



5.20 Knox County Water Supply Plan

Table 5.20-1 lists each water user group in Knox County and their corresponding surplus or shortage in years 2040 and 2070. A brief summary of each water user group supply is presented in the following subsections.

Table 5.20-1. Knox County Surplus/(Shortage)

Water User Group	Surplus/(Shortage) ¹		Comment
	2040 (acft/yr)	2070 (acft/yr)	
Baylor SUD			See Young County
Knox City	(235)	(256)	Projected shortage - see plan below.
City of Munday	(249)	(270)	Projected shortage - see plan below.
County-Other	12	2	Projected surplus
Manufacturing	(4)	(4)	Projected shortage - see plan below.
Steam-Electric	—	—	No projected demand
Mining	(9)	(8)	Projected shortage - see plan below.
Irrigation	(13,590)	(13,381)	Projected shortage - see plan below
Livestock	0	0	Demand equals supply

1 – From Tables C-39 and C-40, Appendix C – Comparison of Water Demands with Water Supplies to Determine Needs.

5.20.1 Knox City

Description of Supply

Knox City obtains its water supply through purchases of treated surface water under contract from the North Central Texas Municipal Water Authority (NCTMWA) and through local groundwater production from the Seymour Aquifer. The City is contracted to purchase up to 260 acft/yr from the NCTMWA; however, due to availability of supplies, this contract is prorated to provide a maximum of only 11 acft/yr during the planning period. Additionally, no local groundwater supply from the Seymour Aquifer is projected to be available to the City.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Knox City.

a. Conservation

- Cost Source: Volume II, Chapter 2
- Date to be Implemented: before 2030
- Annual Cost: maximum of \$30,240 in 2070

- Unit Cost: \$560/acft
- b. Lake Creek Reservoir. This strategy would be developed by NCTMWA to augment existing supplies.
 - Cost Source: Volume II, Chapter 4.10
 - Project requires a subordination agreement with the BRA
 - Date to be Implemented: before 2030
 - Project Cost: none (cost would be borne by NCTMWA)
 - Unit Cost: none (supply already purchased from NCTMWA)

Table 5.20-1. Recommended Plan Costs by Decade for Knox City

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(226)	(231)	(235)	(244)	(250)	(256)
Conservation						
Supply From Plan Element (acft/yr)	—	17	36	52	53	54
Annual Cost (\$/yr)	—	\$9,520	\$20,160	\$29,120	\$29,680	\$30,240
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(226)	(214)	(199)	(191)	(197)	(202)
Lake Creek Reservoir						
Supply From Plan Element (acft/yr)	226	214	199	191	197	202
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—

5.20.2 City of Munday

Description of Supply

City of Munday obtains surface water via a contract with North Central Texas Municipal Water Authority (NCTMWA) and exempt groundwater use in the city limits from the Seymour Aquifer. The City is contracted to purchase up to 268 acft/yr from the NCTMWA; however, due to availability of supplies, this contract is prorated to provide a maximum of only 11 acft/yr during the planning period. Additionally, no local groundwater supply from the Seymour Aquifer is projected to be available to the City

Water Supply Plan

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

- a. Conservation
 - Cost Source: Volume II, Chapter 2
 - Date to be Implemented: before 2030



- Annual Cost: maximum of \$20,160 in 2070
 - Unit Cost: \$560/acft
- b. Lake Creek Reservoir. This strategy would be developed by NCTMWA to augment existing supplies.
- Cost Source: Volume II, Chapter 4.10
 - Project requires a subordination agreement with the BRA
 - Date to be Implemented: before 2030
 - Project Cost: none (cost would be borne by NCTMWA)
 - Unit Cost: none (supply already purchased from NCTMWA)

Table 5.20-2. Recommended Plan Costs by Decade for the City of Munday

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(242)	(246)	(249)	(258)	(264)	(270)
Conservation						
Supply From Plan Element (acft/yr)	—	17	35	36	35	36
Annual Cost (\$/yr)	—	\$9,520	\$19,960	\$20,160	\$19,600	\$20,160
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(242)	(229)	(214)	(222)	(228)	(234)
Alternative: Lake Creek Reservoir						
Supply From Plan Element (acft/yr)	242	229	214	222	228	234
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—

5.20.3 County-Other

Entities in Knox County-Other obtain water supply through groundwater production from the Seymour and Blaine Aquifers and through purchases of surface water under contracts with the NCTMWA. The combined supply under contract with the NCTMWA is for 131 acft/yr; however, this annual supply is projected to be prorated and only provide a maximum of 6 acft/yr during the planning period. No future local groundwater supply is projected to be available from the Seymour Aquifer; local available supply to Knox County-Other users from the Blaine Aquifer is projected at 100 acft/yr. No water supply shortages are projected and no change in water supply is recommended. Conservation was also considered; however, the current per capita use rate is below the selected target of 140 gpcd.

5.20.4 Manufacturing

Description of Supply

Manufacturing entities in Knox County are projected to have a constant shortage during the planning period; no existing water supplies are currently allocated for this WUG.

Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water management strategies are recommended for Manufacturing:

a. Groundwater Development – Blaine Aquifer

- Cost Source: Volume II, Chapter 14
- Date to be Implemented: before 2030
- Project Cost: \$525,000
- Unit Cost: maximum of \$872/acft

Table 5.20-3. Recommended Plan Costs by Decade for Knox County – Manufacturing

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(4)	(4)	(4)	(4)	(4)	(4)
Conservation						
Supply From Plan Element (acft/yr)	—	—	—	—	—	—
Annual Cost (\$/yr)	—	—	—	—	—	—
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(4)	(4)	(4)	(4)	(4)	(4)
Groundwater Development – Blaine Aquifer						
Supply From Plan Element (acft/yr)	50	50	50	50	50	50
Annual Cost (\$/yr)	\$43,596	\$43,596	\$6,596	\$6,596	\$6,596	\$6,596
Unit Cost (\$/acft)	\$872	\$872	\$132	\$132	\$132	\$132

5.20.5 Steam-Electric

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

5.20.6 Mining

Description of Supply

No water supplies are currently allocated for Mining operations in Knox County. Water supply shortages are projected for Mining beginning in 2020.

Water Supply Plan

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

a. Conservation

- Cost Source: Volume II, Chapter 2
- Date to be Implemented: 2030



- Annual Cost: not determined
- b. Groundwater Development – Blaine Aquifer
- Cost Source: Volume II, Chapter 14
 - Date to be Implemented: before 2030
 - Project Cost: \$522,000
 - Unit Cost: maximum of \$829

Table 5.20-5. Recommended Plan Costs by Decade for Knox County – Mining

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	(9)	(10)	(9)	(9)	(8)	(8)
Conservation						
Supply From Plan Element (acft/yr)	—	1	1	1	1	1
Annual Cost (\$/yr)	—	ND	ND	ND	ND	ND
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	(9)	(9)	(8)	(8)	(7)	(7)
Groundwater Development – Blaine Aquifer						
Supply From Plan Element (acft/yr)	50	50	50	50	50	50
Annual Cost (\$/yr)	\$41,457	\$41,457	\$4,457	\$4,457	\$4,457	\$4,457
Unit Cost (\$/acft)	\$809	\$809	\$89	\$89	\$89	\$89

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

5.20.7 Irrigation

Description of Supply

Knox County Irrigation obtains water supplies from the Seymour and the Blaine Aquifer as well as surface water supplies from Lake Davis and run-of-the river water rights. Irrigation shortages are projected through 2070.

Water Supply Plan

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

- a. Conservation
- Cost Source: Volume II, Chapter 2
 - Date to be Implemented: before 2030
 - Annual Cost: maximum of \$509,298
 - Unit Cost: \$122/acft
- b. Groundwater Development – Blaine Aquifer
- Cost Source: Volume II, Chapter 14

- Date to be Implemented: before 2030
 - Project Cost: \$2,865,000
 - Unit Cost: maximum of \$564/acft
- c. Leave needs unmet:
- Cost Source: Cost of not meeting needs – see appendix H
 - Date to be Implemented: before 2030

Table 5.20-6. Recommended Plan Costs by Decade for Knox County – Irrigation

Plan Element	2020	2030	2040	2050	2060	2070
<i>Projected Surplus/(Shortage) (acft/yr)</i>	<i>(14,884)</i>	<i>(17,282)</i>	<i>(13,590)</i>	<i>(11,488)</i>	<i>(11,188)</i>	<i>(13,381)</i>
Conservation						
Supply From Plan Element (acft/yr)	1,319	2,199	2,791	2,665	2,829	2,829
Annual Cost (\$/yr)	\$221,921	\$369,869	\$498,104	\$499,580	\$509,298	\$509,298
<i>Projected Surplus/(Shortage) after Conservation (acft/yr)</i>	<i>(13,565)</i>	<i>(15,083)</i>	<i>(10,799)</i>	<i>(8,823)</i>	<i>(8,359)</i>	<i>(10,552)</i>
Groundwater Development – Blaine Aquifer						
Supply From Plan Element (acft/yr)	405	405	405	405	405	405
Annual Cost (\$/yr)	\$228,513	\$228,513	\$26,513	\$26,513	\$26,513	\$26,513
Unit Cost (\$/acft)	564	564	564	65	65	65
Leave Needs Unmet						
Supply From Plan Element (acft/yr)	13,160	14,678	10,394	8,418	7,954	10,117
Annual Cost (\$/yr)	—	—	—	—	—	—
Unit Cost (\$/acft)	—	—	—	—	—	—

5.20.8 Livestock

No shortages are projected for Livestock, the demand equals the supply, and no changes in water supply are recommended.