000	$141,000	$21,000	$21,000	$21,000	$21,000
Unit Cost ($/acft)	$363	$363	$54	$54	$54	$54

5.23.13 Mining

Description of Supply

Mining operations in Limestone County are supplied by Carrizo-Wilcox groundwater. Demands for Mining exceed current supplies resulting in shortages beginning in 2020.

Recommended Strategy

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 Limestone County-Mining. Conservation is recommended.

a. Conservation

- Cost Source: Volume II
- Date to be Implemented: before 2030
- Annual Cost: not determined

b. Leave Needs Unmet

- Mining activity in Limestone County has slowed down since the release of the most recent demand projections and current mine operations are focused on reclamation. Projected demands and corresponding shortages are not anticipated to be realized during the planning period.
- Cost Source: Cost of not meeting needs – see Appendix G
- Date to be Implemented: before 2030

Table 5.23-9. Recommended Plan Costs by Decade for Limestone County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*(7,159)*	*(6,767)*	*(6,707)*	*(7,181)*	*(7,647)*	*(8,267)*
Conservation						
Supply From Plan Element (acft/yr)	310	496	691	724	756	800
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(6,849)*	*(6,271)*	*(6,016)*	*(6,457)*	*(6,891)*	*(7,467)*
Leave Needs Unmet (acft/yr)	*(6,849)*	*(6,271)*	*(6,016)*	*(6,457)*	*(6,891)*	*(7,467)*

ND – Not determined. Costs to implement industrial conservation technologies will vary based on each location.

5.23.14 Irrigation

Irrigation in Limestone County obtains water supply through local groundwater production from the Carrizo-Wilcox Aquifer and through purchases of surface water from Limestone County-Other entities. Irrigation is projected to have a surplus of water supply throughout the planning period. No change in water supply is recommended.

5.23.15 Livestock

Water supply for Livestock in Limestone County is obtained from local stock surface water impoundments, which are projected to meet demands through the planning period. No change in water supply is recommended.

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