

5B.33 Taylor County Water Supply Plan

Table 5B.33-1 lists each water user group in Taylor 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. Taylor 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.33-1.
Taylor County Surplus/(Shortage)**

| <i>Water User Group</i> | <i>Surplus/(Shortage)¹</i> | | <i>Comment</i> |
|-------------------------|---------------------------------------|---------------------------|-------------------------------------|
| | <i>2030 (acft/yr)</i> | <i>2050 (acft/yr)</i> | |
| City of Abilene | (2,610) | (7,067) | Projected shortage – see plan below |
| City of Merkel | (294) | (355) | Projected shortage – see plan below |
| City of Potosi | 196 | 206 | Projected surplus |
| City of Tuscola | 0 | 0 | Supply equals demand |
| City of Tye | 12 | 21 | Projected surplus |
| County Other | 914 | 833 | Projected surplus |
| Manufacturing | (1,953) | (2,327) | Projected shortage – see plan below |
| Steam-Electric | 2,319 | 2,319 | Projected surplus |
| Mining | 38 | 18 | Projected surplus |
| Irrigation | (68) | (47) | Projected shortage – see plan below |
| Livestock | 0 | 0 | Supply equals demand |

¹ From Tables 4-65 and 4-66, Section 4 – Comparison of Water Demands with Water Supplies to Determine Needs.

5B.33.1 The City of Abilene

5B.33.1.1 Description of Supply

Surface water supplies are obtained from Lakes Fort Phantom Hill, Hubbard Creek, Abilene, and Kirby (irrigation only). City of Abilene surface water supply from Lake O.H. Ivie (Colorado River MWD) is not available to Abilene until infrastructure is constructed to deliver this supply. Abilene has implemented wastewater reuse that currently supplies about 3,000 acft/yr for landscape irrigation.

Based on yield estimates using the historic drought of record, Abilene's current water sources are sufficient beyond 2015 and current projections show a shortage for the year 2030 of 2,610 acft, or about 7 percent of demand. However, reservoir inflows for the 1997-2000 period are less than the historic drought indicating that a new drought-of-record may be occurring. If so, Abilene may need additional sources of water sooner than projections show.

5B.33.1.2 Options Considered

Table 5B.33-2 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 Abilene's shortages.

**Table 5B.33-2.
Water Management Strategies Considered for the City of Abilene**

| Option | Yield (acft/yr) | Approximate Cost ¹ | |
|---|--------------------|-------------------------------|-----------------------|
| | | Total | Unit (\$/acft) |
| Wastewater Reuse (Section 5A.3) | 5,000 | \$19,250,000 | \$326 |
| Pipeline from O.H. Ivie Reservoir | 15,000 | \$60,000,000 | \$400 |
| Coordinated use of Hubbard Creek & Fort Phantom Hill ⁽²⁾ (Section 5A.4.2) | 7,200 | \$0 | \$0 |
| Seymour Aquifer Development (Section 5A.12) | 11,100 | \$31,895,000 | \$278 |
| Breckenridge Reservoir (Section 5A.14.1) | 20,000 | \$171,462,000 | \$629 |
| Obtain water from Possum Kingdom Reservoir through Oryx/Kerr-McGee Pipeline (5A.20.2) | 5,000 | \$19,500,000 | \$390 |
| No Action | - | \$248,474,000 ³ | \$95,201 ³ |

¹ 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.

² Requires modifications to existing contracts.

³ Economic impact of not meeting shortage (i.e., "no action") in 2030 as estimated by TWDB.

5B.33.1.3 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 Abilene:

- Continue implementation of wastewater reuse.
- Construct pipeline from Ivie Reservoir, which is currently under design.
- Implement coordinated use of Hubbard Creek and Fort Phantom Hill to increase system yield.
- Participate in a regional project to bring water from Possum Kingdom Reservoir through the Oryx/Kerr-McGee pipeline.

Also, the following long-term strategies, beyond 2030, are recommended for consideration:

- ASR (Aquifer Storage & Recovery) in Seymour Aquifer

The Breckenridge Reservoir has been recommended as a major water provider for long-term needs of the West Central Texas Municipal Water District, as described in Section 5B.38. If it is pursued by the WCTMWD, then Abilene should also consider the source.

5B.33.1.4 Costs

Costs of the Recommended Plan for the City of Abilene:

- a. Wastewater reuse:
 - Cost Source: Section 5A.3.
 - Date to be Implemented: 2002
 - Approximate unit cost of \$326/acft, of which about 90 percent is capital cost.
 - Total Project Cost: \$19,250,000 (will require site specific engineering to verify)
 - Total Annual Cost: \$1,630,000
- b. Pipeline from Ivie Reservoir:
 - Cost Source: Engineering estimates from Freese and Nichols
 - Date to be Implemented: prior to 2015
 - Total Project Cost: \$60,000,000

The pipeline from Ivie Reservoir consists of 52 miles of 36" pipeline, two 24-mgd pump stations, and a 10 million-gallon storage tank.
- c. Coordinated use of Hubbard Creek and Fort Phantom Hill
 - Cost Source: Section 5A.4.2
 - Date to be Implemented: 2002
 - Total Project Cost: \$0

d. Oryx/Kerr-McGee Pipeline from:

- Cost Source: construction of approximately 40 miles of 18-inch pipeline and pump station.
- Date to be Implemented: prior to 2020
- Unit cost of \$390/acft
- Total Project Cost: \$19,250,000
- Total Annual Cost: \$1,950,000

Table 5B.33-3.
Recommended Plan Costs by Decade for the City of Abilene

| <i>Plan Element</i> | <i>2000</i> | <i>2010</i> | <i>2020</i> | <i>2030</i> | <i>2040</i> | <i>2050</i> |
|---|-------------|-------------|-------------|-------------|-------------|-------------|
| Projected Surplus/(Shortage) (acft/yr) | - | - | (106) | (2,610) | (5,263) | (7,067) |
| Wastewater Reuse | | | | | | |
| Supply From Plan Element (acft/yr) | 0 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 |
| Annual Cost (\$/yr) | 0 | \$1,630,000 | \$1,630,000 | \$1,630,000 | \$163,000 | \$163,000 |
| Unit Cost (\$/acft) | \$0 | \$326 | \$326 | \$326 | \$33 | \$33 |
| Pipeline From Ivie Reservoir | | | | | | |
| Supply From Plan element (acft/yr) | 0 | 0 | 15,000 | 15,000 | 15,000 | 15,000 |
| Annual Cost (\$/yr) | \$0 | \$0 | \$6,000,000 | \$6,000,000 | \$6,000,000 | \$1,200,000 |
| Unit Cost (\$/acft) | \$0 | \$0 | \$400 | \$400 | \$400 | \$80 |
| Coordinated Use of Hubbard Creek and Ford Phantom Hill | | | | | | |
| Supply From Plan Element (acft/yr) | 0 | 7,200 | 7,200 | 7,200 | 7,200 | 7,200 |
| Annual Cost (\$/yr) | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Unit Cost (\$/acft) | \$0 | \$0 | \$0 | \$0 | \$0 | \$0 |
| Oryx/Kerr-McGee Pipeline | | | | | | |
| Supply From Plan Element (acft/yr) | 0 | 0 | 5,000 | 5,000 | 5,000 | 5,000 |
| Annual Cost (\$/yr) | \$0 | \$0 | \$1,950,000 | \$1,950,000 | \$1,950,000 | \$390,000 |
| Unit Cost (\$/acft) | \$0 | \$0 | \$390 | \$390 | \$390 | \$78 |
| Total New Supply (acft/yr) | 0 | 12,200 | 32,200 | 32,200 | 32,200 | 32,200 |

5B.33.2 The City of Merkel**5B.33.2.1 Description of Supply**

The City of Merkel obtains surface water from local sources and from the City of Abilene.

5B.33.2.2 Options Considered

Table 5B.33-4 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 Merkel.

**Table 5B.33-4.
Water Management Strategies Considered for the City of Merkel**

| Option | Yield (acft/yr) | Approximate Cost ¹ | |
|--|--------------------|-------------------------------|-----------------------|
| | | Total | Unit (\$/acft) |
| Voluntary redistribution from Abilene | 294 | \$191,100/yr | \$650 ² |
| Wastewater Reuse | 104 | \$420,008 | \$326 |
| Breckenridge Reservoir (Section 5A.14.1) | 20,000 | \$171,462,000 | \$629 ³ |
| No Action | - | \$12,478,000 ⁴ | \$42,443 ⁴ |

¹ 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.

² Estimated wholesale rate for treated water.

³ Raw water cost in the reservoir.

⁴ Economic impact of not meeting shortage (i.e., "no action") in 2030 as estimated by TWDB.

5B.33.2.3 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 2030 shortage of the City of Merkel:

- Voluntary redistribution of municipal supply for Abilene
- Wastewater Reuse

The Breckenridge Reservoir has been recommended for the long-term needs of the West Central Texas Municipal Water District, as described in Section 5B.38. The project is much too

large to be pursued by any individual municipality, but if it is pursued by the WCTMWD, then the source should be considered by local entities.

5B.33.2.4 Costs

Costs of the recommended plan for the City of Merkel to meet 2030 shortages are:

- a. Voluntary redistribution of municipal supply for Abilene:
 - Cost Source: Estimated wholesale of \$650/acft for treated water
 - Date to be Implemented: In place
 - Total Annual Cost: \$191,100
- b. Wastewater Reuse
 - Cost Source: Section 5A.3
 - Date to be Implemented: before 2010
 - Total Project Cost: \$420,008

**Table 5B.33-5.
Recommended Plan Costs by Decade for City of Merkel**

| <i>Plan Element</i> | <i>2000</i> | <i>2010</i> | <i>2020</i> | <i>2030</i> | <i>2040</i> | <i>2050</i> |
|--|-------------|-------------|-------------|-------------|-------------|-------------|
| Projected Surplus/(Shortage) (acft/yr) | (213) | (239) | (264) | (294) | (321) | (355) |
| Voluntary Redistribution from Abilene | | | | | | |
| Supply from Plan Elements (acft/yr) | 0 | 294 | 294 | 294 | 294 | 294 |
| Annual Cost (\$/yr) | \$0 | \$191,100 | \$191,100 | \$191,100 | \$191,100 | \$191,100 |
| Unit Cost (\$/acft) | 0 | \$650 | \$650 | \$650 | \$650 | \$650 |
| Wastewater Reuse | | | | | | |
| Supply From Plan Element (acft/yr) | 0 | 104 | 104 | 104 | 104 | 104 |
| Annual Cost (\$/yr) | \$0 | \$34,000 | \$34,000 | \$34,000 | \$3,400 | \$3,400 |
| Unit Cost (\$/acft) | \$0 | \$326 | \$326 | \$326 | \$33 | \$33 |
| Total New Supply (acft/yr) | 0 | 398 | 398 | 398 | 398 | 398 |

5B.33.3 The City of Potosi

The City of Potosi purchases water from the City of Abilene, and shows a projected surplus. Therefore, no changes in water supply are recommended.

5B.33.4 The City of Tuscola

The City of Tuscola purchases water from the City of Abilene, and shows a projected surplus. Therefore, no changes in water supply are recommended.

5B.33.5 City of Tye

The City of Tye purchases water from the City of Abilene, and shows a projected surplus. Therefore, no changes in water supply are recommended.

5B.33.6 County-Other Category

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

5B.33.7 Manufacturing**5B.33.7.1 Description of Supply**

Water supply for Manufacturing consists of surface water from local sources along with a small amount of groundwater from the Trinity and Edwards-Trinity (Plateau) Aquifers.

5B.33.7.2 Options Considered

Table 5B.33-6 lists the water management strategies, report section references detailing the strategy, total project cost, and unit costs that were considered for Manufacturing.

**Table 5B.33-6.
Water Management Strategies Considered for Taylor County Manufacturing**

| <i>Option</i> | <i>Yield (acft/yr)</i> | <i>Approximate Cost</i> | |
|---|----------------------------|----------------------------|---------------------------|
| | | <i>Total</i> | <i>Unit (\$/acft)</i> |
| Voluntary redistribution from Municipal use | 1,953 | \$0 | \$0 |
| Breckenridge Reservoir (Section 5A.14.1) | 20,000 | \$171,462,000 | \$629 ¹ |
| No Action | - | \$311,905,000 ² | \$159,705 ² |

¹ Raw water cost in the reservoir.
² Economic impact of not meeting shortage (i.e., "no action") in 2030 as estimated by TWDB.

5B.33.7.3 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 for Manufacturing:

- Voluntary redistribution of municipal supply

The Breckenridge Reservoir has been recommended for the long-term needs for the West Central Texas Municipal Water District, as described in Section 5B.38. The project is much too large to be pursued by any individual municipality, but if it is pursued by the WCTMWD, then the source should be considered by local entities.

5B.33.7.4 Costs

Costs of the recommended plan to meet 2030 shortages for Manufacturing are:

- a. Voluntary redistribution of municipal supply:
 - Cost Source: Estimated wholesale of \$650/acft for treated water
 - Date to be Implemented: In place
 - Total Project Cost: \$0

5B.33.8 Steam-Electric

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

5B.33.9 Mining

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

5B.33.10 Irrigation

5B.33.10.1 Description of Supply

Surface water supplies for Irrigation in Taylor County are obtained from Cedar Creek, Elm Creek, and small tributaries to these streams. The estimated reliable supply of surface water for Irrigation is 138 acft in 2000, then 88 acft until 2050. The groundwater supplies in the county are obtained from the Seymour Aquifer. The estimated reliable supply of groundwater

for Irrigation is 286 acft until 2050. A small shortage in Irrigation water supplies exists through the year 2050.

5B.33.10.2 Options Considered

Table 5B.33-7 lists the water management strategies that were considered for Taylor County Irrigation shortages, and references the report section discussing the strategy, total project cost, and unit costs for meeting the shortage.

Table 5B.33-7.
Water Management Strategies Considered for Taylor County Irrigation

| Option | Yield (acft/yr) | Approximate Cost | |
|---|--------------------|---------------------------------|--------------------|
| | | Total | Unit (\$/acft) |
| Irrigation System Conversion ¹ | 68 | \$2,992/yr | \$44 |
| Brush Control (Section 5A.9) | (*) | (*) | (*) |
| Weather Modification (Section 5A.10) | (*) | \$500,000 to \$850,000/yr | (*) |
| No Action | (*) | \$41,000 ² | \$144 ² |

¹ Source of Cost Estimate: Texas Agriculture Experiment Station.
² 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.33.10.3 Water Supply Plan

Taylor County has projected Irrigation shortages of 68 acft in 2030 and 47 acft in 2050. No new water supplies are economically feasible to meet this projected shortage. Water conservation strategies in the form of conversion to irrigation systems with increased efficiency could partially meet the projected shortages. Options are conversion of gated pipe systems to center pivots and possibly some renozzling of older center pivots. Brush control and weather modification may also be used to enhance soil moisture.

As shown in Table 5B.33-7, conservation practices can meet about 68 acft/yr of the projected shortage. This will meet the projected shortage by the year 2030. Prior to 2030, small irrigation shortages are projected. Apart from the conservation options presented, it is not economically feasible to meet projected Irrigation shortages listed as unmet demand in Taylor County.

5B.33.10.4 Costs

Costs of the Recommended Plan for Irrigation supply are outlined in Table 5B.33-7. Costs for some options, such as brush control and weather modification, can not be directly quantified due to lack of specific data. Costs for these options have been estimated based on generally available data outlined in the corresponding chapter in Section 5B. For irrigation upgrades, conversion of 62 acres of gated pipe to center pivot for fully irrigated forages would provide 68 acft of water annually at a cost of \$44/acft.

5B.33.11 Livestock

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

**Table 5B.33-7.
Recommended Plan Costs by Decade for the Taylor County Irrigation¹**

| <i>Plan Element</i> | <i>2000</i> | <i>2010</i> | <i>2020</i> | <i>2030</i> | <i>2040</i> | <i>2050</i> |
|---|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Irrigation System Conversion² | | | | | | |
| Projected Shortage (acft/yr) ³ | (51) | (89) | (79) | (68) | (58) | (47) |
| Supply from Plan Element (acft/yr) | 68 | 68 | 68 | 68 | 68 | 68 |
| Annual Cost (\$/yr) | \$2,992 | \$2,992 | \$2,992 | \$2,992 | \$2,992 | \$2,992 |
| Unit Cost (\$/acft) | \$44 | \$44 | \$44 | \$44 | \$44 | \$44 |
| Brush Control⁴ | | | | | | |
| Supply from Plan Element (acft/yr) | (*) | (*) | (*) | (*) | (*) | (*) |
| Annual Cost (\$/yr) | (*) | (*) | (*) | (*) | (*) | (*) |
| Unit Cost (\$/acft) | \$53 | \$53 | \$53 | \$53 | \$53 | \$53 |
| Weather Modification | | | | | | |
| 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) | (*) | (*) | (*) | (*) | (*) | (*) |
| Sum of Supply from Plan Elements (acft/yr) | 68 | 68 | 68 | 68 | 68 | 68 |
| Unmet Demand⁵ | 0 | (21) | (11) | 0 | 0 | 0 |
| <p>¹ Unless otherwise noted, costs are Total Project Cost and Unit Cost (\$/acft per year) for water conserved through management practices. Unit cost is for full utilization of project capacity.</p> <p>² Source of Cost Estimate: Texas Agriculture Experiment Station.</p> <p>³ Total projected irrigation shortages are presented.</p> <p>⁴ Source of Cost Estimate: Section 5B.9.</p> <p>⁵ Apart from the conservation options presented, it is not economically feasible to meet projected irrigation shortages listed as unmet demand in Taylor County.</p> <p>* Definitive yield and/or cost cannot be determined.</p> | | | | | | |