

**5B.8 Eastland County Water Supply Plan**

Table 5B.8-1 lists each water user group in Eastland County and their corresponding surplus or shortage in years 2030 and 2050. For each water user group with a projected shortage, a water supply plan has been developed and is presented in the following subsections. Water supply plans are also presented for some entities that need pumping/conveyance facilities to utilize their existing water resources, or to become a regional provider. In addition, long-term considerations are provided for some entities with projected surpluses. Eastland County, through its County Commissioner’s Court, has submitted a series of resolutions supporting a variety of regional water supply planning and development initiatives. The specific resolutions are included at the end of Volume 1. The recommended plan described below either includes specific proposed projects mentioned in the resolutions, or are generally consistent with them.

**Table 5B.8-1.  
Eastland County Surplus/(Shortage)**

<b>Water User Group</b>	<b>Surplus/(Shortage)<sup>1</sup></b>		<b>Comment</b>
	<b>2030 (acft/yr)</b>	<b>2050 (acft/yr)</b>	
City of Cisco	(185)	(119)	Projected shortage – see plan below
City of Eastland	821	(875)	Projected shortage – see plan below
City of Gorman	0	0	Supply matches demand
City of Ranger	189	(460)	Projected shortage – see plan below
City of Rising Star	39	50	Projected surplus
County-Other	6,386	8,968	Projected surplus
Manufacturing	133	130	Projected surplus
Steam-Electric	0	0	No demand or supply
Mining	9	18	Projected surplus
Irrigation	(7,423)	(7,443)	Projected shortage – see plan below
Livestock	71	71	Projected surplus

<sup>1</sup> From Tables 4-15 and 4-16, Section 4 – Comparison of Water Demands with Water Supplies to Determine Needs.

**5B.8.1 The City of Cisco**

**5B.8.1.1 Description of Supply**

The City of Cisco uses surface water from Lake Cisco, which has insufficient yield and is losing capacity due to sedimentation. As a result, Cisco has a current and long-term shortage; the projected shortage in 2030 is 185 acft, or about 34 percent of demand.

**5B.8.1.2 Options Considered**

Table 5B.8-2 lists the water management strategies, references to the report section discussing the strategy, total project cost, and unit costs that were considered for meeting the City of Cisco’s shortage

**Table 5B.8-2.  
Water Management Strategies Considered for the City of Cisco**

Option	Yield (acft/yr)	Approximate Cost <sup>1</sup>	
		Total	Unit (\$/acft)
New Reservoir (Section 5A.14)	400	\$6,500,000	\$1,500
Battle Creek diversion to Lake Cisco (Section 5A.7.1)	500	\$4,700,000	\$960
Voluntary redistribution from Eastland	185	\$4,500,000	\$2,380
Coordinated use of Lake Leon and Groundwater (Section 5A.4.1)	1,900	\$6,000,000	\$650
Raise Lake Leon (Section 5A.7.1)	3,100	\$20,000,000	\$650
Wastewater Reuse (Section 5A.3)	98	\$396,000/yr	\$326
Oryx/Kerr-McGee Pipeline from Possum Kingdom Reservoir (Section 5A.20.2)	5,000	\$19,500,000	\$390
No Action	-	\$7,852,000 <sup>2</sup>	\$42,443 <sup>2</sup>

<sup>1</sup> Unless otherwise noted, costs are Total Project Cost and Unit Cost (\$/acft per year) for treated water delivered to the water supply entity or entities. Unit cost is for full utilization of project capacity. Operation and maintenance of existing facilities is not included.

<sup>2</sup> Economic Impact of not meeting shortage (i.e., “no action” alternative) in 2030 as estimated by TWDB.

**5B.8.1.3 Water Supply Plan**

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to meet the projected 2030 shortage of the City of Cisco:

- Battle Creek diversion to supply up to an additional 500 acft/yr.
- Wastewater Reuse

**5B.8.1.4 Costs**

Costs of the Recommended Plan for the City of Cisco.

- a. Battle Creek diversion:
  - Cost Source: Section 5A.7
  - Date to be Implemented: before 2010
  - Total Project Cost: \$4,700,000
  - Annual Project Cost: \$480,000
- b. Wastewater Reuse
  - Cost Source: Section 5A.3
  - Date to be Implemented: before 2010
  - Total Annual Cost: \$32,000/acft

**Table 5B.8-3.  
Recommended Plan Costs by Decade for the City of Cisco**

	2000	2010	2020	2030	2040	2050
Projected Surplus(Shortage) (acft/yr)	(316)	(268)	(225)	(185)	(149)	(119)
<b>Battle Creek Diversion</b>						
Supply From Plan Elements (acft/yr)	0	500	500	500	500	500
Annual Cost (\$/yr)	\$0	\$480,000	\$480,000	\$480,000	\$138,000	\$138,000
Unit Cost (\$/acft)	\$0	\$960	\$960	\$960	\$276	\$276
<b>Wastewater Reuse</b>						
Supply From Plan Element (acft/yr)	0	98	98	98	98	98
Annual Cost (\$/yr)	\$0	\$32,000	\$32,000	\$32,000	\$3,200	\$3,200
Unit Cost (\$/acft)	\$0	\$326	\$326	\$326	\$32	\$32
Total New Supply (acft/yr)	0	598	598	598	598	598

**5B.8.2 The City of Eastland**

**5B.8.2.1 Description of Supply**

The City of Eastland receives its surface water from a contract with Eastland County WSD. This contract expires in 2032, creating shortages thereafter.

**5B.8.2.2 Options Considered**

Table 5B.8-4 lists the water management strategies, references to the report section detailing the strategy, total project cost, and unit costs that were considered for the City of Eastland.

**Table 5B.8-4.  
Water Management Strategies Considered for the City of Eastland**

Option	Yield (acft/yr)	Approximate Cost <sup>1</sup>	
		Total	Unit (\$/acft)
Extend existing contracts w/Eastland Co. WSD	1000	\$650,000/yr	\$650 <sup>2</sup>
No Action	-	\$37,138,000 <sup>3</sup>	\$42,443 <sup>3</sup>

<sup>1</sup> Unless otherwise noted, costs are Total Project Cost and Unit Cost (\$/acft per year) for treated water delivered to the water supply entity or entities. Unit cost is for full utilization of project capacity. Operation and maintenance of existing facilities is not included.  
<sup>2</sup> Estimated wholesale rate for treated water.  
<sup>3</sup> Economic impact of not meeting shortage (i.e., "no action" alternative) in 2050 as estimated by TWDB.

**5B.8.2.3 Water Supply Plan**

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to meet the projected 2050 shortage of the City of Eastland:

- Extend existing contracts with Eastland Co. WSD to supply an additional 1000 acft/yr.

**5B.8.2.4 Costs**

Costs of the recommended plan for the City of Eastland to meet 2050 shortages are:

- a. Extension of existing contracts with Eastland Co. WSD:
  - Cost Source: Estimated wholesale of \$650/acft for treated water
  - Date to be Implemented: 2032
  - Total Annual Cost: \$650,000

**5B.8.3 The City of Gorman**

**5B.8.3.1 Description of Supply**

The City of Gorman purchases treated water from Upper Leon River MWD and no current or future shortage is projected. Therefore, no changes in water supply are recommended.

**5B.8.4 The City of Ranger**

**5B.8.4.1 Description of Supply**

The City of Ranger is supplied with surface water from a contract with Eastland Co. WSD, which expires in 2032.

**5B.8.4.2 Options Considered**

Table 5B.8-5 lists the water management strategies, report section references discussing the strategy, total project cost, and unit costs that were considered for meeting the City of Ranger’s shortages.

**Table 5B.8-5.  
Water Management Strategies Considered for the City of Ranger**

Option	Yield (acft/yr)	Approximate Cost <sup>1</sup>	
		Total	Unit (\$/acft)
Extend contracts w/Eastland Co. WSD	500	\$325,000/yr	\$650 <sup>2</sup>
No Action	-	\$19,524,000 <sup>3</sup>	\$42,443 <sup>3</sup>

<sup>1</sup> Unless otherwise noted, costs are Total Project Cost and Unit Cost (\$/acft per year) for treated water delivered to the water supply entity. Unit cost is for full utilization of project capacity. Operation and maintenance of existing facilities is not included.  
<sup>2</sup> Estimated wholesale rate for treated water.  
<sup>3</sup> Economic impact of not meeting shortage (i.e., “no action” alternative) in 2050 as estimated by TWDB.

**5B.8.4.3 Water Supply Plan**

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to meet the projected 2030 shortage of the City of Ranger:

- Extend existing contract with Eastland Co. WSD to supply an additional 521 acft/yr

**5B.8.4.4 Costs**

Costs of the Recommended Plan for the City of Ranger to meet 2030 shortages are:

- Extension of contract with Eastland Co. WSD:
  - Cost Source: Estimated wholesale of \$650/acft for treated water
  - Date to be Implemented: 2032
  - Total Annual Cost: \$325,000

**5B.8.5 City of Rising Star**

**5B.8.5.1 Description of Supply**

The City of Rising Star uses locally available groundwater for all of its water supply and no current or future shortage is projected. Therefore, no changes in the water supply system are recommended.

**5B.8.6 County-Other Category**

The water supply entities for County-Other show a projected surplus and no changes in water supply are recommended.

**5B.8.7 Manufacturing**

The water supply entities for Manufacturing show a projected surplus and no changes in water supply are recommended.

**5B.8.8 Steam-Electric**

No Steam-Electric demand exists or is projected for the county.

**5B.8.9 Mining**

The water supply entities for Mining show a projected surplus and no changes in water supply are recommended.

**5B.8.10 Irrigation**

**5B.8.10.1 Description of Supply**

Surface water supplies for Eastland County Irrigation are obtained from Lake Leon, the Leon River, and its tributaries. The estimated reliable supply of surface water for Irrigation is 806 feet until 2050. The groundwater supplies in the county are obtained from the Trinity Aquifer. The estimated reliable supply of groundwater is 4,411 acft until 2050. As demonstrated in Table 5B.8-1, a current and long-term shortage in Irrigation water supplies exists through the year 2050.

**5B.8.10.2 Options Considered**

Table 5B.8-6 lists the water management strategies that were considered for Eastland County Irrigation shortages, and references the report section discussing the strategy, total project cost, and unit costs for meeting the shortage.

**Table 5B.8-6.  
Water Management Strategies Considered for Eastland County Irrigation**

Option	Yield (acft/yr)	Approximate Cost	
		Total	Unit (\$/acft)
Irrigation System Conversion <sup>1</sup>	1,495	\$177,905/yr	\$119
Irrigation Scheduling <sup>1</sup>	650	\$3,250/yr	\$50
Brush Control	(*)	(*)	(*)
Weather Modification <sup>2</sup>	(*)	\$500,000 to \$850,000/yr	(*)
No Action	-	\$1,072,000 <sup>3</sup>	\$144 <sup>3</sup>

<sup>1</sup> Source of Cost Estimate: Texas Agriculture Experiment Station.  
<sup>2</sup> Source of Cost Estimate: Section 5B.10.  
<sup>3</sup> Economic impact of not meeting shortage (i.e., "no action") in 2030 as estimated by TWDB.  
\* Definitive yield and/or cost cannot be determined.

**5B.8.10.3 Water Supply Plan**

No new water supplies are economically feasible to meet the projected shortage. Water conservation strategies in the form of conversion to irrigation systems with increased efficiency could partially meet the unmet demands. The irrigation systems in Eastland County are relatively efficient. Options are upgrade of side roll systems to center pivots and possibly some renozzling of older center pivots, and irrigation scheduling. Cultural practices such as crop selection, deficit irrigation, and conversion to dryland will account for the remainder of the water conserved (i.e., water not used).

As shown on Table 5B.8-7, conservation practices can meet about 2,145 acft/yr of the projected shortage.

**5B.8.10.4 Costs**

Costs of the Recommended Plan for irrigation supply are outlined in Table 5B.8-7. Costs for some options, such as brush control and weather modification, can not be directly quantified due to lack of specific data. Costs have been estimated based on generally available data outlined in the corresponding chapter in Section 5B. For irrigation conversion, an estimated 6,500 acres of the total irrigated acreage would be upgraded to conserve 0.23 acft water per acre of irrigated land, at an average annual cost of \$119.18/acre foot. This would provide 1,495 acft

annually. Irrigation scheduling with scientific methods could save an additional 10 percent of the irrigation water applied (0.1 acft/acre) at an annual cost of \$5/acre for 6,500 acres.

**Table 5B.8-7.  
Recommended Plan Costs by Decade for Eastland County Irrigation<sup>1</sup>**

<i>Plan Element</i>	<i>2000</i>	<i>2010</i>	<i>2020</i>	<i>2030</i>	<i>2040</i>	<i>2050</i>
<b>Irrigation System Conversion<sup>2</sup></b>						
Projected Shortage (acft/yr) <sup>3</sup>	(7,363)	(7,385)	(7,404)	(7,423)	(7,437)	(7,443)
Supply from Plan Element (acft/yr)	1,495	1,495	1,495	1,495	1,495	1,495
Annual Cost (\$/yr)	\$177,905	\$177,905	\$177,905	\$177,905	\$177,905	\$177,905
Unit Cost (\$/acft)	\$119	\$119	\$119	\$119	\$119	\$119
<b>Irrigation Scheduling<sup>2</sup></b>						
Supply from Plan Element (acft/yr)	650	650	650	650	650	650
Annual Cost (\$/yr)	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
Unit Cost (\$/acft)	\$50	\$50	\$50	\$50	\$50	\$50
<b>Brush Control</b>						
Supply from Plan Element (acft/yr)	(*)	(*)	(*)	(*)	(*)	(*)
Annual Cost (\$/yr)	(*)	(*)	(*)	(*)	(*)	(*)
Unit Cost (\$/acft)	(*)	(*)	(*)	(*)	(*)	(*)
<b>Weather Modification<sup>4</sup></b>						
Supply from Plan Element (acft/yr)	(*)	(*)	(*)	(*)	(*)	(*)
Annual Cost (\$/yr)	\$500,000 to \$850,000	\$500,000 to \$850,000	\$500,000 to \$850,000	\$500,000 to \$850,000	\$500,000 to \$850,000	\$500,000 to \$850,000
Unit Cost (\$/acft)	(*)	(*)	(*)	(*)	(*)	(*)
<b>Sum of Supply from Plan Elements (acft/yr)</b>	(2,145)	(2,145)	(2,145)	(2,145)	(2,145)	(2,145)
<b>Unmet Demand (acft/yr)<sup>5</sup></b>	(5,218)	(5,240)	(5,259)	(5,278)	(5,292)	(5,298)
<sup>1</sup> Unless otherwise noted, costs are Total Project Cost and Unit Cost (\$/acft per year) for water conserved through management practices. <sup>2</sup> Source of Cost Estimate: Texas Agriculture Experiment Station. <sup>3</sup> Total projected irrigation shortages are presented. <sup>4</sup> Source of Cost Estimate: Section 5B.10. <sup>5</sup> Apart from the conservation options presented, it is not economically feasible to meet projected irrigation shortage in Eastland County. * Definitive yield and/or cost cannot be determined.						

**5B.8.11 Livestock**

Livestock water use category shows a projected surplus and no changes in water supply are recommended.