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)[1]		Comment
	2040 (acft/yr)	2070 (acft/yr)	
City of Coolidge	38	(140)	Projected shortage – see plan below
City of Groesbeck	(668)	(672)	Projected shortage – see plan below
City of Mart			See McLennan County
City of Mexia[2]	1,082	497	Projected Surplus
City of Thornton	206	207	Projected Surplus
Tri-County SUD			See Falls County
County-Other	399	330	Projected surplus
Manufacturing	0	0	Demand equals supply
Steam-Electric	(9,017)	(30,893)	Projected shortage – see plan below
Mining	(9,056)	(10,616)	Projected shortage – see plan below
Irrigation	14	14	Projected surplus
Livestock	0	0	Demand equals supply

1 – From Tables C-45 and C-46, Appendix C – Comparison of Water Demands with Water Supplies to Determine Needs.
2 – Mexia balance after Region C strategy applied to provide additional supply to Wortham.

5.23.1 City of Coolidge

Description of Supply

The City of Coolidge has a contract from Post Oak SUD in Region C and also has a contract for 225 acft/yr from Bistone MWSD, which obtains its water supply from groundwater from the Carrizo-Wilcox Aquifer and surface water from Lake Mexia. However, Bistone MWSD does not have sufficient supplies to meet the contracted demand.

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 to meet the projected water shortage for the City of Coolidge.

a. Conservation
   - Cost Source: Volume II, Chapter 2
   - Date to be Implemented: 2020
   - Annual Cost:$2,502 Maximum in 2020
   - Unit Cost: $496/acft

b. Increase supplies from Post Oak SUD
   - Cost Source: 2016 Region C Water Plan (see Appendix K)
   - Date to be Implemented: 2040
   - Project Cost: None. Contracted supplies with existing infrastructure

c. Bistone MWSD to firm up contracts through Carrizo-Wilcox Aquifer Development
   - Cost Source: Volume II, Chapter 12
   - Date to be Implemented: 2020
   - Project Cost: Infrastructure assumed appropriate

Table 5.23-2. Recommended Plan Costs by Decade for City of Coolidge

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*71*	*(12)*	*(38)*	*(70)*	*(105)*	*(140)*
Conservation						
Supply From Plan Element (acft/yr)	5	4	1	—	—	—
Annual Cost ($/yr)	$2,502	$2,213	$496	—	—	—
Projected Surplus/(Shortage) after Conservation (acft/yr)	*76*	*(7)*	*(37)*	*(70)*	*(105)*	*(140)*
Increase supplies from Post Oak SUD						
Supply From Plan Element (acft/yr)	—	—	—	—	—	13
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—
Bistone MWSD to firm up contracts through Carrizo-Wilcox Aquifer Development						
Supply From Plan Element (acft/yr)	104	109	113	118	123	127
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—

5.23.2 City of Groesbeck

Description of Supply

The City of Groesbeck obtains its water supply from the Navasota River. The City owns senior water rights (priority date of 1921) on the Navasota River and has limited storage available from Springfield Lake. The City recently 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 with future droughts.

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.

a. Conservation

- Cost Source: Volume II, Chapter 2
- Date to be Implemented: 2020
- Annual Cost:$793
- Unit Cost: $496/acft

b. Groesbeck Off-Channel Reservoir

- Cost Source: Volume II, Chapter 4.4
    - Project requires a subordination agreement with the BRA, which is dependent on the BRA obtaining the System Operations permit
- Date to be Implemented: 2020
- Project Cost:$11,909,000
- Unit Cost: $617/acft

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

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*(688)*	*(677)*	*(668)*	*(665)*	*(668)*	*(672)*
Conservation						
Supply From Plan Element (acft/yr)	2	—	—	—	—	—
Annual Cost ($/yr)	$793	—	—	—	—	—
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(686)*	*(677)*	*(668)*	*(665)*	*(668)*	*(672)*
Groesbeck OCR						
Supply From Plan Element (acft/yr)	1,755	1,755	1,755	1,755	1,755	1,755
Annual Cost ($/yr)	$1,082,835	$1,082,835	$1,082,835	$1,082,835	$212,355	$212,355
Unit Cost ($/acft)	$617	$617	$617	$617	$121	$121

5.23.3 City of Mexia

The City of Mexia has a contract for 4,480 acft/yr from Bistone MWSD, which obtains its water supply from groundwater from the Carrizo-Wilcox Aquifer and surface water from Lake Mexia. The city provides supply to the City of Wortham (Region C) and to other entities in Limestone County-Other. Region C has recommended that the contract with Wortham (157 acft/yr) be increased to 336 acft/yr by 2070 to meet projected shortages for Wortham. The city is projected to have surplus supply through 2070 and no changes in water supply are recommended. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

5.23.4 City of Thornton

The City of Thornton obtains its water supply from groundwater from the Carrizo-Wilcox Aquifer. No shortages are projected for the City of Thornton, and no changes in water supply are recommended. Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

5.23.5 County-Other

Description of Supply

Entities in County-Other are projected to have a surplus of water through the year 2070 and no changes in water supply are 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. Surpluses are projected through the year 2070.

Conservation was considered; however, the entity's current per capita use rate is below the selected target rate of 140 gpcd.

Water Supply Plan

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

a. Upgrade Treatment for Arsenic

Entities within County-Other for which Arsenic treatment is recommended include Prairie Hill WSC.

- Cost Source: Volume II, Chapter 12.5
- Date to be Implemented: 2020
- Project Cost: $1,115,000
- Unit Cost: $1,414/acft

Table 5.23-4. Recommended Plan Costs by Decade for the Limestone County – Other

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*396*	*399*	*399*	*384*	*357*	*330*
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost ($/yr)	—	—	—	—	—	—
Projected Surplus/(Shortage) after Conservation	*396*	*399*	*399*	*384*	*357*	*330*
Upgrade Treatment for Arsenic						
Supply From Plan Element (acft/yr)	268	268	268	268	268	268
Annual Cost ($/yr)	$379,000	$379,000	$286,000	$286,000	$286,000	$286,000
Unit Cost ($/yr)	$1,414	$1,414	$1,067	$1,067	$1,067	$1,067

5.23.6 Manufacturing

Limestone County Manufacturing obtains its water supply the cities of Coolidge, Groesbeck, Mexia and Bistone MWSD. Based on the available surface water supply, Limestone County Manufacturing is projected to have sufficient supplies through 2070.

5.23.7 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 water supply from Lake Limestone. Additional Steam-Electric demands are projected for Limestone County and are anticipated to come online before 2040. Based on the available surface water 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.

a. Conservation

- Cost Source: Volume II, Chapter 2
- Date to be Implemented: before 2020
- Annual Cost: not determined

b. Reallocation of surplus McLennan County Steam-Electric supplies

- Cost Source: Unknown – the exact location of the projected Steam-Electric demands in Limestone County is unknown, but could be located near supplies in McLennan County.
- Date to be Implemented: 2030
- Project Cost: Capital cost unknown, as demands vary geographically.
- Unit Cost: assumed $250/acft

c. Reduce Demand through Alternative Cooling Technology

Steam-Electric cooling is often water-intensive, and the water demands provided by the TWDB reflect this. Alternative technologies that utilize air cooling or other less water intensive methods could be substituted. Costs shown are for the additional costs for implementation of these more advanced technologies for cooling.

- Cost Source: Volume II, Chapter 12
- Date to be Implemented: 2060
- Project Cost: Unable to determine with available information

Table 5.23-5. Recommended Plan Costs by Decade for Limestone County – Steam-Electric

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*78*	*(4,051)*	*(9,017)*	*(15,003)*	*(22,234)*	*(30,893)*
Conservation						
Supply From Plan Element (acft/yr)	678	1,321	2,176	2,573	3,058	3,642
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*78*	*(2,730)*	*(6,842)*	*(12,430)*	*(19,176)*	*(27,250)*
Reallocation of supplies from McLennan County Steam-Electric						
Supply From Plan Element (acft/yr)	—	2,730	6,842	12,430	17,963	17,129
Annual Cost ($/yr)	—	$682,500	$1,710,500	$3,107,500	$4,490,750	$4,282,250
Unit Cost ($/acft)	—	$250	$250	$250	$250	$250
Reduce Demand through Alternative Cooling Technology						
Supply From Plan Element (acft/yr)	—	—	—	—	1,213	10,121
Annual Cost ($/yr)	—	—	—	—	ND	ND
Unit Cost ($/acft)	—	—	—	—	ND	ND

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

5.23.8 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.

a. Conservation
   - Cost Source: Volume II, Chapter 2
   - Date to be Implemented: before 2020
   - Annual Cost: not determined

b. Carrizo-Wilcox Aquifer Development (Brazos-Basin)
   - Cost Source: Volume II, Chapter 12
   - Date to be Implemented: before 2020
   - Project Cost: $31,546,000
   - Unit Cost: Max of $603 /acft (2020)

c. Carrizo-Wilcox Aquifer Development (Trinity-Basin)
   - Cost Source: Volume II, Chapter 12
   - Date to be Implemented: before 2020
   - Project Cost: $5,871,000
   - Unit Cost: Max of $607 /acft (2020)

d. Leave needs unmet
   - Cost Source: Cost of not meeting needs – see Appendix H
   - Date to be Implemented: 2020

Table 5.23-6. Recommended Plan Costs by Decade for Limestone County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
Projected Surplus/(Shortage) (acft/yr)	*(9,508)*	*(9,116)*	*(9,056)*	*(9,530)*	*(9,996)*	*(10,616)*
Conservation						
Supply From Plan Element (acft/yr)	310	496	691	724	756	800
Annual Cost ($/yr)	ND	ND	ND	ND	ND	ND
Projected Surplus/(Shortage) after Conservation (acft/yr)	*(9,198)*	*(8,619)*	*(8,365)*	*(8,806)*	*(9,239)*	*(9,816)*
Carrizo Aquifer Development (Brazos Basin)						
Supply From Plan Element (acft/yr)	4,510	4,535	4,610	4,806	4,699	4,592
Annual Cost ($/yr)	$2,898,125	$2,898,125	$257,125	$257,125	$257,125	$257,125
Unit Cost ($/acft)	$603	$603	$54	$54	$54	$54

Table 5.23-6. Recommended Plan Costs by Decade for Limestone County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
Carrizo Aquifer Development (Trinity Basin)						
Supply From Plan Element (acft/yr)	888	888	888	888	888	888
Annual Cost ($/yr)	$538,837	$538,837	$47,837	$47,837	$47,837	$47,837
Unit Cost ($/acft)	$607	$607	$54	$54	$54	$54
Leave Needs Unmet						
Supply From Plan Element (acft/yr)	3,800	3,197	2,867	3,112	3,652	4,336
Annual Cost ($/yr)	—	—	—	—	—	—
Unit Cost ($/acft)	—	—	—	—	—	—

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

5.23.9 Irrigation

Irrigation is projected to have a surplus of water through the year 2070 and no changes in water supply are recommended.

5.23.10 Livestock

Livestock water supply is projected to meet demands through 2070 and no changes in water supply are recommended.