

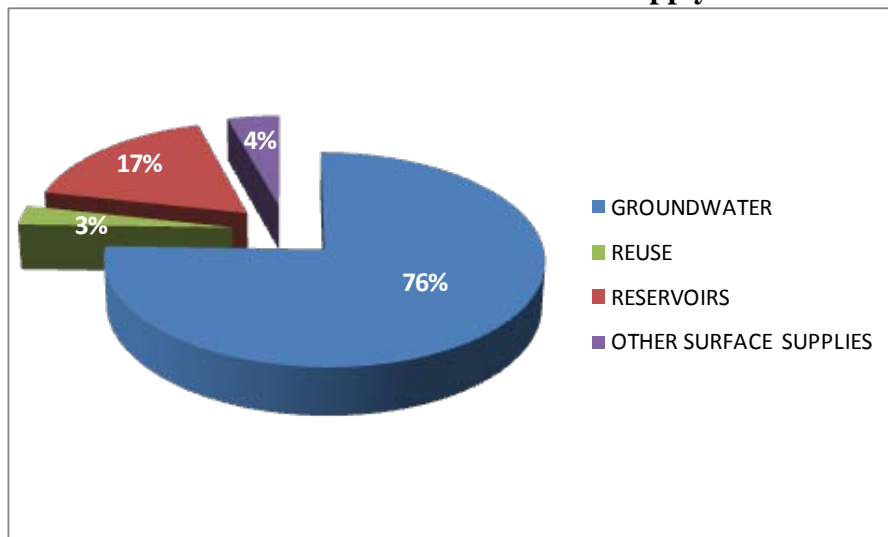
4 IDENTIFICATION, EVALUATION, AND SELECTION OF WATER MANAGEMENT STRATEGIES BASED ON NEEDS

4.1 Comparison of Current Supplies and Demand

4.1.1 Current Supply

The current supply in Region F consists of groundwater, surface water from in-region reservoirs, local supplies and wastewater reuse. There is a small amount of groundwater that comes from outside the region (Regions G and O). Based on the assessment of currently available supplies (Chapter 3), groundwater is the largest source of water in Region F, accounting for 78 percent of the total supply. Reservoirs are the second largest source of water, with 14 percent of the supply. Run-of-the-river supplies and alternative sources such as desalination and wastewater reuse provide the remainder of the region’s supply. (Reservoir and run-of-the-river supplies are based on the Colorado WAM, which underestimates the amount of water available from reservoirs in Region F.) The total currently available water supply for Region F is approximately 641,000 acre-feet per year. The distribution of this supply by source type in the year 2010 is shown in Figure 4.1-1.

Figure 4.1-1
2010 Distribution of Available Supply



Surface water supplies are based on the Colorado WAM.

4.1.2 Regional Demands

Regional demands were developed by city, county and category, and are discussed in Chapter 2. In summary, the total demands for the region are projected to increase from 803,376 in 2010 to 814,991 acre-feet per year in 2060. The largest water demand category is irrigation, which accounts for about 72 percent of the total demand in the region. Municipal is the next largest water user in the Region F. Manufacturing, mining, steam electric power and livestock demands combined account for only about 10 percent of the total water demands. Over the planning period, irrigation demand is expected to decrease, while municipal, manufacturing, mining and steam electric are projected to increase. Livestock demands are projected to remain the same through 2060. The projected increases in demands are expected to occur near the larger municipalities and to a lesser extent in the rural areas.

Irrigation demands for 2010 through 2060 are higher than the historical irrigation use in the year 2006. Irrigation demands in Region F in 2006 were lower than they could have been due to reduced surface water supplies. Baseline irrigation demands are based upon full availability of surface water supplies. More information on irrigation demands may be found in Section 2.3.3.

4.1.3 Comparison of Demand to Currently Available Supplies

This comparison of supply to demand is based on the projected demands developed in Chapter 2 and the currently available supplies developed in Chapter 3. As discussed in Chapter 3, currently available supplies are based on the most restrictive of current water rights, contracts and available yields for surface water and historical use and/or groundwater availability for groundwater. There may be supplies not included in this comparison that can meet a need with changes to existing infrastructure or contractual agreements. Surface water supplies in the Colorado Basin are based on the Colorado WAM, which substantially underestimates the actual supply available to Region F.

Figure 4.1-2 compares the overall supply allocation for projected supplies and demands from 2010 through 2060. On a regional basis the demand exceeds the currently available supply by about 162,000 acre-feet per year in the year 2010, increasing to over 183,000 acre-feet per year by 2060. On a water user group basis, the sum of the shortages is about 191,000 acre-feet

per year in 2010, and increases to nearly 220,000 acre-feet per year by 2060. Figures 4.1-3 through 4.1-5 compare supply and demand for the three largest water use categories: irrigation, municipal and steam-electric. Irrigation demand exceeds available supply by about 142,000 acre-feet per year in the year 2010, decreasing to 120,000 acre-feet per year by the year 2060. Municipal demand exceeds currently available supplies by over 12,000 acre-feet per year in the year 2010, increasing to nearly 40,000 acre-feet per year by 2060. Steam-electric demand is expected to exceed supply by approximately 6,500 acre-feet per year in 2010, increasing to almost 21,000 acre-feet per year by 2060.

Tables 4.1-1 to 4.1-3 compare the current available supply to demand by county, divided into use categories, for years 2010, 2030 and 2060. Based on this analysis, there are significant irrigation, municipal and steam-electric generation needs throughout the 50-year planning period. Typically the counties with the largest irrigation needs are those with large irrigation demands and limited groundwater supplies. Most of the municipal needs are the result of underestimation of available supply based on the Colorado WAM (the Colorado WAM is discussed in section 3.2). Steam-electric generation needs are largely associated with growth in demand that exceeds the available supply, although this demand category is significantly impacted by the Colorado WAM as well. Specific needs by user group are included in Appendix 4A.

4.1.4 Identified Needs for Wholesale Water Providers

Table 4.1-4 is a summary of the needs for the seven Wholesale Water Providers in Region F. Needs for CRMWD, San Angelo, Odessa and UCRA are primarily the result of using the Colorado WAM for water availability. Needs for University Lands are the result of contract expiration. More information on contracts with University Lands may be found in Section 3.5. A summary of the supply and demand comparison for each designated wholesale provider is included in Appendix 4A.

Figure 4.1-2
Comparison of Total Region F Supplies and Demands

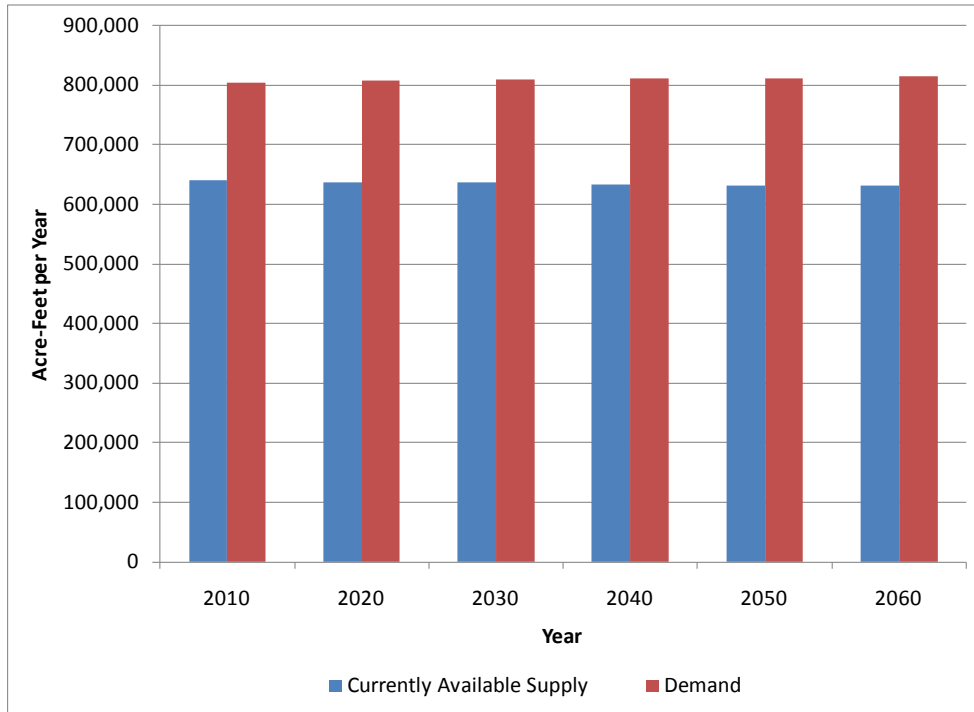
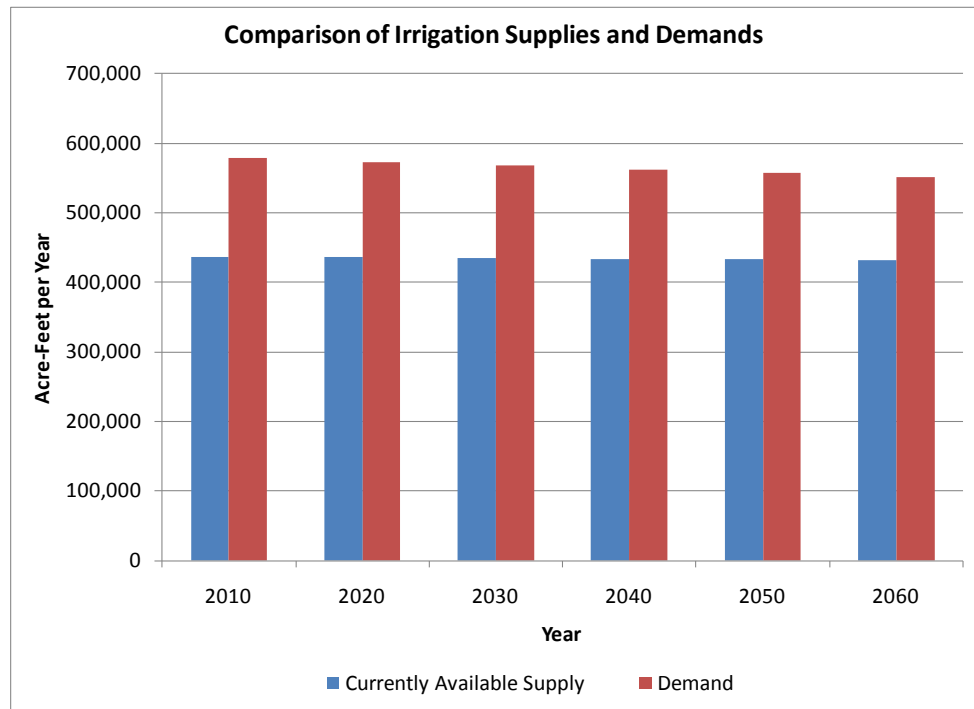


Figure 4.1-3
Comparison of Irrigation Supplies and Demands



Historical water demand data and projections are from the Texas Water Development Board.

Figure 4.1-4
Comparison of Municipal Supplies and Demands

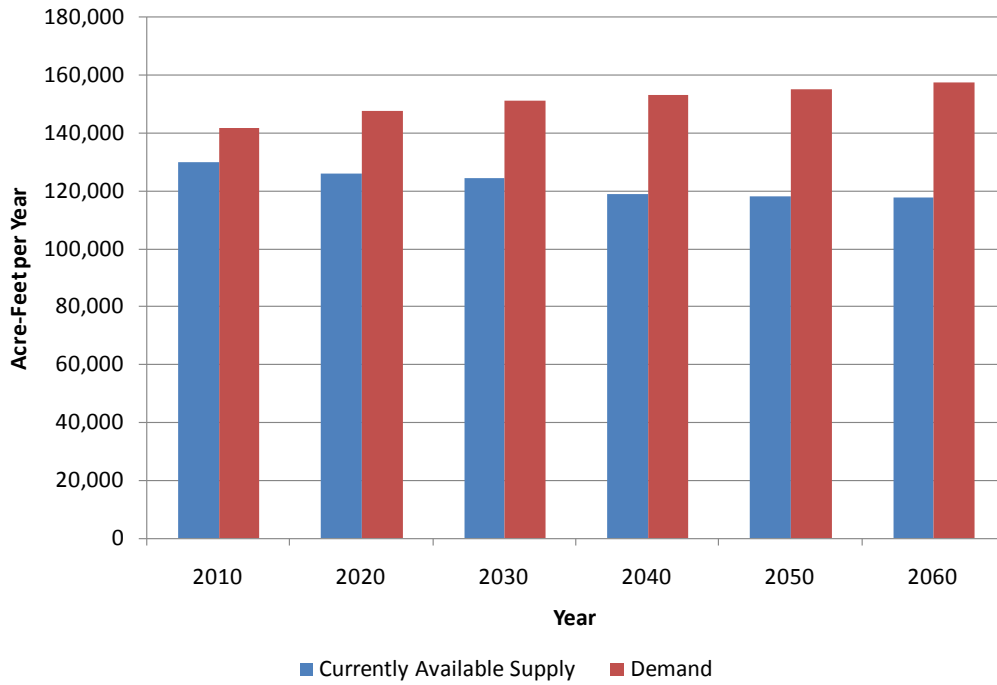
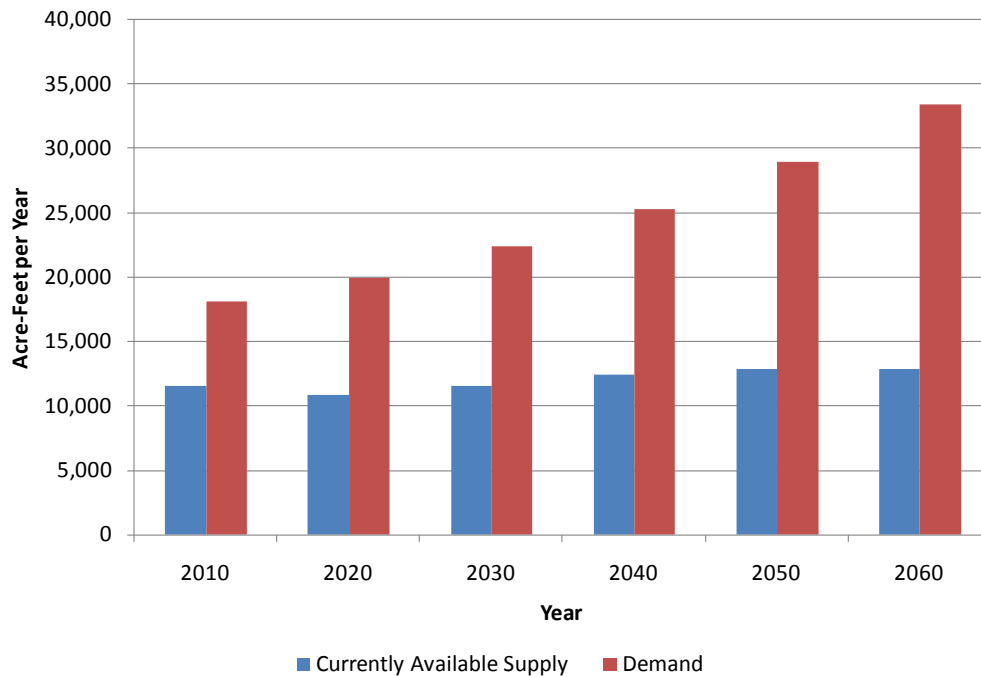


Figure 4.1-5
Comparison of Steam Electric Supplies and Demands



Historical water demand data and projections are from the Texas Water Development Board.

**Table 4.1-1
Comparison of Currently Available Supply to Projected Demands by County and Category
Year 2010**

County ¹	Irrigation			Manufacturing			Mining			Municipal			Steam Electric Power			Livestock			Total		
	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)
Andrews	19,733	32,608	(12,875)	0	0	0	1,965	1,908	57	3,625	3,625	0	0	0	0	438	438	0	25,761	38,579	(12,818)
Borden	843	2,690	(1,847)	0	0	0	1,014	690	324	178	175	3	0	0	0	281	281	0	2,316	3,836	(1,520)
Brown	9,307	12,313	(3,006)	577	577	0	2,487	2,487	0	7,743	7,106	637	0	0	0	1,636	1,636	0	21,750	24,119	(2,369)
Coke	573	936	(363)	0	0	0	402	488	(86)	660	771	(111)	0	310	(310)	593	593	0	2,228	3,098	(870)
Coleman	31	1,379	(1,348)	0	6	(6)	1	18	(17)	1,515	1,874	(359)	0	0	0	1,259	1,259	0	2,806	4,536	(1,730)
Concho	5,265	4,297	968	0	0	0	0	0	0	995	873	122	0	0	0	775	775	0	7,035	5,945	1,090
Crane	337	337	0	0	0	0	2,221	2,221	0	1,256	1,256	0	0	0	0	155	155	0	3,969	3,969	0
Crockett	535	525	10	0	0	0	402	402	0	2,546	1,707	839	1,500	973	527	997	997	0	5,980	4,604	1,376
Ector	5,533	5,533	0	2,393	2,759	(366)	10,074	9,888	186	24,616	28,708	(4,092)	5,156	6,375	(1,219)	293	293	0	48,065	53,556	(5,491)
Glasscock	24,488	52,272	(27,784)	0	0	0	5	5	0	181	181	0	0	0	0	232	232	0	24,906	52,690	(27,784)
Howard	4,862	4,799	63	1,471	1,648	(177)	1,383	1,783	(400)	5,958	7,308	(1,350)	0	0	0	366	366	0	14,040	15,904	(1,864)
Irion	1,501	2,803	(1,302)	0	0	0	122	122	0	248	238	10	0	0	0	460	460	0	2,331	3,623	(1,292)
Kimble	1,771	985	786	3	702	(699)	104	71	33	203	1,148	(945)	0	0	0	668	668	0	2,749	3,574	(825)
Loving	583	581	2	0	0	0	3	2	1	11	11	0	0	0	0	70	70	0	667	664	3
Martin	13,536	14,324	(788)	39	39	0	705	674	31	396	788	(392)	0	0	0	273	273	0	14,949	16,098	(1,149)
Mason	16,099	10,079	6,020	0	0	0	6	6	0	956	932	24	0	0	0	1,036	1,036	0	18,097	12,053	6,044
McCulloch	6,103	2,824	3,279	844	844	0	154	154	0	1,321	2,252	(931)	0	0	0	1,027	1,027	0	9,449	7,101	2,348
Menard	3,620	6,061	(2,441)	0	0	0	0	0	0	388	458	(70)	0	0	0	642	642	0	4,650	7,161	(2,511)
Midland	25,260	41,493	(16,233)	164	164	0	677	677	0	31,326	32,568	(1,242)	0	0	0	904	904	0	58,331	75,806	(17,475)
Mitchell	5,564	5,534	30	0	0	0	141	115	26	1,728	1,703	25	0	5,023	(5,023)	449	449	0	7,882	12,824	(4,942)
Pecos	82,583	79,681	2,902	3	2	1	286	159	127	7,660	4,816	2,844	0	0	0	1,240	1,239	1	91,772	85,897	5,875
Reagan	25,600	36,597	(10,997)	0	0	0	2,036	2,036	0	1,035	1,035	0	0	0	0	279	272	7	28,950	39,940	(10,990)
Reeves	88,816	103,069	(14,253)	720	720	0	182	182	0	3,846	3,834	12	0	0	0	2,283	2,283	0	95,847	110,088	(14,241)
Runnels	2,973	4,331	(1,358)	0	63	(63)	44	44	0	406	2,091	(1,685)	0	0	0	1,530	1,530	0	4,953	8,059	(3,106)
Schleicher	3,132	2,108	1,024	0	0	0	150	125	25	852	723	129	0	0	0	787	787	0	4,921	3,743	1,178
Scurry	3,529	2,815	714	0	0	0	3,880	3,107	773	3,101	3,666	(565)	0	0	0	629	629	0	11,139	10,217	922
Sterling	745	648	97	0	0	0	590	590	0	349	349	0	0	0	0	503	503	0	2,187	2,090	97
Sutton	1,812	1,811	1	0	0	0	80	80	0	2,196	1,472	724	0	0	0	796	796	0	4,884	4,159	725
Tom Green	57,531	104,621	(47,090)	0	2,226	(2,226)	150	73	77	14,770	23,494	(8,724)	0	543	(543)	1,978	1,978	0	74,429	132,935	(58,506)
Upton	6,119	16,759	(10,640)	0	0	0	2,662	2,662	0	1,550	942	608	0	0	0	212	212	0	10,543	20,575	(10,032)
Ward	8,266	13,793	(5,527)	7	7	0	153	153	0	3,484	3,484	0	4,914	4,914	0	126	126	0	16,950	22,477	(5,527)
Winkler	10,000	10,000	0	0	0	0	1,878	928	950	4,721	2,377	2,344	0	0	0	169	151	18	16,768	13,456	3,312
<i>Total</i>	436,650	578,606	(141,956)	6,221	9,757	(3,536)	33,957	31,850	2,107	129,820	141,965	(12,145)	11,570	18,138	(6,568)	23,086	23,060	26	641,304	803,376	(162,072)

1. County shown is the county where the supply is used. The actual supply may come from a different county.

2. Surplus and need are calculated on a county basis. The surplus and needs for individual water users are included in Appendix 4A.

**Table 4.1-2
Comparison of Currently Available Supply to Projected Demands by County and Category
Year 2030**

County ¹	Irrigation			Manufacturing			Mining			Municipal			Steam Electric Power			Livestock			Total		
	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)
Andrews	19,355	32,062	(12,707)	0	0	0	2,031	1,976	55	3,937	3,937	0	0	0	0	438	438	0	25,761	38,413	(12,652)
Borden	843	2,682	(1,839)	0	0	0	1,014	646	368	178	169	9	0	0	0	281	281	0	2,316	3,778	(1,462)
Brown	9,284	12,230	(2,946)	686	686	0	2,510	2,510	0	7,727	7,111	616	0	0	0	1,636	1,636	0	21,843	24,173	(2,330)
Coke	573	934	(361)	0	0	0	548	550	(2)	732	755	(23)	0	289	(289)	593	593	0	2,446	3,121	(675)
Coleman	31	1,379	(1,348)	0	6	(6)	1	19	(18)	1,497	1,814	(317)	0	0	0	1,259	1,259	0	2,788	4,477	(1,689)
Concho	5,265	4,262	1,003	0	0	0	0	0	0	1,151	884	267	0	0	0	775	775	0	7,191	5,921	1,270
Crane	337	337	0	0	0	0	2,214	2,214	0	1,453	1,453	0	0	0	0	155	155	0	4,159	4,159	0
Crockett	535	508	27	0	0	0	431	431	0	2,543	1,865	678	1,500	907	593	997	997	0	6,006	4,708	1,298
Ector	5,402	5,402	0	3,017	3,125	(108)	11,078	10,911	167	28,268	32,271	(4,003)	5,156	10,668	(5,512)	293	293	0	53,214	62,670	(9,456)
Glasscock	24,466	51,438	(26,972)	0	0	0	5	5	0	203	203	0	0	0	0	232	232	0	24,906	51,878	(26,972)
Howard	4,862	4,690	172	1,843	1,832	11	1,915	1,924	(9)	7,346	7,310	36	0	0	0	366	366	0	16,332	16,122	210
Irion	1,501	2,682	(1,181)	0	0	0	122	122	0	242	227	15	0	0	0	460	460	0	2,325	3,491	(1,166)
Kimble	1,771	913	858	3	823	(820)	104	65	39	200	1,129	(929)	0	0	0	668	668	0	2,746	3,598	(852)
Loving	583	576	7	0	0	0	3	2	1	10	10	0	0	0	0	70	70	0	666	658	8
Martin	13,500	13,822	(322)	42	42	0	705	634	71	429	858	(429)	0	0	0	273	273	0	14,949	15,629	(680)
Mason	16,099	9,792	6,307	0	0	0	6	6	0	956	916	40	0	0	0	1,036	1,036	0	18,097	11,750	6,347
McCulloch	6,103	2,754	3,349	1,004	1,004	0	162	162	0	1,349	2,236	(887)	0	0	0	1,027	1,027	0	9,645	7,183	2,462
Menard	3,620	6,022	(2,402)	0	0	0	0	0	0	384	446	(62)	0	0	0	642	642	0	4,646	7,110	(2,464)
Midland	24,500	40,848	(16,348)	198	198	0	846	846	0	19,541	35,301	(15,760)	0	0	0	904	904	0	45,989	78,097	(32,108)
Mitchell	5,564	5,479	85	0	0	0	141	108	33	1,704	1,621	83	0	4,670	(4,670)	449	449	0	7,858	12,327	(4,469)
Pecos	82,583	77,191	5,392	3	2	1	286	158	128	7,689	5,071	2,618	0	0	0	1,240	1,239	1	91,801	83,661	8,140
Reagan	25,269	35,385	(10,116)	0	0	0	2,235	2,235	0	1,167	1,167	0	0	0	0	279	272	7	28,950	39,059	(10,109)
Reeves	88,780	101,323	(12,543)	756	756	0	175	175	0	4,288	4,272	16	0	0	0	2,283	2,283	0	96,282	108,809	(12,527)
Runnels	2,973	4,298	(1,325)	0	76	(76)	45	45	0	554	2,174	(1,620)	0	0	0	1,530	1,530	0	5,102	8,123	(3,021)
Schleicher	3,132	2,024	1,108	0	0	0	150	139	11	834	795	39	0	0	0	787	787	0	4,903	3,745	1,158
Scurry	3,477	2,630	847	0	0	0	3,880	3,413	467	3,711	3,721	(10)	0	0	0	629	629	0	11,697	10,393	1,304
Sterling	745	595	150	0	0	0	605	605	0	387	387	0	0	0	0	503	503	0	2,240	2,090	150
Sutton	1,794	1,742	52	0	0	0	83	83	0	2,206	1,539	667	0	0	0	796	796	0	4,879	4,160	719
Tom Green	57,531	104,107	(46,576)	0	2,737	(2,737)	150	85	65	14,382	24,648	(10,266)	0	909	(909)	1,978	1,978	0	74,041	134,464	(60,423)
Upton	6,099	16,285	(10,186)	0	0	0	2,687	2,687	0	1,551	1,024	527	0	0	0	212	212	0	10,549	20,208	(9,659)
Ward	7,733	13,454	(5,721)	7	7	0	156	156	0	3,122	3,522	(400)	4,937	4,937	0	126	126	0	16,081	22,202	(6,121)
Winkler	10,000	10,000	0	0	0	0	1,878	883	995	4,721	2,444	2,277	0	0	0	169	151	18	16,768	13,478	3,290
Total	434,310	567,846	(133,536)	7,559	11,294	(3,735)	36,166	33,795	2,371	124,462	151,280	(26,818)	11,593	22,380	(10,787)	23,086	23,060	26	637,176	809,655	(172,479)

1. County shown is the county where the supply is used. The actual supply may come from a different county.

2. Surplus and need are calculated on a county basis. The surplus and needs for individual water users are included in Appendix 4A.

**Table 4.1-3
Comparison of Currently Available Supply to Projected Demands by County and Category
Year 2060**

County ¹	Irrigation			Manufacturing			Mining			Municipal			Steam Electric Power			Livestock			Total		
	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)	Supply	Demand	Surplus ² (Need)
Andrews	20,299	31,245	(10,946)	0	0	0	2,089	2,036	53	3,400	4,173	(773)	0	0	0	438	438	0	26,226	37,892	(11,666)
Borden	847	2,673	(1,826)	0	0	0	1,014	612	402	174	123	51	0	0	0	281	281	0	2,316	3,689	(1,373)
Brown	9,264	12,105	(2,841)	837	837	0	2,530	2,530	0	7,610	6,932	678	0	0	0	1,636	1,636	0	21,877	24,040	(2,163)
Coke	573	933	(360)	0	0	0	542	614	(72)	619	737	(118)	0	477	(477)	593	593	0	2,327	3,354	(1,027)
Coleman	31	1,379	(1,348)	0	6	(6)	1	19	(18)	1,490	1,766	(276)	0	0	0	1,259	1,259	0	2,781	4,429	(1,648)
Concho	5,265	4,213	1,052	0	0	0	0	0	0	1,089	865	224	0	0	0	775	775	0	7,129	5,853	1,276
Crane	337	337	0	0	0	0	2,208	2,208	0	1,623	1,623	0	0	0	0	155	155	0	4,323	4,323	0
Crockett	535	482	53	0	0	0	459	459	0	2,539	1,949	590	1,500	1,500	0	997	997	0	6,030	5,387	643
Ector	5,204	5,204	0	3,083	3,491	(408)	12,117	11,970	147	29,619	36,725	(7,106)	5,156	17,637	(12,481)	293	293	0	55,472	75,320	(19,848)
Glasscock	24,468	50,190	(25,722)	0	0	0	5	5	0	201	201	0	0	0	0	232	232	0	24,906	50,628	(25,722)
Howard	4,862	4,527	335	1,879	2,099	(220)	1,767	2,052	(285)	6,420	7,140	(720)	0	0	0	366	366	0	15,294	16,184	(890)
Irion	1,501	2,501	(1,000)	0	0	0	122	122	0	222	185	37	0	0	0	460	460	0	2,305	3,268	(963)
Kimble	1,771	807	964	3	1,002	(999)	104	60	44	200	1,104	(904)	0	0	0	668	668	0	2,746	3,641	(895)
Loving	583	572	11	0	0	0	3	2	1	10	10	0	0	0	0	70	70	0	666	654	12
Martin	13,075	13,075	0	47	47	0	705	603	102	396	789	(393)	0	0	0	273	273	0	14,496	14,787	(291)
Mason	16,099	9,363	6,736	0	0	0	6	6	0	956	900	56	0	0	0	1,036	1,036	0	18,097	11,305	6,792
McCulloch	6,103	2,649	3,454	1,233	1,233	0	171	171	0	1,230	2,190	(960)	0	0	0	1,027	1,027	0	9,764	7,270	2,494
Menard	3,620	5,962	(2,342)	0	0	0	0	0	0	384	435	(51)	0	0	0	642	642	0	4,646	7,039	(2,393)
Midland	23,891	39,884	(15,993)	245	245	0	1,046	1,046	0	14,574	37,180	(22,606)	0	0	0	904	904	0	40,660	79,259	(38,599)
Mitchell	5,564	5,398	166	0	0	0	141	104	37	1,639	1,409	230	0	4,140	(4,140)	449	449	0	7,793	11,500	(3,707)
Pecos	82,583	73,475	9,108	3	2	1	286	158	128	7,670	4,980	2,690	0	0	0	1,240	1,239	1	91,782	79,854	11,928
Reagan	25,186	33,579	(8,393)	0	0	0	2,436	2,436	0	1,049	1,049	0	0	0	0	279	272	7	28,950	37,336	(8,386)
Reeves	88,707	98,710	(10,003)	825	825	0	170	170	0	4,731	4,713	18	0	0	0	2,283	2,283	0	96,716	106,701	(9,985)
Runnels	2,973	4,241	(1,268)	0	94	(94)	45	45	0	184	2,319	(2,135)	0	0	0	1,530	1,530	0	4,732	8,229	(3,497)
Schleicher	3,132	1,897	1,235	0	0	0	154	154	0	824	824	0	0	0	0	787	787	0	4,897	3,662	1,235
Scurry	3,400	2,355	1,045	0	0	0	3,947	3,693	254	3,348	3,696	(348)	0	0	0	629	629	0	11,324	10,373	951
Sterling	745	518	227	0	0	0	620	620	0	379	379	0	0	0	0	503	503	0	2,247	2,020	227
Sutton	1,794	1,639	155	0	0	0	86	86	0	2,196	1,499	697	0	0	0	796	796	0	4,872	4,020	852
Tom Green	57,531	103,338	(45,807)	0	3,425	(3,425)	150	99	51	13,567	24,888	(11,321)	0	1,502	(1,502)	1,978	1,978	0	73,226	135,230	(62,004)
Upton	6,081	15,576	(9,495)	0	0	0	2,708	2,708	0	1,553	1,088	465	0	0	0	212	212	0	10,554	19,584	(9,030)
Ward	6,059	12,947	(6,888)	7	7	0	159	159	0	3,069	3,469	(400)	6,189	8,162	(1,973)	126	126	0	15,609	24,870	(9,261)
Winkler	10,000	10,000	0	0	0	0	1,878	847	1,031	4,721	2,292	2,429	0	0	0	169	151	18	16,768	13,290	3,478
Total	432,083	551,774	(119,691)	8,162	13,313	(5,151)	37,669	35,794	1,875	117,686	157,632	(39,946)	12,845	33,418	(20,573)	23,086	23,060	26	631,531	814,991	(183,460)

1. County shown is the county where the supply is used. The actual supply may come from a different county.

2. Surplus and need are calculated on a county basis. The surplus and needs for individual water users are included in Appendix 4A.

Table 4.1-4
Comparison of Supplies and Demands for Wholesale Water Providers
(Values in Acre-Feet per Year)

Wholesale Water Provider	Category	2010	2020	2030	2040	2050	2060
BCWID	Supply	29,712	29,712	29,712	29,712	29,712	29,712
	Demand	15,085	15,209	15,192	15,105	15,097	15,163
	<i>Surplus (Need)</i>	<i>14,627</i>	<i>14,503</i>	<i>14,520</i>	<i>14,607</i>	<i>14,615</i>	<i>14,549</i>
CRMWD	Supply	74,485	67,935	66,585	65,235	63,885	62,535
	Demand	89,212	91,631	73,743	74,129	73,699	74,644
	<i>Surplus (Need)</i>	<i>(14,727)</i>	<i>(23,696)</i>	<i>(7,158)</i>	<i>(8,894)</i>	<i>(9,814)</i>	<i>(12,109)</i>
City of Odessa	Supply	21,606	16,688	24,372	24,503	25,055	25,084
	Demand	26,150	27,480	28,634	29,866	31,285	32,887
	<i>Surplus (Need)</i>	<i>(4,544)</i>	<i>(10,792)</i>	<i>(4,262)</i>	<i>(5,363)</i>	<i>(6,230)</i>	<i>(7,803)</i>
City of San Angelo	Supply	20,116	19,893	19,670	19,446	19,223	19,000
	Demand	50,519	51,643	52,330	52,686	53,053	53,365
	<i>Surplus (Need)</i>	<i>(30,403)</i>	<i>(31,750)</i>	<i>(32,660)</i>	<i>(33,240)</i>	<i>(33,830)</i>	<i>(34,365)</i>
Great Plains Water System	Supply	5,220	5,220	5,220	5,220	5,220	5,220
	Demand	5,220	5,220	5,220	5,220	5,220	5,220
	<i>Surplus (Need)</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
UCRA	Supply	0	0	0	0	0	0
	Demand	3,862	3,743	3,625	3,507	3,388	3,270
	<i>Surplus (Need)</i>	<i>(3,862)</i>	<i>(3,743)</i>	<i>(3,625)</i>	<i>(3,507)</i>	<i>(3,388)</i>	<i>(3,270)</i>
University Lands	Supply	10,593	5,430	5,452	0	0	0
	Demand	10,593	10,630	10,652	5,950	5,960	5,973
	<i>Surplus (Need)</i>	<i>0</i>	<i>(5,200)</i>	<i>(5,200)</i>	<i>(5,950)</i>	<i>(5,960)</i>	<i>(5,973)</i>

Note: The demands on San Angelo include irrigation demands (26,500 ac-ft/year).

4.1.5 Socio-Economic Impacts of Not Meeting Projected Shortages

Based on the above analysis, Region F will face substantial shortages in water supply over the planning period. The TWDB provided technical assistance to regional water planning groups in the development of specific information on the socio-economic impacts of failing to meet projected water needs.¹

The TWDB’s analysis calculated the impacts of a severe drought occurring in a single year at each decadal period in Region F. It was assumed that all of the projected shortage was attributed to drought. Under these assumptions, the TWDB’s findings are shown on Table 4.1-5 and can be summarized as follows:

- With the projected shortages, the region’s projected 2060 population would be reduced by 49,236, which is approximately 7 percent.
- Without any additional supplies, the projected water needs would reduce the region’s projected 2060 employment by 40,877 jobs (18 percent reduction). Most of this reduction occurs in the municipal and manufacturing sectors.
- Without any additional supplies, the projected water needs would reduce the region’s projected annual income and taxes in 2060 by \$3.9 billion. This represents about 19 percent of the region’s current income and business taxes.

**Table 4.1-5
Socio-Economic Impacts in Region F for a Single Year Extreme Drought without
Implementation of Water Management Strategies**

Year	Lost Income (\$ millions)	Lost State and Local Taxes (\$ millions)	Lost Jobs
2010	\$1,444	\$145	19,225
2020	\$1,715	\$176	21,784
2030	\$2,195	\$236	26,293
2040	\$2,729	\$288	34,853
2050	\$3,061	\$330	37,661
2060	\$3,470	\$380	40,877