APPENDIX A

WATER AVAILABILITY MODELING

2021 FINAL PLAN

REGION B

OCTOBER 2020

APPENDIX A

WATER AVAILABILITY MODELING
2021 FINAL PLAN
REGION B

A.1 Yield Calculation Using Extended Hydrology and Evaporation

Due to recent drought conditions within Region B, the Region B Planning Group requested to use extended hydrology for several water supply reservoirs within the region to reflect the impact on water supply availability. In a letter dated June 27, 2018, the Texas Water Development Board approved this request. The reservoirs which were extended include Lakes Arrowhead, Kemp, Kickapoo, Olney/Cooper, and Nocona. The hydrology was extended using USGS gages, existing diversion data and drainage area ratios. The net evaporation which is the evaporation minus precipitation was developed using TWDB Quadrangle data. The yields were calculated using a Microsoft Excel model based on the hydrology from the Red River Water Availability Model (WAM) for the period of record (1948-1998). The extended hydrology includes the period before and after the WAM (1940-1947, 1999-2015). Table A-1 through Table A-10 show the extended hydrology and net evaporation for each lake.

The safe yield for the Kemp-Diversion system, Lakes Arrowhead and Kickapoo were calculated using TWDB approved reservoir specific operation models with a safe yield with a 20 percent reserve capacity. Reservoir specific operation models were also used Olney/Cooper and Nocona. The Region B Planning Group also submitted a request to use extended hydrology and the Lakes Arrowhead and Kickapoo operations model for calculating the yield of Lake Ringgold. In a letter dated August 22, 2019, the Texas Water Development Board approved this request. Table A-11 to Table A-12 show the extended hydrology and net evaporation for Lake Ringgold.

Supplies from Greenbelt Reservoir and Amon Carter Lake were calculated based on the modeling conducted by Region A and Region C respectively and the assumptions utilized for those models can be found in those regions plans.

Table A-1: Extended Inflows - Lake Arrowhead

-Values are in Acre-Feet per Month-

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1940	1	1,411	3	7,273	15,342	17,548	7,581	4,978	0	0	5,982	1,759
1941	76	12,927	499	12,818	44,585	46,492	5,316	10,205	8,168	86,546	23,470	4,650
1942	4	6	82	67,548	411	2,723	14	255	879	15,570	8,217	2,653
1943	61	6	3,577	11,944	2,166	2,891	950	0	0	352	0	369
1944	937	3,945	1,093	269	1,182	4,094	525	797	357	8,744	874	381
1945	646	3,359	20,857	16,942	188	486	17,269	285	5,475	8,707	0	0
1946	25	1,342	879	8	0	0	59	1,173	30,124	3,873	11,666	21,339
1947	0	0	0	4,020	41,169	1,248	4,537	722	1,156	4,438	2,137	3,697
1948	706	1,619	766	0	634	15,501	3,287	1,326	183	126	334	440
1949	2,612	4,008	1,930	0	20,281	20,768	971	1,986	7,763	6,488	225	629
1950	1,019	0	0	5,707	28,717	4,252	50,646	85,974	12,909	0	0	0
1951	0	0	326	0	11,814	4,436	491	0	3,414	713	0	0
1952	406	0	0	48	4,800	268	1,599	2,921	965	453	2	356
1953	0	0	3,126	232	1,263	0	4,595	2,112	292	48,717	2,966	455
1954	69	112	0	4,473	39,547	11,128	0	0	0	0	0	0
1955	531	1,556	998	2,514	16,118	23,196	704	0	26,455	19,840	0	0
1956	0	0	0	0	7,929	1,231	78	0	0	3,656	1,036	839
1957	0	2,268	4,191	40,176	110,316	21,795	790	0	0	7,078	30,354	0
1958	0	0	501	1,175	13,691	100	7,825	984	1,233	0	0	0
1959	0	0	0	0	1,060	14,993	1,692	0	1,111	18,283	0	4,055
1960	1,818	4,618	353	0	1,512	962	208	0	0	12,005	0	3,385
1961	151	1,270	4,379	0	4,637	3,895	1,546	0	5,022	87	3,427	643
1962	0	0	181	1,795	2,822	20,394	2,285	0	31,191	7,706	12,216	17,470
1963	0	0	0	3,019	1,203	2,781	0	0	340	363	1,582	0
1964	492	3,014	1,240	1,247	3,427	6,286	0	1,081	14,839	429	4,196	478
1965	659	688	0	2,301	9,037	4,812	0	2,469	1,465	3,356	355	422
1966	0	0	930	30,725	29,543	0	3,477	10,956	25,938	2,323	161	0
1967	249	195	149	6,317	86	7,628	1,811	0	3,492	0	408	273
1968	12,421	233	15,132	5,344	14,122	3,180	4,321	725	0	0	1,847	860
1969	413	4,851	19,046	2,223	31,282	2,230	366	659	13,727	0	371	2,562
1970	2,953	1,219	11,205	3,355	5,118	3,131	0	0	0	0	0	0
1971	0	0	0	1,011	0	269	722	13,093	5,902	4,595	0	6,858
1972	0	1,004	616	3,474	34,411	2,244	836	0	0	7,386	13,707	793
1973	8,551	2,701	7,807	8,907	0	3,013	5,573	3,234	1,273	1,423	5,867	0
1974	0	1,311	1,556	374	2,838	4,637	0	0	22,637	3,725	8,178	268
1975	1,432	2,191	837	1,930	47,909	16,564	8,449	2,442	5,041	1,087	0	0
1976	0	0	0	0	2,675	3,430	0	394	11,926	9,428	5,203	0
1977	0	1,967	6,598	7,454	5,973	1,624	0	755	0	0	0	0

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1978	0	0	759	720	211	1,592	625	5,699	0	0	0	0
1979	0	0	2,679	870	4,776	2,985	1,121	3,777	1,277	0	0	0
1980	0	0	715	128	3,797	1,575	0	0	23,155	10,400	1,714	4,160
1981	642	3,649	19,100	2,319	0	4,806	0	0	1,327	103,940	0	0
1982	0	0	1,350	0	90,738	41,011	3,344	440	0	700	0	0
1983	0	3,484	1,006	4,451	0	3,781	0	602	0	9,268	0	0
1984	0	0	3,371	1,401	0	0	0	0	0	13,994	2,218	18,770
1985	8,638	15,588	32,445	35,516	5,301	29,865	424	863	0	1,698	0	0
1986	0	1,040	2,792	1,526	4,921	21,217	1,107	887	41,027	3,476	6,334	2,349
1987	4,007	11,603	16,060	1,772	14,544	5,116	0	489	0	550	0	18,048
1988	130	419	2,091	1,888	0	373	0	0	951	0	0	0
1989	0	2,104	1,267	436	56,446	35,517	226	2,684	26,587	1,991	0	0
1990	3,446	5,048	36,242	80,990	67,362	16,911	1,388	3,245	0	0	0	0
1991	404	1,129	1,498	437	6,252	7,057	1,746	2,268	7,673	5,545	743	47,412
1992	10,423	11,587	9,446	344	10,628	58,162	21,056	0	0	69	4,296	2,345
1993	1,810	10,565	14,451	1,490	32,693	14,157	4,426	1,005	2,715	0	0	4,131
1994	0	0	2,642	201	9,721	3,243	2,323	5,430	0	13,141	2,396	2,460
1995	152	0	1,977	2,215	31,882	18,048	0	7,307	0	667	0	0
1996	604	872	2,240	0	0	1,038	0	358	4,799	0	3,893	1,862
1997	1,062	16,930	540	3,089	26,830	3,225	0	0	0	0	0	0
1998	3,154	4,339	26,084	2,667	860	1,906	1,490	2,412	1,137	0	1,860	0
1999	3,151	0	8,885	1,351	2,621	2,404	0	0	0	0	0	0
2000	1,427	494	1,724	1,041	261	202	646	0	0	0	18,499	1,283
2001	5,537	40,651	34,431	2,017	4,007	665	865	275	0	0	0	0
2002	0	1,577	1,820	17,195	0	12,788	3,327	0	0	604	1,548	1,186
2003	847	0	1,461	904	3,456	2,720	742	152	0	0	0	0
2004	0	2,341	2,945	0	0	316	31,222	6,792	1,817	6,502	29,581	979
2005	6,046	2,308	352	707	142	4,198	16,713	31,503	1,461	16,494	1,262	403
2006	1,942	581	1,491	811	1,023	0	0	2,032	4,400	542	3,234	1,528
2007	2,355	1,455	4,172	5,815	12,512	42,239	15,136	1,252	0	0	0	0
2008	0	0	3,735	2,414	0	0	177	1,154	328	0	0	0
2009	581	649	1,731	10,553	16,823	545	3,531	524	2,490	711	120	1,689
2010	7,922	7,037	5,164	31,567	36,451	0	2,556	0	1,942	1,122	0	264
2011	0	1,224	825	978	1,111	0	0	1,750	390	5,820	2,279	995
2012	6,384	0	2,545	2,444	0	944	674	1,100	2,308	3,057	463	0
2013	391	1,510	1,100	2,780	1,460	0	1,017	860	983	256	0	0
2014	0	0	0	937	532	0	5,387	0	88	665	2,216	0
2015	727	40	3,017	1,562	168,544	41,362	752	2,430	507	0	18,129	17,984

Table A-2: Extended Net Evaporation Rate - Lake Arrowhead

-Values are in Feet per Month -

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1940	0.14	0.05	0.46	0.24	0.32	0.23	0.83	0.50	0.54	0.46	-0.10	-0.07
1941	0.04	-0.09	0.16	-0.06	0.09	-0.01	0.55	0.42	0.42	-0.20	0.26	0.14
1942	0.16	0.21	0.31	-0.14	0.43	0.42	0.78	0.61	0.35	0.00	0.35	0.02
1943	0.19	0.27	0.10	0.27	0.22	0.40	0.88	1.03	0.63	0.45	0.31	-0.07
1944	-0.03	-0.10	0.20	0.29	0.26	0.61	0.72	0.76	0.59	0.20	0.05	0.02
1945	0.05	-0.04	-0.02	0.05	0.56	0.47	0.38	0.74	0.53	0.30	0.35	0.21
1946	-0.06	0.14	0.18	0.33	0.31	0.58	1.00	0.84	0.26	0.34	0.01	-0.05
1947	0.10	0.19	0.11	0.01	0.05	0.65	0.86	1.01	0.87	0.43	0.10	0.02
1948	0.15	-0.07	0.19	0.43	0.14	0.40	0.78	0.90	0.91	0.47	0.43	0.25
1949	-0.15	-0.03	0.15	0.23	-0.09	0.48	0.83	0.66	0.31	0.15	0.35	0.11
1950	0.07	0.15	0.45	0.18	0.00	0.44	-0.01	0.53	0.25	0.58	0.45	0.22
1951	0.19	0.07	0.28	0.28	0.07	0.13	0.73	0.88	0.61	0.42	0.19	0.26
1952	0.18	0.22	0.24	0.17	0.21	0.77	0.80	1.36	1.00	0.82	0.15	0.15
1953	0.17	0.20	0.17	0.29	0.41	0.95	0.69	0.64	0.80	0.17	0.21	0.25
1954	0.05	0.28	0.34	-0.05	-0.08	0.45	0.64	0.70	0.59	0.30	0.17	0.06
1955	0.01	0.08	0.15	0.36	0.08	0.18	0.60	0.59	-0.04	0.36	0.26	0.15
1956	0.06	0.07	0.39	0.40	0.21	0.67	0.76	0.80	0.74	0.18	0.19	0.05
1957	0.04	-0.11	0.05	-0.18	-0.25	0.24	0.53	0.59	0.24	-0.02	-0.25	0.11
1958	-0.01	0.08	-0.04	0.03	0.14	0.40	0.34	0.47	0.18	0.23	0.16	0.06
1959	0.09	0.12	0.31	0.29	0.07	-0.15	0.23	0.45	0.35	-0.20	0.18	-0.07
1960	-0.03	0.03	0.12	0.24	0.16	0.41	0.24	0.43	0.11	-0.07	0.28	-0.10
1961	0.00	0.00	0.04	0.35	0.25	0.07	0.25	0.42	-0.01	0.20	-0.08	0.03
1962	0.12	0.15	0.16	0.03	0.35	-0.12	0.11	0.37	-0.39	0.12	-0.04	0.03
1963	0.09	0.07	0.15	0.08	0.03	0.22	0.34	0.32	0.14	0.16	-0.02	0.04
1964	0.03	0.02	0.28	0.32	-0.02	0.57	0.84	0.42	0.06	0.35	-0.10	0.15
1965	0.03	0.08	0.21	0.22	-0.04	0.43	0.89	0.46	0.28	0.14	0.31	0.24
1966	0.01	0.04	0.34	-0.14	0.40	0.58	0.70	0.07	-0.16	0.41	0.36	0.14
1967	0.24	0.24	0.40	0.15	0.14	0.55	0.51	0.73	-0.03	0.37	0.17	0.05
1968	-0.29	0.02	0.02	0.23	0.05	0.38	0.22	0.57	0.35	0.28	-0.06	0.14
1969	0.12	-0.03	-0.01	0.20	0.09	0.41	0.72	0.36	-0.08	0.07	0.18	-0.08
1970	0.16	0.01	0.03	0.07	0.38	0.58	0.74	0.60	0.20	0.22	0.33	0.24
1971	0.22	0.17	0.46	0.51	0.40	0.58	0.59	-0.03	0.03	0.05	0.18	-0.11
1972	0.14	0.18	0.43	0.28	0.21	0.42	0.61	0.43	0.24	-0.12	0.12	0.16
1973	-0.11	0.04	0.14	0.08	0.33	0.30	0.30	0.60	-0.07	0.07	0.17	0.23
1974	0.14	0.20	0.32	0.24	0.36	0.57	0.63	0.28	-0.25	-0.03	0.16	0.05
1975	0.10	-0.01	0.18	0.24	-0.33	0.34	0.19	0.37	0.18	0.46	0.17	0.11
1976	0.23	0.38	0.36	0.09	0.11	0.42	0.36	0.54	-0.15	-0.14	0.17	0.11
1977	-0.05	0.18	0.28	0.17	0.08	0.43	0.64	0.35	0.51	0.36	0.22	0.29

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1978	0.07	-0.05	0.18	0.41	0.19	0.45	0.83	0.21	0.33	0.28	-0.04	0.19
1979	-0.03	0.08	0.12	0.17	0.09	0.28	0.38	0.31	0.48	0.43	0.18	-0.01
1980	0.07	0.10	0.31	0.42	-0.22	0.67	0.93	0.78	-0.07	0.30	0.11	0.04
1981	0.18	0.03	0.14	0.14	0.10	0.18	0.62	0.48	0.34	-0.17	0.18	0.16
1982	0.13	0.09	0.18	0.24	-0.41	0.04	0.49	0.58	0.37	0.29	0.04	-0.01
1983	0.04	0.03	0.07	0.26	0.04	0.15	0.62	0.64	0.63	0.10	0.14	0.06
1984	0.19	0.20	0.19	0.50	0.37	0.57	0.71	0.50	0.41	-0.22	0.06	-0.15
1985	0.12	-0.05	0.03	0.17	0.26	0.22	0.57	0.66	0.38	-0.03	0.11	0.15
1986	0.28	0.10	0.32	0.17	-0.05	0.09	0.67	0.50	0.16	-0.16	-0.01	-0.01
1987	0.05	-0.13	0.30	0.41	-0.09	0.24	0.55	0.43	0.23	0.45	0.16	-0.20
1988	0.09	0.18	0.21	0.23	0.47	0.25	0.44	0.58	0.04	0.33	0.25	0.14
1989	0.07	-0.10	0.17	0.44	-0.16	0.15	0.54	0.29	0.10	0.39	0.32	0.22
1990	0.04	-0.15	-0.02	0.05	0.28	0.62	0.40	0.43	0.12	0.36	-0.01	0.07
1991	-0.09	0.23	0.33	0.41	0.26	0.29	0.73	0.41	0.22	0.20	0.26	0.02
1992	0.01	0.07	0.19	0.30	0.08	0.23	0.51	0.46	0.34	0.44	-0.04	0.04
1993	0.05	0.00	0.19	0.23	0.35	0.43	1.02	0.72	0.34	0.18	0.28	0.02
1994	0.09	-0.06	0.26	0.17	0.12	0.74	0.59	0.81	0.35	-0.25	0.12	0.08
1995	0.00	0.00	0.07	0.26	-0.03	0.25	0.45	0.29	0.17	0.49	0.30	0.17
1996	0.18	0.32	0.21	0.43	0.59	0.34	0.55	0.12	-0.09	0.21	-0.32	0.18
1997	0.21	0.01	0.34	0.01	0.14	0.25	0.58	0.38	0.49	0.23	0.19	-0.27
1998	-0.05	0.02	0.28	0.38	0.46	0.64	0.78	0.66	0.62	0.21	0.12	0.04
1999	-0.05	0.12	-0.20	0.21	0.06	0.20	0.59	0.70	0.57	0.21	0.29	0.26
2000	0.40	0.16	0.27	0.15	0.41	0.19	0.61	0.77	0.33	-0.26	-0.34	0.12
2001	-0.05	-0.03	0.08	0.35	0.22	0.71	0.90	0.61	0.34	0.32	0.19	0.13
2002	0.15	0.16	0.09	0.06	0.25	0.21	0.20	0.68	0.39	-0.15	0.21	-0.01
2003	0.19	0.08	0.29	0.43	0.18	-0.05	0.77	0.50	0.19	0.44	0.15	0.26
2004	0.09	-0.12	0.21	0.13	0.32	-0.14	0.24	0.32	0.48	0.06	-0.32	0.13
2005	0.06	0.04	0.28	0.46	0.24	0.49	0.44	-0.02	0.48	0.06	0.38	0.24
2006	0.31	0.14	0.22	0.34	0.27	0.63	0.82	0.69	0.32	0.13	0.19	0.06
2007	0.01	0.21	-0.02	0.19	-0.23	-0.22	0.30	0.59	0.13	0.48	0.25	0.09
2008	0.25	0.19	0.06	0.28	0.28	0.47	0.72	0.25	0.23	0.22	0.30	0.23
2009	0.22	0.31	0.38	0.12	0.26	0.42	0.33	0.71	0.04	-0.10	0.26	0.01
2010	-0.04	0.01	0.22	0.03	0.21	0.38	0.27	0.69	0.06	0.35	0.35	0.14
2011	0.13	0.11	0.43	0.61	0.48	0.66	1.07	1.07	0.63	0.19	0.19	0.03
2012	-0.18	0.09	0.12	0.46	0.46	0.57	0.82	0.49	0.34	0.31	0.36	0.13
2013	0.18	0.13	0.37	0.29	0.46	0.56	0.49	0.60	0.41	0.28	0.18	0.00
2014	0.19	0.10	0.30	0.38	0.44	0.31	0.30	0.54	0.40	0.41	-0.02	0.07
2015	0.06	0.05	0.17	0.09	-0.41	0.24	0.51	0.65	0.59	-0.02	0.01	0.10

Table A-3: Extended Inflows - Lake Kemp

-Values are in Acre-Feet per Month-

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1940	0	2,980	0	8,000	14,400	12,400	3,430	39,200	9,610	4,060	36,700	2,960
1941	4,520	14,350	3,900	29,000	241,000	119,200	17,800	31,800	8,050	116,000	10,700	12,100
1942	4,650	5,900	1,750	48,000	16,900	5,920	1,110	8,120	17,600	40,000	3,130	7,520
1943	930	0	6,950	15,500	19,600	21,800	0	0	0	0	0	1,550
1944	5,980	10,500	6,650	860	3,970	20,650	4,960	0	1,510	16,200	7,800	4,740
1945	6,650	1,790	10,600	7,750	1,400	7,100	48,400	22,150	36,600	14,720	0	0
1946	330	2,710	0	0	7,470	9,500	37,400	32,000	71,500	8,210	11,300	22,000
1947	3,960	0	3,000	4,950	165,500	36,000	3,970	26,000	0	0	7,690	15,000
1948	1,091	10,739	9,662	12,336	25,262	46,631	52,150	23,702	10,509	14,876	4,476	1,951
1949	1,830	7,974	13,786	4,834	37,636	44,117	33,679	32,691	37,098	19,036	20,835	31,737
1950	23,261	4,850	9,953	24,257	50,386	22,405	52,565	160,536	100,386	40,127	168	3,237
1951	1,553	13,865	3,166	8,320	51,965	21,364	8,867	15,409	18,635	3,858	4,733	2,823
1952	9,330	5,589	3,571	7,755	25,595	7,945	16,088	13,377	7,468	2,072	1,214	4,696
1953	2,759	4,593	4,721	4,689	4,084	4,554	22,627	38,018	3,612	86,956	6,688	1,592
1954	1,613	2,311	5,609	14,867	158,280	57,906	9,040	8,548	0	2,385	2,290	5,924
1955	1,540	3,283	10,430	6,705	56,396	35,389	11,319	12,864	31,548	169,851	4,031	1,943
1956	1,409	3,605	2,483	13,132	9,334	4,303	15,551	11,052	6,164	8,236	60	3,180
1957	0	3,745	3,605	63,282	212,138	64,042	15,481	3,666	0	12,379	23,458	942
1958	0	1,462	3,386	47,172	44,867	5,714	19,602	6,139	3,687	5,691	2,086	0
1959	6,299	3,812	0	8,300	16,957	40,093	14,589	31,690	9,980	52,818	3,783	15,517
1960	2,896	2,727	2,987	2,344	20,890	27,436	30,701	9,178	2,561	104,236	5,426	12,699
1961	3,106	3,484	27,283	6,147	37,463	6,858	26,452	7,025	10,257	3,355	10,958	2,013
1962	2,127	1,147	8,793	9,462	5,015	47,274	7,081	2,909	54,809	10,424	10,531	3,420
1963	1,350	1,286	2,829	4,400	16,647	34,180	5,929	5,371	4,429	4,496	7,614	967
1964	1,513	9,173	4,328	3,456	10,485	28,964	4,731	285	49,958	4,903	14,605	1,481
1965	2,728	896	1,800	16,035	11,578	11,369	1,583	25,415	64,943	63,957	7,172	6,252
1966	2,799	3,535	6,038	19,460	8,127	25,334	14,203	101,412	82,620	12,251	3,015	2,179
1967	2,461	1,267	4,774	64,964	14,037	55,203	61,542	7,441	14,645	7,387	1,108	1,594
1968	29,916	13,082	40,582	14,583	10,100	20,926	19,398	7,683	2,686	1,846	6,221	1,639
1969	3,479	6,338	8,247	4,984	32,020	19,266	3,135	10,114	55,858	29,638	8,168	4,043
1970	2,876	4,209	31,832	8,380	9,261	12,446	12,999	2,070	8,051	3,612	1,338	1,475
1971	1,047	727	555	1,504	23,033	12,700	2,354	14,664	19,202	25,649	3,703	7,802
1972	2,180	3,546	2,454	30,357	54,951	25,299	7,835	15,833	40,836	46,474	22,932	2,544
1973	14,742	5,138	36,601	28,819	6,289	2,496	9,784	5,115	23,111	2,693	3,597	1,360
1974	2,722	3,166	7,832	18,397	14,990	29,830	1,301	2,824	33,020	14,967	4,243	2,463
1975	8,164	7,322	5,889	9,897	41,770	20,621	39,877	17,289	19,753	4,044	8,365	5,272
1976	2,978	4,354	4,670	16,497	11,371	4,972	4,389	7,730	11,361	34,688	3,752	2,007
1977	2,301	5,427	3,871	17,498	48,484	8,157	3,815	6,546	1,832	1,824	1,037	1,092

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1978	1,549	3,880	4,456	3,072	10,015	17,632	7,041	33,150	19,877	3,216	3,574	1,705
1979	4,552	3,168	10,737	4,384	17,618	19,797	10,419	20,163	3,144	1,644	6,028	3,510
1980	2,975	4,990	3,031	4,993	52,189	8,532	5,363	4,295	17,008	2,278	2,585	5,894
1981	1,649	10,684	6,949	11,048	19,501	52,260	1,339	5,353	5,088	11,466	1,635	1,784
1982	2,557	3,701	7,105	3,709	71,772	61,993	7,844	4,900	3,205	1,216	1,567	2,673
1983	6,713	5,015	6,460	7,888	10,545	12,159	2,894	416	478	147,250	17,200	4,975
1984	6,365	7,018	7,291	5,521	5,928	3,836	1,626	4,946	4,917	7,772	8,860	18,191
1985	12,800	15,163	18,542	12,399	10,772	34,692	3,451	3,031	2,895	47,750	4,162	2,543
1986	4,612	3,381	3,627	8,216	16,544	26,656	22,946	22,695	62,303	96,524	31,673	8,955
1987	12,716	26,615	26,941	11,051	93,471	48,051	21,248	6,584	5,088	9,969	2,357	3,804
1988	8,267	4,187	8,810	4,861	2,855	3,199	9,568	2,533	31,750	1,932	2,135	2,134
1989	1,043	6,123	5,314	3,370	73,624	46,517	2,640	13,867	66,251	4,824	1,833	2,672
1990	7,358	10,559	36,868	71,126	41,628	81,907	21,891	8,560	7,654	2,550	7,711	2,351
1991	10,470	4,541	3,506	5,077	20,515	69,951	6,819	9,643	38,501	13,814	4,117	29,764
1992	23,537	55,414	22,719	20,601	15,233	124,280	19,988	9,094	4,958	2,727	12,152	10,638
1993	5,201	35,015	30,765	18,003	26,267	18,827	7,062	5,992	5,555	2,946	2,344	6,722
1994	2,621	12,133	8,515	3,473	42,885	5,044	6,805	1,594	10,848	25,590	24,138	4,537
1995	3,773	2,796	5,618	7,509	61,452	101,632	17,689	115,146	20,101	14,676	4,734	3,435
1996	4,448	6,255	6,827	4,766	2,761	9,309	2,955	15,174	44,872	5,054	6,128	4,612
1997	4,524	27,654	7,978	46,690	50,418	13,487	8,385	23,651	11,057	10,558	3,277	10,521
1998	10,829	25,042	35,631	9,381	9,238	9,047	2,079	1,730	1,160	2,480	4,654	1,605
1999	9,716	2,894	13,187	10,047	35,681	20,521	7,818	0	0	0	0	0
2000	0	676	27,418	5,862	0	10,030	3,169	618	0	12,098	25,636	1,949
2001	5,597	12,741	26,768	3,806	11,113	21	0	2,472	4,026	2,151	17,153	3,893
2002	1,343	1,113	6,109	20,794	9,703	15,189	43,178	10,692	5,400	14,121	5,413	8,776
2003	3,078	950	2,325	8,928	3,777	7,702	4,022	3,947	3,716	0	0	0
2004	2,689	3,954	15,156	2,130	0	15,612	18,448	17,731	2,589	6,597	35,393	3,267
2005	2,014	4,241	3,573	2,786	3,909	2,632	5,086	32,186	26,560	5,961	885	1,011
2006	2,420	2,026	4,423	5,665	7,545	11,502	5,046	0	2,701	39,114	4,645	2,705
2007	5,043	3,027	4,709	2,562	6,933	43,484	13,895	17,681	1,582	0	0	0
2008	367	2,013	4,214	14,699	6,236	8,206	3,628	1,720	2,983	4,736	0	0
2009	34	1,125	66	1,733	16,609	22,572	0	577	7,849	8,878	2,121	3,625
2010	9,921	11,321	9,166	39,540	19,263	3,201	39,881	384	16,011	4,877	1,073	1,616
2011	0	351	3,354	3,400	1,647	0	1,621	0	0	149	751	1,117
2012	259	534	1,592	694	1,833	8,914	0	247	3,178	927	50	0
2013	0	2,077	0	2,434	813	11,081	11,876	0	3,654	1,761	0	0
2014	0	657	922	1,074	6,242	11,292	10,630	2,925	1,221	763	4,576	143
2015	1,181	829	2,427	4,264	86,445	40,209						

Table A-4: Extended Net Evaporation Rate - Lake Kemp

-Values are in Feet per Month-

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1940	0.15	0.07	0.48	0.29	0.34	0.29	0.89	0.51	0.65	0.50	0.06	0.06
1941	0.10	-0.08	0.18	-0.03	-0.15	0.09	0.55	0.53	0.43	-0.35	0.25	0.13
1942	0.18	0.24	0.36	-0.18	0.48	0.54	0.76	0.61	0.35	0.04	0.14	0.02
1943	0.20	0.31	0.17	0.30	0.26	0.44	0.81	1.05	0.65	0.50	0.31	-0.05
1944	0.00	-0.06	0.23	0.36	0.32	0.59	0.66	0.76	0.60	0.21	0.11	0.04
1945	0.04	0.01	0.06	0.14	0.62	0.46	0.41	0.68	0.55	0.29	0.37	0.23
1946	-0.12	0.16	0.28	0.46	0.36	0.56	1.01	0.89	0.27	0.38	0.13	-0.02
1947	0.14	0.20	0.14	0.12	-0.09	0.64	0.90	0.94	0.85	0.49	0.12	0.07
1948	0.06	0.04	0.30	0.75	0.35	0.62	0.82	0.93	0.79	0.36	0.41	0.36
1949	-0.15	-0.09	0.36	0.45	-0.36	0.52	1.01	0.60	0.18	0.24	0.37	0.15
1950	0.20	0.02	0.78	0.54	0.12	0.51	0.13	0.12	0.09	0.54	0.39	0.12
1951	0.11	0.04	0.31	0.67	0.38	0.49	0.92	0.74	0.52	0.42	0.18	0.12
1952	0.09	0.15	0.41	0.45	0.49	1.04	0.81	1.00	0.75	0.68	0.17	0.02
1953	0.17	0.17	0.26	0.54	0.72	0.94	0.70	0.41	0.81	-0.07	0.12	0.17
1954	0.13	0.36	0.47	-0.01	-0.07	0.73	0.99	1.01	0.80	0.46	0.24	0.14
1955	0.03	0.17	0.11	0.61	0.34	0.24	0.70	0.77	-0.13	0.29	0.30	0.17
1956	0.09	0.13	0.47	0.63	0.46	0.93	1.06	1.16	0.92	0.37	0.29	0.15
1957	0.10	0.02	0.09	-0.20	-0.16	0.35	0.70	0.65	0.37	-0.05	-0.30	0.15
1958	-0.06	0.06	0.01	0.16	0.18	0.54	0.26	0.58	0.25	0.26	0.21	0.13
1959	0.13	0.18	0.39	0.33	0.14	0.09	0.35	0.56	0.44	-0.01	0.16	-0.05
1960	-0.02	0.10	0.22	0.41	0.27	0.56	0.34	0.55	0.26	-0.13	0.29	-0.11
1961	0.12	0.01	0.06	0.44	0.38	0.17	0.26	0.55	0.05	0.30	-0.02	0.06
1962	0.13	0.25	0.33	0.11	0.73	0.04	0.45	0.44	-0.27	0.15	-0.03	0.06
1963	0.10	0.12	0.23	0.33	0.13	0.36	0.54	0.39	-0.10	0.29	0.06	0.11
1964	0.24	0.09	0.51	0.67	0.62	0.88	1.19	0.85	0.09	0.38	-0.02	0.21
1965	0.09	0.15	0.35	0.51	0.41	0.81	1.22	0.85	0.69	0.14	0.39	0.33
1966	0.06	0.10	0.57	0.23	0.69	0.91	0.93	0.32	0.13	0.48	0.31	0.20
1967	0.26	0.28	0.55	0.15	0.53	0.66	0.57	0.86	0.35	0.51	0.16	0.09
1968	-0.21	0.06	0.18	0.34	0.28	0.62	0.45	0.76	0.57	0.23	-0.02	0.19
1969	0.22	0.05	0.19	0.46	0.24	0.65	1.00	0.57	0.02	0.06	0.21	0.07
1970	0.16	0.16	0.09	0.27	0.65	0.95	1.06	0.88	0.36	0.23	0.37	0.30
1971	0.29	0.29	0.64	0.57	0.63	0.84	0.92	0.19	0.10	0.08	0.23	-0.01
1972	0.19	0.32	0.59	0.48	0.44	0.69	0.84	0.69	0.33	-0.11	0.06	0.23
1973	-0.06	0.15	0.27	0.22	0.61	0.60	0.56	0.68	0.00	0.26	0.25	0.27
1974	0.20	0.38	0.49	0.38	0.55	0.60	0.85	0.51	-0.05	0.18	0.21	0.11
1975	0.12	0.09	0.39	0.44	0.02	0.50	0.27	0.68	0.21	0.50	0.21	0.10
1976	0.25	0.38	0.40	0.21	0.40	0.81	0.64	0.83	0.13	-0.15	0.26	0.22
1977	-0.03	0.25	0.45	0.20	0.27	0.76	0.82	0.29	0.68	0.37	0.27	0.28

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1978	0.06	-0.07	0.43	0.66	0.58	0.94	1.14	0.23	0.35	0.40	0.12	0.18
1979	0.16	0.15	0.19	0.40	0.45	0.53	0.76	0.44	0.54	0.69	0.09	0.07
1980	0.12	0.29	0.47	0.55	0.33	0.94	1.35	1.07	0.21	0.51	0.15	0.11
1981	0.19	-0.06	0.28	0.34	0.37	0.52	1.05	0.72	0.69	-0.02	0.23	0.22
1982	0.15	0.25	0.32	0.48	-0.12	0.10	0.77	0.78	0.61	0.49	0.09	0.11
1983	0.06	0.13	0.19	0.36	0.37	0.30	0.94	0.88	0.61	-0.06	0.15	0.14
1984	0.15	0.29	0.25	0.61	0.74	0.76	0.84	0.55	0.73	0.06	0.09	-0.16
1985	0.12	-0.07	0.11	0.41	0.56	0.46	0.81	0.89	0.64	0.05	0.18	0.14
1986	0.29	0.18	0.31	0.50	0.28	0.16	0.99	0.75	-0.27	-0.14	-0.03	0.08
1987	0.08	0.02	0.26	0.52	0.23	0.52	0.82	0.56	0.41	0.50	0.28	-0.05
1988	0.15	0.25	0.42	0.49	0.83	0.38	0.66	0.85	0.09	0.40	0.30	0.14
1989	0.12	-0.01	0.41	0.69	0.31	0.26	0.74	0.46	0.15	0.53	0.37	0.32
1990	0.10	0.00	0.15	0.05	0.46	0.78	0.67	0.50	0.33	0.42	0.09	0.20
1991	-0.01	0.29	0.54	0.64	0.28	0.34	0.60	0.37	-0.02	0.29	0.20	-0.19
1992	0.00	0.12	0.21	0.34	0.29	-0.06	0.69	0.57	0.41	0.47	-0.15	0.04
1993	0.08	-0.06	0.24	0.49	0.35	0.60	1.13	0.85	0.41	0.14	0.21	0.09
1994	0.21	0.07	0.35	0.58	0.06	0.81	0.75	0.77	0.39	0.06	0.10	0.07
1995	0.19	0.26	0.24	0.45	0.00	0.36	0.74	0.30	0.17	0.60	0.23	0.18
1996	0.22	0.44	0.49	0.76	1.00	0.64	0.92	0.20	-0.04	0.40	-0.01	0.28
1997	0.32	-0.04	0.46	0.15	0.32	0.25	0.99	0.46	0.63	0.29	0.15	-0.01
1998	0.11	0.00	0.17	0.52	0.74	0.88	1.05	0.79	0.61	0.26	0.00	0.12
1999	-0.01	0.18	-0.05	0.24	0.04	0.20	0.67	0.64	0.43	0.25	0.27	0.14
2000	0.24	0.14	0.13	0.24	0.41	0.09	0.56	0.67	0.58	-0.17	-0.06	0.08
2001	-0.03	-0.06	0.04	0.38	0.11	0.69	0.92	0.54	0.30	0.42	0.12	0.17
2002	0.15	0.17	0.18	0.08	0.30	0.31	0.27	0.65	0.41	-0.13	0.23	0.02
2003	0.19	0.11	0.29	0.39	0.25	-0.02	0.79	0.52	0.31	0.45	0.19	0.26
2004	0.06	-0.02	0.18	0.14	0.42	-0.02	0.30	0.32	0.48	0.03	-0.35	0.16
2005	0.05	0.06	0.28	0.45	0.19	0.47	0.42	0.07	0.43	0.15	0.41	0.27
2006	0.38	0.24	0.25	0.38	0.29	0.63	0.77	0.63	0.29	0.08	0.27	0.05
2007	0.05	0.25	-0.03	0.18	-0.18	-0.16	0.38	0.43	0.29	0.48	0.28	0.13
2008	0.23	0.19	0.23	0.34	0.27	0.55	0.70	0.32	0.27	0.22	0.31	0.25
2009	0.22	0.32	0.42	0.17	0.15	0.39	0.42	0.72	0.06	-0.02	0.31	0.05
2010	-0.03	0.06	0.25	0.17	0.17	0.44	0.10	0.67	0.14	0.34	0.38	0.28
2011	0.23	0.25	0.43	0.62	0.48	0.88	1.04	1.03	0.62	0.25	0.25	0.02
2012	0.09	0.17	0.18	0.38	0.40	0.51	0.81	0.58	0.33	0.37	0.39	0.19
2013	0.19	0.11	0.45	0.27	0.44	0.53	0.40	0.61	0.43	0.33	0.28	0.07
2014	0.26	0.14	0.32	0.43	0.34	0.25	0.34	0.56	0.37	0.43	0.06	0.10
2015	0.09	0.16	0.17	0.17	-0.71	0.23						

Table A-5: Extended Inflows - Lake Kickapoo

-Values are in Acre-Feet per Month-

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1940	1	812	2	4,185	8,827	10,097	4,362	2,864	0	0	3,442	1,012
1941	43	7,438	287	7,375	25,653	26,751	3,059	5,872	4,700	49,797	13,504	2,676
1942	2	3	47	38,866	237	1,567	8	147	506	8,959	4,728	1,527
1943	35	3	2,058	6,872	1,246	1,664	547	0	0	202	0	212
1944	539	2,270	629	155	680	2,356	302	459	205	5,031	503	219
1945	372	1,932	12,001	9,748	108	280	9,937	164	3,150	5,010	0	0
1946	14	772	506	5	0	0	34	675	17,333	2,229	6,713	12,278
1947	0	0	0	2,313	23,688	718	2,610	416	665	2,553	1,230	2,127
1948	406	931	441	0	365	8,919	1,891	763	105	73	192	253
1949	1,503	2,306	1,110	0	11,669	11,950	559	1,143	4,467	3,733	129	362
1950	587	0	0	3,284	16,523	2,446	29,141	49,468	7,428	0	0	0
1951	0	0	188	0	6,798	2,552	282	0	1,964	410	0	0
1952	234	0	0	27	2,762	154	920	1,681	555	604	99	726
1953	0	0	3,071	460	1,209	0	4,859	2,582	456	27,949	1,481	353
1954	93	149	0	3,838	19,805	6,182	0	0	0	0	0	0
1955	0	1,078	1,046	2,131	12,002	19,978	211	0	28,316	8,153	0	0
1956	0	0	0	0	4,562	708	45	0	0	2,104	596	483
1957	0	1,305	2,411	23,116	63,474	12,541	454	0	0	4,073	17,465	0
1958	0	0	288	676	7,878	58	4,503	566	710	0	0	0
1959	0	0	0	0	610	8,627	974	0	639	10,520	0	2,333
1960	1,046	2,657	203	0	870	554	120	0	0	6,907	0	1,948
1961	87	731	2,520	0	2,668	2,241	889	0	2,890	50	1,972	370
1962	0	0	104	1,033	1,624	11,735	1,315	0	17,947	4,434	7,029	10,052
1963	0	0	0	1,737	692	1,600	0	0	195	209	910	0
1964	283	1,734	714	717	1,972	3,617	0	622	8,538	247	2,414	275
1965	379	396	0	1,324	5,200	2,769	0	1,421	843	1,931	204	243
1966	0	0	535	17,679	16,998	0	2,001	6,304	14,281	182	218	0
1967	332	261	200	3,787	551	2,745	2,760	284	2,389	225	603	541
1968	8,646	1,057	10,415	5,669	7,579	2,189	6,236	1,105	0	0	21	1,571
1969	196	2,568	8,093	798	14,062	2,863	757	0	15,076	546	453	1,384
1970	1,462	896	7,702	787	3,953	1,073	0	0	0	0	1,572	0
1971	1,956	0	2,272	972	0	1,837	89	28,345	6,030	3,678	0	2,351
1972	206	586	835	635	7,279	1,628	328	0	0	3,259	12,312	268
1973	3,708	580	5,326	3,251	832	1,237	1,319	3,502	1,122	795	1,107	796
1974	0	1,070	291	581	3,106	4,744	0	625	14,136	4,182	4,653	0
1975	416	1,336	60	1,541	24,157	15,396	3,796	1,098	802	1,604	888	0
1976	0	0	0	0	532	1,858	0	1,386	4,004	6,878	4,179	0
1977	0	0	1,426	5,843	5,701	2,314	78	261	1,201	0	0	0

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1978	0	0	0	0	0	346	744	7,961	0	0	0	0
1979	0	0	893	990	5,154	1,635	1,963	1,627	1,653	0	0	0
1980	0	0	306	210	4,067	2,433	0	504	15,939	4,329	891	2,736
1981	386	547	8,843	2,205	0	6,265	173	0	2,331	44,760	0	0
1982	0	0	179	0	50,741	20,635	0	0	0	0	0	0
1983	0	2,685	941	1,297	1,488	4,719	0	0	262	3,376	0	0
1984	0	0	0	0	0	0	0	0	0	2,042	1,647	3,286
1985	6,238	12,021	9,176	31,088	6,886	32,811	170	219	0	2,529	0	137
1986	0	535	561	1,776	4,332	11,126	1,240	0	22,958	6,131	6,614	1,012
1987	3,144	2,807	9,671	0	10,025	3,990	79	529	0	635	0	4,124
1988	2,978	284	209	1,240	0	429	447	0	1,376	0	0	196
1989	0	3,045	883	0	49,193	11,226	0	3,306	24,319	1,743	0	25
1990	2,191	3,642	17,409	30,163	35,668	11,113	0	0	0	0	176	0
1991	1,533	59	49	378	3,451	5,662	0	1,683	2,594	3,836	267	19,696
1992	4,658	9,872	4,023	0	2,393	26,438	5,433	0	2,803	487	5,515	2,497
1993	245	7,874	8,562	2,987	18,594	5,690	366	906	2,479	544	0	4,558
1994	0	0	856	0	7,339	932	2,784	2,368	0	1,773	1,056	342
1995	0	0	0	1,147	15,646	11,842	257	4,526	65	180	0	0
1996	0	31	264	712	0	232	0	663	1,195	0	2,615	135
1997	379	5,784	437	1,373	3,309	2,926	0	0	0	0	0	739
1998	513	2,536	11,317	58	337	1,125	866	523	457	691	969	0
1999	1,431	0	10,599	863	3,964	917	0	0	0	0	0	0
2000	182	157	1,639	276	780	192	1,933	0	0	1,231	13,681	365
2001	2,265	15,431	21,282	955	2,820	101	509	214	0	214	0	51
2002	230	0	1,396	10,840	503	9,671	2,776	0	0	800	884	1,322
2003	305	0	202	264	5,591	4,016	509	212	196	99	0	154
2004	9	1,695	1,847	142	63	383	15,762	0	1,826	5,828	4,699	300
2005	1,587	408	0	0	0	0	22,953	14,558	2,179	6,025	887	10
2006	1,016	435	0	197	0	0	0	574	3,972	443	482	838
2007	93	854	501	3,534	15,317	7,018	1,119	1,713	0	636	119	0
2008	27	454	822	1,212	0	0	305	513	967	192	174	60
2009	132	400	1,244	1,026	6,816	1,237	1,581	96	2,811	1,361	0	1,336
2010	8,268	2,856	1,845	13,783	12,213	33	3,273	0	1,127	383	0	0
2011	0	195	178	275	83	0	142	402	0	3,131	1,674	588
2012	304	46	1,457	926	196	1,422	427	666	2,977	140	91	0
2013	0	0	0	1,588	0	1,030	1,151	553	1,479	173	0	0
2014	0	0	0	500	155	149	4,825	315	144	860	2,089	0
2015	304	0	1,280	83	90,884	31,370	13,890	2,517	341	857	9,779	9,363

Table A-6: Extended Net Evaporation Rate - Lake Kickapoo

-Values are in Feet per Month-

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1940	0.14	0.05	0.47	0.27	0.32	0.29	0.88	0.50	0.60	0.49	-0.03	-0.01
1941	0.07	-0.07	0.17	-0.04	-0.01	0.06	0.56	0.46	0.42	-0.14	0.29	0.15
1942	0.17	0.22	0.34	-0.06	0.45	0.48	0.77	0.60	0.34	0.03	0.37	0.02
1943	0.20	0.29	0.13	0.30	0.23	0.40	0.84	1.04	0.64	0.47	0.31	-0.05
1944	-0.01	-0.09	0.21	0.33	0.28	0.58	0.68	0.75	0.60	0.22	0.06	0.03
1945	0.05	-0.01	0.04	0.12	0.59	0.51	0.39	0.72	0.56	0.30	0.36	0.22
1946	-0.01	0.16	0.23	0.39	0.35	0.57	1.01	0.86	0.27	0.36	0.06	-0.03
1947	0.12	0.20	0.13	0.08	0.02	0.67	0.89	0.96	0.87	0.45	0.11	0.03
1948	0.16	-0.05	0.22	0.47	0.22	0.40	0.74	0.91	0.89	0.46	0.43	0.28
1949	-0.15	0.00	0.19	0.22	-0.01	0.48	0.82	0.63	0.31	0.19	0.37	0.13
1950	0.09	0.16	0.45	0.21	0.00	0.42	0.06	0.57	0.24	0.57	0.45	0.22
1951	0.19	0.09	0.29	0.32	0.10	0.21	0.74	0.83	0.60	0.43	0.22	0.27
1952	0.19	0.24	0.28	0.19	0.26	0.83	0.77	1.31	0.95	0.81	0.19	0.16
1953	0.20	0.20	0.19	0.32	0.47	0.91	0.63	0.57	0.80	0.20	0.22	0.26
1954	0.06	0.30	0.35	0.02	-0.12	0.49	0.69	0.69	0.62	0.34	0.18	0.06
1955	0.01	0.10	0.20	0.41	0.11	0.20	0.60	0.60	0.01	0.33	0.27	0.16
1956	0.09	0.10	0.40	0.43	0.26	0.69	0.79	0.81	0.75	0.23	0.22	0.09
1957	0.07	-0.06	0.10	-0.02	-0.17	0.30	0.60	0.60	0.30	0.00	-0.21	0.15
1958	0.00	0.07	-0.02	0.08	0.15	0.44	0.34	0.50	0.16	0.23	0.17	0.08
1959	0.11	0.14	0.32	0.27	0.06	-0.10	0.23	0.49	0.38	-0.15	0.19	-0.06
1960	-0.03	0.03	0.16	0.24	0.19	0.39	0.22	0.44	0.15	-0.11	0.28	-0.09
1961	0.02	0.00	0.05	0.38	0.23	0.04	0.17	0.45	0.03	0.21	-0.06	0.04
1962	0.13	0.19	0.22	0.08	0.39	-0.06	0.16	0.38	-0.41	0.13	-0.01	0.05
1963	0.10	0.09	0.16	0.13	0.00	0.19	0.37	0.34	0.18	0.23	0.01	0.05
1964	0.09	0.01	0.31	0.39	0.08	0.54	0.86	0.48	0.04	0.35	-0.05	0.16
1965	0.06	0.10	0.22	0.23	0.02	0.46	0.89	0.49	0.31	0.12	0.33	0.25
1966	0.01	0.05	0.37	-0.05	0.42	0.59	0.73	0.07	-0.12	0.42	0.37	0.18
1967	0.26	0.26	0.41	0.13	0.21	0.54	0.45	0.71	0.06	0.38	0.17	0.05
1968	-0.28	0.02	0.05	0.25	0.07	0.40	0.22	0.56	0.39	0.31	-0.02	0.16
1969	0.12	-0.01	0.03	0.25	0.07	0.44	0.78	0.41	-0.08	0.06	0.20	-0.04
1970	0.15	0.04	0.02	0.13	0.39	0.62	0.70	0.60	0.21	0.23	0.33	0.24
1971	0.25	0.18	0.49	0.52	0.38	0.62	0.65	0.00	0.06	0.04	0.18	-0.07
1972	0.14	0.20	0.44	0.32	0.24	0.44	0.60	0.45	0.21	-0.13	0.10	0.18
1973	-0.10	0.04	0.11	0.12	0.36	0.33	0.37	0.63	-0.06	0.11	0.20	0.24
1974	0.15	0.24	0.34	0.29	0.36	0.55	0.71	0.33	-0.22	0.00	0.19	0.06
1975	0.11	0.01	0.20	0.28	-0.24	0.38	0.18	0.39	0.15	0.46	0.15	0.11
1976	0.23	0.39	0.36	0.10	0.16	0.46	0.38	0.56	-0.10	-0.17	0.19	0.14
1977	-0.03	0.18	0.33	0.15	0.04	0.46	0.62	0.36	0.52	0.36	0.24	0.31

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1978	0.07	-0.04	0.22	0.46	0.22	0.50	0.84	0.13	0.25	0.30	0.00	0.19
1979	-0.01	0.09	0.12	0.21	0.12	0.25	0.42	0.33	0.48	0.49	0.18	0.01
1980	0.08	0.11	0.33	0.45	-0.20	0.67	0.98	0.79	-0.04	0.34	0.13	0.06
1981	0.19	0.05	0.17	0.15	0.11	0.23	0.65	0.45	0.39	0.01	0.20	0.17
1982	0.12	0.10	0.21	0.26	-0.37	0.01	0.54	0.56	0.40	0.32	0.10	0.01
1983	0.02	0.04	0.08	0.27	0.06	0.17	0.63	0.65	0.62	0.02	0.15	0.05
1984	0.19	0.22	0.21	0.50	0.42	0.54	0.69	0.50	0.42	-0.11	0.06	-0.13
1985	0.14	-0.04	0.06	0.16	0.28	0.26	0.59	0.66	0.39	-0.01	0.15	0.15
1986	0.29	0.11	0.35	0.21	0.00	0.12	0.67	0.48	0.11	-0.22	0.02	0.00
1987	0.06	-0.10	0.29	0.41	-0.10	0.23	0.58	0.46	0.26	0.46	0.19	-0.15
1988	0.09	0.18	0.23	0.25	0.49	0.26	0.43	0.62	0.03	0.35	0.28	0.16
1989	0.11	-0.08	0.22	0.47	-0.01	0.20	0.56	0.34	0.11	0.42	0.32	0.22
1990	0.06	-0.10	0.03	0.10	0.31	0.60	0.42	0.41	0.14	0.36	0.01	0.07
1991	-0.07	0.25	0.36	0.42	0.25	0.27	0.74	0.41	0.18	0.27	0.27	0.05
1992	0.01	0.04	0.20	0.28	0.14	0.20	0.54	0.47	0.36	0.45	-0.01	0.05
1993	0.07	0.00	0.19	0.26	0.37	0.47	1.02	0.74	0.38	0.29	0.27	0.06
1994	0.14	-0.01	0.27	0.25	0.15	0.76	0.49	0.83	0.28	-0.10	0.15	0.10
1995	0.00	0.00	0.14	0.29	-0.06	0.24	0.48	0.25	0.12	0.49	0.29	0.19
1996	0.19	0.35	0.23	0.47	0.62	0.38	0.59	0.10	-0.07	0.28	-0.14	0.25
1997	0.23	0.04	0.35	0.00	0.17	0.22	0.61	0.38	0.45	0.21	0.20	-0.21
1998	-0.01	0.03	0.28	0.40	0.47	0.61	0.75	0.66	0.63	0.22	0.13	0.08
1999	-0.04	0.15	-0.12	0.24	0.06	0.20	0.63	0.68	0.53	0.25	0.29	0.23
2000	0.32	0.16	0.22	0.19	0.42	0.17	0.61	0.76	0.44	-0.18	-0.22	0.13
2001	-0.04	0.01	0.07	0.37	0.21	0.71	0.92	0.60	0.32	0.37	0.15	0.14
2002	0.16	0.16	0.12	0.08	0.28	0.27	0.17	0.67	0.40	-0.14	0.21	0.00
2003	0.19	0.09	0.29	0.42	0.21	-0.04	0.78	0.53	0.24	0.46	0.17	0.26
2004	0.08	-0.10	0.21	0.15	0.37	-0.09	0.26	0.33	0.48	0.04	-0.33	0.15
2005	0.09	0.05	0.27	0.47	0.24	0.48	0.42	-0.04	0.45	0.10	0.40	0.26
2006	0.34	0.17	0.23	0.36	0.29	0.64	0.81	0.69	0.32	0.09	0.22	0.06
2007	0.02	0.23	0.00	0.19	-0.20	-0.21	0.32	0.55	0.19	0.50	0.26	0.13
2008	0.23	0.19	0.13	0.31	0.26	0.51	0.73	0.32	0.24	0.23	0.31	0.24
2009	0.23	0.31	0.40	0.19	0.25	0.40	0.37	0.74	0.04	-0.07	0.29	0.03
2010	-0.04	0.03	0.23	0.07	0.24	0.43	0.17	0.68	0.07	0.36	0.38	0.20
2011	0.19	0.19	0.43	0.63	0.51	0.79	1.08	1.07	0.64	0.21	0.23	0.01
2012	-0.06	0.13	0.18	0.49	0.45	0.56	0.83	0.53	0.34	0.33	0.38	0.17
2013	0.19	0.13	0.42	0.31	0.48	0.55	0.46	0.62	0.43	0.31	0.23	0.03
2014	0.23	0.12	0.31	0.41	0.42	0.30	0.33	0.53	0.38	0.42	0.01	0.08
2015	0.03	0.07	0.19	0.08	-0.27	0.28	0.50	0.65	0.60	0.03	0.06	0.10

Table A-7: Extended Inflows – Lake Olney/Cooper

-Values are in Acre-Feet per Month-

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1948	100	100	42	7	78	490	105	36	0	0	0	13
1949	77	98	53	9	491	514	2	31	164	169	0	15
1950	34	0	0	201	847	107	1,974	3,281	470	0	0	0
1951	0	0	64	30	385	152	22	0	73	2	0	0
1952	7	0	3	53	154	12	16	8	0	0	0	25
1953	0	0	145	26	58	0	221	113	0	1,243	58	9
1954	10	14	0	170	932	307	0	0	8	0	0	42
1955	48	68	39	104	571	967	15	7	1,758	537	0	0
1956	0	5	10	4	228	51	22	7	7	111	25	24
1957	0	61	104	988	4,409	811	27	0	0	173	1,002	0
1958	0	8	22	36	414	8	182	26	39	0	0	0
1959	0	0	0	0	68	380	55	2	38	463	0	112
1960	39	121	9	2	44	29	14	0	14	300	0	87
1961	9	36	111	7	127	109	46	0	140	6	92	19
1962	0	0	12	51	72	511	63	0	868	232	446	668
1963	0	0	46	89	53	134	0	14	12	6	46	3
1964	14	82	36	38	114	179	0	39	388	8	112	12
1965	19	22	7	67	245	129	12	70	50	87	10	13
1966	0	19	34	785	826	8	90	290	1,039	15	16	0
1967	45	0	29	187	46	135	148	22	102	5	19	20
1968	416	39	399	330	548	114	437	61	0	2	56	68
1969	5	113	400	53	1,022	166	56	0	821	27	17	63
1970	65	51	517	53	267	88	43	0	14	15	37	0
1971	53	0	53	22	15	72	25	1,022	276	180	2	119
1972	12	37	54	58	364	104	46	0	56	162	691	0
1973	227	43	370	224	78	101	82	167	68	60	48	41
1974	0	82	17	31	169	227	0	66	748	340	298	5
1975	27	78	12	93	1,759	1,083	253	82	48	87	51	0
1976	0	24	46	21	112	122	27	97	177	332	201	0
1977	15	41	80	286	421	165	19	14	78	0	9	0
1978	0	0	91	46	41	68	46	409	6	0	0	3
1979	24	31	97	66	271	99	107	97	72	0	0	15
1980	15	54	21	5	240	121	0	60	744	196	41	136
1981	13	28	428	116	20	336	35	0	177	1,674	19	17
1982	19	19	22	25	2,977	1,561	62	38	29	54	0	0
1983	17	153	61	65	111	239	0	41	29	153	0	0
1984	0	0	68	4	0	66	0	37	0	112	75	155
1985	295	606	429	2,155	531	2,346	42	26	0	163	0	14

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986	0	44	20	100	225	540	77	0	1,550	465	447	74
1987	201	228	644	12	741	540	39	48	39	38	36	220
1988	51	15	34	87	8	55	39	0	87	0	0	10
1989	0	155	48	0	3,097	797	10	181	1,657	87	0	12
1990	96	174	1,291	2,205	2,557	756	37	112	0	0	31	0
1991	104	5	7	15	186	279	0	87	97	176	0	1,031
1992	323	713	261	11	124	1,844	340	0	157	31	249	121
1993	10	534	605	188	1,255	355	19	29	99	68	24	39
1994	22	38	26	46	133	39	75	51	41	36	36	7
1995	7	9	29	66	743	586	0	274	15	0	0	0
1996	0	17	35	48	0	53	0	34	68	0	75	68
1997	12	267	32	72	184	164	0	142	0	0	0	68
1998	29	136	536	8	65	70	22	31	5	24	49	0
1999	52	3	396	30	117	73	1	2	0	0	5	0
2000	0	0	30	12	83	6	108	0	0	62	508	9
2001	120	786	775	7	60	13	0	1	6	5	0	1
2002	0	1	13	311	17	253	71	3	0	110	44	50
2003	20	0	0	0	267	130	30	30	20	0	0	0
2004	0	37	68	5	2	27	1245	35	0	7	543	18
2005	23	63	12	0	0	8	10	1453	2	675	2	0
2006	0	2	16	0	57	3	0	0	2	67	2	9
2007	23	0	43	35	225	810	230	0	92	0	0	0
2008	0	0	70	7	20	5	3	12	35	52	0	0
2009	0	0	0	69	358	40	62	7	43	32	3	20
2010	153	96	67	1196	991	7	74	0	50	15	0	1
2011	0	3	0	0	0	0	0	0	0	129	128	7
2012	144	1	20	3	9	17	0	5	97	108	0	0
2013	0	0	0	45	0	17	8	1	35	3	0	1
2014	0	0	0	12	5	5	150	2	20	25	109	1
2015	12	7	63	23	4,887							

Table A-8: Extended Net Evaporation Rate – Lake Olney/Cooper

-Values are in Feet per Month-

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1948	0.14	-0.07	0.19	0.43	0.14	0.37	0.76	0.90	0.91	0.48	0.43	0.25
1949	-0.14	-0.03	0.15	0.23	-0.16	0.42	0.84	0.66	0.30	0.13	0.35	0.11
1950	0.07	0.15	0.45	0.17	-0.05	0.43	-0.06	0.27	0.22	0.58	0.45	0.22
1951	0.19	0.07	0.28	0.28	0.03	0.12	0.72	0.88	0.61	0.42	0.19	0.26
1952	0.18	0.22	0.25	0.17	0.22	0.77	0.80	1.36	1.00	0.82	0.16	0.15
1953	0.17	0.20	0.17	0.30	0.42	0.95	0.68	0.63	0.80	0.04	0.21	0.25
1954	0.05	0.28	0.34	-0.08	-0.18	0.42	0.65	0.70	0.59	0.30	0.18	0.06
1955	0.01	0.08	0.15	0.35	0.06	0.14	0.60	0.59	-0.13	0.31	0.26	0.15
1956	0.06	0.07	0.39	0.40	0.21	0.65	0.76	0.80	0.74	0.17	0.18	0.05
1957	0.05	-0.14	0.05	-0.59	-0.56	0.18	0.53	0.59	0.25	-0.03	-0.30	0.11
1958	-0.01	0.08	-0.05	0.02	0.09	0.40	0.33	0.47	0.18	0.23	0.17	0.06
1959	0.10	0.12	0.31	0.29	0.08	-0.16	0.23	0.45	0.35	-0.27	0.18	-0.07
1960	-0.05	0.02	0.13	0.24	0.17	0.41	0.24	0.44	0.11	-0.08	0.28	-0.10
1961	-0.02	0.00	0.04	0.35	0.26	0.08	0.24	0.42	-0.01	0.19	-0.08	0.03
1962	0.12	0.16	0.17	0.02	0.36	-0.18	0.08	0.37	-0.43	0.12	-0.06	0.01
1963	0.09	0.07	0.16	0.07	0.04	0.22	0.35	0.33	0.14	0.16	-0.02	0.04
1964	0.03	0.03	0.28	0.31	-0.01	0.58	0.84	0.43	0.06	0.35	-0.10	0.15
1965	0.03	0.09	0.21	0.23	-0.05	0.41	0.89	0.45	0.29	0.15	0.31	0.24
1966	0.01	0.04	0.34	-0.26	0.36	0.58	0.70	0.06	-0.20	0.41	0.36	0.14
1967	0.24	0.24	0.40	0.15	0.14	0.49	0.51	0.73	-0.02	0.37	0.17	0.05
1968	-0.29	0.02	-0.05	0.23	0.02	0.38	0.22	0.57	0.35	0.28	-0.05	0.14
1969	0.12	-0.03	-0.07	0.18	0.03	0.41	0.72	0.36	-0.08	0.08	0.19	-0.09
1970	0.16	0.00	0.02	0.06	0.32	0.58	0.74	0.60	0.20	0.22	0.34	0.24
1971	0.22	0.17	0.46	0.51	0.41	0.59	0.60	-0.03	0.03	0.05	0.18	-0.13
1972	0.14	0.18	0.43	0.28	0.04	0.43	0.61	0.43	0.24	-0.13	0.10	0.16
1973	-0.12	0.04	0.14	0.04	0.34	0.26	0.24	0.58	-0.06	0.07	0.13	0.23
1974	0.14	0.19	0.32	0.24	0.37	0.57	0.63	0.28	-0.25	-0.03	0.14	0.06
1975	0.10	-0.04	0.18	0.23	-0.41	0.32	0.18	0.37	0.19	0.46	0.18	0.11
1976	0.23	0.38	0.36	0.09	0.11	0.42	0.36	0.54	-0.16	-0.15	0.17	0.11
1977	-0.06	0.17	0.20	0.16	0.09	0.44	0.64	0.35	0.51	0.36	0.22	0.29
1978	0.07	-0.04	0.18	0.40	0.20	0.43	0.83	0.21	0.33	0.29	-0.03	0.19
1979	-0.02	0.09	0.10	0.17	0.09	0.29	0.38	0.32	0.48	0.44	0.18	-0.01
1980	0.07	0.10	0.31	0.42	-0.20	0.68	0.93	0.79	-0.12	0.31	0.11	0.04
1981	0.18	0.03	0.12	0.14	0.08	0.17	0.62	0.49	0.34	-0.64	0.18	0.16
1982	0.13	0.09	0.18	0.24	-0.57	-0.07	0.49	0.58	0.37	0.29	0.05	-0.01
1983	0.04	0.03	0.07	0.25	0.05	0.15	0.62	0.64	0.64	0.09	0.14	0.06
1984	0.19	0.20	0.19	0.50	0.37	0.58	0.71	0.51	0.41	-0.25	0.06	-0.23
1985	0.05	-0.07	-0.12	0.15	0.27	0.12	0.58	0.66	0.38	-0.07	0.12	0.15

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986	0.28	0.10	0.32	0.17	-0.07	0.07	0.67	0.50	0.13	-0.16	-0.03	-0.03
1987	0.03	-0.20	0.20	0.40	-0.10	0.22	0.55	0.44	0.23	0.45	0.16	-0.24
1988	0.09	0.18	0.21	0.23	0.48	0.26	0.44	0.59	0.05	0.33	0.25	0.15
1989	0.08	-0.10	0.17	0.44	-0.37	-0.08	0.54	0.30	0.09	0.39	0.32	0.22
1990	0.04	-0.15	-0.16	-0.29	0.06	0.60	0.40	0.43	0.12	0.36	-0.01	0.07
1991	-0.09	0.24	0.33	0.41	0.27	0.30	0.73	0.41	0.23	0.20	0.25	-0.13
1992	-0.03	0.04	0.18	0.30	-0.09	-0.01	0.50	0.46	0.34	0.44	-0.03	0.03
1993	0.05	-0.05	0.12	0.23	0.19	0.37	1.02	0.73	0.34	0.19	0.28	0.02
1994	0.09	-0.06	0.26	0.17	0.04	0.74	0.59	0.80	0.35	-0.24	0.08	0.08
1995	0.01	0.01	0.07	0.25	-0.10	0.24	0.45	0.27	0.18	0.49	0.30	0.17
1996	0.18	0.32	0.22	0.43	0.60	0.34	0.55	0.12	-0.08	0.21	-0.31	0.19
1997	0.21	-0.19	0.34	0.01	0.04	0.25	0.58	0.38	0.49	0.23	0.19	-0.27
1998	-0.05	0.02	0.14	0.38	0.46	0.64	0.79	0.66	0.62	0.21	0.13	0.04
1999	-0.03	0.14	-0.10	0.18	-0.02	0.25	0.59	0.65	0.43	0.19	0.26	0.15
2000	0.24	0.17	0.26	0.22	0.49	0.25	0.59	0.70	0.44	-0.26	-0.28	0.03
2001	-0.05	-0.09	0.08	0.30	0.21	0.58	0.79	0.50	0.23	0.27	0.20	0.05
2002	0.14	0.12	-0.04	0.07	0.15	0.22	0.19	0.62	0.34	-0.19	0.21	-0.04
2003	0.18	0.03	0.25	0.37	0.09	0.06	0.71	0.45	0.14	0.39	0.09	0.22
2004	0.04	-0.15	0.18	0.11	0.24	-0.39	0.12	0.25	0.42	-0.04	-0.32	0.10
2005	0.10	0.06	0.27	0.46	0.24	0.46	0.40	0.10	0.51	0.20	0.36	0.26
2006	0.29	0.15	0.19	0.26	0.31	0.60	0.80	0.71	0.33	0.21	0.17	0.06
2007	0.01	0.29	-0.01	0.20	-0.27	-0.25	0.32	0.56	0.23	0.42	0.27	0.15
2008	0.23	0.16	-0.03	0.23	0.25	0.48	0.67	0.21	0.25	0.25	0.29	0.24
2009	0.19	0.27	0.30	0.00	0.17	0.41	0.36	0.65	0.01	-0.26	0.25	-0.01
2010	-0.03	-0.04	0.16	0.10	0.25	0.37	0.29	0.65	-0.07	0.33	0.29	0.12
2011	0.11	0.10	0.42	0.45	0.28	0.61	0.94	0.93	0.57	0.15	0.13	-0.01
2012	-0.20	0.07	0.00	0.40	0.39	0.43	0.69	0.41	0.36	0.28	0.32	0.10
2013	0.12	0.11	0.29	0.29	0.27	0.44	0.41	0.69	0.38	0.16	0.14	-0.05
2014	0.15	0.12	0.25	0.42	0.41	0.28	0.19	0.51	0.39	0.34	0.02	0.08
2015	0.06	0.06	0.16	0.18	0.13							

Table A-9: Extended Inflows – Lake Nocona

-Values are in Acre-Feet per Month-

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1948	573	475	258	48	503	2,660	624	236	0	0	3	84
1949	495	634	344	57	3,053	3,179	16	200	1,064	953	0	94
1950	223	0	0	1,284	4,975	669	8,258	13,649	2,159	0	0	0
1951	0	1	416	194	2,401	977	149	0	470	16	0	0
1952	48	0	21	338	997	72	102	54	0	0	0	164
1953	0	0	935	169	373	0	1,432	730	0	8,036	214	59
1954	68	88	0	1,041	5,654	1,951	0	0	52	0	0	270
1955	310	444	254	676	3,532	5,916	98	47	8,109	2,315	0	0
1956	8	20	41	17	1,287	303	94	35	31	616	165	157
1957	0	333	569	5,478	17,532	3,478	130	0	6	927	4,580	0
1958	3	38	122	188	2,089	42	956	128	201	0	0	0
1959	0	0	9	3	348	2,283	367	9	220	2,670	19	646
1960	138	692	68	12	202	162	75	0	93	1,616	0	534
1961	64	200	535	57	564	570	222	0	764	49	485	109
1962	0	1	49	291	428	2,828	380	0	4,222	915	1,792	2,947
1963	0	0	236	484	268	642	0	61	65	87	263	0
1964	5	30	1	498	509	12	0	166	215	7	593	8
1965	0	5	1	0	1,584	1,166	1	307	69	41	0	0
1966	0	0	213	7,469	1,978	280	0	911	2,410	45	1	0
1967	0	0	0	7	841	3,151	62	0	49	0	0	0
1968	730	42	3,875	42	2,518	372	8	27	24	1	141	7
1969	0	347	3,331	1,289	3,840	23	0	0	110	1	0	627
1970	61	308	844	601	2,849	111	0	0	134	36	0	0
1971	0	0	0	0	0	0	0	532	713	249	0	1,228
1972	0	0	0	322	10,120	127	1	0	67	1,240	1,566	2
1973	901	256	34	2,874	33	2,628	3,532	1,130	255	253	2,719	61
1974	11	180	21	58	240	1	0	0	769	315	1,015	3
1975	36	1,950	332	358	5,827	1,607	589	33	79	0	5	8
1976	0	0	1	462	642	557	13	0	641	1,017	136	8
1977	803	788	4,302	778	214	6	24	448	2	0	0	0
1978	0	0	222	677	73	1,580	0	97	1	0	0	0
1979	16	2	1,136	126	1,107	134	0	0	0	0	0	0
1980	0	1	0	0	263	0	0	0	2,853	151	16	529
1981	0	219	1,203	423	1,995	1,122	0	0	420	25,631	70	16
1982	8	22	49	12	10,112	6,867	248	4	11	153	50	246
1983	54	224	318	845	235	333	4	0	0	968	1	0
1984	0	0	67	0	0	0	0	0	0	2,705	327	4,625
1985	3,551	1,106	8,533	1,361	358	6,392	30	2	0	2,511	14	170

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1986	8	6	4	250	1,966	2,039	2	0	1,748	278	1,358	925
1987	1,410	3,757	5,566	144	1,833	1,426	442	24	11	1	1	2,460
1988	14	24	26	189	11	94	2	0	25	4	2	1
1989	3	321	129	5	12,689	13,244	22	17	691	16	10	2
1990	307	781	7,752	19,218	12,514	1,615	249	118	138	3	137	3
1991	755	6	35	8	578	133	8	10	49	330	264	8,450
1992	2,453	1,486	821	118	10,032	14,197	861	16	37	3	254	824
1993	165	3,261	3,754	260	9,158	3,382	9	16	417	4	1	6
1994	3	67	92	261	4,669	116	9	292	252	171	2,258	575
1995	92	32	457	726	4,514	959	20	1,408	6	1	0	1
1996	2	3	95	15	2	0	0	1	32	8	410	47
1997	2	10,635	150	518	5,902	410	11	3	0	1	0	421
1998	399	110	7,992	100	22	6	0	0	0	0	0	0
1999	0	4	757	863	714	13	0	0	0	0	0	0
2000	0	0	0	1	467	12	6	0	0	145	2,759	1,205
2001	1,337	9,159	5,726	150	52	3	0	0	0	177	0	0
2002	0	0	1	981	0	1,514	15	0	0	40	1	92
2003	14	0	0	0	30	59	0	0	120	0	0	0
2004	0	119	276	2,006	30	93	237	40	0	48	3,312	124
2005	3,749	190	30	0	0	185	0	14	0	0	0	0
2006	0	0	68	2	1,426	0	0	0	17	1	73	446
2007	279	0	2,787	2,006	577	6,532	935	77	5	0	0	0
2008	0	0	1,316	116	16	0	0	0	66	0	0	0
2009	0	0	0	2,497	4,256	0	2	1	4	358	22	91
2010	831	1,524	1,500	2,350	8,409	11	0	0	90	0	0	0
2011	0	5	0	0	0	0	0	0	89	499	338	0
2012	1,293	18	2,417	3,708	0	0	0	0	46	5	0	0
2013	0	0	0	130	0	34	2	0	0	0	0	0
2014	0	0	0	0	0	44	864	0	143	0	47	0
2015	3	18	554	839	43,425	13,557						

Table A-10: Extended Net Evaporation Rate – Lake Nocona

-Values are in Feet per Month-

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1948	0.04	-0.12	0.11	0.28	0.07	-0.11	0.19	0.42	0.44	0.18	0.17	0.08
1949	-0.04	-0.05	0.05	0.16	-0.38	0.22	0.68	0.33	-0.15	-0.11	0.17	-0.04
1950	-0.02	0.04	0.30	0.15	-0.11	0.11	-0.22	-0.17	-0.06	0.24	0.18	0.10
1951	0.09	0.01	0.21	0.18	0.11	-0.17	0.23	0.44	0.20	0.02	0.03	0.13
1952	0.09	0.11	0.09	0.01	0.04	0.46	0.38	0.68	0.49	0.38	-0.10	0.04
1953	0.18	0.15	0.17	0.25	0.41	0.78	0.17	0.26	0.37	-0.15	-0.03	0.07
1954	0.01	0.16	0.23	-0.06	-0.13	0.19	0.40	0.50	0.33	0.07	0.13	-0.02
1955	-0.02	0.01	0.09	0.40	0.15	0.21	0.63	0.60	0.06	0.31	0.22	0.09
1956	0.03	0.08	0.38	0.41	0.35	0.71	0.66	0.70	0.68	0.09	0.02	-0.05
1957	0.00	-0.04	0.04	-0.12	-0.13	0.28	0.63	0.52	0.16	0.04	-0.32	0.05
1958	-0.06	0.11	-0.04	0.15	0.22	0.37	0.32	0.50	0.34	0.22	0.11	0.06
1959	0.09	0.17	0.33	0.39	0.29	0.01	0.21	0.37	0.26	-0.11	0.18	-0.07
1960	-0.03	0.10	0.07	0.20	0.12	0.32	0.11	0.43	0.04	-0.09	0.20	-0.13
1961	0.04	0.03	0.00	0.26	0.14	0.16	0.24	0.27	-0.01	0.07	-0.10	0.01
1962	0.12	0.15	0.10	0.00	0.29	-0.18	-0.02	0.31	-0.28	0.12	-0.15	0.02
1963	0.08	0.10	0.11	0.07	0.03	0.24	0.24	0.30	0.14	0.16	0.04	0.00
1964	0.03	0.11	0.27	0.34	0.26	0.62	0.86	0.40	0.00	0.34	-0.18	0.13
1965	0.06	0.11	0.21	0.37	0.06	0.22	0.86	0.43	0.36	0.17	0.11	0.10
1966	0.03	0.06	0.34	0.14	0.48	0.66	0.64	0.00	0.07	0.31	0.22	0.08
1967	0.20	0.28	0.47	0.10	0.21	0.34	0.43	0.76	0.01	0.22	0.12	0.06
1968	-0.21	0.06	0.09	0.26	0.06	0.35	0.33	0.53	0.18	0.11	-0.02	0.11
1969	0.10	0.04	0.11	0.26	0.18	0.46	0.76	0.47	0.17	0.06	0.16	-0.05
1970	0.12	0.09	0.08	0.08	0.33	0.54	0.60	0.63	-0.12	0.06	0.22	0.19
1971	0.12	0.16	0.46	0.37	0.37	0.54	0.60	0.08	0.12	-0.01	0.14	-0.12
1972	0.15	0.21	0.50	0.26	0.31	0.60	0.71	0.45	0.25	-0.01	0.03	0.11
1973	-0.08	0.08	0.17	0.12	0.44	0.10	0.13	0.55	-0.11	0.08	-0.06	0.21
1974	0.13	0.24	0.35	0.21	0.49	0.42	0.61	0.24	-0.16	0.01	0.11	0.05
1975	0.11	0.03	0.14	0.28	0.01	0.30	0.31	0.32	0.15	0.40	0.24	0.06
1976	0.30	0.36	0.27	0.06	0.17	0.43	0.41	0.61	0.09	-0.05	0.18	0.08
1977	-0.03	0.18	0.25	0.31	0.34	0.58	0.68	0.36	0.43	0.28	0.19	0.25
1978	0.06	-0.02	0.22	0.38	0.15	0.43	0.88	0.42	0.38	0.33	-0.05	0.17
1979	-0.02	0.12	0.12	0.22	0.25	0.39	0.48	0.29	0.35	0.34	0.19	0.06
1980	0.08	0.18	0.39	0.37	0.11	0.63	0.90	0.90	0.24	0.26	0.10	0.11
1981	0.20	0.06	0.27	0.22	-0.06	0.38	0.59	0.48	0.18	-0.02	0.10	0.20
1982	0.12	0.13	0.23	0.28	-0.16	-0.01	0.37	0.55	0.34	0.11	0.03	0.02
1983	0.06	0.06	0.15	0.23	0.07	0.25	0.53	0.36	0.50	-0.11	0.10	0.08
1984	0.08	0.20	0.15	0.36	0.34	0.46	0.63	0.42	0.40	-0.15	0.08	-0.11
1985	0.06	0.03	0.04	0.21	0.26	0.14	0.61	0.80	0.32	0.03	0.16	0.08

1986	0.22	0.18	0.36	0.12	0.10	0.10	0.92	0.41	0.03	-0.04	-0.13	0.02
1987	0.01	-0.10	0.18	0.44	0.15	0.21	0.53	0.47	0.28	0.37	0.11	-0.17
1988	0.09	0.22	0.32	0.35	0.56	0.30	0.48	0.67	0.04	0.26	0.17	0.06
1989	0.07	0.10	0.20	0.53	0.13	-0.06	0.46	0.52	0.15	0.41	0.31	0.23
1990	0.09	0.08	0.00	0.09	0.32	0.71	0.48	0.48	0.19	0.33	-0.04	0.05
1991	-0.04	0.19	0.43	0.36	0.34	0.34	0.55	0.16	0.01	0.16	0.09	-0.20
1992	-0.07	0.17	0.25	0.28	0.11	0.09	0.43	0.42	0.20	0.35	-0.11	-0.05
1993	-0.01	0.00	0.19	0.36	0.11	0.35	0.83	0.58	0.15	0.10	0.14	0.01
1994	0.14	0.10	0.25	0.35	0.14	0.54	0.27	0.58	0.16	0.06	-0.10	-0.02
1995	0.06	0.23	0.15	0.30	0.04	0.28	0.51	0.41	0.16	0.49	0.28	0.08
1996	0.11	0.37	0.34	0.50	0.69	0.57	0.59	0.11	0.10	0.29	-0.15	0.20
1997	0.26	-0.06	0.29	0.08	0.22	0.15	0.63	0.51	0.45	0.06	0.14	-0.05
1998	-0.08	0.13	0.16	0.38	0.61	0.67	1.02	0.63	0.51	0.10	0.07	0.03
1999	-0.03	0.14	-0.10	0.18	-0.02	0.25	0.59	0.65	0.43	0.19	0.26	0.15
2000	0.24	0.17	0.26	0.22	0.49	0.25	0.59	0.70	0.44	-0.26	-0.28	0.03
2001	-0.05	-0.09	0.08	0.30	0.21	0.58	0.79	0.50	0.23	0.27	0.20	0.05
2002	0.14	0.12	-0.04	0.07	0.15	0.22	0.19	0.62	0.34	-0.19	0.21	-0.04
2003	0.18	0.03	0.25	0.37	0.09	0.06	0.71	0.45	0.14	0.39	0.09	0.22
2004	0.04	-0.15	0.18	0.11	0.24	-0.39	0.12	0.25	0.42	-0.04	-0.32	0.10
2005	0.10	0.06	0.27	0.46	0.24	0.46	0.40	0.10	0.51	0.20	0.36	0.26
2006	0.29	0.15	0.19	0.26	0.31	0.60	0.80	0.71	0.33	0.21	0.17	0.06
2007	0.01	0.29	-0.01	0.20	-0.27	-0.25	0.32	0.56	0.23	0.42	0.27	0.15
2008	0.23	0.16	-0.03	0.23	0.25	0.48	0.67	0.21	0.25	0.25	0.29	0.24
2009	0.19	0.27	0.30	0.00	0.17	0.41	0.36	0.65	0.01	-0.26	0.25	-0.01
2010	-0.03	-0.04	0.16	0.10	0.25	0.37	0.29	0.65	-0.07	0.33	0.29	0.12
2011	0.11	0.10	0.42	0.45	0.28	0.61	0.94	0.93	0.57	0.15	0.13	-0.01
2012	-0.20	0.07	0.00	0.40	0.39	0.43	0.69	0.41	0.36	0.28	0.32	0.10
2013	0.12	0.11	0.29	0.29	0.27	0.44	0.41	0.69	0.38	0.16	0.14	-0.05
2014	0.15	0.12	0.25	0.42	0.41	0.28	0.19	0.51	0.39	0.34	0.02	0.08
2015	0.02	0.01	0.10	-0.04	-0.37	0.17						

Table A-11: Extended Inflows - Lake Ringgold

-Values are in Acre-Feet per Month-

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1940	1	1,325	3	6,830	14,406	16,477	7,119	4,674	0	0	5,617	1,651
1941	71	12,138	468	12,036	41,864	43,656	4,992	9,582	7,669	81,265	22,038	4,366
1942	4	6	77	63,426	386	2,556	13	240	826	14,620	7,716	2,491
1943	57	6	3,359	11,215	2,034	2,715	892	0	0	330	0	346
1944	880	3,704	1,026	253	1,110	3,844	493	748	335	8,211	821	357
1945	606	3,154	19,584	15,908	176	456	16,216	268	5,141	8,176	0	0
1946	23	1,260	826	7	0	0	55	1,102	28,286	3,637	10,954	20,037
1947	0	0	0	3,775	38,657	1,172	4,260	678	1,085	4,167	2,007	3,472
1948	663	1,520	719	0	595	14,555	3,086	1,245	172	118	313	413
1949	2,453	3,764	1,812	0	19,044	19,501	912	1,865	7,290	6,093	211	591
1950	957	0	0	5,359	26,965	3,992	47,556	80,728	12,122	0	0	0
1951	0	0	306	0	11,094	4,165	461	0	3,206	670	0	0
1952	382	0	0	45	4,507	252	1,501	2,743	906	317	0	170
1953	0	0	2,536	116	1,035	0	3,620	1,554	184	45,770	2,856	399
1954	49	78	0	3,803	38,060	10,519	0	0	0	0	0	0
1955	594	1,403	789	2,145	14,278	19,699	723	0	20,730	19,654	0	0
1956	0	0	0	0	7,445	1,156	73	0	0	3,433	972	788
1957	0	2,129	3,935	37,724	103,585	20,465	741	0	0	6,646	28,502	0
1958	0	0	470	1,103	12,856	94	7,348	924	1,158	0	0	0
1959	0	0	0	0	3,234	21,096	851	0	4,031	21,649	405	8,736
1960	3,850	6,430	1,023	0	942	732	1,030	0	1,006	9,399	0	4,053
1961	1,276	682	2,076	1,226	4,486	8,363	708	0	3,136	380	5,448	2,814
1962	0	59	278	3,166	487	19,983	6,648	0	27,768	2,740	11,678	17,793
1963	0	0	3,431	1,584	991	5,489	0	152	0	130	1,061	0
1964	554	1,277	434	978	3,905	4,465	0	1,250	7,564	464	3,256	235
1965	598	957	0	319	14,056	8,558	230	3,397	686	3,151	333	396
1966	0	0	873	28,851	27,740	0	3,265	10,288	24,557	2,544	111	0
1967	174	137	105	5,884	0	7,679	1,161	0	3,159	0	267	136
1968	11,192	0	16,387	4,203	13,431	2,873	2,880	465	0	0	2,062	470
1969	401	4,625	18,784	2,238	30,609	1,598	173	738	13,160	0	273	2,434
1970	2,847	1,084	10,127	3,509	4,489	3,169	0	0	0	0	0	0
1971	774	0	318	1,424	0	929	511	15,943	4,715	3,990	0	6,941
1972	0	940	427	3,690	36,242	2,002	833	0	0	7,246	11,481	804
1973	8,410	2,842	7,068	8,952	0	2,985	5,826	2,521	1,073	1,344	6,221	0
1974	0	1,132	1,650	236	2,202	3,702	0	0	20,906	2,858	7,695	300
1975	1,473	2,033	918	1,677	46,056	13,712	8,268	2,390	5,392	713	0	0
1976	0	0	0	0	2,828	3,257	0	6	12,096	8,396	4,513	0
1977	0	2,202	6,940	6,511	4,898	1,092	0	764	0	0	0	0

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1978	0	0	849	806	236	1,673	467	3,881	0	0	0	0
1979	0	0	2,719	664	3,729	2,829	639	3,718	911	0	0	0
1980	0	0	704	77	2,975	999	0	0	20,921	10,285	1,639	3,798
1981	598	3,914	18,608	1,905	0	3,414	0	0	754	102,322	0	0
1982	0	0	1,455	0	85,663	39,438	3,744	492	0	784	0	0
1983	0	3,058	831	4,577	0	2,752	0	674	0	9,317	0	0
1984	0	0	3,774	1,568	0	0	0	0	0	15,027	1,966	19,984
1985	7,713	13,679	33,446	30,004	3,773	23,136	421	898	0	1,107	0	0
1986	0	997	2,950	1,151	4,149	20,262	851	993	38,727	1,966	5,015	2,312
1987	3,499	12,110	14,945	1,985	13,137	4,476	0	381	0	416	0	18,913
1988	0	380	2,276	1,724	0	283	0	0	632	0	0	0
1989	0	1,399	1,141	488	47,754	36,241	253	1,967	22,132	1,682	0	0
1990	3,170	4,508	35,112	81,210	64,223	15,445	524	415	0	0	0	0
1991	0	1,245	1,662	371	5,917	6,123	1,955	2,011	7,777	5,004	749	46,900
1992	10,207	9,874	9,313	385	11,149	56,820	21,870	0	0	0	3,079	1,841
1993	1,950	9,357	13,492	730	30,766	14,065	4,841	841	2,261	0	0	3,194
1994	0	0	2,689	225	8,580	3,338	1,727	5,337	0	14,156	2,351	2,647
1995	170	0	2,213	2,119	30,784	16,490	0	6,760	0	690	0	0
1996	676	966	2,425	0	0	1,089	0	193	4,998	0	3,538	2,043
1997	1,070	17,140	467	3,028	29,001	2,692	0	0	0	0	0	0
1998	3,370	4,061	25,651	2,968	857	1,780	1,397	2,536	1,130	0	1,778	0
1999	3,079	0	6,620	1,242	1,689	2,403	0	0	0	0	0	0
2000	1,540	504	1,415	1,079	48	166	117	0	0	0	16,416	1,322
2001	5,488	40,669	31,868	1,958	3,600	713	809	241	0	0	0	0
2002	0	1,766	1,600	15,849	0	11,281	2,853	0	0	425	1,455	913
2003	852	0	1,572	929	2,113	1,784	671	103	0	0	0	0
2004	0	2,089	2,718	0	0	233	21,381	7,605	1,462	5,450	31,645	1,002
2005	6,271	2,456	394	792	159	4,700	11,506	30,701	951	16,576	1,135	448
2006	1,856	514	1,669	846	1,145	0	0	2,095	3,679	468	3,469	1,448
2007	2,608	1,361	4,513	5,401	9,200	45,089	16,596	864	0	0	0	0
2008	0	0	3,924	2,322	0	0	102	1,131	63	0	0	0
2009	609	601	1,547	11,494	15,621	221	3,457	556	1,905	369	134	1,472
2010	6,274	6,982	5,203	21,888	29,916	0	1,834	0	1,821	1,136	0	295
2011	0	1,310	868	1,009	1,218	0	0	1,834	437	5,533	2,027	929
2012	5,121	0	2,980	2,964	0	1,230	883	1,357	2,055	1,873	490	0
2013	437	1,691	1,231	2,614	1,634	0	777	789	636	232	0	0
2014	0	0	0	893	548	0	4,516	0	53	475	1,825	0
2015	719	45	2,977	1,723	160,173	36,461	0	1,930	460	0	17,228	17,195

Table A-12: Extended Net Evaporation Rate - Lake Ringgold

-Values are in Feet per Month -

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1940	0.12	0.02	0.44	0.13	0.21	0.21	0.60	0.53	0.59	0.45	-0.13	-0.07
1941	0.03	-0.07	0.16	-0.10	0.23	0.01	0.58	0.42	0.42	-0.21	0.25	0.11
1942	0.16	0.19	0.30	-0.23	0.31	0.32	0.74	0.55	0.31	0.06	0.32	0.03
1943	0.19	0.25	0.05	0.27	-0.01	0.37	0.83	1.00	0.53	0.39	0.30	-0.09
1944	-0.03	-0.16	0.14	0.23	0.12	0.58	0.66	0.70	0.55	0.22	0.02	0.00
1945	0.05	-0.12	-0.15	-0.03	0.49	0.36	0.28	0.70	0.35	0.24	0.30	0.19
1946	-0.12	0.07	0.11	0.24	0.04	0.48	0.89	0.73	0.29	0.35	-0.08	-0.07
1947	0.13	0.21	0.11	0.00	0.08	0.48	0.86	0.94	0.75	0.36	0.11	-0.09
1948	0.13	-0.12	0.16	0.40	0.02	0.36	0.62	0.87	0.83	0.48	0.46	0.25
1949	-0.17	-0.02	0.14	0.23	-0.11	0.38	0.72	0.62	0.27	0.08	0.35	0.11
1950	0.01	0.13	0.43	0.14	-0.04	0.31	0.01	0.53	0.13	0.57	0.47	0.26
1951	0.20	0.02	0.28	0.28	0.15	0.04	0.62	0.83	0.56	0.36	0.22	0.25
1952	0.19	0.19	0.17	0.11	0.19	0.67	0.80	1.11	0.86	0.75	0.25	0.11
1953	0.18	0.16	0.10	0.19	0.33	0.78	0.62	0.70	0.76	0.22	0.20	0.27
1954	0.00	0.26	0.34	0.05	-0.08	0.37	0.55	0.71	0.52	0.21	0.17	0.04
1955	0.02	0.04	0.13	0.25	0.04	0.20	0.52	0.56	0.11	0.41	0.29	0.15
1956	0.04	0.02	0.35	0.34	0.15	0.66	0.62	0.72	0.69	0.17	0.16	-0.01
1957	0.02	-0.08	0.01	-0.22	-0.29	0.22	0.48	0.51	0.19	0.01	-0.25	0.09
1958	-0.04	0.07	-0.10	-0.04	0.08	0.30	0.35	0.37	0.17	0.21	0.13	0.07
1959	0.09	0.10	0.26	0.25	0.10	-0.16	0.13	0.40	0.27	-0.24	0.15	-0.09
1960	-0.06	0.03	0.11	0.17	0.11	0.32	0.14	0.42	0.13	-0.05	0.25	-0.14
1961	-0.02	-0.02	-0.02	0.31	0.20	0.07	0.20	0.38	-0.01	0.15	-0.05	0.01
1962	0.11	0.13	0.16	0.00	0.32	-0.13	0.09	0.36	-0.39	0.09	-0.06	0.05
1963	0.08	0.08	0.17	0.03	0.03	0.31	0.28	0.36	0.19	0.24	0.05	0.02
1964	0.00	0.05	0.20	0.22	0.01	0.53	0.80	0.36	-0.07	0.35	-0.19	0.13
1965	0.00	0.03	0.19	0.21	-0.08	0.32	0.78	0.41	0.26	0.18	0.22	0.14
1966	0.00	-0.04	0.31	-0.12	0.34	0.44	0.59	0.05	-0.05	0.37	0.30	0.10
1967	0.22	0.22	0.38	0.09	0.05	0.48	0.45	0.67	-0.05	0.28	0.16	0.03
1968	-0.28	0.01	-0.02	0.15	0.01	0.30	0.23	0.49	0.24	0.23	-0.06	0.11
1969	0.06	-0.03	-0.03	0.17	0.04	0.38	0.67	0.40	0.04	-0.01	0.19	-0.10
1970	0.12	-0.03	-0.01	-0.01	0.30	0.49	0.66	0.56	-0.03	0.11	0.29	0.21
1971	0.18	0.15	0.44	0.43	0.34	0.50	0.53	0.07	0.07	-0.06	0.13	-0.18
1972	0.13	0.18	0.38	0.21	0.31	0.45	0.62	0.34	0.23	-0.12	0.05	0.12
1973	-0.11	0.02	0.09	0.02	0.22	0.11	0.22	0.56	-0.09	0.00	0.11	0.20
1974	0.12	0.18	0.31	0.20	0.37	0.48	0.63	0.22	-0.27	-0.14	0.09	0.03
1975	0.07	-0.03	0.10	0.19	-0.23	0.31	0.23	0.31	0.19	0.42	0.17	0.08
1976	0.24	0.36	0.29	0.03	0.05	0.39	0.34	0.54	-0.05	-0.10	0.17	0.09
1977	-0.07	0.15	0.17	0.21	0.15	0.50	0.63	0.35	0.48	0.34	0.21	0.27

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1978	0.03	-0.08	0.17	0.35	0.12	0.44	0.82	0.34	0.35	0.34	-0.07	0.16
1979	-0.04	0.04	0.02	0.12	0.04	0.31	0.44	0.31	0.41	0.39	0.17	-0.01
1980	0.05	0.10	0.29	0.39	-0.09	0.67	0.90	0.81	-0.01	0.27	0.12	0.05
1981	0.17	0.04	0.09	0.13	-0.04	0.24	0.57	0.47	0.27	-0.38	0.11	0.16
1982	0.08	0.07	0.15	0.20	-0.40	0.08	0.45	0.56	0.42	0.25	-0.02	-0.04
1983	0.04	0.01	0.06	0.29	0.03	0.18	0.58	0.59	0.61	0.03	0.10	0.03
1984	0.17	0.16	0.13	0.42	0.32	0.56	0.66	0.44	0.43	-0.25	0.04	-0.16
1985	0.12	-0.06	0.03	0.11	0.21	0.20	0.53	0.64	0.36	-0.09	0.06	0.14
1986	0.27	0.03	0.28	0.08	-0.12	0.12	0.64	0.43	0.08	-0.11	-0.04	-0.03
1987	0.05	-0.18	0.25	0.40	-0.14	0.16	0.49	0.46	0.22	0.41	0.06	-0.23
1988	0.09	0.15	0.16	0.25	0.42	0.24	0.43	0.60	0.00	0.27	0.16	0.07
1989	0.02	-0.11	0.11	0.40	-0.14	0.04	0.43	0.34	0.10	0.38	0.30	0.23
1990	0.01	-0.13	-0.08	0.00	0.20	0.52	0.37	0.43	0.16	0.29	-0.05	0.03
1991	-0.08	0.18	0.28	0.29	0.14	0.23	0.62	0.29	0.14	0.05	0.19	-0.10
1992	-0.05	0.05	0.15	0.26	0.08	0.24	0.45	0.41	0.21	0.39	-0.05	-0.07
1993	0.01	-0.07	0.14	0.14	0.27	0.35	0.97	0.68	0.22	0.02	0.21	-0.02
1994	0.05	-0.06	0.19	0.14	0.05	0.62	0.39	0.68	0.20	-0.20	-0.02	0.04
1995	0.00	0.00	-0.01	0.12	-0.12	0.24	0.39	0.29	0.15	0.46	0.28	0.10
1996	0.17	0.33	0.18	0.36	0.54	0.36	0.48	0.05	-0.10	0.16	-0.44	0.12
1997	0.20	-0.07	0.24	-0.02	0.10	0.21	0.53	0.38	0.46	0.11	0.16	-0.24
1998	-0.10	0.02	0.22	0.34	0.45	0.60	0.83	0.66	0.56	0.16	0.08	0.00
1999	-0.03	0.14	-0.10	0.18	-0.02	0.25	0.59	0.65	0.43	0.19	0.26	0.15
2000	0.24	0.17	0.26	0.22	0.49	0.25	0.59	0.70	0.44	-0.26	-0.28	0.03
2001	-0.05	-0.09	0.08	0.30	0.21	0.58	0.79	0.50	0.23	0.27	0.20	0.05
2002	0.14	0.12	-0.04	0.07	0.15	0.22	0.19	0.62	0.34	-0.19	0.21	-0.04
2003	0.18	0.03	0.25	0.37	0.09	0.06	0.71	0.45	0.14	0.39	0.09	0.22
2004	0.04	-0.15	0.18	0.11	0.24	-0.39	0.12	0.25	0.42	-0.04	-0.32	0.10
2005	0.10	0.06	0.27	0.46	0.24	0.46	0.40	0.10	0.51	0.20	0.36	0.26
2006	0.29	0.15	0.19	0.26	0.31	0.60	0.80	0.71	0.33	0.21	0.17	0.06
2007	0.01	0.29	-0.01	0.20	-0.27	-0.25	0.32	0.56	0.23	0.42	0.27	0.15
2008	0.23	0.16	-0.03	0.23	0.25	0.48	0.67	0.21	0.25	0.25	0.29	0.24
2009	0.19	0.27	0.30	0.00	0.17	0.41	0.36	0.65	0.01	-0.26	0.25	-0.01
2010	-0.03	-0.04	0.16	0.10	0.25	0.37	0.29	0.65	-0.07	0.33	0.29	0.12
2011	0.11	0.10	0.42	0.45	0.28	0.61	0.94	0.93	0.57	0.15	0.13	-0.01
2012	-0.20	0.07	0.00	0.40	0.39	0.43	0.69	0.41	0.36	0.28	0.32	0.10
2013	0.12	0.11	0.29	0.29	0.27	0.44	0.41	0.69	0.38	0.16	0.14	-0.05
2014	0.15	0.12	0.25	0.42	0.41	0.28	0.19	0.51	0.39	0.34	0.02	0.08
2015	0.02	0.01	0.10	-0.04	-0.37	0.17	0.50	0.65	0.55	-0.10	-0.11	0.04

A.2 Sedimentation and Impacts to Reservoir Yields

As shown on Table A-13, there are areas with highly erodible soils in Region B that contribute to the accumulation of sediment, which can significantly impact reservoir storage capacities. Reservoirs with higher sedimentation rates include Lakes Kickapoo, Nocona and Arrowhead. The recent volumetric survey for Lake Kemp shows lower sediment accumulation than previously predicted. This has resulted in greater projected storage over the planning period.

Table A-13: Estimated Sedimentation Rates and Projected Capacities

Reservoir	Drainage Area (Sq mi)	Sediment Rate (af/yr/sq mi)	Year of Initial Capacity	Capacities (Ac-ft)			Source (sediment rate)
				Initial	2020	2070	
Lake Kemp	2,086	1.02	1922[1]	(1)	221,929	126,790	TWDB, 2006
Lake Kickapoo	275	1.07	1946	106,000	86,345	69,644	TWDB, 2013
Lake Arrowhead	822	0.87	1966	262,100	230,359	189,262	TWDB 2013
Olney/Cooper	12.3	0.68	1935/1953	6,650	4,546	2,806	TBWE 1959
Lake Nocona	94	0.94	1961	25,400	20,917	18,661	TWDB, 2002
Amon Carter Lake	100	0.65	1956/1983	28,589	27,541	23,075	TBWE 1959

1. The capacity of Lake Kemp in 1922 was estimated 560,000 ac-ft at elevation 1153ft. There are multiple datum references used over time for estimates of reservoir volume. In 1973 the USACE estimated the volume of the lake at 268,000 ac-ft at the current conservation elevation of 1144 ft msl. The sediment rate shown considers the full record of data.

A.3 Reservoir Water Rights

Water rights for reservoirs located in Region B are summarized on Table A-14. Comparisons of rights to firm yields indicate that water rights for several of the reservoirs in Region B exceed firm yield. The current firm yield of Lake Kemp is about 30 percent of the total permitted diversion. The firm yields for Lakes Amon Carter and Wichita System are about half of the permitted diversions.

Table A-14: Summary of Reservoir Water Rights

Reservoir	Water Right No.	Priority Date	Holder	Water Right Amount (acre-feet/year)						2020 Yield[2] (ac-ft/yr)
				Mun	Ind	Irr	Mining	Rec	Total	
Kemp/ Diversion	5123	10/2/20	Wichita Co WID#2 Wichita Falls	25,150	40,000	120,000[1]	2,000	5,850	193,000[1]	44,000
Santa Rosa	5124	6/30/26	W.T. Waggoner Estate			3,075			3,075	3,075
Electra	5128 5128	3/29/49 2/25/74	City of Electra Emergency supply	600 800					600 800	454 0
Kickapoo	5144	6/21/44	Wichita Falls	40,000					40,000	32,670
Arrowhead[3]	5150	6/20/62	Wichita Falls	45,000					45,000	
Olney/ Cooper	5146	3/26/53	City of Olney	1,260		35			1,295	268
N.F. Buffalo Creek	5131	9/19/62	City of Iowa Park	840					840	840
Iowa Park/ Lake Gordon	5132 5133	8/3/49 11/22/38	City of Iowa Park	500 300					800	555
Nocona	4879	10/9/58	City of Nocona	1,080		100		80	1,260	1,260
Amon Carter	3320	7/12/54	City of Bowie	3,500	1,300		200		5,000	1,689

Mun – Municipal Use Ind – Industrial Use Irr – Irrigation Use Rec – Recreational Use

1. Water right 5123 includes the ability to divert 16,660 acre-feet per year of the permitted 120,000 acre-feet per year directly from the river for irrigation. This portion of the right was evaluated as a run-of-the-river right and is also shown in Table A-13.
2. Yield reported is the firm yield as determined for this plan.
3. Wichita Falls is authorized to use the bed and banks of Arrowhead to convey 22,302 acre-feet per year of existing and future surface water-based return flows. The yield from this supply is identified as an indirect reuse project and is not included in the yield calculation in this table.

Source: Texas Commission on Environmental Quality, Water Rights Database, 2019.

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A.4 Run-of-the-River Supplies

Portions of three river basins are located in Region B. The Red River and its tributaries represent the largest river system, flowing across the central and northern areas of the region. The Brazos River flows through the southern portion of King and Baylor Counties, and the upper tributaries of the Trinity River lie in southwest Montague County.

The Red River forms the northern boundary of Region B and flows eastward along the Texas – Oklahoma border. Major tributaries within the region include the Pease River, Wichita River and Little Wichita River. High concentrations of total dissolved solids, sulfate and chloride are concerns for the upper reaches of these streams during low flow conditions. Naturally occurring salt springs, seeps and gypsum outcrops are found in the area westward of Wichita County to the High Plains Caprock Escarpment in the Panhandle Region Planning Area. As a result water from these rivers in Cottle, Foard, King, Hardeman and parts of Baylor and Wilbarger Counties is generally not used or is restricted to irrigation use only. The quality of the water gradually improves downstream toward the eastern portion of the region.

Table A-15 includes a list of the run-of-river water rights within Region B. The total available supplies from the run-of-the-river diversions are shown by use type, county and basin in Table A-16. These supplies were determined using the TCEQ Water Availability Models (WAM) Run 3 and were aggregated by county and use type. Generally, the available supply represents the minimum annual diversion over the historical record in the respective model unless noted. This is considered a reasonable approach to reliable supplies for these water rights given the monthly time-step of the WAM and the uncertainty of the diversions. Some of these rights include storage and may also be supplemented with other sources of water, such as groundwater. There is no direct connection between the aggregated water demand by county and an individual water right. Therefore, evaluating water reliability as if such direct relationship existed is not practical.

Table A-15: Summary of Run of the River Water Rights

Water Right	County	Permitted Amount (acre-feet/year)	Use Type	Owner
Red River				
5143	Clay	200	Irrigation	Joe J. Parker
Little Wichita River				
4268	Clay	3,600	Irrigation	A.L. Rhodes
5147	Archer	30	Irrigation	Joy Graham
5152	Clay	1,560	Municipal	City of Henrietta
5153	Clay	50	Irrigation	Clay County Country Club Inc.
5154	Clay	15	Irrigation	Johnnie H. Shaw
Wichita River				
4433	Wichita	300	Irrigation	Alvin & Nana Robertson
5123	Wichita	16,660	Irrigation	WCWID #2
5135	Clay	357	Irrigation	Eagle Farms, Inc.
5136	Clay	200	Irrigation	Joe L. Hale Estate
5138	Clay	55	Irrigation	M.E. McBride
5139	Clay	30	Irrigation	Bob Brown
5140	Clay	270	Industrial	Red River Feed Yard, Inc.
5530	Wichita	32	Irrigation	Joe L. Burton
Beaver Creek				
5125	Wilbarger	675	Irrigation	W.T. Waggoner Estate
5126	Wilbarger	60	Municipal	W.T. Waggoner Estate
5127	Wilbarger	85	Municipal, Mining	W.T. Waggoner Estate
5129	Wichita	404	Irrigation	Harry L. Mitchell
5393	Wichita	450	Irrigation	James Brockriede
5128[1]	Wilbarger	800	Municipal	City of Electra
Groesbeck Creek				
5225	Hardeman	96	Irrigation	Hunter Brothers
5226	Hardeman	60	Irrigation	FW Howard Jr.
5227	Hardeman	100	Irrigation	FW Howard Jr. & Wife
5228	Hardeman	63	Irrigation	BJ Howard & Wife
5231	Hardeman	41	Irrigation	Garland Welborn
Antelope Creek				
5130	Wichita	40	Irrigation	Hulen J. Cook Jr. Et Al
Big Mineral Creek				
5113	Wilbarger	150	Irrigation	James David Belew & Wife
Sherwood				
5238	Wilbarger	160	Irrigation	Joyce Virginia Chapman
Devils Creek				
5112	Hardeman	45	Irrigation	Texas Parks & Wildlife Dept.
Armand Bayou				
5230	Hardeman	16	Irrigation	AEP Texas North Company
Belknap				
4874	Clay	30	Irrigation	Herschel H. Studdard
4875	Montague	133	Irrigation	Clarice Benton Whiteside
Frog Creek				
5142	Clay	200	Irrigation	Joe J. Parker
Long Creek				
5109	Clay	200	Irrigation	A D Hanna
Mesquite Creek				
5146	Archer	35	Irrigation	City of Olney
Deep Draw				
5605	Montague	100	Irrigation	Jerry D. Nunneley
Pease Creek				
5111	Cottle	23	Irrigation	John E. Isbell Jr. & Wife

Table A-16: Run of the River WAM Availability by County and Use Type

Use Type	County	Basin	Available Supply (ac-ft/yr)
Irrigation	Archer	Red	7
Irrigation	Baylor	Red	0
Irrigation	Baylor	Brazos	17
Irrigation	Clay	Red	2,272
Irrigation	Cottle	Red	11
Irrigation	Hardeman	Red	146
Irrigation	Montague	Red	108
Irrigation	Wichita	Red	300
Irrigation	Wichita	Red	2,752
Irrigation	Wilbarger	Red	807
Municipal	Clay	Red	0
Municipal	Archer	Red	278
Municipal	Clay	Red	107
Municipal*	Clay	Red	1,315
Municipal-	Wichita	Red	555
Municipal	Montague	Trinity	0
Municipal	Wilbarger	Red	115
Industrial	Clay	Red	141
Mining	Clay	Red	1
Mining	Montague	Red	0
Mining	Wilbarger	Red	30
Total Run of River			**8,962**

* Henrietta has an agreement in place with Wichita Falls to make releases from Lake Arrowhead for their run-of-river diversion. For Henrietta in this table supplies were determined based on the TCEQ WAM Run 3 minimum monthly diversions.

APPENDIX B

WUG SUMMARY TABLES

2021 FINAL PLAN

REGION B

OCTOBER 2020

APPENDIX B
WUG SUMMARY TABLES
MULTIPLE COUNTY

Water User Group:	**Baylor County SUD - Archer, Baylor and Young Counties**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population - Archer	152	154	154	157	158	159
Population - Baylor	893	910	917	923	928	933
Population - Young	195	198	200	201	203	204
Population - Total (number of persons)	**1,240**	**1,262**	**1,271**	**1,281**	**1,289**	**1,296**
Water Demand - Archer (ac-ft/yr)	33	33	33	33	33	33
Water Demand - Baylor (ac-ft/yr)	197	196	194	195	195	196
Water Demand - Young (ac-ft/yr)	43	43	42	42	43	43
Water Demand - Total (ac-ft/yr)	**273**	**272**	**269**	**270**	**271**	**272**
Current Supply - Seymour Aquifer Baylor County	333	333	333	333	333	333
Total Current Supply	**333**	**333**	**333**	**333**	**333**	**333**
Supply - Archer County	45	45	45	45	45	45
Supply - Baylor County	204	204	204	204	204	204
Supply - Young County	52	52	52	52	52	52
Supply - Demand (ac-ft/yr)	60	61	64	63	62	61

Water User Group:	**Wichita Valley WSC - Archer and Wichita Counties**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population - Archer	1,877	1,962	1,998	1,998	1,998	1,998
Population - Wichita	3,145	3,256	3,343	3,404	3,462	3,512
Population - Total (number of persons)	**5,022**	**5,218**	**5,341**	**5,402**	**5,460**	**5,510**
Water Demand - Archer (ac-ft/yr)	221	222	220	216	215	215
Water Demand - Wichita (ac-ft/yr)	370	369	368	368	373	379
Water Demand - Total (ac-ft/yr)	**591**	**591**	**588**	**584**	**588**	**594**
Current Supply - treated and raw - Wichita Falls (ac-ft/yr)	1,131	1,115	1,077	1,038	992	854
Current Supply - sales from Iowa Park (Wichita System) (ac-ft/yr)	675	666	642	619	592	509
Current Supply - sales from Archer City (Wichita System) (ac-ft/yr)	40	39	38	37	35	30
Total Current Supply	**1,846**	**1,820**	**1,757**	**1,694**	**1,619**	**1,393**
Supply - Archer County	715	708	681	650	614	523
Supply - Wichita County	1,131	1,112	1,076	1,044	1,005	870
Supply - Demand (ac-ft/yr)	1,255	1,229	1,169	1,110	1,031	799

Water User Group:	**Dean Dale SUD - Clay and Wichita Counties**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population - Clay	2,150	2,218	2,218	2,218	2,218	2,218
Population - Wichita	1,066	1,103	1,134	1,156	1,176	1,194
Population - Total (number of persons)	**3,216**	**3,321**	**3,352**	**3,374**	**3,394**	**3,412**
Demand - Clay	163	159	151	149	149	149
Demand - Wichita	81	79	77	78	79	80
Water Demand (ac-ft/yr)	**244**	**238**	**228**	**227**	**228**	**229**
Current Supply - Contracts w/ Wichita Falls (ac-ft/yr)	483	456	440	424	405	349
Current Supply - Seymour Aquifer (ac-ft/yr)	0	0	0	0	0	0
Total Current Supply	**483**	**456**	**440**	**424**	**405**	**349**
Current Supply - Clay County	323	305	291	278	265	227
Current Supply - Wichita County	160	151	149	146	140	122
Supply - Demand (ac-ft/yr)	239	218	212	197	177	120

Water User Group:	**Windthorst WSC - Archer and Clay Counties**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population - Archer	988	1,033	1,045	1,045	1,045	1,045
Population - Clay	469	480	480	480	480	480
Population - Total (number of persons)	**1,457**	**1,513**	**1,525**	**1,525**	**1,525**	**1,525**
Demand - Archer	294	303	303	301	301	301
Demand - Clay	140	141	139	138	138	138
Water Demand (ac-ft/yr)	**434**	**444**	**442**	**439**	**439**	**439**
Current Supply - Contracts w/ Wichita Falls (ac-ft/yr)	421	414	400	385	368	318
Total Current Supply	**421**	**414**	**400**	**385**	**368**	**318**
Current Supply - Archer County	285	283	274	264	252	218
Current Supply - Clay County	136	131	126	121	116	100
Supply - Demand (ac-ft/yr)	-13	-30	-42	-54	-71	-121

Water User Group:	**Harrold WSC - Wichita and Wilbarger Counties**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population - Wichita	43	45	47	48	49	50
Population - Wilbarger	333	348	359	368	375	381
Population - Total (number of persons)	**376**	**393**	**406**	**416**	**424**	**431**
Demand - Wichita	12	13	13	13	13	14
Demand - Wilbarger	94	97	98	101	102	104
Water Demand (ac-ft/yr)	**106**	**110**	**111**	**114**	**115**	**118**
Current Supply - Electra	**90**	**90**	**86**	**84**	**80**	**69**
Current Supply - Wichita County	10	11	10	10	9	8
Current Supply - Wilbarger County	80	79	76	74	71	61
Supply - Demand (ac-ft/yr)	-16	-20	-25	-30	-35	-49

Water User Group:	**Archer City - Archer**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population	1,727	1,727	1,727	1,727	1,727	1,727
Water Demand (ac-ft/yr)	263	255	248	244	244	244
Current Supply - contract w/ Wichita Falls (ac-ft/yr)	296	292	282	272	259	224
Current Supply - Archer City Lake (ac-ft/yr)	0	0	0	0	0	0
Supply - Demand (ac-ft/yr)	33	37	34	28	15	-20
Required Safe Supply (ac-ft/yr)	316	306	298	293	293	293
Safe Supply Shortage (ac-ft/yr)	-20	-14	-16	-21	-34	-69

Water User Group:	**Archer County MUD 1 - Archer**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population	806	807	817	817	817	817
Water Demand (ac-ft/yr)	147	144	143	141	141	141
Current Supply - contract w/ Wichita Falls (ac-ft/yr)	84	83	80	76	73	63
Supply - Demand (ac-ft/yr)	-63	-61	-63	-65	-68	-78
Required Safe Supply (ac-ft/yr)	176	173	172	169	169	169
Safe Supply Shortage (ac-ft/yr)	-92	-90	-92	-93	-96	-106

Water User Group:	**Baylor County SUD - Archer**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population	152	154	154	157	158	159
Water Demand (ac-ft/yr)	33	33	33	33	33	33
Current Supply - Seymour Aquifer Baylor County	45	45	45	45	45	45
Supply - Demand (ac-ft/yr)	12	12	12	12	12	12
Required Safe Supply (ac-ft/yr)	40	40	40	40	40	40
Safe Supply Shortage (ac-ft/yr)	5	5	5	5	5	5

Water User Group:	**County-Other - Archer**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	764	661	630	627	626	625
Water Demand (ac-ft/yr)	133	114	108	107	106	106
Current supply - Lake Megargel	0	0	0	0	0	0
Cross Timbers Aquifer	95	95	95	95	95	95
Supply - Demand (ac-ft/yr)	-38	-19	-13	-12	-11	-11
Required Safe Supply (ac-ft/yr)	160	137	130	128	127	127
Safe Supply Shortage (ac-ft/yr)	-65	-42	-35	-33	-32	-32

Water User Group:	**Holliday - Archer**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	1,606	1,832	1,920	1,920	1,920	1,920
Water Demand (ac-ft/yr)	231	255	262	259	258	258
Current Supply - Wichita Falls (ac-ft/yr)	241	251	249	237	227	194
Supply - Demand (ac-ft/yr)	10	-4	-13	-22	-31	-64
Required Safe Supply (ac-ft/yr)	277	306	314	311	310	310
Safe Supply Shortage (ac-ft/yr)	-36	-55	-65	-74	-83	-116

Water User Group:	**Lakeside City - Archer**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	937	971	971	971	971	971
Water Demand (ac-ft/yr)	125	125	121	120	119	119
Current Supply - Wichita Falls (ac-ft/yr)	179	176	170	165	156	135
Supply - Demand (ac-ft/yr)	54	51	49	45	37	16
Required Safe Supply (ac-ft/yr)	150	150	145	144	143	143
Safe Supply Shortage (ac-ft/yr)	29	26	25	21	13	-8

Water User Group:	**City of Scotland**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	552	698	698	698	698	698
Water Demand (ac-ft/yr)	194	242	240	239	239	239
Current Supply- Wichita Falls System (ac-ft/yr)	202	199	193	185	176	152
Supply - Demand (ac-ft/yr)	8	-43	-47	-54	-63	-87
Required Safe Supply (ac-ft/yr)	233	290	288	287	287	287
Safe Supply Shortage (ac-ft/yr)	-31	-91	-95	-102	-111	-135

Water User Group:	**Wichita Valley WSC - Archer**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	1,877	1,962	1,998	1,998	1,998	1,998
Water Demand (ac-ft/yr)	221	222	220	216	215	215
Current Supply- Wichita Falls System (Sales from Wichita Falls, Iowa Park, and Archer City) (ac-ft/yr)	715	708	681	650	614	523
Supply - Demand (ac-ft/yr)	494	486	461	434	399	308
Required Safe Supply (ac-ft/yr)	265	266	264	259	258	258
Safe Supply Shortage (ac-ft/yr)	450	442	417	391	356	265

Water User Group:	**Windthorst WSC - Archer**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	988	1,033	1,045	1,045	1,045	1,045
Water Demand (ac-ft/yr)	294	303	303	301	301	301
Current Supply - raw water - Wichita Falls (ac-ft/yr)	285	283	274	264	252	218
Supply - Demand (ac-ft/yr)	-9	-20	-29	-37	-49	-83
Required Safe Supply (ac-ft/yr)	353	364	364	361	361	361
Safe Supply Shortage (ac-ft/yr)	-68	-81	-90	-97	-109	-143

Water User Group:	**Irrigation - Archer**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	1,251	1,251	1,251	1,251	1,251	1,251
Current Supply- Lake Kemp (ac-ft/yr)	574	517	459	402	345	287
Current Supply- Cross Timbers Aquifer (ac-ft/yr)	200	200	200	200	200	200
Current Supply- Run-of-river	7	7	7	7	7	7
Supply - Demand (ac-ft/yr)	-470	-527	-585	-642	-699	-757

Water User Group:	**Livestock - Archer**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	2,165	2,165	2,165	2,165	2,165	2,165
Current Supply stock ponds (ac-ft/yr)	2,090	2,090	2,090	2,090	2,090	2,090
Current Supply - Cross Timbers Aquifer	195	195	195	195	195	195
Current Supply Lake Kemp/Diversion (Dundee Fish Hatchery)	0	0	0	0	0	0
Supply - Demand (ac-ft/yr)	120	120	120	120	120	120

Water User Group:	**Manufacturing - Archer**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	3	3	3	3	3	3
Current Supply - Cross Timbers Aquifer (ac-ft/yr)	3	3	3	3	3	3
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Mining - Archer**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	405	483	344	279	213	213
Current Supply - Cross Timbers Aquifer (ac-ft/yr)	80	82	79	78	76	76
Supply - Demand (ac-ft/yr)	-325	-401	-265	-201	-137	-137

Water User Group:	**Steam Electric Power - Archer**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	0	0	0	0	0	0
Current Supply - Lake Kemp (ac-ft/yr)	0	0	0	0	0	0
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Baylor County SUD - Baylor**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	893	910	917	923	928	933
Water Demand (ac-ft/yr)	197	196	194	195	195	196
Current Supply - Milllers Creek Lake - Sales from North Central Texas MWA (ac-ft/yr)	6	5	4	2	1	0
Current Supply - Seymour Aquifer Baylor County (ac-ft/yr)	204	204	204	204	204	204
Supply - Demand (ac-ft/yr)	13	13	14	11	10	8
Required Safe Supply (ac-ft/yr)	236	235	233	234	234	235
Safe Supply Shortage (ac-ft/yr)	-26	-26	-25	-28	-29	-31

Water User Group:	**County-Other - Baylor**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	121	104	97	91	86	81
Water Demand (ac-ft/yr)	16	13	12	11	11	10
Current Supply - Seymour Aquifer (ac-ft/yr)	20	20	20	20	20	20
Current Supply - Cross Timbers Aquifer (ac-ft/yr)	5	5	5	5	5	5
Supply - Demand (ac-ft/yr)	9	12	13	14	14	15
Required Safe Supply (ac-ft/yr)	19	16	14	13	13	12
Safe Supply Shortage (ac-ft/yr)	6	9	11	12	12	13

Water User Group:	**Irrigation - Baylor**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	4,949	4,949	4,949	4,949	4,949	4,949
Current Supply - Brazos Run-of-river	17	17	17	17	17	17
Current Supply - Seymour Aquifer (ac-ft/yr)	5,000	5,000	5,000	5,000	5,000	5,000
Supply - Demand (ac-ft/yr)	68	68	68	68	68	68

Water User Group:	**Livestock - Baylor**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	1,190	1,190	1,190	1,190	1,190	1,190
Current Supply Stock ponds (ac-ft/yr)	899	899	899	899	899	899
Current Supply - Seymour Aquifer	276	276	276	276	276	276
Current Supply - Cross Timbers Aquifer	15	15	15	15	15	15
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Mining - Baylor**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	14	14	13	13	13	13
Current Supply - Seymour Aquifer (ac-ft/yr)	10	10	10	10	10	10
Current Supply - Cross Timbers Aquifer (ac-ft/yr)	10	10	10	10	10	10
Supply - Demand (ac-ft/yr)	6	6	7	7	7	7

Water User Group:	**Seymour - Baylor**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	2,712	2,712	2,712	2,712	2,712	2,712
Water Demand (ac-ft/yr)	490	476	465	464	463	463
Current Supply - Seymour Aquifer (ac-ft/yr)	600	600	600	600	600	600
Current Supply - Direct Reuse Golf Course Irrigation (ac-ft/yr)	63	63	63	63	63	63
Supply - Demand (ac-ft/yr)	173	187	198	199	200	200
Required Safe Supply (ac-ft/yr)	588	571	558	557	556	556
Safe Supply Shortage (ac-ft/yr)	12	29	42	43	44	44

Water User Group:	**County-Other - Clay**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	3,672	3,838	3,838	3,838	3,838	3,838
Water Demand (ac-ft/yr)	451	455	442	435	434	434
Current Supply - Seymour Aquifer (ac-ft/yr)	80	80	80	80	80	80
Current Supply - Cross TimbersAquifer (ac-ft/yr)	384	384	384	384	384	384
Supply - Demand (ac-ft/yr)	**13**	**9**	**22**	**29**	**30**	**30**
Required Safe Supply (ac-ft/yr)	541	546	530	522	521	521
Safe Supply Surplus/(Shortage) (ac-ft/yr)	**-77**	**-82**	**-66**	**-58**	**-57**	**-57**

Water User Group:	**Dean Dale SUD - Clay**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	2,150	2,218	2,218	2,218	2,218	2,218
Water Demand (ac-ft/yr)	163	159	151	149	149	149
Current Supply - Contracts w/ Wichita Falls (ac-ft/yr)	323	305	291	278	265	227
Current Supply - Seymour Aquifer (ac-ft/yr)	0	0	0	0	0	0
Supply - Demand (ac-ft/yr)	160	146	140	129	116	78
Required Safe Supply (ac-ft/yr)	196	191	181	179	179	179
Safe Supply Surplus/(Shortage) (ac-ft/yr)	127	114	110	99	86	48

Water User Group:	**Henrietta - Clay**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	3,321	3,425	3,425	3,425	3,425	3,425
Water Demand (ac-ft/yr)	664	669	657	650	649	649
Current Supply - Run-of-river (ac-ft/yr)	1,090	1,090	1,090	1,090	1,090	1,090
Supply - Demand (ac-ft/yr)	426	421	433	440	441	441
Required Safe Supply (ac-ft/yr)	797	803	788	780	779	779
Safe Supply Surplus/(Shortage) (ac-ft/yr)	293	287	302	310	311	311

Water User Group:	**Irrigation - Clay**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population						
Water Demand (ac-ft/yr)	1,629	1,629	1,629	1,629	1,629	1,629
Current Supply - Lake Kemp (ac-ft/yr)	46	41	37	32	28	23
Current supply - Run-of-river	529	529	529	529	529	529
Current Supply - Seymour Aquifer (ac-ft/yr)	500	500	500	500	500	500
Current Supply - Cross Timbers Aquifer (ac-ft/yr)	600	600	600	600	600	600
Supply - Demand (ac-ft/yr)	**46**	**41**	**37**	**32**	**28**	**23**

Water User Group:	**Livestock - Clay**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population						
Water Demand (ac-ft/yr)	2,101	2,101	2,101	2,101	2,101	2,101
Current Supply Stock Ponds (ac-ft/yr)	1,801	1,801	1,801	1,801	1,801	1,801
Current Supply Cross Timbers Aquifer (ac-ft/yr)	250	250	250	250	250	250
Current Supply Seymour Aquifer (ac-ft/yr)	50	50	50	50	50	50
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Mining - Clay**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population						
Water Demand (ac-ft/yr)	613	786	584	471	357	357
Current Supply Red Run-of-River	1	1	1	1	1	1
Current Supply Cross Timbers Aquifer	600	750	600	500	400	400
Current Supply Seymour Aquifer (ac-ft/yr)	25	35	0	0	0	0
Supply - Demand (ac-ft/yr)	13	0	17	30	44	44

Water User Group:	**Red River Authority - Clay**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	1,542	1,542	1,542	1,542	1,542	1,542
Water Demand (ac-ft/yr)	379	372	366	365	364	364
Current Supply - Lake Arrowhead	415	409	395	380	364	313
Supply - Demand (ac-ft/yr)	36	37	29	15	0	-51
Required Safe Supply (ac-ft/yr)	455	446	439	438	437	437
Safe Supply Surplus/(Shortage) (ac-ft/yr)	-40	-37	-44	-58	-73	-124

Water User Group:	**Windthorst WSC - Clay**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	469	480	480	480	480	480
Water Demand (ac-ft/yr)	140	141	139	138	138	138
Current Supply - Sales Wichita Falls (ac-ft/yr)	136	131	126	121	116	100
Supply - Demand (ac-ft/yr)	-4	-10	-13	-17	-22	-38
Required Safe Supply (ac-ft/yr)	168	169	167	166	166	166
Safe Supply Surplus/(Shortage)	-32	-38	-41	-45	-50	-66

Water User Group:	**County-Other - Cottle**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	307	307	307	307	307	307
Water Demand (ac-ft/yr)	42	41	40	40	40	40
Current Supply Other Aquifer (ac-ft/yr)	200	200	200	200	200	200
Supply - Demand (ac-ft/yr)	158	159	160	160	160	160
Required Safe Supply (ac-ft/yr)	50	49	48	48	48	48
Safe Supply Shortage (ac-ft/yr)	150	151	152	152	152	152

Water User Group:	**Irrigation - Cottle**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population						
Water Demand (ac-ft/yr)	3,926	3,926	3,926	3,926	3,926	3,926
Current Supply Blaine Aquifer (ac-ft/yr)	2,700	2,700	2,700	2,700	2,700	2,700
Current Supply Other Aquifer (ac-ft/yr)	1,400	1,400	1,400	1,300	1,300	1,300
Current Supply Run of River (ac-ft/yr)	11	11	11	11	11	11
Supply - Demand (ac-ft/yr)	185	185	185	85	85	85

Water User Group:	**Livestock - Cottle**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population						
Water Demand (ac-ft/yr)	551	551	551	551	551	551
Current Supply Blaine Aquifer (ac-ft/yr)	380	380	380	380	380	380
Current Supply Stock Ponds (ac-ft/yr)	171	171	171	171	171	171
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Mining - Cottle**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population						
Water Demand (ac-ft/yr)	41	41	38	34	31	31
Current Supply Blaine Aquifer (ac-ft/yr)	41	41	38	34	31	31
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Paducah - Cottle**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population	1,196	1,196	1,196	1,196	1,196	1,196
Water Demand (ac-ft/yr)	290	283	282	281	281	281
Current Supply - Blaine Aquifer (ac-ft/yr)	494	494	494	494	494	494
Supply - Demand (ac-ft/yr)	204	211	212	213	213	213
Required Safe Supply (ac-ft/yr)	348	340	338	337	337	337
Safe Supply Shortage (ac-ft/yr)	146	154	156	157	157	157

Water User Group:	**Red River Authority - Cottle**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	49	49	49	49	49	49
Water Demand (ac-ft/yr)	12	12	12	12	12	12
Current Supply - Other Aquifer	14	14	14	14	14	14
Supply - Demand (ac-ft/yr)	2	2	2	2	2	2
Required Safe Supply (ac-ft/yr)	14	14	14	14	14	14
Safe Supply Surplus/(Shortage) (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**County-Other - Foard**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	40	43	43	43	43	43
Water Demand (ac-ft/yr)	7	8	8	8	8	8
Current Supply Seymour Aquifer (ac-ft/yr)	20	20	20	20	20	20
Supply - Demand (ac-ft/yr)	13	12	12	12	12	12
Required Safe Supply (ac-ft/yr)	8	10	10	10	10	10
Safe Supply Shortage (ac-ft/yr)	12	10	10	10	10	10

Water User Group:	**Crowell - Foard**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	986	995	995	995	995	995
Water Demand (ac-ft/yr)	138	133	131	131	131	130
Current Supply Greenbelt Reservoir (ac-ft/yr)	103	103	105	90	84	77
Current Supply Ogallala Aquifer Donley County (ac-ft/yr)	63	57	52	41	34	29
Supply - Demand (ac-ft/yr)	28	27	26	0	-13	-24
Required Safe Supply (ac-ft/yr)	166	160	157	157	157	156
Safe Supply Shortage (ac-ft/yr)	0	0	0	-26	-39	-50

Water User Group:	**Irrigation - Foard**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	3,213	3,213	3,213	3,213	3,213	3,213
Current Supply Seymour Aquifer (ac-ft/yr)	3,300	3,300	3,300	3,300	3,300	3,300
Current Supply Blaine Aquifer (ac-ft/yr)	0	0	0	0	0	0
Supply - Demand (ac-ft/yr)	87	87	87	87	87	87

Water User Group:	**Livestock - Foard**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	401	401	401	401	401	401
Current Supply Seymour Aquifer (ac-ft/yr)	8	8	8	8	8	8
Current Supply Blaine Aquifer (ac-ft/yr)	23	23	23	23	23	23
Current Supply Stock Ponds (ac-ft/yr)	370	370	370	370	370	370
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Mining - Foard**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	12	12	12	12	11	11
Current Supply Other Aquifer (ac-ft/yr)	12	12	12	12	11	11
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Red River Authority - Foard**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	363	363	363	363	363	363
Water Demand (ac-ft/yr)	89	87	86	86	86	86
Current Supply Greenbelt Reservoir (ac-ft/yr)	195	203	210	181	169	154
Current Supply Ogallala Aquifer Donley County (ac-ft/yr)	119	111	104	81	69	58
Current Supply	314	314	314	262	238	212
Supply - Demand (ac-ft/yr)	225	227	228	176	152	126
Required Safe Supply (ac-ft/yr)	107	104	103	103	103	103
Safe Supply Surplus/(Shortage) (ac-ft/yr)	207	210	211	159	135	109

Water User Group:	**County-Other - Hardeman**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	1,022	1,002	962	941	906	871
Water Demand (ac-ft/yr)	163	154	144	141	135	130
Current Supply Greenbelt Reservoir (ac-ft/yr)	30	31	32	28	26	24
Current Supply Ogallala Aquifer Donley County (ac-ft/yr)	18	17	16	12	11	9
Current Supply Seymour Aquifer (ac-ft/yr)	175	175	175	175	175	175
Supply - Demand (ac-ft/yr)	60	69	79	74	77	78
Required Safe Supply (ac-ft/yr)	196	185	173	169	162	156
Safe Supply Shortage (ac-ft/yr)	9	21	34	34	39	43

Water User Group:	**Irrigation - Hardeman**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	12,498	12,498	12,498	12,498	12,498	12,498
Current Supply Blaine Aquifer (ac-ft/yr)	6,350	6,350	6,350	6,350	6,350	6,350
Current Supply Run-of-river	146	146	146	146	146	146
Current Supply Seymour Aquifer (ac-ft/yr)	6,002	6,002	6,002	6,002	6,002	6,002
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Livestock - Hardeman**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	646	646	646	646	646	646
Current Supply Seymour Aquifer (ac-ft/yr)	57	57	57	57	57	57
Current Supply Blaine Aquifer (ac-ft/yr)	158	158	158	158	158	158
Current Supply Other Aquifer (ac-ft/yr)	34	34	34	34	34	34
Current Supply Stock Ponds (ac-ft/yr)	400	400	400	400	400	400
Supply - Demand (ac-ft/yr)	3	3	3	3	3	3

Water User Group:	**Manufacturing - Hardeman**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	440	483	483	483	483	483
Current Supply Seymour Aquifer	300	300	300	300	300	300
Current Supply Greenbelt Reservoir (ac-ft/yr)	142	147	152	131	123	112
Current Supply Ogallala Donley County (ac-ft/yr)	86	81	76	59	50	42
Supply - Demand (ac-ft/yr)	88	45	45	7	-10	-29
Required Safe Supply (ac-ft/yr)	528	580	580	580	580	580
Safe Supply Shortage (ac-ft/yr)	0	-52	-52	-90	-107	-126

Water User Group:	**Mining - Hardeman**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	17	17	18	18	18	18
Current Supply Blaine Aquifer (ac-ft/yr)	12	12	12	12	12	12
Current Supply - Other Local Supply (ac-ft/yr)	7	7	7	7	7	7
Supply - Demand (ac-ft/yr)	2	2	1	1	1	1

Water User Group:	**Quanah - Hardeman**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	2,728	2,797	2,821	2,876	2,905	2,927
Water Demand (ac-ft/yr)	396	391	387	394	397	400
Current Supply Greenbelt Reservoir (ac-ft/yr)	295	303	310	272	256	236
Current Supply Ogallala Reservoir (ac-ft/yr)	180	166	154	122	105	88
Supply - Demand (ac-ft/yr)	79	78	77	0	-36	-76
Required Safe Supply (ac-ft/yr)	475	469	464	473	476	480
Safe Supply Shortage (ac-ft/yr)	0	0	0	-79	-115	-156

Water User Group:	**Red River Authority - Hardeman**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	524	584	637	690	741	789
Water Demand (ac-ft/yr)	129	141	151	163	175	186
Current Supply - Greenbelt Reservoir	104	108	112	97	90	83
Current Supply Ogallala Aquifer Donley County	64	60	56	43	37	31
Supply - Demand (ac-ft/yr)	39	27	17	-23	-48	-72
Required Safe Supply (ac-ft/yr)	155	169	181	196	210	223
Safe Supply Surplus/(Shortage) (ac-ft/yr)	13	-1	-13	-56	-83	-109

Water User Group:	**County-Other - King**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	83	99	99	99	99	99
Water Demand (ac-ft/yr)	22	25	25	25	25	25
Current Supply Blaine Aquifer (ac-ft/yr)	30	30	30	30	30	30
Current Supply Other Aquifer (ac-ft/yr)	12	12	12	12	12	12
Supply - Demand (ac-ft/yr)	20	17	17	17	17	17
Required Safe Supply (ac-ft/yr)	26	30	30	30	30	30
Safe Supply Shortage (ac-ft/yr)	16	12	12	12	12	12

Water User Group:	**Irrigation - King**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	0	0	0	0	0	0
Current Supply Blaine Aquifer (ac-ft/yr)	0	0	0	0	0	0
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Livestock - King**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	419	419	419	419	419	419
Current Supply Other Aquifer (ac-ft/yr)	130	130	130	130	130	130
Current Supply Blaine Aquifer (ac-ft/yr)	150	150	150	150	150	150
Current Supply Stock Ponds (ac-ft/yr)	142	142	142	142	142	142
Supply - Demand (ac-ft/yr)	3	3	3	3	3	3

Water User Group:	**Mining - King**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	380	331	289	251	219	219
Current Supply - Other Aquifer (ac-ft/yr)	380	331	289	251	219	219
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Red River Authority - King**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	217	217	217	217	217	217
Water Demand (ac-ft/yr)	53	52	52	51	51	51
Current Supply - Other Aquifer (Dickens County)	64	62	62	61	61	61
Supply - Demand (ac-ft/yr)	11	10	10	10	10	10
Required Safe Supply (ac-ft/yr)	64	62	62	61	61	61
Safe Supply Surplus/(Shortage) (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Bowie - Montague**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	5,828	6,042	6,139	6,247	6,316	6,367
Water Demand (ac-ft/yr)	995	1,003	997	1,002	1,011	1,019
Current Supply Amon Carter (ac-ft/yr)	1,154	1,066	980	892	803	714
Supply - Demand (ac-ft/yr)	159	63	-17	-110	-208	-305
Required Safe Supply (ac-ft/yr)	1,194	1,204	1,196	1,202	1,213	1,223
Safe Supply Shortage (ac-ft/yr)	-40	-138	-216	-310	-410	-509

Water User Group:	**County-Other - Montague**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	9,621	9,950	10,081	10,233	10,321	10,378
Water Demand (ac-ft/yr)	1,164	1,162	1,144	1,144	1,150	1,156
Current Supply Amon Carter (ac-ft/yr)	116	116	114	114	115	116
Current Supply Trinity Aquifer (ac-ft/yr)	500	500	500	500	500	500
Current Supply Lake Nocona (ac-ft/yr)	47	46	46	46	46	46
Current Supply Cross Timbers Aquifer (ac-ft/yr)	700	700	700	700	700	700
Supply - Demand (ac-ft/yr)	199	200	216	216	211	206
Required Safe Supply (ac-ft/yr)	1,397	1,394	1,373	1,373	1,380	1,387
Safe Supply Shortage (ac-ft/yr)	-34	-32	-13	-13	-19	-25

Water User Group:	**Irrigation - Montague**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	584	584	584	584	584	584
Current Supply Trinity Aquifer (ac-ft/yr)	315	315	315	315	315	315
Current Supply Cross Timbers Aquifer (ac-ft/yr)	350	350	350	350	350	350
Current Supply Lk Nocona (ac-ft/yr)	100	100	100	100	100	100
Current Supply Red Run-of-River Wtr Rt 5605 (ac-ft/yr)	108	108	108	108	108	108
Current Supply Direct Reuse from Nocona for Golf Course (ac-ft/yr)	16	16	16	16	16	16
Supply - Demand (ac-ft/yr)	305	305	305	305	305	305

Water User Group:	**Livestock - Montague**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	1,704	1,704	1,704	1,704	1,704	1,704
Current Supply Trinity Aquifer (ac-ft/yr)	0	0	0	0	0	0
Current Supply Cross Timbers Aquifer (ac-ft/yr)	76	76	76	76	76	76
Current Supply Stock ponds (ac-ft/yr)	1,628	1,628	1,628	1,628	1,628	1,628
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Manufacturing - Montague**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	1	1	1	1	1	1
Current Supply Lk Nocona (ac-ft/yr)	1	1	1	1	1	1
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0
Required Safe Supply (ac-ft/yr)	1	1	1	1	1	1
Safe Supply Shortage (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Mining - Montague**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	3,639	2,577	1,606	691	777	777
Current Supply Cross Timbers Aquifer (ac-ft/yr)	2,000	2,000	1,000	700	800	800
Current Supply Trinity Aquifer (ac-ft/yr)	0	0	0	0	0	0
Current Supply Run-of-River (ac-ft/yr)	0	0	0	0	0	0
Current Supply - Direct Reuse (Sales from Bowie) (ac-ft/yr)	348	351	349	0	0	0
Supply - Demand (ac-ft/yr)	-1,291	-226	-257	9	23	23

Water User Group:	**Nocona - Montague**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	3,155	3,271	3,323	3,381	3,419	3,446
Water Demand (ac-ft/yr)	740	751	750	758	765	771
Current Supply Lake Nocona (ac-ft/yr)	1,112	1,101	1,098	1,113	1,113	1,113
Supply - Demand (ac-ft/yr)	372	350	348	355	348	342
Required Safe Supply (ac-ft/yr)	888	901	900	910	918	925
Safe Supply Shortage (ac-ft/yr)	224	200	198	203	195	188

Water User Group:	**Nocona Hills WSC - Montague**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	536	556	565	575	581	586
Water Demand (ac-ft/yr)	105	106	106	107	108	108
Current Supply - Trinity Aquifer (ac-ft/yr)	118	118	118	118	118	118
Supply - Demand (ac-ft/yr)	13	12	12	11	10	10
Required Safe Supply (ac-ft/yr)	126	127	127	128	130	130
Safe Supply Shortage (ac-ft/yr)	-8	-9	-9	-10	-12	-12

Water User Group:	**Red River Authority - Montague**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	316	352	385	417	447	476
Water Demand (ac-ft/yr)	78	85	91	99	106	112
Current Supply - Trinity Aquifer	94	102	109	119	127	134
Supply - Demand (ac-ft/yr)	16	17	18	20	21	22
Required Safe Supply (ac-ft/yr)	94	102	109	119	127	134
Safe Supply Surplus/(Shortage) (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Saint Jo - Montague**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	1,051	1,089	1,107	1,126	1,139	1,148
Water Demand (ac-ft/yr)	155	156	155	155	157	158
Current Supply Trinity Aquifer (ac-ft/yr)	211	211	211	211	211	211
Supply - Demand (ac-ft/yr)	56	55	56	56	54	53
Required Safe Supply (ac-ft/yr)	186	187	186	186	188	190
Safe Supply Shortage (ac-ft/yr)	25	24	25	25	23	21

Water User Group:	**Burkburnett - Wichita**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	11,004	11,405	11,721	11,941	12,153	12,331
Water Demand (ac-ft/yr)	1,461	1,460	1,457	1,462	1,483	1,505
Current Supply Seymour Aquifer (ac-ft/yr)	968	968	968	968	968	968
Current Supply Wichita System (ac-ft/yr)	1,821	1,720	1,726	1,660	1,584	1,359
Current Supply Direct Reuse for ISD, Golf Course, Parks (ac-ft/yr)	167	167	167	167	167	167
Supply - Demand (ac-ft/yr)	1,495	1,395	1,404	1,333	1,236	989
Required Safe Supply (ac-ft/yr)	1,753	1,752	1,748	1,754	1,780	1,806
Safe Supply Shortage (ac-ft/yr)	1,036	936	946	874	772	521

Water User Group:	**County-Other - Wichita**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	265	502	685	814	938	1,043
Water Demand (ac-ft/yr)	33	61	84	99	114	127
Current Supply Wichita System (ac-ft/yr)	279	275	267	257	246	212
Sales from Iowa Park to Horseshoe Bend Estates	75	74	72	69	66	57
Current Supply Seymour Aquifer (ac-ft/yr)	100	100	100	100	100	100
Supply - Demand (ac-ft/yr)	421	388	355	327	298	242
Required Safe Supply (ac-ft/yr)	40	73	101	119	137	152
Safe Supply Shortage (ac-ft/yr)	339	302	266	238	209	160

Water User Group:	**Dean Dale SUD - Wichita**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	1,066	1,103	1,134	1,156	1,176	1,194
Water Demand (ac-ft/yr)	81	79	77	78	79	80
Current Supply - Wichita System (ac-ft/yr)	160	151	149	146	140	122
Supply - Demand (ac-ft/yr)	79	72	72	68	61	42
Required Safe Supply (ac-ft/yr)	97	95	92	94	95	96
Safe Supply Shortage (ac-ft/yr)	63	56	57	52	45	26

Water User Group:	**Electra - Wichita**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	2,694	2,793	2,869	2,924	2,975	3,019
Water Demand (ac-ft/yr)	884	902	916	932	947	961
Current Supply Lk Electra (ac-ft/yr)	0	0	0	0	0	0
Current Supply Sales from Iowa Park (Wichita System) (ac-ft/yr)	751	738	714	686	657	566
Current Supply Seymour Aquifer (ac-ft/yr)	0	0	0	0	0	0
Supply - Demand (ac-ft/yr)	-133	-164	-202	-246	-290	-395
Required Safe Supply (ac-ft/yr)	1,061	1,082	1,099	1,118	1,136	1,153
Safe Supply Shortage (ac-ft/yr)	-310	-344	-385	-432	-479	-587

Water User Group:	**Harrold WSC - Wichita**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	43	45	47	48	49	50
Water Demand (ac-ft/yr)	12	13	13	13	13	14
Current Supply - City of Electra (ac-ft/yr)	10	11	10	10	9	8
Supply - Demand (ac-ft/yr)	-2	-2	-3	-3	-4	-6
Required Safe Supply (ac-ft/yr)	14	16	16	16	16	17
Safe Supply Shortage (ac-ft/yr)	-4	-5	-6	-6	-7	-9

Water User Group:	**Iowa Park - Wichita**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	6,492	6,728	6,913	7,044	7,168	7,274
Water Demand (ac-ft/yr)	884	884	882	885	898	911
Current Supply Lk Iowa Park/Lake Gordon (ac-ft/yr)	0	0	0	0	0	0
Current Supply NF Buffalo Crk (ac-ft/yr)	0	0	0	0	0	0
Current Supply Wichita System (ac-ft/yr)	1,172	1,144	1,103	1,064	1,016	876
Supply - Demand (ac-ft/yr)	288	260	221	179	118	-35
Required Safe Supply (ac-ft/yr)	1,061	1,061	1,058	1,062	1,078	1,093
Safe Supply Shortage (ac-ft/yr)	111	83	45	2	-62	-217

Water User Group:	**Irrigation - Wichita**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population						
Water Demand (ac-ft/yr)	39,156	39,156	39,156	39,156	39,156	39,156
Current Supply Lk Kemp (ac-ft/yr)	17,561	15,804	14,048	12,292	10,536	8,780
Current Supply WR #5023(ROR) (ac-ft/yr)	0	0	0	0	0	0
Current Supply Run-of-river (ac-ft/yr)	300	300	300	300	300	300
Current Supply Seymour Aquifer (ac-ft/yr)	0	0	0	0	0	0
Current Supply Cross Timbers Aquifer (ac-ft/yr)	600	600	600	600	600	600
Supply - Demand (ac-ft/yr)	-20,695	-22,452	-24,208	-25,964	-27,720	-29,476

Water User Group:	**Livestock - Wichita**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	975	975	975	975	975	975
Current Supply Cross Timbers Aquifer (ac-ft/yr)	59	59	59	59	59	59
Current Supply Stock Ponds (ac-ft/yr)	916	916	916	916	916	916
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Manufacturing - Wichita**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population						
Water Demand (ac-ft/yr)	1,025	1,100	1,100	1,100	1,100	1,100
Current Supply Wichita System (sales from Wichita Falls) (ac-ft/yr)	643	651	628	605	578	498
Current Supply Wichita System (sales from Burkburnett) (ac-ft/yr)	51	55	55	55	55	55
Current Supply Wichita System (sales from Iowa Park) (ac-ft/yr)	154	163	157	151	145	125
Current Supply Seymour Aquifer (ac-ft/yr)	129	129	129	129	129	129
Current Supply Direct Reuse from Wichita Falls and Iowa Park	190	190	190	190	190	190
Supply - Demand (ac-ft/yr)	142	88	59	30	-3	-103
Required Safe Supply (ac-ft/yr)	1,230	1,319	1,319	1,320	1,320	1,320
Safe Supply Shortage (ac-ft/yr)	-253	-321	-350	-380	-413	-513

Water User Group:	**Mining - Wichita**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	62	61	55	49	44	44
Current Supply Seymour Aquifer (ac-ft/yr)	62	61	55	49	44	44
Current Supply Run-of-river (ac-ft/yr)	0	0	0	0	0	0
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Sheppard Air Force Base - Wichita**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	6,088	6,088	6,088	6,088	6,088	6,088
Water Demand (ac-ft/yr)	979	951	929	919	917	917
Current Supply Wichita Falls (ac-ft/yr)	1,023	937	884	841	804	692
Supply - Demand (ac-ft/yr)	44	-14	-45	-78	-113	-225
Required Safe Supply (ac-ft/yr)	1,175	1,141	1,115	1,103	1,100	1,100
Safe Supply Shortage (ac-ft/yr)	-152	-204	-231	-262	-296	-408

Water User Group:	**Steam Electric Power - Wichita**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	31	31	31	31	31	31
Current Supply Wichita System (ac-ft/yr)	32	30	29	29	27	24
Supply - Demand (ac-ft/yr)	1	-1	-2	-2	-4	-7

Water User Group:	**Wichita Falls - Wichita**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	104,830	108,653	111,648	113,752	115,762	117,471
Water Demand (ac-ft/yr)	16,873	16,987	17,055	17,159	17,422	17,677
Current Supply Little Wichita System (ac-ft/yr)	9,494	8,620	8,359	8,100	7,872	6,209
Current Supply Indirect Reuse	5,556	5,538	5,508	5,555	5,620	5,661
Current Supply Lk Kemp (ac-ft/yr)	2,948	2,652	2,357	2,063	1,768	1,474
Supply - Demand (ac-ft/yr)	1,125	-177	-831	-1,441	-2,162	-4,333
Required Safe Supply (ac-ft/yr)	20,248	20,384	20,466	20,591	20,906	21,212
Safe Supply Shortage (ac-ft/yr)	-2,250	-3,574	-4,242	-4,873	-5,646	-7,868

Water User Group:	**Wichita Valley WSC - Wichita**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	3,145	3,256	3,343	3,404	3,462	3,512
Water Demand (ac-ft/yr)	370	369	368	368	373	379
Current Supply - Wichita System (Sales from Wichita Falls, Iowa Park and Archer City) (ac-ft/yr)	1,131	1,112	1,076	1,044	1,005	870
Supply - Demand (ac-ft/yr)	761	743	708	676	632	491
Required Safe Supply (ac-ft/yr)	444	443	442	442	448	455
Safe Supply Shortage (ac-ft/yr)	687	669	634	602	557	415

Water User Group:	**County-Other - Wilbarger**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	1,324	1,335	1,305	1,279	1,233	1,178
Water Demand (ac-ft/yr)	210	204	196	192	185	176
Current Supply Seymour Aquifer Sales from Vernon	50	50	50	50	50	49
Current Supply Seymour Aquifer	100	100	100	100	100	100
Current Supply Red Run-of-River (ac-ft/yr)	115	115	115	115	115	115
Supply - Demand (ac-ft/yr)	55	61	69	73	80	88
Required Safe Supply (ac-ft/yr)	252	245	235	230	222	211
Safe Supply Shortage (ac-ft/yr)	13	20	30	35	43	53

Water User Group:	**Harrold WSC - Wilbarger**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	333	348	359	368	375	381
Water Demand (ac-ft/yr)	94	97	98	101	102	104
Current Supply - City of Electra (ac-ft/yr)	80	79	76	74	71	61
Supply - Demand (ac-ft/yr)	-14	-18	-22	-27	-31	-43
Required Safe Supply (ac-ft/yr)	113	116	118	121	122	125
Safe Supply Shortage (ac-ft/yr)	-33	-37	-42	-47	-51	-64

Water User Group:	**Irrigation - Wilbarger**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	29,289	29,289	29,289	29,289	29,289	29,289
Current Supply Seymour Aq (ac-ft/yr)	25,500	25,500	25,500	25,500	25,500	25,500
Current Supply Other Aq (ac-ft/yr)	3,040	3,040	3,040	3,040	3,040	3,040
Current Supply Run-of-river (ac-ft/yr)	807	807	807	807	807	807
Supply - Demand (ac-ft/yr)	58	58	58	58	58	58

Water User Group:	**Livestock - Wilbarger**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	965	965	965	965	965	965
Current Supply Seymour Aquifer (ac-ft/yr)	125	125	125	125	125	125
Current Supply Santa Rosa Lake (ac-ft/yr)	50	50	50	50	50	50
Current Supply Stock Ponds (ac-ft/yr)	790	790	790	790	790	790
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Manufacturing - Wilbarger**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	958	1,048	1,048	1,048	1,048	1,048
Current Supply Seymour Aquifer Sales from Vernon	958	1,048	1,048	1,048	1,048	1,035
Supply - Demand (ac-ft/yr)	0	0	0	0	0	-13
Required Safe Supply (ac-ft/yr)	1,150	1,258	1,258	1,258	1,258	1,258
Safe Supply Shortage (ac-ft/yr)	-192	-210	-210	-210	-210	-223

Water User Group:	**Mining - Wilbarger**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	20	20	19	19	18	18
Current Supply Other Aquifer (ac-ft/yr)	10	10	10	10	10	10
Current Supply Beaver Creek (ac-ft/yr)	30	30	30	30	30	30
Supply - Demand (ac-ft/yr)	20	20	21	21	22	22

Water User Group:	**Steam Electric Power - Wilbarger**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	7,711	7,711	7,711	7,711	7,711	7,711
Current Supply Lk Kemp (ac-ft/yr)	6,010	5,409	4,808	4,207	3,606	3,005
Supply - Demand (ac-ft/yr)	-1,701	-2,302	-2,903	-3,504	-4,105	-4,706

Water User Group:	**Red River Authority - Wilbarger**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	1,050	1,171	1,279	1,386	1,487	1,584
Water Demand (ac-ft/yr)	258	282	304	328	351	374
Curren Supplies - Seymour Aquifer	50	50	50	50	50	50
Current Supply - Sales from Vernon Seymour Aquifer	260	288	315	344	371	394
Supply - Demand (ac-ft/yr)	52	56	61	66	70	70
Required Safe Supply (ac-ft/yr)	310	338	365	394	421	449
Safe Supply Surplus/(Shortage) (ac-ft/yr)	0	0	0	0	0	-5

Water User Group:	**Vernon - Wilbarger**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	11,758	12,398	12,785	13,175	13,447	13,653
Water Demand (ac-ft/yr)	1,882	1,922	1,933	1,981	2,018	2,048
Current Supply Seymour Aquifer (ac-ft/yr)	2,232	2,114	2,087	2,058	2,031	2,022
Supply - Demand (ac-ft/yr)	350	192	154	77	13	-26
Required Safe Supply (ac-ft/yr)	2,258	2,306	2,320	2,377	2,422	2,458
Safe Supply Shortage (ac-ft/yr)	**-26**	**-192**	**-233**	**-319**	**-391**	**-436**

Water User Group:	**Baylor County SUD - Young**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	195	198	200	201	203	204
Water Demand (ac-ft/yr)	43	43	42	42	43	43
Current Supply - Seymour Aquifer Baylor County (ac-ft/yr)	52	52	52	52	52	52
Supply - Demand (ac-ft/yr)	9	9	10	10	9	9
Required Safe Supply (ac-ft/yr)	52	52	50	50	52	52
Safe Supply Shortage (ac-ft/yr)	0	0	2	2	0	0

Water User Group:	**County-Other - Young (Region B portion)**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	339	436	506	581	653	723
Water Demand (ac-ft/yr)	41	51	58	66	74	82
Purchase from Graham	22	25	28	30	32	33
Current Supply - Cross Timbers Aquifer (ac-ft/yr)	41	51	58	66	74	82
Supply - Demand (ac-ft/yr)	22	25	28	30	32	33
Required Safe Supply (ac-ft/yr)	49	61	70	79	89	98
Safe Supply Shortage (ac-ft/yr)	-8	-10	-12	-13	-15	-16

Water User Group:	**Irrigation - Young**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	3	3	3	3	3	3
Current Supply Cross Timbers Aquifer (ac-ft/yr)	3	3	3	3	3	3
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Livestock - Young**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)						
Water Demand (ac-ft/yr)	122	122	122	122	122	122
Current Supply Stock Ponds (ac-ft/yr)	122	122	122	122	122	122
Supply - Demand (ac-ft/yr)	0	0	0	0	0	0

Water User Group:	**Olney - Young**					
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Population (number of persons)	3,370	3,485	3,568	3,655	3,740	3,822
Water Demand (ac-ft/yr)	556	558	558	566	577	590
Current Supply Wichita System (ac-ft/yr)	561	553	534	514	491	424
Current Supply Lk Olney/Cooper (ac-ft/yr)	169	156	143	131	118	105
Current Supply Direct Reuse to Golf Course (ac-ft/yr)	5	5	5	5	5	5
Supply - Demand (ac-ft/yr)	179	156	124	84	37	-56
Required Safe Supply (ac-ft/yr)	667	670	670	679	692	708
Safe Supply Shortage (ac-ft/yr)	63	39	7	-34	-83	-179

APPENDIX C

COST ESTIMATES

2021 FINAL PLAN

REGION B

OCTOBER 2020

APPENDIX C

COST ESTIMATES
2021 FINAL PLAN
REGION B

Region B Regional Water Planning Area Cost Estimates

As part of the 2021 Region B Regional Water Plan, cost estimates were developed for each of the recommended water management strategies in Region B. As appropriate, these cost estimates have been updated from the 2016 regional water plan. In accordance with the Texas Water Development Board guidance the costs for water management strategies are to be updated from September 2013 dollars to September 2018 dollars. The methodology used to develop the 2021 costs is described in the following sections. Where updated unit costs were not available, the Engineering News Record (ENR) Index for construction was used to increase the costs from September 2013 to September 2018 costs. An increase of 116.9% from September 2013 to September 2018 was determined using the ENR Index method.

Introduction

1. The evaluation of water management strategies requires developing cost estimates. Guidance for cost estimates may be found in the TWDB's "Exhibit C - Second Amended General Guidelines for Fifth Cycle of Regional Water Plan Development Section 5.5". Costs are to be reported in September 2018 dollars.

2. Standard unit costs for installed pipe, pump stations, standard treatment facilities, and well fields were developed and/or updated using the costing tool provided by the TWDB. The unit costs do not include engineering, contingency, financial and legal services, costs for land and rights-of-way, permits, environmental and archeological studies, or mitigation. The costs for these items are determined separately in the cost tables.

3. The information presented in this section is intended to be 'rule-of-thumb' guidance. Specific situations may call for alteration of the procedures and costs. Note that the costs in this memorandum provide a planning level estimate for comparison purposes.

4. It is important that when comparing alternatives that the cost estimates be similar and include similar items. If an existing reliable cost estimate is available for a project it should be used

where appropriate. All cost estimates must meet the requirements set forth in the TWDB's "Exhibit C - Second Amended General Guidelines for Fifth Cycle of Regional Water Plan Development Section 5.5".

5. The cost estimates have two components:
   - Initial Capital Costs: Including total construction cost of facilities, engineering and legal contingencies, environmental and archaeology studies and mitigation, land acquisition and surveying, and interest incurred during construction (3.0 percent annual interest rate less a 0.5 percent rate of return on investment of unspent funds).
   - Average Annual Costs: Including annual operation and maintenance costs, pumping energy costs, purchase of water and debt service.

TWDB does not require the consultant to determine life cycle or present value analysis. For most situations annual costs are sufficient for comparison purposes and a life-cycle analysis is not required.

ASSUMPTIONS FOR CAPITAL COSTS:

Conveyance Systems

The unit costs and factors shown in Tables C-1 through C-7 were developed directly from the TWDB Uniform Costing Model (UCM). These costs are the basis of the capital costs developed for this plan. Standard pipeline costs used for these cost estimates are shown in Table C-1. Pump station costs are based on required Horsepower capacity and are listed in Table C-2. The power capacity is to be determined from the hydraulic analyses included in the TWDB costing tool (or detailed analysis if available). Pipelines and pump stations are to be sized for peak pumping capacity.

- Pump efficiency is assumed to be 70 percent.
- Peaking factor of 2 times the average demand is to be used for strategies when the water is pumped directly to a water treatment plant. (or historical peaking factor, if available)
- The target flow velocity in pipes is 5 fps and the Hazen-Williams Factor is assumed

to be 120.

- Peaking factor of 1.2 to 1.5 is to be used if there are additional water sources and/or the water is transported to a terminal storage facility.
- Ground storage is to be provided at each booster pump station along the transmission line unless there is a more detailed design.
- Ground storage tanks should provide sufficient storage for 2.5 to 4 hours of pumping at peak capacity. Costs for ground storage are shown in Table C-3. Covered storage tanks are used for all strategies transporting treated water.

Water Treatment Plants

Water treatment plants are to be sized for peak day capacity (assume peaking factor of 2 if no specific data is available). Costs estimated include six different treatment levels of varying degree. These levels are groundwater chlorine disinfection, iron and manganese removal, simple filtration, construction of a new conventional treatment plant, expansion of a conventional treatment plant, brackish desalination, and seawater desalination. Costs are also based upon a TDS factor that will increase or decrease the cost of treatment accordingly. These costs are summarized in Table C-4. **All treatment plants are to be sized for finished water capacity**.

Direct Reuse

Direct reuse refers to the introduction of reclaimed water directly from a water reclamation plant to a distribution system. The following assumptions were made for direct potable and non-potable reuse strategies.

Direct Non-Potable Reuse

Non-potable reuse is the use of reclaimed water that is used directly for non-potable beneficial uses such as landscape irrigation. The TWDB costing tool currently does not have a direct non-potable reuse treatment plant improvements option, therefore the following assumptions were made.

- It was assumed that the cost of an iron and manganese removal plant would be an appropriate approximation of the improvements that would be needed at the Wastewater Treatment Plant. This cost was further refined by assuming that only upgrades to an existing facility would be required, and not construction of an entirely new plant.
- Approximately two miles of 6-inch pipeline was also included in the cost estimates for transport of the treated water to the destination. Since reuse is still relatively new, there is a lack of piping infrastructure for reuse water. It was also assumed that the pump station was included in the WWTP improvements.

Direct Potable Reuse

Direct potable reuse is the use of reclaimed water that is transported directly from a wastewater treatment plant to a drinking water system. The TWDB costing tool currently does not have a direct potable reuse treatment plant improvements option, therefore the following assumptions were made.

- Due to the high level of treatment that is required for direct potable reuse, the wastewater treatment plant improvements cost was assumed to be equivalent to 75 percent of a conventional treatment plant expansion plus brackish desalination treatment improvements. The 25 percent discount was given to Level 3 Treatment in order to alleviate any redundancy being assumed by the costing tool.

New Groundwater Wells

Cost estimates required for water management strategies that include additional wells or well fields were determined through the TWDB costing tool (unless a more detailed design was available). The associated costs are shown in Table C-5. The costing tool differentiated the wells based upon purpose. The categories were Public Supply, Irrigation, and ASR. These cost relationships are "rule-of-thumb" in nature and are only appropriate in the broad context of the cost evaluations for the RWP process.

The cost relationships assume construction methods required for public water supply wells, including carbon steel surface casing and pipe-based, stainless steel, and wire-wrap screen. The cost estimates assume that wells would be gravel-packed in the screen sections and the surface casing cemented to their total depth. Estimates include the cost of drilling, completion, well development, well testing, pump, motor, motor controls, column pipe, installation and mobilization. The cost relationships do not include engineering, contingency, financial and legal services, land costs, or permits. A more detailed cost analysis should be completed prior to developing a project.

The costs associated with conveyance systems for multi-well systems can vary widely based on the distance between wells, terrain characteristics, well production, and distance to the treatment facility. These costs should be estimated using standard engineering approaches and site-specific information. For planning purposes, these costs were estimated using the TWDB costing tool's assumptions for conveyance. It is important to note that conveyance costs were not included for point of use water user groups such as mining.

Other Costs

- Engineering, contingency, construction management, financial and legal costs are to be estimated at 30 percent of construction cost for pipelines and 35 percent of construction costs for pump stations, treatment facilities and reservoir projects. (This is in accordance with TWDB guidance.)
- Permitting and mitigation for transmission and treatment projects are to be estimated at $25,000 per mile. For reservoirs, mitigation and permitting costs are assumed equal to twice the land purchase cost, unless site specific data is available.
- Right-of-way (ROW) costs for transmission lines are estimated through costs provided by the Texas A&M University Real Estate Center (https://www.recenter.tamu.edu/data/rural-land/) which gives current land costs based on county. The ROW width is assumed to be 50 ft. If a small pipeline follows existing right-of-ways (such as highways), no additional right-of-way cost may be assumed. Large pipelines will require ROW costs regardless of routing.

Interest during construction is the total of interest accrued at the end of the construction period using a 3.0 percent annual interest rate on total borrowed funds, less a 0.5 percent rate of return on investment of unspent funds. This is calculated assuming that the total estimated project cost (excluding interest during construction) would be drawn down at a constant rate per month during the construction period. Factors were determined for different lengths of time for project construction. These factors were used in cost estimating and are presented in Table C-6.

ASSUMPTIONS FOR ANNUAL COSTS:

Annual costs are to be estimated using the following assumptions:

- Debt service for all transmission and treatment facilities is to be annualized over 20 years, but not longer than the life of the project. [Note: uniform amortization periods should be used when evaluating similar projects for an entity.]
- Annual interest rate for debt service is 3.5 percent.
- Water purchase costs are to be based on wholesale rates reported by the selling entity when possible. In lieu of known rates, a typical regional cost for treated water and raw water will be developed.
- Operation and Maintenance costs are to be calculated based on the construction cost of the capital improvement. Engineering, permitting, etc. should not be included as a basis for this calculation. However, a 20% allowance for construction contingencies should be included for all O&M calculations. Per the "Exhibit C - Second Amended General Guidelines for Fifth Cycle of Regional Water Plan Development Section 5.5", O&M should be calculated at:
    - 1 percent of the construction costs for pipelines
    - 1.5 percent for dams
    - 2.5 percent of the construction costs for pump stations
    - O&M Costs for the varying levels of water treatment plant improvements were developed by the TWDB and are shown in Table C-7.

- Pumping costs are to be estimated using an electricity rate of $0.08 per Kilowatt Hour. If local data is available, this can be used.

Table C-1

Pipeline Costs

Diameter	Soil		Rock	
	Rural	**Urban**	**Rural**	**Urban**
(Inches)	($/Foot)	($/Foot)	($/Foot)	(Feet)
6	$25	$31	$35	$49
8	$40	$50	$56	$77
10	$54	$69	$76	$106
12	$68	$87	$97	$134
14	$82	$106	$118	$162
16	$97	$125	$138	$191
18	$111	$144	$159	$219
20	$125	$162	$179	$248
24	$154	$200	$220	$304
30	$196	$256	$282	$390
36	$239	$312	$344	$475
42	$282	$369	$406	$560
48	$325	$425	$467	$645
54	$367	$481	$529	$730
60	$410	$537	$591	$815
66	$453	$594	$653	$901
72	$496	$650	$714	$986
78	$605	$776	$865	$1,156
84	$713	$902	$1,016	$1,326
90	$822	$1,028	$1,167	$1,496
96	$931	$1,154	$1,317	$1,667
102	$1,040	$1,280	$1,468	$1,837
108	$1,149	$1,406	$1,619	$2,007
114	$1,258	$1,533	$1,769	$2,177
120	$1,366	$1,659	$1,920	$2,347
132	$1,584	$1,911	$2,221	$2,688
144	$1,802	$2,163	$2,523	$3,028

Table C-2
Pump Station Costs

Horsepower	Booster PS Cost ($-million)	Intake PS cost ($-millions)
0	$0.00	$0.00
5	$0.73	$2.75
10	$0.80	$2.84
20	$0.84	$3.00
25	$0.88	$3.08
50	$0.92	$3.49
100	$0.97	$4.31
200	$1.28	$5.96
300	$1.90	$7.60
400	$2.51	$9.25
500	$3.12	$10.89
600	$3.72	$12.53
700	$4.32	$14.18
800	$4.92	$15.82
900	$5.51	$17.46
1,000	$6.10	$19.11
2,000	$11.75	$35.55
3,000	$16.99	$37.09
4,000	$23.78	$38.31
5,000	$30.56	$39.53
6,000	$31.92	$41.09
7,000	$32.94	$42.31
8,000	$34.13	$43.52
9,000	$35.32	$44.73
10,000	$36.51	$45.94
20,000	$48.40	$58.06
30,000	$60.30	$70.18
40,000	$72.19	$82.30
50,000	$84.08	$94.42
60,000	$95.98	$106.54
70,000	$107.87	$118.66

Note:
1. Intake PS costs include intake and pump station.
2. Adjust pump station costs upward if the pump station is designed to move large quantities of water at a low head (i.e. low horsepower).
3. Assumed multiple pump setup for all pump stations.

Table C-3
Ground Storage Tanks

Tank Volume (MG)	With Roof ($)	Without Roof ($)
0.05	$833,996	$413,402
0.1	$901,492	$432,305
0.5	$1,077,270	$583,324
1	$1,296,813	$772,047
1.5	$1,516,458	$960,769
2	$1,736,104	$1,149,595
2.5	$1,955,647	$1,338,317
3	$2,175,292	$1,527,143
3.5	$2,394,938	$1,715,865
4	$2,614,480	$1,904,588
5	$3,053,771	$2,282,136
6	$3,492,960	$2,659,683
7	$3,932,251	$3,037,231
8	$4,371,439	$3,414,779
10	$5,376,487	$4,444,586
12	$6,603,646	$5,474,393
14	$7,815,600	$6,504,302

Note: Costs assume steel tanks smaller than 1 MG, concrete tanks 1 MG and larger.

Table C-4
Conventional Water Treatment Plant Costs

	Level 0	Level 1	Level 2	Level 3 (new)	Level 3 (exp)	Level 4	Level 5
	Chlorine Disinfection (GW)	Iron & Manganese Removal	Simple Filtration	Conventional Treatment	Conventional Treatment	Brackish Desalination	Seawater Desalination
Capacity (MGD)	Capital Cost ($)	Capital Cost ($)	Capital Cost ($)	Capital Cost ($)	Capital Cost ($)	Capital Cost ($)	Capital Cost ($)
$0	$0	$0	$0	$0	$0	$0	$0
$23,087	$288,588	$1,325,778	$1,767,123	$1,767,123	$1,178,589	$2,833,393	$23,087
$88,885	$1,158,201	$4,640,222	$6,231,155	$6,231,155	$4,714,357	$18,958,622	$88,885
$566,903	$4,820,001	$24,526,888	$42,424,887	$23,863,999	$31,872,968	$126,854,757	$566,903
$2,834,513	$13,998,840	$92,804,441	$174,438,444	$86,175,552	$121,218,137	$478,967,996	$2,834,513
$4,251,769	$20,197,138	$135,671,254	$256,406,422	$137,000,217	$169,716,220	$669,375,527	$4,251,769
$5,669,026	$24,745,097	$178,538,068	$336,992,859	$166,063,345	$215,487,708	$848,802,709	$5,669,026
$8,503,538	$37,868,167	$264,271,694	$495,344,555	$249,090,998	$301,702,040	$1,186,233,245	$8,503,538
$11,338,051	$43,605,494	$350,005,321	$651,027,289	$307,211,963	$383,069,344	$1,504,204,967	$11,338,051

Note: Plant is sized for finished peak day capacity.

Table C-5
Cost Elements for Water Wells

Public Supply Well Costs						
	Well Capacity (MGD)					
Well Depth (ft)	**100**	**175**	**350**	**700**	**1000**	**1800**
50	$88,218	$112,093	$144,629	$0	$0	$0
150	$145,169	$220,377	$376,039	$425,012	$529,953	$774,816
300	$195,890	$279,843	$447,749	$512,463	$633,146	$897,247
500	$253,608	$349,804	$531,702	$612,157	$753,828	$1,044,164
700	$306,079	$412,769	$606,910	$703,106	$862,267	$1,173,592
1000	$402,275	$528,204	$746,831	$869,263	$1,063,404	$1,414,957
1500	$563,184	$722,345	$977,702	$1,147,357	$1,395,717	$1,813,734
2000	$724,094	$914,737	$1,208,573	$1,425,451	$1,729,781	$2,214,259
Irrigation Well Costs						
150	$80,455	$124,181	$211,631	$243,114	$307,828	$444,251
300	$106,690	$159,161	$258,854	$306,079	$388,283	$542,196
500	$132,926	$199,389	$309,576	$374,290	$475,734	$655,883
700	$153,913	$229,122	$353,302	$432,008	$552,690	$753,828
1000	$201,137	$295,585	$444,251	$550,941	$704,855	$946,220
1500	$281,593	$409,271	$594,667	$748,580	$956,714	$1,264,541
2000	$360,298	$519,459	$745,082	$944,471	$1,210,322	$1,584,612
ASR Well Costs						
150	$160,910	$248,360	$432,008	$487,977	$608,659	$897,247
300	$211,631	$307,828	$503,717	$575,427	$711,851	$1,021,427
500	$269,349	$379,538	$587,670	$675,122	$834,283	$1,166,596
700	$323,568	$442,502	$664,628	$766,071	$940,973	$1,297,772
1000	$418,015	$557,938	$802,801	$932,228	$1,142,111	$1,537,389
1500	$580,675	$750,330	$1,033,670	$1,210,322	$1,474,424	$1,936,165
2000	$739,836	$942,722	$1,264,541	$1,488,416	$1,808,486	$2,336,690

Table C-6
Factors for Interest During Construction

Construction Period	Factor
6 months	0.0125
12 months	0.025
18 months	0.0375
24 months	0.05
36 months	0.075
48 month	0.1
60 months	0.125
72 months	0.15
84 months	0.175

Table C-7
Annual Water Treatment Plant O&M Costs

	Level 0	Level 1	Level 2	Level 3 (New)	Level (Exp)	Level 4	Level 5
Capacity (MGD)	**Chlorine Disinfection (GW)**	**Iron & Manganese Removal**	**Simple Filtration**	**Conventional Treatment**	**Conventional Treatment**	**Brackish Desalination**	**Seawater Desalination**
0	$0	$0	$0	$0	$0	$0	$0
0.1	$13,852	$95,234	$132,578	$176,712	$176,712	$214,289	$425,009
1	$53,331	$382,206	$464,022	$623,116	$623,116	$857,156	$2,843,793
10	$340,142	$1,590,600	$1,716,882	$2,969,742	$1,670,480	$5,795,085	$19,028,214
50	$1,700,708	$4,619,617	$6,496,311	$12,210,691	$6,032,289	$22,039,661	$71,845,199
75	$2,551,062	$6,665,056	$9,496,988	$17,948,450	$9,590,015	$30,857,495	$100,406,329
100	$3,401,415	$8,165,882	$12,497,665	$23,589,500	$11,624,434	$39,179,583	$127,320,406
150	$5,102,123	$12,496,495	$18,499,019	$34,674,119	$17,436,370	$54,854,916	$177,934,987
200	$6,802,831	$14,389,813	$24,500,372	$45,571,910	$21,504,837	$69,648,972	$225,630,745

Cost Estimate Summary
Water Supply Project Option
September 2018 Prices
Wichita Falls - Lake Ringgold

Cost based on ENR CCI 11170.28 for September 2018 and a PPI of 201.9 for September 2018

Item	*Estimated Costs for Facilities*
CAPITAL COST	
Dam and Reservoir (Conservation Pool acft, 17280 acres)	$72,731,000
Transmission Pipeline (48 in dia., 29.7 miles)	$59,057,000
Intake Pump Stations (43 MGD)	$40,481,000
Transmission Pump Station(s) & Storage Tank(s)	$0
Pipeline Crossings	$16,372,000
Integration, Relocations, & Other	$7,911,000
TOTAL COST OF FACILITIES	**$196,552,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$65,022,000
Environmental & Archaeology Studies and Mitigation	$86,683,000
Land Acquisition and Surveying (17486 acres)	$41,076,000
Interest During Construction (3% for 5 years with a 0.5% ROI)	$53,534,000
TOTAL COST OF PROJECT	**$442,867,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$13,175,000
Reservoir Debt Service (3.5 percent, 40 years)	$11,970,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$833,000
Intakes and Pump Stations (2.5% of Cost of Facilities)	$1,012,000
Dam and Reservoir (1.5% of Cost of Facilities)	$1,091,000
Water Treatment Plant	$5,269,000
Pumping Energy Costs (9866677 kW-hr @ 0.08 $/kW-hr)	$789,000
TOTAL ANNUAL COST	**$34,139,000**
Available Project Yield (acft/yr)	23,450
Annual Cost of Water ($ per acft), based on PF=2	$1,456
Annual Cost of Water After Debt Service ($ per acft), based on PF=2	$384
Annual Cost of Water ($ per 1,000 gallons), based on PF=2	$4.47
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=2	$1.18
Note: One or more cost element has been calculated externally	

Jeremy Rice *7/1/2019*

Cost Estimate Summary *Water Supply Project Option* *September 2018 Prices* *RRA - Chloride Control Project*	
Cost based on ENR CCI 11170.28 for September 2018 and a PPI of 201.9 for September 2018	
Item	***Estimated Costs for Facilities***
CAPITAL COST	
Corps Estimate of Construction Cost Remaining	$69,430,000
TOTAL COST OF FACILITIES	**$69,430,000**
TOTAL COST OF PROJECT	**$69,430,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$4,885,000
Operation and Maintenance	
Intakes and Pump Stations (2.5% of Cost of Facilities)	$1,736,000
TOTAL ANNUAL COST	**$6,621,000**
Available Project Yield (acft/yr)	5,800
Annual Cost of Water ($ per acft), based on PF=1	$1,142
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$299
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$3.50
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.92
Note: One or more cost element has been calculated externally	
Jeremy Rice	*7/1/2019*

Cost Estimate Summary Water Supply Project Option September 2018 Prices WCWID#2 – Canal Conversion Project							
Lateral	**Ranking**	**Water Saved**	**Capital Cost**	**Annual Debt**	**Annual Cost**	**Total Annual Cost**	**Unit Cost**
		(ac-ft/yr)	**($)**	**($)**	**($)**	**($)**	**($/ac-ft)**
Priority Group A							
PB	1	830	$470,000	$34,583	$346	34,900	$42.08
SJ	2	1,462	$558,500	$41,095	$411	41,500	$28.39
RR	3	1,364	$608,800	$44,797	$448	45,200	$33.17
NF	4	3,362	$1,925,500	$141,682	$1,417	143,100	$42.57
Subtotal		**7,018**	**$3,562,800**	**$262,157**	**$2,622**	**264,800**	**$37.73**
Priority Group B							
WJ	5	970	$855,200	$62,927	$629	63,600	$65.54
PO	6	1,248	$1,429,800	$105,207	$1,052	106,300	$85.14
Subtotal		**2,218**	**$2,285,000**	**$168,134**	**$1,681**	**169,800**	**$76.57**
Priority Group C							
RRG	7	1,672	$1,263,400	$92,963	$930	93,900	$56.16
SK	8	790	$684,100	$50,337	$503	50,800	$64.35
NB	9	1,152	$1,917,200	$141,071	$1,411	142,500	$123.68
Subtotal		**3,614**	**$3,864,700**	**$284,371**	**$2,844**	**287,200**	**$79.47**
Total		**12,849**	**$9,713,000**	**$715,000**	**$7,000**	**722,000**	**$56.19**

Cost Estimate Summary
Water Supply Project Option
September 2018 Prices
Baylor County SUD - Baylor County SUD Additional Groundwater Supply

Cost based on ENR CCI 11170.28 for September 2018 and a PPI of 201.9 for September 2018

Item	*Estimated Costs for Facilities*
CAPITAL COST	
Well Fields (Wells, Pumps, and Piping)	$98,000
TOTAL COST OF FACILITIES	**$98,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$34,000
Environmental & Archaeology Studies and Mitigation	$2,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$4,000
TOTAL COST OF PROJECT	**$138,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$10,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$1,000
TOTAL ANNUAL COST	**$11,000**
Available Project Yield (acft/yr)	31
Annual Cost of Water ($ per acft), based on PF=	$355
Annual Cost of Water After Debt Service ($ per acft), based on PF=	$32
Annual Cost of Water ($ per 1,000 gallons), based on PF=	$1.09
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=	$0.10

KDM *12/23/2019*

Cost Estimate Summary
Water Supply Project Option
September 2018 Prices
Red River Authority of Texas - Red River Authority of Texas Treated Water Line

Cost based on ENR CCI 11170.28 for September 2018 and a PPI of 201.9 for September 2018

Item	*Estimated Costs for Facilities*
CAPITAL COST	
Transmission Pipeline (12 in dia., 7 miles)	$2,520,000
TOTAL COST OF FACILITIES	**$2,520,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$756,000
Environmental & Archaeology Studies and Mitigation	$175,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$95,000
TOTAL COST OF PROJECT	**$3,546,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$250,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$25,000
Purchase of Water (533 acft/yr @ 1,140 $/acft)	$608,000
TOTAL ANNUAL COST	**$883,000**
Available Project Yield (acft/yr)	533
Annual Cost of Water ($ per acft), based on PF=	$1,657
Annual Cost of Water After Debt Service ($ per acft), based on PF=	$1,188
Annual Cost of Water ($ per 1,000 gallons), based on PF=	$5.08
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=	$3.64

KDM *12/23/2019*

Cost Estimate Summary *Water Supply Project Option* *September 2018 Prices* *Red River Authority of Texas - Automated Meter Infrastructure*	
Cost based on ENR CCI 11170.28 for September 2018 and a PPI of 201.9 for September 2018	
Item	***Estimated Costs for Facilities***
CAPITAL COST	
Automated Meter Infrastructure (AMI)	$1,300,000
TOTAL COST OF FACILITIES	**$1,300,000**
Contingencies 10%	$130,000
TOTAL COST OF PROJECT	**$1,430,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$101,000
Operation and Maintenance (1% of Cost of Facilities)	$13,000
TOTAL ANNUAL COST	**$114,000**
Available Project Yield (acft/yr)	105
Annual Cost of Water ($ per acft), based on PF=1	$1,086
Annual Cost of Water After Debt Service ($ per acft), based on PF=1	$124
Annual Cost of Water ($ per 1,000 gallons), based on PF=1	$3.33
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=1	$0.38
Note: One or more cost element has been calculated externally	
Jeremy Rice	*2/4/2020*

Cost Estimate Summary *Water Supply Project Option* *September 2018 Prices* *City of Bowie - City of Bowie Wastewater Indirect Reuse*	
Cost based on ENR CCI 11170.28 for September 2018 and a PPI of 201.9 for September 2018	
Item	***Estimated Costs for Facilities***
CAPITAL COST	
Transmission Pipeline (6 in dia., 6.1 miles)	$811,000
Water Treatment Plant (0.5 MGD)	$2,799,000
TOTAL COST OF FACILITIES	**$3,610,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$1,223,000
Environmental & Archaeology Studies and Mitigation	$152,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$138,000
TOTAL COST OF PROJECT	**$5,123,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$360,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$8,000
Water Treatment Plant	$280,000
Advanced Water Treamtent Facility	$0
TOTAL ANNUAL COST	**$648,000**
Available Project Yield (acft/yr)	550
Annual Cost of Water ($ per acft), based on PF=	$1,178
Annual Cost of Water After Debt Service ($ per acft), based on PF=	$524
Annual Cost of Water ($ per 1,000 gallons), based on PF=	$3.62
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=	$1.61
KDM	*12/23/2019*

2021 Region B Water Plan				
City of Vernon				
Water Conservation (Replace Transmission Line)				
Supply (Ac-Ft)	313	AF/Y		
Supply (MGD)	0.28			
Construction Cost:	**Quantity**	**Unit**	**Unit Price**	**Cost**
Transmission System				
21" Pipeline - Transmission Line Replacement	63,360	LF	$104	$6,589,000
Subtotal for Transmission				**$6,589,000**
TOTAL CONSTRUCTION COST				**$6,589,000**
Engineering and Contingencies (30% for pipelines)				$1,977,000
Permitting and Mitigation	1	MI	$25,000	$25,000
Interest During Construction (6 Months)				$231,000
TOTAL CAPITAL COST				**$8,822,000**
Annual Costs				
Debt Service (5.5 percent for 20 years)				$738,000
Operation and Maintenance				$66,000
Total Annual Cost				**$804,000**
UNIT COSTS (Until Amortized)				
Water Cost ($ per ac-ft)				**$2,568**
Water Cost ($ per 1,000 gallons)				**$7.88**
UNIT COSTS (After Amortization)				
Water Cost ($ per ac-ft)				**$211**
Water Cost ($ per 1,000 gallons)				**$0.65**

Cost Estimate Summary
Water Supply Project Option
September 2018 Prices
City of Vernon - City of Vernon Additional Groundwater Supply

Cost based on ENR CCI 11170.28 for September 2018 and a PPI of 201.9 for September 2018

Item	*Estimated Costs for Facilities*
CAPITAL COST	
Well Fields (Wells, Pumps, and Piping)	$318,000
Water Treatment Plant (0.3 MGD MGD)	$482,000
TOTAL COST OF FACILITIES	**$800,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Counsel, and Contingencies (30% for pipes & 35% for all other facilities)	$280,000
Environmental & Archaeology Studies and Mitigation	$5,000
Interest During Construction (3% for 1 years with a 0.5% ROI)	$30,000
TOTAL COST OF PROJECT	**$1,115,000**
ANNUAL COST	
Debt Service (3.5 percent, 20 years)	$78,000
Operation and Maintenance	
Pipeline, Wells, and Storage Tanks (1% of Cost of Facilities)	$3,000
Water Treatment Plant	$159,000
TOTAL ANNUAL COST	**$240,000**
Available Project Yield (acft/yr)	600
Annual Cost of Water ($ per acft), based on PF=	$400
Annual Cost of Water After Debt Service ($ per acft), based on PF=	$270
Annual Cost of Water ($ per 1,000 gallons), based on PF=	$1.23
Annual Cost of Water After Debt Service ($ per 1,000 gallons), based on PF=	$0.83

KDM *12/23/2019*

2021 Region B Water Plan						
Steam Electric Power - Wilbarger County						
Alternative Cooling Technology						
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Supply (Ac-Ft)	6,010	5,409	4,808	4,207	3,606	3,005
Supply (MGD)	5.4	4.8	4.3	3.8	3.2	2.7
	2020	**2030**	**2040**	**2050**	**2060**	**2070**
Steam-Electric Needs (acft)	1,701	2,302	2,903	3,504	4,105	4,706
Equivalent Needs (GWh)	0	0	0	0	0	0
MW Capacity Needed (MW)	0	0	0	0	0	0
Incremental Capacity Installed (MW)	400	0	0	400	0	0
Cumulative Capacity Installed (MW)	400	400	400	800	800	800
Incremental Cost of ACT (million $)	$50.78	$0.00	$0.00	$50.78	$0.00	$0.00
Total Capital Cost (million $)	$50.78	$50.78	$50.78	$101.56	$101.56	$101.56
Debt Service (million $)	$3.57	$3.57	$0.00	$3.57	$3.57	$0.00
Operation & Maintenance (million $)	$1.27	$1.27	$1.27	$2.54	$2.54	$2.54
Total Annual Cost (million $)	$4.84	$4.84	$1.27	$6.11	$6.11	$2.54
Amount of Water Saved (acft/yr)	1,701	2,302	2,903	3,504	4,105	4,706
Annual Cost of Water ($ per acft)	$2,845	$2,103	$437	$1,744	$1,488	$540
Annual Cost of Water ($ per 1,000 gallons)	$8.73	$6.45	$1.34	$5.35	$4.57	$1.66

APPENDIX D

STRATEGY EVALUATION AND QUANTIFIED ENVIRONMENTAL IMPACT MATRIX

2021 FINAL PLAN

REGION B

OCTOBER 2020

APPENDIX D

STRATEGY EVALUATION AND QUANTIFIED ENVIRONMENTAL IMPACT MATRIX
2021 FINAL PLAN
REGION B

In accordance with TWDB rules and guidelines, the Region B Water Planning Group has adopted a standard procedure for ranking potential water management strategies. This procedure classifies the strategies using the TWDB's standard categories developed for regional water planning.

The strategies are ranked based upon the following categories;

- Quantity
- Reliability
- Cost
- Environmental Factors
- Agricultural Resources/Rural Areas
- Other Natural Resources
- Key Water Quality Parameters
- Third Party Social & Economic Factors

Each category is quantitatively assessed and assigned a ranking from 1 to 5. With the exception of the Environmental Factors category, Table D-1 shows the correlation between the category and the ranking. The Environmental Factors score is taken directly from the Environmental Matrix where the potential environmental considerations are evaluated in more detail.

Table D-1
Evaluation Matrix Category Ranking Correlation

Rank	Quantity	Cost per Ac-Ft	Reliability	Remaining Strategy Impacts
1	Meets 0-25% Shortage	>$5,000	Low	High
2	Meets 25-50% Shortage	$1,000-$5,000	Low to Medium	Medium
3	Meets 50-75% of Shortage	$500-$1,000	Medium	Low
4	Meets 75-100% of Shortage	$0-$500	Medium to High	None
5	Exceeds Shortage	No Cost	High	Positive Impact

Environmental Matrix

The Environmental Matrix is used to determine the score of the 'Environmental Factors' category on the Evaluation Matrix.

The Environmental Matrix takes into consideration the following categories;

- Total Acres Impacted
- Total Wetland Acres Impacted
- Environmental Water Needs
- Habitat
- Threatened and Endangered Species
- Cultural Resources
- Bays & Estuaries
- Environmental Water Quality

Each category is quantitatively assessed and assigned a ranking from 1 to 5. The Overall Environmental Impacts column averages all of the rankings assigned to the strategy. This value is also illustrated in the Evaluation Matrix as the Environmental Factors rank. Table D-2 shows the correlation between the rank assigned within each category.

Table D-2
Environmental Matrix Category Ranking Correlation

Rank	Acres Impacted	Threatened and Endangered Species	Agricultural Impacts	All Remaining Categories
1	Greater than 500 Acres and/or Wetlands	Greater than 20	Greater than 2,000 acres	High Impact
2	100-500 Acres	Between 15-20	Between 50 and 2,000 acres	Medium Impact
3	50-100 Acres	Between 10-15 or 'varies'	Between 6 and 50 acres	Low Impact
4	0-50 Acres	Between 5-10	Between 0 and 5 acres	No Impact or n/a
5	None	Between 0-5 (or n/a)	Provides water to agriculture or rural	Positive

Acres Impacted

Acres Impacted refers to the total amount of area that will be impacted due to the implementation of a strategy.

The following conservative assumptions were made (unless more detailed information was available);

- Each well will impact approximately 1 acre of land
- The acres impacted for pipelines is equivalent to the right of way easements required
- Reservoirs will impact an area equal to their surface area
- A conventional water treatment plant will impact 5 acres
- Conservation and Precipitation Enhancement strategies will have no impact on acres

Wetland Acres

Wetland Acres refers to how many acres that are classified as wetlands are impacted by implementation of the strategy. The only strategy that had a quantified impact on surrounding wetlands was the Lake Ringgold strategy. The total acreage was determined using the National Wetlands Inventory located at http://www.fws.gov/wetlands/Data/Mapper.html, as prepared for the Lake Ringgold Feasibility Study in October 2013.

Environmental Water Needs

Environmental Water Needs refers to how the strategy will impact the area's overall environmental water needs. Water is vital to the environmental health of a region, and so it is important to take into account how strategies will impact the amount of water that will be available to the environment.

The following conservative assumptions were made (unless more detailed information was available);

- The majority of the strategies will have a low impact on environmental water needs
- Reuse will also have a medium impact if the effluent was previously used for irrigation or discharged back into the water system. This will decrease the overall amount of water that is available to the environment by diverting the effluent and using it for another purpose
- Precipitation Enhancement will have a positive impact because both of these strategies increase the amount of water available to the environment.

Habitat

Habitat refers to how the strategy will impact the habitat of the local area. The more area that is impacted due to the implementation of the strategy, the more the area's habitat will be disrupted.

The following conservative assumptions were made (unless more detailed information was available);

- Strategies with less than 100 acres impacted will have a low impact
- Strategies above 100 acres impacted will have a medium impact

Threatened and Endangered Species

Threatened and endangered species refers to how the strategy will impact those species in the area once implemented.

The following conservative assumptions were made (unless more detailed information was available);

- Only applicable to strategies implementing infrastructure
- Rankings were based on the amount of threatened and endangered species located within the county. This amount was found using the Texas Parks and Wildlife Database located at http://tpwd.texas.gov/gis/rtest/ and the U.S. Fish and Wildlife Service Database located at http://www.fws.gov/endangered/ .
- This ranking only includes threatened and endangered species as defined in the TWDB guidelines and does not include species without official protection such as those proposed for listing or species that are considered rare or otherwise of special concern.

Agricultural Resources

Impacts to Agricultural Resources is quantified based on the permanent impacts to water supplies to irrigation users or direct impacts to irrigated acreage. Projects with only temporary impacts, such as pipeline projects, would be classified as low impacts. Specific assumptions include:

- If the location of the strategy is known and data is available, actual impacts to agricultural lands will be used. An example of this was Lake Ringgold.
- If a strategy is located in a rural area of a county with significant irrigation use (>10,000 irrigated acres), it is assumed that the strategy could potentially impact agricultural

lands. Since most projects will avoid direct impacts to agricultural lands, the quantity of impacts is estimated to be no more than 10% of the total area for the strategy.

- If a strategy impacts more than 2,000 acres of agricultural land, the impacts are classified as "high". If a strategy impacts between 5 and 50 acres of agricultural lands, the impacts are classified as "low". If the strategy impacts less than 5 acres, it was assumed to negligible.
- If a strategy will reduce the available water to an irrigation user (by county) by the greater of 10% current irrigation use or 5,000 ac-ft/yr, the strategy is determined to have "high" impacts. If a strategy will reduce the available water to an irrigation user (by county) by 1% of current irrigation use or 500 ac-ft/yr, the strategy is determined to have "low" impacts.
- If the entity already holds water rights for the strategy, the impacts would be "none".
- If the strategy does not impact any agricultural or rural user, "none" is selected.
- For strategies that provide water to agricultural and rural users, the strategy is rated as "positive impacts."

Cultural Resources

Cultural Resources refers to how the strategy will impact cultural resources located within the area. Cultural resources are defined as the collective evidence of the past activities and accomplishments of people. Locations, buildings and features with scientific, cultural or historic value are considered to be cultural resources.

The following conservative assumptions were made (unless more detailed information was available);

- Only applicable to strategies implementing infrastructure
- All applicable strategies will have a low impact on cultural resources

Bays and Estuaries

Region B is located too far away from and bays or estuaries to have a quantifiable impact. Therefore this category was assumed to be non-applicable for every strategy.

Environmental Water Quality

Environmental Water Quality refers to the impact that the implementation of the strategy will have on the area's water quality. Generally most strategies will have a neutral to low impact on water quality and are ranked as "3" as documented in Table D-2. Similarly, strategies with no impacts are assigned a "4" and those with a positive impact are assigned a "5".

Region B
Appendix D
Strategy Evaluation Matrix

Entity	County Used	Strategy	Maximum Quantity (Ac-Ft/Yr)	Maximum Safe Need	Percentage of Max Need Met	Quantity Score	Reliability	Maximum Cost ($/Ac-Ft)	Cost Score	Impacts of Strategy on:					Overall Score (5-45)	Implementation Issues	Comments
										Environmental Factors	Agricultural Resources/ Rural Areas	Other Natural Resources	Key Water Quality Parameters	Third Party Social & Economic Factors			
Archer City	Archer	Conservation	12	69	17%	1	3	$438	4	4	5	5	3	5	30		
Archer County MUD No. 1	Archer	Conservation	7	106	7%	1	3	$429	4	4	5	5	3	5	30		
Archer County-Other	Archer	Conservation	5	65	8%	1	3	$483	4	4	5	5	3	5	30		
Holliday	Archer	Conservation	14	116	12%	1	3	$415	4	4	5	5	3	5	30		
Irrigation	Archer	Conservation	63	757	8%	1	3	$10	4	4	5	5	3	5	30		
Lakeside City	Archer	Conservation	6	8	75%	3	3	$460	4	4	5	5	3	5	32		
Mining	Archer	Conservation	121	401	30%	3	3	$2,800	2	4	5	5	3	5	30		
Scotland	Archer	Conservation	12	135	9%	1	3	$464	4	4	5	5	3	5	30		
Windthorst WSC	Archer, Clay	Conservation	22	209	11%	1	3	$404	4	4	5	5	3	5	30		
Archer County MUD No. 1	Archer	Voluntary Transfer	83	106	78%	4	5	$1,140	2	4	3	4	3	4	29		
Archer County-Other	Archer	Voluntary Transfer	37	65	57%	3	5	$1,140	2	4	3	4	3	4	28		
Scotland	Archer	Voluntary Transfer	76	135	56%	3	5	$1,629	2	4	3	4	3	4	28		
Windthorst WSC	Archer	Voluntary Transfer	93	209	44%	3	5	$1,140	2	4	3	4	3	4	28		
Baylor SUD	Baylor	Conservation	14	31	45%	3	3	$430	4	4	5	5	3	5	32		
Mining	Baylor	Conservation	4	0	100%	4	3	$2,800	2	4	5	5	3	5	31		
Baylor SUD	Archer, Baylor, Young	New Groundwater	31	31	100%	4	4	$355	4	4	3	3	3	5	30		
County Other	Clay	Conservation	21	82	26%	3	3	$410	4	4	5	5	3	5	32		
Mining	Clay	Conservation	197	0	100%	4	3	$2,800	2	4	5	5	3	5	31		
Red River Authority	Clay	Conservation	32	124	26%	3	3	$1,086	2	4	5	5	3	5	30		
Red River Authority	Clay	Treated Water Line	533	124	430%	5	5	$1,656	2	4	5	4	3	4	32		
County Other	Clay	Voluntary Transfer	70	82	85%	4	5	$1,140	2	4	5	4	3	4	31		
Mining	Cottle	Conservation	10	0	100%	4	3	$2,800	2	4	5	5	3	5	31		
Crowell	Foard	Conservation	6	50	12%	1	3	$419	4	4	5	5	3	5	30		
Mining	Foard	Conservation	3	0	100%	4	3	$2,800	2	4	5	5	3	5	31		
Crowell	Foard	Voluntary Transfer	44	50	88%	4	5	$1,140	2	4	3	4	3	4	29		
Mining	Hardeman	Conservation	5	0	100%	4	3	$2,800	2	4	5	5	3	5	31		
Quanah	Hardeman	Conservation	20	156	13%	1	3	$409	4	4	5	5	3	5	30		
Red River Authority	Hardeman	Conservation	16	109	15%	1	5	$1,086	2	4	5	5	3	5	30		
Quanah	Hardeman	Voluntary Transfer	136	156	87%	4	5	$1,140	2	4	3	4	3	4	29		
Red River Authority	Hardeman	Voluntary Transfer	93	109	85%	4	6	$1,140	2	4	3	4	3	4	30		
Manufacturing	Hardeman	Voluntary Transfer	126	126	100%	4	5	$1,140	2	4	3	4	3	4	29		
Mining	King	Conservation	95	0	100%	4	3	$2,800	2	4	5	5	3	5	31		
Bowie	Montague	Conservation	57	509	11%	1	3	$404	4	4	5	5	3	5	30		
County Other	Montague	Conservation	63	34	185%	5	3	$404	4	4	5	5	3	5	34		
Nocona Hills	Montague	Conservation	6	12	50%	3	3	$453	4	4	5	5	3	5	32		
Bowie	Montague	Reuse	550	509	108%	5	5	$1,178	2	4	3	4	3	4	30		
Mining	Montague	Conservation	910	805	113%	5	3	$2,800	2	4	5	5	3	5	32		
County Other	Montague	Voluntary Transfer	23	34	68%	3	5	$1,140	2	4	3	4	3	4	28		
Electra	Wichita	Conservation	48	587	8%	1	3	$402	4	4	5	5	3	5	30		
Iowa Park	Wichita	Conservation	47	217	22%	1	3	$413	4	4	5	5	3	5	30		
Irrigation	Wichita	Conservation	1,958	29,476	7%	1	3	$10	4	4	5	5	3	5	30		
Mining	Wichita	Conservation	16	0	100%	4	3	$2,800	2	4	5	5	3	5	31		
Sheppard AFB	Wichita	Conservation	44	408	11%	1	3	$403	4	4	5	5	3	5	30		
Wichita Falls	Wichita	Conservation	884	10,864	8%	1	3	$400	4	4	5	5	3	5	30		
Steam Electric Power	Wichita	Conservation	10	7	143%	5	3	$0	5	4	5	5	3	5	35		
Electra	Wichita	Voluntary Transfer	333	587	57%	3	5	$1,629	2	4	3	4	3	4	28		
Irrigation	Wichita	Red River Chloride	5,800	29,476	20%	1	4	$0	5	4	5	5	5	5	34		
Wichita Falls	Wichita	Reservoir	23,450	10,864	216%	5	4	$1,456	2	3	1	3	3	3	24		
Wichita County WID2	Wichita	Irrigation Conservation	12,850	13,034	99%	4	4	$56	4	4	5	5	3	5	34		
Harrold WSC	Wilbarger	Conservation	6	73	8%	1	3	$451	4	4	5	5	3	5	30		
Mining	Wilbarger	Conservation	5	0	100%	4	3	$2,800	2	4	5	5	3	5	31		
Red River Authority	Wilbarger	Conservation	33	5	100%	4	3	$1,086	2	4	5	5	3	5	31		
Vernon	Wilbarger	Conservation	415	754	55%	3	3	$402	4	4	5	5	3	5	32		
Vernon	Wilbarger	New Groundwater	600	754	80%	4	5	$400	4	4	3	3	3	5	31		
Harrold WSC	Wilbarger	Voluntary Transfer	67	73	92%	4	5	$1,629	2	4	3	4	3	4	29		
Manufacturing	Wilbarger	Voluntary Transfer	223	223	100%	4	5	$0	5	4	3	4	3	4	32		
Steam Electric Power	Wilbarger	Alternative Cooling	4,706	4,706	100%	4	3	$3,236	2	4	5	5	3	5	31		
County Other	Young	Conservation	4	16	25%	1	3	$491	4	4	5	5	3	5	30		
Mining	Young	Conservation	0	0	100%	4	3	$2,800	2	4	5	5	3	5	31		
Olney	Young	Conservation	152	179	85%	4	3	$401	4	4	5	5	3	5	33		
County Other	Young	Voluntary Transfer	16	16	100%	4	5	$1,140	2	4	3	4	3	4	29		
Olney	Young	Voluntary Transfer	150	179	84%	4	5	$815	3	4	3	4	3	4	30		

Region B
Appendix D
Strategy Evaluation Matrix

Entity	County	Strategy	Environmental Factors														Agriculutral Resource Impacts		
			Acres Impacted	Wetland Acres	Acres Impacted Score	Envir Water Needs	Envir Water Needs Score	Habitat	Habitat Score	Threatened and Endangered Species	Threat and Endanger Species Score	Cultural Resources	Cultural Resources Score	Bays & Estuaries	Bays & Estuaries Score	Envir Water Quality	Overall Environmental Impacts	Temp Ag Acres Impacted	Permanent Ag Acres Impacted	Agricultural Resources Score
Archer City	Archer	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Archer County MUD No. 1	Archer	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Archer County MUD No. 1	Archer	Voluntary Transfer	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Archer County-Other	Archer	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Archer County-Other	Archer	Voluntary Transfer	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Holliday	Archer	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Irrigation	Archer	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	5
Lakeside City	Archer	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Mining	Archer	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Scotland	Archer	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Scotland	Archer	Voluntary Transfer	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Windthorst WSC	Archer, Clay	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Windthorst WSC	Archer	Voluntary Transfer	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Baylor SUD	Archer, Baylor, Young	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Baylor SUD	Baylor	New Groundwater	1	n/a	4	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Mining	Baylor	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
County Other	Clay	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
County Other	Clay	Voluntary Transfer	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Red River Authority	Clay, Cottle, Foard, Hardeman, King, Montague, Wilbarger	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Red River Authority	Clay	Treated Waterline	17	n/a	4	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Mining	Clay	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Mining	Cottle	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Crowell	Foard	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Crowell	Foard	Voluntary Transfer	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Mining	Foard	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Manufacturing	Hardeman	Voluntary Transfer	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Quanah	Hardeman	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Quanah	Hardeman	Voluntary Transfer	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Mining	Hardeman	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Red River Authority	Hardeman	Voluntary Transfer	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Mining	King	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Bowie	Montague	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Bowie	Montague	Reuse	15	n/a	4	Medium	2	Low	3	n/a	5	Low	3	None	5	3	4	2	2	4
County Other	Montague	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
County Other	Montague	Voluntary Transfer	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Nocona Hills WSC	Montague	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Mining	Montague	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Electra	Wichita	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Electra	Wichita	Voluntary Transfer	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Iowa Park	Wichita	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Irrigation	Wichita	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	5
Irrigation	Wichita	Red River Chloride	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	5	4	0	0	5
Sheppard AFB	Wichita	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Wichita Falls	Wichita	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Wichita Falls	Wichita	Reservoir	17,460	910	1	Medium	2	High	1	9	4	Mid-High	2	None	5	3	3	0	667	2
Mining	Wichita	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Wichita County WID2	Wichita	Irrigation Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Harrold WSC	Wilbarger	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Harrold WSC	Wilbarger	Voluntary Transfer	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Manufacturing	Wilbarger	Voluntary Transfer	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Mining	Wilbarger	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Steam Electric Power	Wilbarger	Alternative Cooling	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Vernon	Wilbarger	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Vernon	Wilbarger	New Groundwater	34	n/a	4	Low	3	Low	3	9	4	Low	3	None	5	3	4	3	3	4
County Other	Young	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
County Other	Young	Voluntary Transfer	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Mining	Young	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Olney	Young	Conservation	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4
Olney	Young	Voluntary Transfer	0	n/a	5	Low	3	Low	3	n/a	5	n/a	4	None	5	3	4	0	0	4

APPENDIX E

SOCIOECONOMIC IMPACTS OF PROJECTED WATER SHORTAGES FOR THE REGION B REGIONAL WATER PLANNING AREA

2021 FINAL PLAN

REGION B

OCTOBER 2020

Socioeconomic Impacts of Projected Water Shortages for the Region B Regional Water Planning Area

Prepared in Support of the 2021 Region B Regional Water Plan

Dr. John R. Ellis
Water Use, Projections, & Planning Division
Texas Water Development Board

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Table of Contents

Executive Summary

Evaluating the social and economic impacts of not meeting identified water needs is a required analysis in the regional water planning process. The Texas Water Development Board (TWDB) estimates these impacts for regional water planning groups (RWPGs) and summarizes the impacts in the state water plan. The analysis presented is for the Region B Regional Water Planning Group (Region B).

Based on projected water demands and existing water supplies, Region B identified water needs (potential shortages) that could occur within its region under a repeat of the drought of record for six water use categories (irrigation, livestock, manufacturing, mining, municipal and steam-electric power). The TWDB then estimated the annual socioeconomic impacts of those needs—if they are not met—for each water use category and as an aggregate for the region.

This analysis was performed using an economic impact modeling software package, IMPLAN (Impact for Planning Analysis), as well as other economic analysis techniques, and represents a snapshot of socioeconomic impacts that may occur during a single year repeat of the drought of record with the further caveat that no mitigation strategies are implemented. Decade specific impact estimates assume that growth occurs, and future shocks are imposed on an economy at 10-year intervals. The estimates presented are not cumulative (i.e., summing up expected impacts from today up to the decade noted), but are simply snapshots of the estimated annual socioeconomic impacts should a drought of record occur in each particular decade based on anticipated water supplies and demands for that same decade.

For regional economic impacts, income losses and job losses are estimated within each planning decade (2020 through 2070). The income losses represent an approximation of gross domestic product (GDP) that would be foregone if water needs are not met.

The analysis also provides estimates of financial transfer impacts, which include tax losses (state, local, and utility tax collections); water trucking costs; and utility revenue losses. In addition, social impacts are estimated, encompassing lost consumer surplus (a welfare economics measure of consumer wellbeing); as well as population and school enrollment losses.

IMPLAN data reported that Region B generated more than $8.6 billion in GDP (2018 dollars) and supported more than 111,000 jobs in 2016. The Region B estimated total population was approximately 197,000 in 2016.

It is estimated that not meeting the identified water needs in Region B would result in an annually combined lost income impact of approximately $1.4 billion in 2020 and $339 million in 2070 (Table ES-1). It is also estimated that the region would lose approximately 5,200 jobs in 2020, and 1,300 in 2070.

All impact estimates are in year 2018 dollars and were calculated using a variety of data sources and tools including the use of a region-specific IMPLAN model, data from TWDB annual water use

estimates, the U.S. Census Bureau, Texas Agricultural Statistics Service, and the Texas Municipal League.

Table ES-1 Region B socioeconomic impact summary

Regional Economic Impacts	2020	2030	2040	2050	2060	2070
Income losses ($ millions)*	$1,423	$505	$460	$320	$284	$339
Job losses	5,249	1,703	1,460	863	699	1,316
Financial Transfer Impacts	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Tax losses on production and imports ($ millions)*	$164	$51	$43	$23	$16	$19
Water trucking costs ($ millions)*	$-	$-	$-	$-	$-	$-
Utility revenue losses ($ millions)*	$2	$3	$3	$6	$11	$23
Utility tax revenue losses ($ millions)*	$0	$0	$0	$0	$0	$0
Social Impacts	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Consumer surplus losses ($ millions)*	$1	$1	$1	$2	$3	$7
Population losses	964	313	268	158	128	242
School enrollment losses	184	60	51	30	24	46

* Year 2018 dollars, rounded**.** Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

1 Introduction

Water shortages during a repeat of the drought of record would likely curtail or eliminate certain economic activity in businesses and industries that rely heavily on water. Insufficient water supplies could not only have an immediate and real impact on the regional economy in the short term, but they could also adversely and chronically affect economic development in Texas. From a social perspective, water supply reliability is critical as well. Shortages could disrupt activity in homes, schools and government, and could adversely affect public health and safety. For these reasons, it is important to evaluate and understand how water supply shortages during drought could impact communities throughout the state.

As part of the regional water planning process, RWPGs must evaluate the social and economic impacts of not meeting water needs (31 Texas Administrative Code §357.33 (c)). Due to the complexity of the analysis and limited resources of the planning groups, the TWDB has historically performed this analysis for the RWPGs upon their request. Staff of the TWDB's Water Use, Projections, & Planning Division designed and conducted this analysis in support of Region B, and those efforts for this region as well as the other 15 regions allow consistency and a degree of comparability in the approach.

This document summarizes the results of the analysis and discusses the methodology used to generate the results. Section 1 provides a snapshot of the region's economy and summarizes the identified water needs in each water use category, which were calculated based on the RWPG's water supply and demand established during the regional water planning process. Section 2 defines each of ten impact assessment measures used in this analysis. Section 3 describes the methodology for the impact assessment and the approaches and assumptions specific to each water use category (i.e., irrigation, livestock, manufacturing, mining, municipal, and steam-electric power). Section 4 presents the impact estimates for each water use category with results summarized for the region as a whole. Appendix A presents a further breakdown of the socioeconomic impacts by county.

1.1 Regional Economic Summary

The Region B Regional Water Planning Area generated more than $8.6 billion in gross domestic product (2018 dollars) and supported more than 111,000 jobs in 2016, according to the IMPLAN dataset utilized in this socioeconomic analysis. This activity accounted for approximately 0.5 percent of the state's total gross domestic product of 1.73 trillion dollars for the year based on IMPLAN. Table 1-1 lists all economic sectors ranked by the total value-added to the economy in Region B. The manufacturing and mining sectors generated 24 percent of the region's total value-added and were also significant sources of tax revenue. The top employers in the region were in the public administration, health care, and retail trade sectors. Region B's estimated total population was roughly 197,000 in 2016, approximately 0.7 percent of the state's total.

This represents a snapshot of the regional economy as a whole, and it is important to note that not all economic sectors were included in the TWDB socioeconomic impact analysis. Data considerations prompted use of only the more water-intensive sectors within the economy because

damage estimates could only be calculated for those economic sectors which had both reliable income and water use estimates.

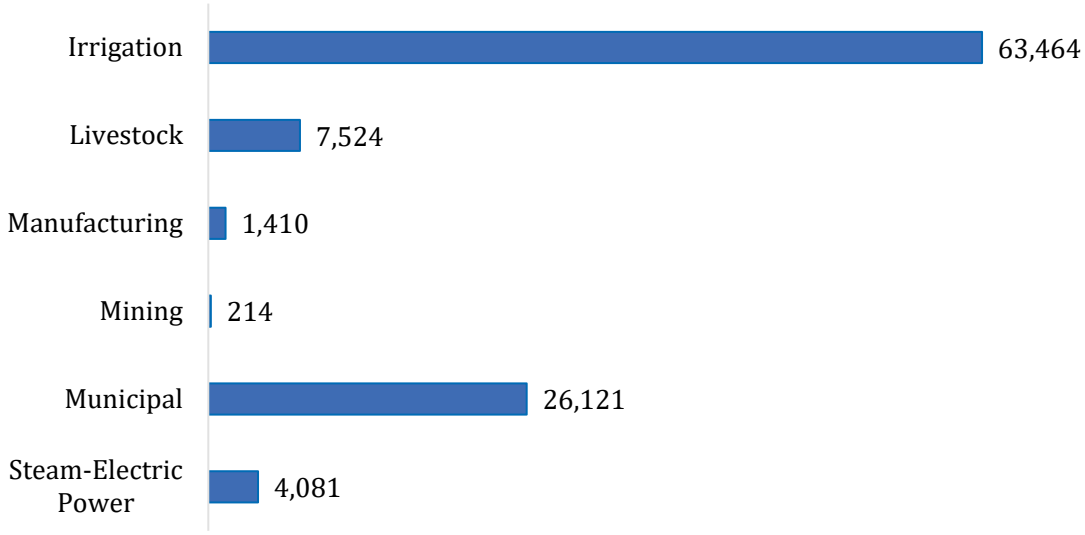
Table 1-1 Region B regional economy by economic sector*

Economic sector	Value-added ($ millions)	Tax ($ millions)	Jobs
Public Administration	$1,674.5	$(22.5)	20,810
Mining, Quarrying, and Oil and Gas Extraction	$1,127.0	$332.8	9,477
Manufacturing	$970.9	$37.7	6,520
Real Estate and Rental and Leasing	$792.4	$129.5	3,148
Health Care and Social Assistance	$646.2	$10.8	11,558
Retail Trade	$596.9	$159.3	11,547
Finance and Insurance	$340.4	$27.5	5,204
Construction	$325.3	$5.7	5,198
Wholesale Trade	$318.7	$72.4	2,461
Other Services (except Public Administration)	$274.1	$30.1	5,785
Utilities	$273.9	$39.8	432
Transportation and Warehousing	$269.3	$8.7	3,220
Accommodation and Food Services	$267.9	$48.1	7,987
Professional, Scientific, and Technical Services	$256.6	$8.2	3,870
Information	$165.7	$58.0	1,095
Administrative and Support and Waste Management and Remediation Services	$147.7	$5.4	3,541
Agriculture, Forestry, Fishing and Hunting	$147.1	$6.7	6,216
Arts, Entertainment, and Recreation	$24.5	$7.5	1,248
Educational Services	$13.1	$0.8	793
Management of Companies and Enterprises	$12.4	$4.1	1,459
Grand Total	$8,644.7	$970.5	111,569

*Source: 2016 IMPLAN for 536 sectors aggregated by 2-digit NAICS (North American Industry Classification System)

While the public administration and mining sectors led the region in economic output, the majority (62 percent) of water use occurred in irrigated agriculture in 2016. Livestock was also a significant water user, with more than 2 percent of the state's livestock water use occurring within Region B. Figure 1-1 illustrates Region B's breakdown of the 2016 water use estimates by TWDB water use category.

Figure 1-1 Region B 2016 water use estimates by water use category (in acre-feet)



Source: TWDB Annual Water Use Estimates (all values in acre-feet)

1.2 Identified Regional Water Needs (Potential Shortages)

As part of the regional water planning process, the TWDB adopted water demand projections for water user groups (WUG) in Region B with input from the planning group. WUG-level demand projections were established for utilities that provide more than 100 acre-feet of annual water supply, combined rural areas (designated as county-other), and county-wide water demand projections for five non-municipal categories (irrigation, livestock, manufacturing, mining and steam-electric power). The RWPG then compared demands to the existing water supplies of each WUG to determine potential shortages, or needs, by decade.

Table 1-2 summarizes the region's identified water needs in the event of a repeat of the drought of record. Demand management, such as conservation, or the development of new infrastructure to increase supplies, are water management strategies that may be recommended by the planning group to address those needs. This analysis assumes that no strategies are implemented, and that the identified needs correspond to future water shortages. Note that projected water needs generally increase over time, primarily due to anticipated population growth, economic growth, or declining supplies. To provide a general sense of proportion, total projected needs as an overall percentage of total demand by water use category are also presented in aggregate in Table 1-2. Projected needs for individual water user groups within the aggregate can vary greatly and may reach 100% for a given WUG and water use category. A detailed summary of water needs by WUG and county appears in Chapter 4 of the 2021 Region B Regional Water Plan.

Table 1-2 Regional water needs summary by water use category *

Water Use Category		2020	2030	2040	2050	2060	2070
Irrigation	water needs (acre-feet per year)	21,167	22,981	24,795	26,608	28,421	30,235
	% of the category's total water demand	22%	24%	26%	28%	29%	31%
Livestock	water needs (acre-feet per year)	-	-	-	-	-	-
	% of the category's total water demand	0%	0%	0%	0%	0%	0%
Manufacturing	water needs (acre-feet per year)	-	-	-	-	10	133
	% of the category's total water demand	0%	0%	0%	0%	0%	5%
Mining	water needs (acre-feet per year)	1,616	678	556	201	137	137
	% of the category's total water demand	31%	16%	19%	11%	8%	8%
Municipal**	water needs (acre-feet per year)	380	532	606	1,393	2,492	5,607
	% of the category's total water demand	1%	2%	2%	4%	7%	16%
Steam-electric power	water needs (acre-feet per year)	1,704	2,306	2,908	3,510	4,112	4,716
	% of the category's total water demand	22%	30%	38%	45%	53%	61%
Total water needs (acre-feet per year)		**24,867**	**26,497**	**28,865**	**31,712**	**35,172**	**40,828**

*Entries denoted by a dash (-) indicate no identified water need for a given water use category.
** Municipal category consists of residential and non-residential (commercial and institutional) subcategories.

2 Impact Assessment Measures

A required component of the regional and state water plans is to estimate the potential economic and social impacts of potential water shortages during a repeat of the drought of record. Consistent with previous water plans, ten impact measures were estimated and are described in Table 2-1.

Table 2-1 Socioeconomic impact analysis measures

Regional economic impacts	Description
Income losses - value-added	The value of output less the value of intermediate consumption; it is a measure of the contribution to gross domestic product (GDP) made by an individual producer, industry, sector, or group of sectors within a year. Value-added measures used in this report have been adjusted to include the direct, indirect, and induced monetary impacts on the region.
Income losses - electrical power purchase costs	Proxy for income loss in the form of additional costs of power as a result of impacts of water shortages.
Job losses	Number of part-time and full-time jobs lost due to the shortage. These values have been adjusted to include the direct, indirect, and induced employment impacts on the region.
Financial transfer impacts	**Description**
Tax losses on production and imports	Sales and excise taxes not collected due to the shortage, in addition to customs duties, property taxes, motor vehicle licenses, severance taxes, other taxes, and special assessments less subsidies. These values have been adjusted to include the direct, indirect and induced tax impacts on the region.
Water trucking costs	Estimated cost of shipping potable water.
Utility revenue losses	Foregone utility income due to not selling as much water.
Utility tax revenue losses	Foregone miscellaneous gross receipts tax collections.
Social impacts	**Description**
Consumer surplus losses	A welfare measure of the lost value to consumers accompanying restricted water use.
Population losses	Population losses accompanying job losses.
School enrollment losses	School enrollment losses (K-12) accompanying job losses.

2.1 Regional Economic Impacts

The two key measures used to assess regional economic impacts are income losses and job losses. The income losses presented consist of the sum of value-added losses and the additional purchase costs of electrical power.

Income Losses - Value-added Losses

Value-added is the value of total output less the value of the intermediate inputs also used in the production of the final product. Value-added is similar to GDP, a familiar measure of the productivity of an economy. The loss of value-added due to water shortages is estimated by input-output analysis using the IMPLAN software package, and includes the direct, indirect, and induced monetary impacts on the region. The indirect and induced effects are measures of reduced income as well as reduced employee spending for those input sectors which provide resources to the water shortage impacted production sectors.

Income Losses - Electric Power Purchase Costs

The electrical power grid and market within the state is a complex interconnected system. The industry response to water shortages, and the resulting impact on the region, are not easily modeled using traditional input/output impact analysis and the IMPLAN model. Adverse impacts on the region will occur and are represented in this analysis by estimated additional costs associated with power purchases from other generating plants within the region or state. Consequently, the analysis employs additional power purchase costs as a proxy for the value-added impacts for the steam-electric power water use category, and these are included as a portion of the overall income impact for completeness.

For the purpose of this analysis, it is assumed that power companies with insufficient water will be forced to purchase power on the electrical market at a projected higher rate of 5.60 cents per kilowatt hour. This rate is based upon the average day-ahead market purchase price of electricity in Texas that occurred during the recent drought period in 2011. This price is assumed to be comparable to those prices which would prevail in the event of another drought of record.

Job Losses

The number of jobs lost due to the economic impact is estimated using IMPLAN output associated with each TWDB water use category. Because of the difficulty in predicting outcomes and a lack of relevant data, job loss estimates are not calculated for the steam-electric power category.

2.2 Financial Transfer Impacts

Several impact measures evaluated in this analysis are presented to provide additional detail concerning potential impacts on a portion of the economy or government. These financial transfer impact measures include lost tax collections (on production and imports), trucking costs for imported water, declines in utility revenues, and declines in utility tax revenue collected by the

state. These measures are not solely adverse, with some having both positive and negative impacts. For example, cities and residents would suffer if forced to pay large costs for trucking in potable water. Trucking firms, conversely, would benefit from the transaction. Additional detail for each of these measures follows.

Tax Losses on Production and Imports

Reduced production of goods and services accompanying water shortages adversely impacts the collection of taxes by state and local government. The regional IMPLAN model is used to estimate reduced tax collections associated with the reduced output in the economy. Impact estimates for this measure include the direct, indirect, and induced impacts for the affected sectors.

Water Trucking Costs

In instances where water shortages for a municipal water user group are estimated by RWPGs to exceed 80 percent of water demands, it is assumed that water would need to be trucked in to support basic consumption and sanitation needs. For water shortages of 80 percent or greater, a fixed, maximum of $35,000[1] per acre-foot of water applied as an economic cost. This water trucking cost was utilized for both the residential and non-residential portions of municipal water needs.

Utility Revenue Losses

Lost utility income is calculated as the price of water service multiplied by the quantity of water not sold during a drought shortage. Such estimates are obtained from utility-specific pricing data provided by the Texas Municipal League, where available, for both water and wastewater. These water rates are applied to the potential water shortage to estimate forgone utility revenue as water providers sold less water during the drought due to restricted supplies.

Utility Tax Losses

Foregone utility tax losses include estimates of forgone miscellaneous gross receipts taxes. Reduced water sales reduce the amount of utility tax that would be collected by the State of Texas for water and wastewater service sales.

2.3 Social Impacts

Consumer Surplus Losses for Municipal Water Users

Consumer surplus loss is a measure of impact to the wellbeing of municipal water users when their water use is restricted. Consumer surplus is the difference between how much a consumer is

[1] Based on staff survey of water hauling firms and historical data concerning transport costs for potable water in the recent drought in California for this estimate. There are many factors and variables that would determine actual water trucking costs including distance to, cost of water, and length of that drought.

willing and able to pay for a commodity (i.e., water) and how much they actually have to pay. The difference is a benefit to the consumer's wellbeing since they do not have to pay as much for the commodity as they would be willing to pay. Consumer surplus may also be viewed as an estimate of how much consumers would be willing to pay to keep the original quantity of water which they used prior to the drought. Lost consumer surplus estimates within this analysis only apply to the residential portion of municipal demand, with estimates being made for reduced outdoor and indoor residential use. Lost consumer surplus estimates varied widely by location and degree of water shortage.

Population and School Enrollment Losses

Population loss due to water shortages, as well as the associated decline in school enrollment, are based upon the job loss estimates discussed in Section 2.1. A simplified ratio of job and net population losses are calculated for the state as a whole based on a recent study of how job layoffs impact the labor market population.[2] For every 100 jobs lost, 18 people were assumed to move out of the area. School enrollment losses are estimated as a proportion of the population lost based upon public school enrollment data from the Texas Education Agency concerning the age K-12 population within the state (approximately 19%).

[2] Foote, Andrew, Grosz, Michel, Stevens, Ann. "Locate Your Nearest Exit: Mass Layoffs and Local Labor Market Response." University of California, Davis. April 2015, http://paa2015.princeton.edu/papers/150194. The study utilized Bureau of Labor Statistics data regarding layoffs between 1996 and 2013, as well as Internal Revenue Service data regarding migration, to model the change in the population as the result of a job layoff event. The study found that layoffs impact both out-migration and in-migration into a region, and that a majority of those who did move following a layoff moved to another labor market rather than an adjacent county.

3 Socioeconomic Impact Assessment Methodology

This portion of the report provides a summary of the methodology used to estimate the potential economic impacts of future water shortages. The general approach employed in the analysis was to obtain estimates for income and job losses on the smallest geographic level that the available data would support, tie those values to their accompanying historic water use estimate, and thereby determine a maximum impact per acre-foot of shortage for each of the socioeconomic measures. The calculations of economic impacts are based on the overall composition of the economy divided into many underlying economic sectors. Sectors in this analysis refer to one or more of the 536 specific production sectors of the economy designated within IMPLAN, the economic impact modeling software used for this assessment. Economic impacts within this report are estimated for approximately 330 of these sectors, with the focus on the more water-intensive production sectors. The economic impacts for a single water use category consist of an aggregation of impacts to multiple, related IMPLAN economic sectors.

3.1 Analysis Context

The context of this socioeconomic impact analysis involves situations where there are physical shortages of groundwater or surface water due to a recurrence of drought of record conditions. Anticipated shortages for specific water users may be nonexistent in earlier decades of the planning horizon, yet population growth or greater industrial, agricultural or other sector demands in later decades may result in greater overall demand, exceeding the existing supplies. Estimated socioeconomic impacts measure what would happen if water user groups experience water shortages for a period of one year. Actual socioeconomic impacts would likely become larger as drought of record conditions persist for periods greater than a single year.

3.2 IMPLAN Model and Data

Input-Output analysis using the IMPLAN software package was the primary means of estimating the value-added, jobs, and tax related impact measures. This analysis employed regional level models to determine key economic impacts. IMPLAN is an economic impact model, originally developed by the U.S. Forestry Service in the 1970's to model economic activity at varying geographic levels. The model is currently maintained by the Minnesota IMPLAN Group (MIG Inc.) which collects and sells county and state specific data and software. The year 2016 version of IMPLAN, employing data for all 254 Texas counties, was used to provide estimates of value-added, jobs, and taxes on production for the economic sectors associated with the water user groups examined in the study. IMPLAN uses 536 sector-specific Industry Codes, and those that rely on water as a primary input were assigned to their appropriate planning water user categories (irrigation, livestock, manufacturing, mining, and municipal). Estimates of value-added for a water use category were obtained by summing value-added estimates across the relevant IMPLAN sectors associated with that water use category. These calculations were also performed for job losses as well as tax losses on production and imports.

The adjusted value-added estimates used as an income measure in this analysis, as well as the job and tax estimates from IMPLAN, include three components:

- ***Direct effects*** representing the initial change in the industry analyzed;
- ***Indirect effects*** that are changes in inter-industry transactions as supplying industries respond to reduced demands from the directly affected industries; and,
- ***Induced effects*** that reflect changes in local spending that result from reduced household income among employees in the directly and indirectly affected industry sectors.

Input-output models such as IMPLAN only capture backward linkages and do not include forward linkages in the economy.

3.3 Elasticity of Economic Impacts

The economic impact of a water need is based on the size of the water need relative to the total water demand for each water user group. Smaller water shortages, for example, less than 5 percent, are generally anticipated to result in no initial negative economic impact because water users are assumed to have a certain amount of flexibility in dealing with small shortages. As a water shortage intensifies, however, such flexibility lessens and results in actual and increasing economic losses, eventually reaching a representative maximum impact estimate per unit volume of water. To account for these characteristics, an elasticity adjustment function is used to estimate impacts for the income, tax and job loss measures. Figure 3-1 illustrates this general relationship for the adjustment functions. Negative impacts are assumed to begin accruing when the shortage reaches the lower bound 'b1' (5 percent in Figure 3-1), with impacts then increasing linearly up to the 100 percent impact level (per unit volume) once the upper bound reaches the 'b2' level shortage (40 percent in Figure 3-1).

To illustrate this, if the total annual value-added for manufacturing in the region was $2 million and the reported annual volume of water used in that industry is 10,000 acre-feet, the estimated economic measure of the water shortage would be $200 per acre-foot. The economic impact of the shortage would then be estimated using this value-added amount as the maximum impact estimate ($200 per acre-foot) applied to the anticipated shortage volume and then adjusted by the elasticity function. Using the sample elasticity function shown in Figure 3-1, an approximately 22 percent shortage in the livestock category would indicate an economic impact estimate of 50% of the original $200 per acre-foot impact value (i.e., $100 per acre-foot).

Such adjustments are not required in estimating consumer surplus, utility revenue losses, or utility tax losses. Estimates of lost consumer surplus rely on utility-specific demand curves with the lost consumer surplus estimate calculated based on the relative percentage of the utility's water shortage. Estimated changes in population and school enrollment are indirectly related to the elasticity of job losses.

Assumed values for the lower and upper bounds 'b1' and 'b2' vary by water use category and are presented in Table 3-1.

Figure 3-1 Example economic impact elasticity function (as applied to a single water user's shortage)

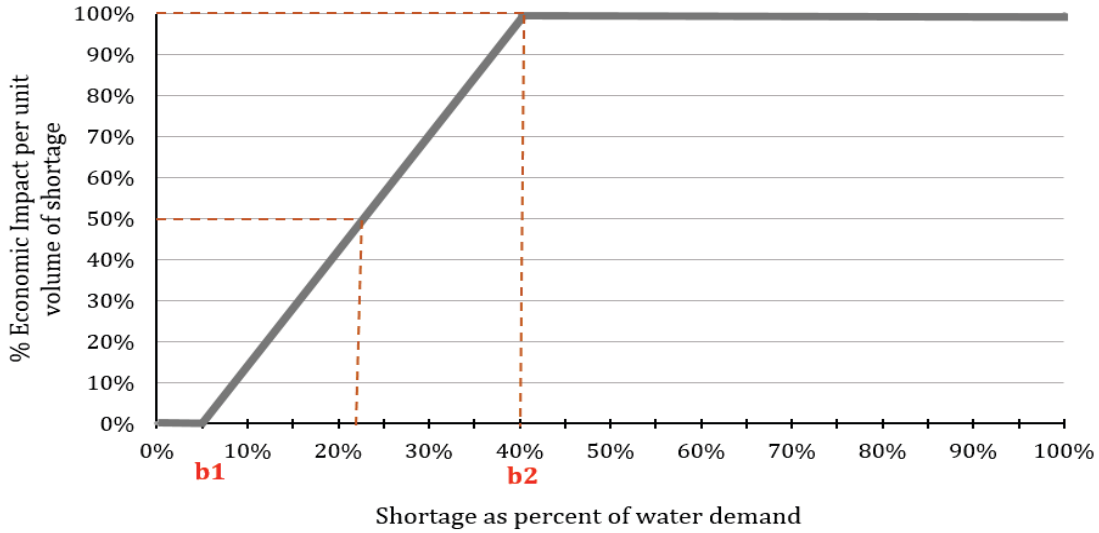


Table 3-1 Economic impact elasticity function lower and upper bounds

Water use category	Lower bound (b1)	Upper bound (b2)
Irrigation	**5%**	**40%**
Livestock	**5%**	**10%**
Manufacturing	**5%**	**40%**
Mining	**5%**	**40%**
Municipal (non-residential water intensive subcategory)	**5%**	**40%**
Steam-electric power	**N/A**	**N/A**

3.4 Analysis Assumptions and Limitations

The modeling of complex systems requires making many assumptions and acknowledging the model's uncertainty and limitations. This is particularly true when attempting to estimate a wide range of socioeconomic impacts over a large geographic area and into future decades. Some of the key assumptions and limitations of this methodology include:

1. The foundation for estimating the socioeconomic impacts of water shortages resulting from a drought are the water needs (potential shortages) that were identified by RWPGs as part of the

regional water planning process. These needs have some uncertainty associated with them but serve as a reasonable basis for evaluating the potential impacts of a drought of record event.

2. All estimated socioeconomic impacts are snapshots for years in which water needs were identified (i.e., 2020, 2030, 2040, 2050, 2060, and 2070). The estimates are independent and distinct "what if" scenarios for each particular year, and water shortages are assumed to be temporary events resulting from a single year recurrence of drought of record conditions. The evaluation assumed that no recommended water management strategies are implemented. In other words, growth occurs and future shocks are imposed on an economy at 10-year intervals, and the resulting impacts are estimated. Note that the estimates presented are not cumulative (i.e., summing up expected impacts from today up to the decade noted), but are simply snapshots of the estimated annual socioeconomic impacts should a drought of record occur in each particular decade based on anticipated water supplies and demands for that same decade.

3. Input-output models such as IMPLAN rely on a static profile of the structure of the economy as it appears today. This presumes that the relative contributions of all sectors of the economy would remain the same, regardless of changes in technology, availability of limited resources, and other structural changes to the economy that may occur in the future. Changes in water use efficiency will undoubtedly take place in the future as supplies become more stressed. Use of the static IMPLAN structure was a significant assumption and simplification considering the 50-year time period examined in this analysis. To presume an alternative future economic makeup, however, would entail positing many other major assumptions that would very likely generate as much or more error.

4. This is not a form of cost-benefit analysis. That approach to evaluating the economic feasibility of a specific policy or project employs discounting future benefits and costs to their present value dollars using some assumed discount rate. The methodology employed in this effort to estimate the economic impacts of future water shortages did not use any discounting methods to weigh future costs differently through time.

5. All monetary values originally based upon year 2016 IMPLAN and other sources are reported in constant year 2018 dollars to be consistent with the water management strategy requirements in the State Water Plan.

6. IMPLAN based loss estimates (income-value-added, jobs, and taxes on production and imports) are calculated only for those IMPLAN sectors for which the TWDB's Water Use Survey (WUS) data was available and deemed reliable. Every effort is made in the annual WUS effort to capture all relevant firms who are significant water users. Lack of response to the WUS, or omission of relevant firms, impacts the loss estimates.

7. Impacts are annual estimates. The socioeconomic analysis does not reflect the full extent of impacts that might occur as a result of persistent water shortages occurring over an extended duration. The drought of record in most regions of Texas lasted several years.

8. Value-added estimates are the primary estimate of the economic impacts within this report. One may be tempted to add consumer surplus impacts to obtain an estimate of total adverse economic impacts to the region, but the consumer surplus measure represents the change to the wellbeing of households (and other water users), not an actual change in the flow of dollars through the economy. The two measures (value-added and consumer surplus) are both valid impacts but ideally should not be summed.

9. The value-added, jobs, and taxes on production and import impacts include the direct, indirect and induced effects to capture backward linkages in the economy described in Section 2.1. Population and school enrollment losses also indirectly include such effects as they are based on the associated losses in employment. The remaining measures (consumer surplus, utility revenue, utility taxes, additional electrical power purchase costs, and potable water trucking costs), however, do not include any induced or indirect effects.

10. The majority of impacts estimated in this analysis may be more conservative (i.e., smaller) than those that might actually occur under drought of record conditions due to not including impacts in the forward linkages in the economy. Input-output models such as IMPLAN only capture backward linkages on suppliers (including households that supply labor to directly affected industries). While this is a common limitation in this type of economic modeling effort, it is important to note that forward linkages on the industries that use the outputs of the directly affected industries can also be very important. A good example is impacts on livestock operators. Livestock producers tend to suffer substantially during droughts, not because there is not enough water for their stock, but because reductions in available pasture and higher prices for purchased hay have significant economic effects on their operations. Food processors could be in a similar situation if they cannot get the grains or other inputs that they need. These effects are not captured in IMPLAN, resulting in conservative impact estimates.

11. The model does not reflect dynamic economic responses to water shortages as they might occur, nor does the model reflect economic impacts associated with a recovery from a drought of record including:
    a. The likely significant economic rebound to some industries immediately following a drought, such as landscaping;
    b. The cost and time to rebuild liquidated livestock herds (a major capital investment in that industry);
    c. Direct impacts on recreational sectors (i.e., stranded docks and reduced tourism); or,
    d. Impacts of negative publicity on Texas' ability to attract population and business in the event that it was not able to provide adequate water supplies for the existing economy.

12. Estimates for job losses and the associated population and school enrollment changes may exceed what would actually occur. In practice, firms may be hesitant to lay off employees, even in difficult economic times. Estimates of population and school enrollment changes are based on regional evaluations and therefore do not necessarily reflect what might occur on a statewide basis.

13. **The results must be interpreted carefully. It is the general and relative magnitudes of impacts as well as the changes of these impacts over time that should be the focus rather than the absolute numbers.** Analyses of this type are much better at predicting relative percent differences brought about by a shock to a complex system (i.e., a water shortage) than the precise size of an impact. To illustrate, assuming that the estimated economic impacts of a drought of record on the manufacturing and mining water user categories are $2 and $1 million, respectively, one should be more confident that the economic impacts on manufacturing are twice as large as those on mining and that these impacts will likely be in the millions of dollars. But one should have less confidence that the actual total economic impact experienced would be $3 million.

14. The methodology does not capture "spillover" effects between regions – or the secondary impacts that occur outside of the region where the water shortage is projected to occur.

15. The methodology that the TWDB has developed for estimating the economic impacts of unmet water needs, and the assumptions and models used in the analysis, are specifically designed to estimate potential economic effects at the regional and county levels. Although it may be tempting to add the regional impacts together in an effort to produce a statewide result, the TWDB cautions against that approach for a number of reasons. The IMPLAN modeling (and corresponding economic multipliers) are all derived from regional models – a statewide model of Texas would produce somewhat different multipliers. As noted in point 14 within this section, the regional modeling used by TWDB does not capture spillover losses that could result in other regions from unmet needs in the region analyzed, or potential spillover gains if decreased production in one region leads to increases in production elsewhere. The assumed drought of record may also not occur in every region of Texas at the same time, or to the same degree.

4 Analysis Results

This section presents estimates of potential economic impacts that could reasonably be expected in the event of water shortages associated with a drought of record and if no recommended water management strategies were implemented. Projected economic impacts for the six water use categories (irrigation, livestock, manufacturing, mining, municipal, and steam-electric power) are reported by decade.

4.1 Impacts for Irrigation Water Shortages

Three of the 11 counties in the region are projected to experience water shortages in the irrigated agriculture water use category for one or more decades within the planning horizon. Estimated impacts to this water use category appear in Table 4-1. Note that tax collection impacts were not estimated for this water use category. IMPLAN data indicates a negative tax impact (i.e., increased tax collections) for the associated production sectors, primarily due to past subsidies from the federal government. However, it was not considered realistic to report increasing tax revenues during a drought of record.

Table 4-1 Impacts of water shortages on irrigation in Region B

Impact measure	2020	2030	2040	2050	2060	2070
Income losses ($ millions)*	$2	$2	$3	$3	$3	$3
Job losses	77	84	90	97	103	110

* Year 2018 dollars, rounded. Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

4.2 Impacts for Livestock Water Shortages

None of the 11 counties in the region are projected to experience water shortages in the livestock water use category. Estimated impacts to this water use category appear in Table 4-2.

Table 4-2 Impacts of water shortages on livestock in Region B

Impact measure	2020	2030	2040	2050	2060	2070
Income losses ($ millions)*	$-	$-	$-	$-	$-	$-
Jobs losses	-	-	-	-	-	-
Tax losses on production and imports ($ millions)*	$-	$-	$-	$-	$-	$-

* Year 2018 dollars, rounded. Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

4.3 Impacts of Manufacturing Water Shortages

Manufacturing water shortages in the region are projected to occur in three of the 11 counties in the region for at least one decade of the planning horizon. Estimated impacts to this water use category appear in Table 4-3.

Table 4-3 Impacts of water shortages on manufacturing in Region B

Impacts measure	2020	2030	2040	2050	2060	2070
Income losses ($ millions)*	$-	$-	$-	$-	$-	$7
Job losses	-	-	-	-	-	66
Tax losses on production and Imports ($ millions)*	$-	$-	$-	$-	$-	$0

* Year 2018 dollars, rounded. Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

4.4 Impacts of Mining Water Shortages

Mining water shortages in the region are projected to occur in two of the 11 counties in the region for one or more decades within the planning horizon. Estimated impacts to this water use type appear in Table 4-4.

Table 4-4 Impacts of water shortages on mining in Region B

Impacts measure	2020	2030	2040	2050	2060	2070
Income losses ($ millions)*	$1,359	$419	$351	$188	$128	$128
Job losses	5,152	1,587	1,330	715	487	487
Tax losses on production and Imports ($ millions)*	$164	$51	$42	$23	$16	$16

* Year 2018 dollars, rounded. Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

4.5 Impacts for Municipal Water Shortages

Eight of the 11 counties in the region are projected to experience water shortages in the municipal water use category for one or more decades within the planning horizon.

Impact estimates were made for two sub-categories within municipal water use: residential, and non-residential. Non-residential municipal water use includes commercial and institutional users, which are further divided into non-water-intensive and water-intensive subsectors including car wash, laundry, hospitality, health care, recreation, and education. Lost consumer surplus estimates were made only for needs in the residential portion of municipal water use. Available IMPLAN and TWDB Water Use Survey data for the non-residential, water-intensive portion of municipal demand allowed these sectors to be included in income, jobs, and tax loss impact estimate.

Trucking cost estimates, calculated for shortages exceeding 80 percent, assumed a fixed, maximum cost of $35,000 per acre-foot to transport water for municipal use. The estimated impacts to this water use category appear in Table 4-5.

Table 4-5 Impacts of water shortages on municipal water users in Region B

Impacts measure	2020	2030	2040	2050	2060	2070
Income losses[1] ($ millions)*	$1	$2	$2	$2	$5	$31
Job losses[1]	20	32	40	52	109	653
Tax losses on production and imports[1] ($ millions)*	$0	$0	$0	$0	$1	$3
Trucking costs ($ millions)*	$-	$-	$-	$-	$-	$-
Utility revenue losses ($ millions)*	$2	$3	$3	$6	$11	$23
Utility tax revenue losses ($ millions)*	$0	$0	$0	$0	$0	$0

[1] Estimates apply to the water-intensive portion of non-residential municipal water use.
* Year 2018 dollars, rounded. Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

4.6 Impacts of Steam-Electric Water Shortages

Steam-electric water shortages in the region are projected to occur in two of the 11 counties in the region for one or more decades within the planning horizon. Estimated impacts to this water use category appear in Table 4-6.

Note that estimated economic impacts to steam-electric water users:

- Are reflected as an income loss proxy in the form of estimated additional purchasing costs for power from the electrical grid to replace power that could not be generated due to a shortage;
- Do not include estimates of impacts on jobs. Because of the unique conditions of power generators during drought conditions and lack of relevant data, it was assumed that the industry would retain, perhaps relocating or repurposing, their existing staff in order to manage their ongoing operations through a severe drought.
- Do not presume a decline in tax collections. Associated tax collections, in fact, would likely increase under drought conditions since, historically, the demand for electricity increases during times of drought, thereby increasing taxes collected on the additional sales of power.

Table 4-6 Impacts of water shortages on steam-electric power in Region B

Impacts measure	2020	2030	2040	2050	2060	2070
Income Losses ($ millions)*	$61	$83	$104	$126	$148	$169

* Year 2018 dollars, rounded. Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

4.7 Regional Social Impacts

Projected changes in population, based upon several factors (household size, population, and job loss estimates), as well as the accompanying change in school enrollment, were also estimated and are summarized in Table 4-7.

Table 4-7 Region-wide social impacts of water shortages in Region B

Impacts measure	2020	2030	2040	2050	2060	2070
Consumer surplus losses ($ millions)*	$1	$1	$1	$2	$3	$7
Population losses	964	313	268	158	128	242
School enrollment losses	184	60	51	30	24	46

* Year 2018 dollars, rounded. Entries denoted by a dash (-) indicate no estimated economic impact. Entries denoted by a zero ($0) indicate estimated income losses less than $500,000.

Appendix A - County Level Summary of Estimated Economic Impacts for Region B

County level summary of estimated economic impacts of not meeting identified water needs by water use category and decade (in 2018 dollars, rounded). Values are presented only for counties with projected economic impacts for at least one decade.

(* Entries denoted by a dash (-) indicate no estimated economic impact)

		Income losses (Million $)*						Job losses					
County	Water Use Category	2020	2030	2040	2050	2060	2070	2020	2030	2040	2050	2060	2070
ARCHER	IRRIGATION	$0.06	$0.07	$0.08	$0.08	$0.09	$0.10	2	2	3	3	3	3
ARCHER	MINING	$304.68	$375.93	$248.43	$188.43	$128.43	$128.43	1,155	1,426	942	715	487	487
ARCHER	MUNICIPAL	$0.40	$0.53	$0.57	$0.61	$0.70	$1.16	8	11	12	13	15	24
ARCHER Total		**$305.14**	**$376.52**	**$249.07**	**$189.12**	**$129.22**	**$129.69**	**1,166**	**1,439**	**957**	**730**	**505**	**515**
CLAY	MUNICIPAL	$0.01	$0.03	$0.05	$0.05	$0.08	$0.17	0	1	1	1	2	4
CLAY Total		**$0.01**	**$0.03**	**$0.05**	**$0.05**	**$0.08**	**$0.17**	**0**	**1**	**1**	**1**	**2**	**4**
FOARD	MUNICIPAL	-	-	-	-	$0.01	$0.03	-	-	-	-	0	1
FOARD Total		**-**	**-**	**-**	**-**	**$0.01**	**$0.03**	**-**	**-**	**-**	**-**	**0**	**1**
HARDEMAN	MANUFACTURING	-	-	-	-	-	$0.17	-	-	-	-	-	1
HARDEMAN	MUNICIPAL	-	-	-	-	$0.03	$0.20	-	-	-	-	1	4
HARDEMAN Total		**-**	**-**	**-**	**-**	**$0.03**	**$0.37**	**-**	**-**	**-**	**-**	**1**	**6**
MONTAGUE	MINING	$1,053.87	$42.65	$102.26	-	-	-	3,996	162	388	-	-	-
MONTAGUE	MUNICIPAL	-	-	-	$0.16	$0.80	$1.89	-	-	-	3	17	39
MONTAGUE Total		**$1,053.87**	**$42.65**	**$102.26**	**$0.16**	**$0.80**	**$1.89**	**3,996**	**162**	**388**	**3**	**17**	**39**
WICHITA	IRRIGATION	$2.20	$2.39	$2.57	$2.76	$2.95	$3.13	75	81	87	94	100	107
WICHITA	MANUFACTURING	-	-	-	-	-	$6.56	-	-	-	-	-	64
WICHITA	MUNICIPAL	$0.50	$0.88	$1.16	$1.50	$3.40	$27.20	10	18	24	31	71	568
WICHITA	STEAM ELECTRIC POWER	$0.11	$0.14	$0.18	$0.22	$0.25	$0.36	-	-	-	-	-	-
WICHITA Total		**$2.80**	**$3.41**	**$3.92**	**$4.48**	**$6.60**	**$37.26**	**85**	**100**	**112**	**125**	**171**	**739**
WILBARGER	MUNICIPAL	$0.06	$0.09	$0.12	$0.16	$0.21	$0.26	1	2	3	3	4	5
WILBARGER	STEAM ELECTRIC POWER	$61.07	$82.65	$104.23	$125.81	$147.39	$168.97	-	-	-	-	-	-
WILBARGER Total		**$61.13**	**$82.75**	**$104.36**	**$125.97**	**$147.60**	**$169.23**	**1**	**2**	**3**	**3**	**4**	**5**
YOUNG	MUNICIPAL	-	-	-	-	-	$0.40	-	-	-	-	-	8
YOUNG Total		**-**	**-**	**-**	**-**	**-**	**$0.40**	**-**	**-**	**-**	**-**	**-**	**8**
REGION B Total		**$1,422.94**	**$505.37**	**$459.65**	**$319.79**	**$284.33**	**$339.04**	**5,249**	**1,703**	**1,460**	**863**	**699**	**1,316**

APPENDIX F

TITLE 31 TEXAS ADMINISTRATIVE CODE CHAPTERS 357 AND 358 REGULATIONS PERTAINING TO THE 2021 PLAN

2021 FINAL PLAN

REGION B

OCTOBER 2020

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
31 TAC §357.11			
(c)(1)-(6)	RWPGs shall adopt, by two-thirds vote, bylaws that are consistent with Chapter 357 and shall provide copies of the bylaws and any revisions thereto to the EA.	Yes	The RWPG has adopted, by two-thirds vote, bylaws consistent with the chapter and the bylaws are available on the RWPG's website.
(d)(1)-(12)	RWPGs shall maintain at least one representative of the following interest categories as voting members (unless a category is not applicable to the region): public, counties, municipalities, industries, agricultural interests, environmental interests, small businesses, electric generating utilities, river authorities, water districts, water utilities, and groundwater management areas.	Yes	The Executive Summary and Chapter 10 provide a list of current voting members of the RWPG and the interests they represent.
(e)(1)-(6)	RWPGs shall maintain the following non-voting members: staff member from the TWDB, TPWD, adjacent RWPG liaison(s); person(s) to represent entities headquartered within the RWPA that divert, supply, or receive 1,000 acre-feet per year or more from the RWPA; staff member from TDA; and TSSWCB.	Yes	The Executive Summary provides a list of current non-voting members of the RWPG.
31 TAC §357.12			
(a)(1)-(4)	Prior to preparing the RWP, the RWPG shall hold at least one public meeting to gather recommendations as to issues that should be addressed or provisions that should be included in the next plan; prepare scope of work that includes detailed tasks and task schedule with responsible parties and budgets; approve amendments to the scope in an open meeting of the RWPG; and designate a Political Subdivision as a representative of the RWPG eligible to apply for financial assistance for scope of work and RWP development	Yes	The RWPG held a public meeting on 4/1/2016 prior to preparing the RWP
(b)	A RWPG shall hold a public meeting to determine the process for identifying potentially feasible water management strategies. Input from the public meeting will be documented. All possible water management strategies that are potentially feasible for meeting needs in the region will be listed.	Yes	The process used to identify potentially feasible WMSs was addressed in two regularly scheduled meetings of the RWPG. Appendix D lists all potentially feasible WMSs identified.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(c)(1)-(8)	The RWPGs shall approve and submit a Technical Memorandum to the EA that includes the most recent TWDB population and water demand projections, updated source water availability utilized in the RWPA, updated existing water supplies, identified water needs/surpluses, the documented process used by the RWPG to identify potential feasible WMSs, the potentially feasible WMSs, list of infeasible WMS (beginning with the 2026 RWP), and RWPG's declaration of intent to pursue simplified planning for planning cycle in each off-census RWP development (if applicable).	Yes	A Technical Memorandum has been submitted to the EA that includes data from the TWDB DB22

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(d)	If a RWPG rescinds decision to pursue simplified planning, they must do so prior to executing a contract scope of work and budget amendment with the TWDB. The RWPG must discuss any action on the decision in a public meeting.	Yes	The RWPG has not pursued simplified planning.
(e)	If applicable, RWPG may implement simplified planning in off-census planning cycles if it has sufficient existing water supplies and there are no significant changes to water availability/supplies/demands	Yes	The RWPG has not pursued simplified planning.
(f) - (h)	If an RWPG elects to pursue simplified planning, it must declare so in the Technical Memorandum; meet statutory and planning requirements; adopt previous RWP; complete an RWP that meets rule and statute requirements; hold a public hearing to receive comments; hold a general meeting to consider comments received; and declare implementation of simplified planning.	Yes	The RWPG has not pursued simplified planning.
31 TAC §357.20			
	Development of RWPs shall be guided by the principles stated in Title 31 §358.3 (relating to Guidance Principles).	Yes	See 31 TAC §358.3 below.
31 TAC §357.21			
(a)	Public notice requirements are subject to Chapters 551 and 552. All materials discussed at an opening meeting shall be made available to the public prior to and following the meetings.	Yes	Public notice requirements met and are addressed in Chapter 10.
(b)	Public notice requirements for regular RWPG meetings and meetings where the following were considered: amendments to the RWP scope or budget, process for identification of potentially feasible water management strategies, member addition or replacement, and adoption of water plans.	Yes	Public notice requirements met and are addressed in Chapter 10.
(c)	Public notice requirements for meetings where the following items were considered: population projection and water demand projection revisions, substitution of alternative water management strategies, and minor amendments to the RWPs.	Yes	Public notice requirements met and are addressed in Chapter 10.
(d)	Public notice requirements for holding a preplanning public meeting to obtain public input on development of the next RWP; major amendments to RWPs; holding hearings for IPPs; and requesting research and planning funds from the Board.	Yes	Public notice requirements met and are addressed in Chapter 10.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(e)	Public notice requirements for RWPG requesting research or planning fund from the Board: Notice shall be published in a newspaper, include address of eligible applicant, brief description of RWPA, mailed to mayors/county judge/river authority, and posted on website of RWPG	Yes	Public notice requirements met and are addressed in Chapter 10.
31 TAC §357.22			
(a)	RWPGs shall consider existing local, regional, and state water planning efforts, including water plans, information and relevant local, regional, state and federal programs and goals when developing the regional water plan. RWPGs must also consider:	Yes	Relevant State and federal programs and goals are addressed primarily in Chapter 1. As appropriate, water plans of specific WUGs have been considered in the evaluation of WMSs in Chapter 5. Coordination with Regions A, C, G, and O (all adjacent to Region B) has occurred and planning efforts of these regions considered.
(a)(1)	water conservation plans;	Yes	Chapter 5 addresses water conservation efforts in the region and summarizes water conservation plans reviewed.
(a)(2)	drought management and drought contingency plans;	Yes	Chapter 7 addresses drought management and drought contingency within the region and summarizes drought management and drought contingency plans reviewed.
(a)(3)	information compiled by the Board from water loss audits performed by retail public utilities;	Yes	Chapter 5 describes information on water loss audits.
(a)(4)	publicly available plans for major agricultural, municipal, manufacturing and commercial water users;	Yes	Publicly available plans for major agricultural, municipal, manufacturing, and commercial water users were not identified. However, the demand projections for each use category were reviewed at several meetings as documented in Chapter 10.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(a)(5)	local and regional water management plans;	Yes	Chapter 1 summarizes local and regional water management plans identified in the RWP area. Information from the Wichita Falls water plan is considered in Chapter 5.
(a)(6)	water availability requirements;	Yes	Water availability is addressed primarily in Chapter 3.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(a)(7)	the Texas Clean Rivers Program;	Yes	Chapter 1 references the Texas Clean Rivers program. Where relevant, water quality data from the program were used.
(a)(8)	the U.S. Clean Water Act;	Yes	Chapter 1 references the CWA; the CWA is a cornerstone of the water planning process and central to the planning process for the 2021 Plan.
(a)(9)	water management plans;	Yes	See above.
(a)(10)	other planning goals including regionalization of water and wastewater services where appropriate;	Yes	Regionalization of water and wastewater services has been considered where appropriate. Chapter 5 includes WMSs that may address regionalization.
(a)(11)	approved groundwater conservation district management plans and other plans submitted;	Yes	Groundwater Conservation Districts have been included, where appropriate, in Chapters 1, 3, and 5.
(a)(12)	approved groundwater regulatory plans; and	Yes	See above.
(a)(13)	any other information available from existing local or regional water planning studies.	Yes	See above.
(b)	The following sections from Title 31 should have a separate chapter in the RWP devoted to their contents: §§357.30, 357.31, 357.32, 357.33, 357.42, 357.43, 357.44, 357.45, 357.50, 357.34, 357.35, 357.40, and 357.41	Yes	The 2021 Plan contains chapters as required by the rules and TWDB Guidance.
31 TAC §357.30			
	The description of the RWP area must include a description of the following 12 criteria:		
(1)	social and economic aspects of a region such as information on current population, economic activity and economic sectors heavily dependent on water resources;	Yes	Chapter 1 describes the social and economic aspects of the region relative to water resources.
(2)	current water use and major water demand centers;	Yes	Chapters 1 and 2 include current water use and major water demand centers.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(3)	current groundwater, surface water, and reuse supplies including major springs that are important for water supply or protection of natural resources;	Yes	Chapter 1 generally describes groundwater, surface water, reuse, and springs. Chapter 3 includes more specific information on groundwater, surface water, and reuse sources that are, or may be, used for water supply.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(4)	Major Water Providers;	Yes	Chapter 1 identifies the region's WWPs. Chapters 2 and 3 describe WWP demands and supply. Chapter 5 addresses WMSs for each WWP in the region.
(5)	agricultural and natural resources;	Yes	Chapter 1 provides a description of the agricultural and natural resources of the region; Chapter 6 describes protection of these resources.
(6)	identified water quality problems;	Yes	Chapter 1 provides a discussion of water quality problems that may be relevant to regional water planning. To the extent possible, water quality issues are considered in the evaluation of WMSs in Chapter 5.
(7)	identified threats to agricultural and natural resources due to water quantity problems or water quality problems related to water supply;	Yes	Chapters 1 and 6 describe threats to agricultural and natural resources due to water quantity or quality issues.
(8)	summary of existing local and regional water plans;	Yes	Chapter 1 contains descriptions of relevant existing local and regional water plans.
(9)	the identified historic drought(s) of record within the planning area;	Yes	Chapters 1 and 7 contain a discussion of historic droughts of record within the RWP area.
(10)	current preparations for drought within the RWPA;	Yes	Chapters 1 and 7 describe current preparations for drought within the region.
(11)	information compiled by the Board from water loss audits performed by retail public utilities; and	Yes	Chapters 1 and 5 summarize water loss audits compiled by the TWDB.
(12)	an identification of each threat to agricultural and natural resources and a discussion of how that threat will be addressed or affected by the water management strategies evaluated in the plan.	Yes	Chapters 1 and 6 describe threats to agricultural and natural resources due to water quantity or quality issues. Chapter 5 provides a discussion of how WMSs address threats.
31 TAC §357.31			

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(a)	RWPs shall present projected Population and Water Demands by WUG with river basin, RWPA, and County identified.	Yes	Chapter 2 provides projections of population and WUG water demands for the period 2020-2070.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(b)	RWPs shall present projected water demands associated with MWPs by category of water use, including municipal, manufacturing, irrigation, steam electric power generation, mining, and livestock for each county or portion of a county in the RWPA.	See Comment	Chapter 2 provides projections of WWP water demands for all categories of water use. Appendices G contains a summary of WWP demands by category, county, and basin. The TWDB the DB22 Report to the RWPGs after submittal of the IPP.
(c)	RWPs shall evaluate the current contractual obligations of WUGs and WWPs to supply water in addition to any demands projected for the WUG or WWP.	Yes	Chapter 2 reports current contractual obligations of WUGs and WWPs.
(d)	Municipal demands shall be adjusted to reflect water savings due to plumbing fixture requirements identified in the Texas Health and Safety Code, Chapter 372. RWPGs shall report how changes in plumbing fixtures would affect projected municipal Water Demands using projections with plumbing code savings provided by the Board or by methods approved by the EA.	Yes	Municipal demands, addressed in Chapter 2, include water savings due to plumbing fixture requirements. Chapters 5 and 11 include further discussion of water conservation measures.
(e)(1)-(2)	RWPs are to use population and water demands developed by the EA for the next water plan or use population and water demands revisions (only if requested).	Yes	Population projections and municipal water demands developed by the EA were used in development of the RWP; projections are presented in Chapter 2.
(f)	Population and Water Demand Projections shall be presented for each Planning Decade for WUGs in accordance with subsection (a) of this section and MWPs in accordance with subsection (b).	Yes	Chapter 2 provides projections by decade for each planning decade in the planning horizon.
31 TAC §357.32			
(a)(1)-(2)	RWPGs shall evaluate the source water availability and existing water supplies that are legally and physically available to WUGs and wholesale water providers during drought conditions.	Yes	Water availability, addressed in Chapter 3, includes water legally available to WUGs and WWPs during drought conditions.
(b)-(d)	RWPG evaluations shall consider surface water (firm yield unless otherwise requested) and groundwater (modeled, Board-issued) data from the state water plan, existing water rights, contracts and option agreements relating to water rights, other planning and water supply studies, and analysis of water supplies existing in and available to the RWPA during drought of record conditions.	Yes	The availability of water addressed in Chapter 3 included consideration of the requirements of this section. WMS evaluations in Chapter 5 used Chapter 3 availability.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(e)-(g)	RWPGs shall evaluate the existing water supplies for each WUG and WWP; existing contractual agreements should be taken into account. Evaluation results shall be reported by WUG and MWP	Yes	Contractual agreements were taken into account as appropriate in the development of existing water supplies presented in Chapter 3.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
31 TAC §357.33			
(a)	RWPs shall include comparisons of existing water supplies and projected Water Demands to identify Water Needs.	Yes	Chapter 3 provides a comparison of existing water supplies.
(b)	RWPGs shall compare projected Water Demands with existing water supplies available to WUGs and WWPs in a planning area to determine whether WUGs will experience water surpluses or needs for additional supplies with results reported for WUGs by category of use and county and for MWPs by category of use.	Yes	Chapter 4 provides a comparison of water demands to supplies to determine surplus or needs for each WUG and WWP. WUG results are reported in Appendix B.
(c)	Social and economic impacts of water shortages will be evaluated.	Yes	A socio-economic impact analysis prepared by the TWDB is provided in Appendix E. The analysis report is summarized in Chapter 6.
(d)	Results of evaluations shall be reported by WUG in accordance with 357.31(a) and MWP in accordance with 357.31(b)	Yes	Evaluations are reported by WUG as noted above.
(e)	RWPGs shall perform a secondary water needs analysis (calculating water needs remaining after all conservation and direct reuse strategies are implemented) for all WUGs and WWPs for which conservation water management strategies or direct reuse water management strategies are recommended.	Yes	Secondary water needs analyses were performed for WUGs and WWPS for which conservation WMSs were recommended. The needs analysis considering water conservation is presented in Chapter 5.
31 TAC §357.34			
(a) - (b)	RWPGs shall identify and evaluate potentially feasible water management strategies for all WUGs and WWPs with identified water needs. The strategies shall meet new water supply obligations necessary to implement recommended water management strategies of WWPs and WUGs. RWPGs shall plan for water supply during Drought of Record conditions. In developing RWPs, RWPGs shall provide WMSs to be used during a drought of record.	Yes	Chapter 5 provides an identification and evaluation of potentially feasible WMSs for WUGs and WWPs.
(c)(1)-(6)	Potentially feasible WMSs may include expanded use of existing supplies; new supply development; conservation and drought management measures; reuse; interbasin transfers of surface water; emergency transfers of surface water.	Yes	Chapter 5 describes the types of WMSs used in the 2021 Plan.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(d)	All recommended WMSs and WMSPs that are entered into the State Water Planning Database and prioritized by RWPGs shall be designed to reduce the consumption/loss of water, improve efficiency in the use of water or develop/deliver/treat additional water supply volumes to WUGs or WWPs in at least one planning decade such that additional water is available during Drought of Record conditions.	Yes	Chapter 5 describes the types of WMSs used in the 2021 Plan.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(e)(1)	Evaluations of potentially feasible water management strategies shall use the TCEQ's most current Water Availability Model in addition to the following analyses:	Yes	Chapter 3 describes the use of the WAM in the 2021 Plan. Strategies evaluated in Chapter 5 utilize available water supplies identified in Chapter 3.
(e)(2)	An equitable comparison between and consistent evaluation and application of all water management strategies the RWPGs determine to be potentially feasible for each water supply need;	Yes	Chapter 5 contains potentially feasible WMS evaluations.
(e)(3); (5)	A quantitative reporting of the net quantity, reliability, and cost of water delivered and treated for the end user's requirements during drought of record conditions, environmental factors, and impacts to agricultural resources. Impacts shall include threats to agricultural or natural resources identified including how that threat will be addressed or affected by WMSs evaluated.	Yes	Chapter 5 contains potentially feasible WMS evaluations.
(e)(4); (7)	A discussion of this RWP's impact on other water resources of the state, local third-party social and economic impacts resulting from voluntary redistributions of water, and if applicable, consideration and discussion of the provisions for Interbasin Transfers of Surface Water;	Yes	Chapters 5 and 6 contain discussion of impacts on other water resources of the state and on local third-party social and environmental impacts.
(e)(8)	A description of the major impacts of recommended water management strategies on key parameters of water quality, comparing current conditions to recommended strategies;	Yes	Chapters 1 and 6 address issues of key parameters of water quality. Where appropriate, water quality is considered in the evaluations of WMSs in Chapter 5.
(e)(9)	Consideration of water pipelines and other facilities that are currently used for water conveyance;	Yes	Chapter 5 includes consideration of conveyance for WMSs.
(e)(10)	Other factors deemed relevant by the RWPG including recreational impacts;	See Comment	Additional factors were not deemed relevant by the RWPG.
(f)	RWPGs shall evaluate and present potentially feasible WMSs and WMSPs with sufficient specificity to allow state agencies to make financial or regulatory decisions to determine consistency of the proposed action before the state agency with an approved RWP.	Yes	Chapter 5 describes the types of WMSs used in the 2021 Plan.
(g)	If an RWPG does not recommend aquifer storage and recovery strategies, seawater desalination strategies, or brackish groundwater desalination strategies it must document the reason(s) in the RWP.	Yes	Chapter 5 describes types of WMSs considered, identified as potentially feasible, evaluated, and ultimately recommended.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(h)	In instances where an RWPG had determined there are significant identified Water Needs in the RWPA, the RWP shall include an assessment of the potential for aquifer storage and recovery to meet those Water Needs. Each RWPG shall define the threshold to determine whether it has significant identified Water Needs.	Yes	Summaries of the RWPG's recommendations regarding water conservation are included in Chapter 5.
(i)(1)-(3)	Conservation, Drought Management Measures, and Drought Contingency Plans shall be considered by RWPGs when developing the regional plans, particularly during the process of identifying, evaluating, and recommending WMSs. RWPs shall incorporate water conservation planning and drought contingency planning in the RWPA. RWPGs shall recommend Gallons Per Capita Per Day goal(s) for each municipal WUG or specified groupings of municipal WUGs. Goals must be recommended for each planning decade and may be a specific goal or a range of values.	Yes	Chapters 5 and 7 contain most of the required information regarding conservation and drought management measures for each WUG.
(j)	RWP's shall include a subchapter consolidating the RWPG's recommendations regarding water conservation. RWPG's shall include in the RWPs model Water Conservation Plans.	Yes	Summaries of the RWPG's recommendations regarding water conservation are included in Chapter 5.
31 TAC §357.35			
(a) - (c); (f)	RWPGs shall recommend water management strategies to be used during a drought of record. Potentially feasible water management strategies shall be specific, cost effective, environmentally sensitive, and consistent with the long-term protection of the state's water, agricultural, and natural resources. Strategies shall protect existing water rights, water contracts, and option agreements.	Yes	Chapter 5 contains a list of potentially feasible WMSs identified. Chapter 5 evaluations were performed using a drought of record as a basis for the 2021 Plan.
(d)	Water management strategies shall meet all water needs for drought conditions, except when no water management strategy is feasible or when a political subdivision that provides water explicitly does not participate.	Yes	Chapter 5 WMSs were designed to meet water needs for drought conditions.
(g)(1)	RWPGs shall report recommended water management strategies and the associated results of all the potentially feasible water management strategy evaluations by WUG and MWP for each river basin, RWPA, and County.	Yes	Chapter 5 and associated appendices report results by WUG and WWP.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(g)(2)	RWPGs shall report calculated planning management supply factors for each WUG and MWP included int he RWP assuming all recommended WMSs are implemented.	Yes	Supply factors were evaluated by the TWDB after submission of the IPP and are presented in Appendices.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(g)(3)	RWPGs shall report fully evaluated Alternative Water Management Strategies included in the adopted RWP shall be presented together in one place in the RWP.	Yes	Chapter 5 presents a summary of Alternative WMSs evaluated.
31 TAC §357.40			
(a)	RWPs shall include a quantitative description of the socioeconomic impacts of not meeting the identified water needs.	See Comment	Appendix H contains the socio-economic impact analysis prepared by the TWDB.
(b)(1)-(6)	RWPs shall include a description of the impacts of the RWP regarding agricultural resources, other water resources of the state, threats to agricultural and natural resources, third-party social and economic impacts resulting from voluntary water redistributions, water quality, and effects on navigation.	Yes	Chapter 6 contains discussion of impacts on other water resources of the state and on local third-party social and environmental impacts.
(c)	RWPs shall include a summary of the identified water needs that remain unmet by the RWP.	Yes	Chapters 5 and 6 include a summary of unmet needs.
31 TAC §357.41			
	RWPGs shall describe how RWPs are consistent with the long-term protection of the state's water resources, agricultural resources, and natural resources.	Yes	Chapter 6 provides a demonstration of how the 2021 Plan is consistent with the long-term protection of the state's water resources, agricultural resources, and natural resources
31 TAC §357.42			
(a)	RWPs shall consolidate and present information on current and planned preparations for, and responses to, drought conditions in the region including drought of record conditions based on the following subsections:	Yes	Chapter 7 describes drought of record conditions and presents preparations for and responses to future drought conditions.
(b) - (c)	RWPGs shall conduct an overall assessment of current preparations for drought and develop drought response recommendations for groundwater and surface water sources.	Yes	Chapter 7 describes current preparations for drought within the region.
(d) - (e)	RWPGs will collect (in a closed meeting) and submit (separately to the EA) information on existing major water infrastructure facilities that may be used for interconnections in event of an emergency shortage of water and will provide descriptions of local drought contingency plans that involve making emergency connections.	Yes	Chapter 7 describes emergency interconnections. Information related to existing interconnections is considered confidential and was not presented in the 2021 Plan.
(f)	RWPGs may designate recommended and alternative Drought Management Water Management Strategies and other recommended drought measures in the RWP	See Comment	Additional recommended and alternative drought WMSs are not recommended by the RWPG.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(g)(1)-(3)	The RWPGs shall evaluate, for all applicable municipal WUGs, potential emergency responses to local drought conditions or loss of existing water supplies, including identification of potential alternative water sources that may be considered for temporary emergency use. Minimum requirements: Have existing populations less than 7,500; rely on a sole source for its water supply regardless if water is provided by a WWP; and all County-Other WUG's.	Yes	Chapter 7 describes potential emergency responses to drought within the region.
(h)	RWPGs shall consider any relevant recommendations from the Drought Preparedness Council.	Yes	Relevant recommendations from the Drought Preparedness Council have been considered in Chapter 7.
(i)(1)-(4)	RWPGs shall make drought preparation and response recommendations regarding local drought contingency plans; current drought management preparations, including drought response triggers and responses to drought conditions; and The Drought Preparedness Council and the State Drought Preparedness Plan.	Yes	Chapter 7 contains recommendations regarding local drought contingency plans and preparations.
(j)	The RWPGs shall develop region-specific model drought contingency plans.	Yes	Chapter 7 references model drought contingency plans with reference to the Region B web site where the model plans can be obtained.
31 TAC §357.43			
(a); (d)	The RWPs shall contain any regulatory, administrative, or legislative recommendations developed by the RWPGs, including those that the RWPG believes are needed and desirable to facilitate the orderly development, management, and conservation of water resources and prepare for and respond to drought conditions.	Yes	Chapter 8 includes relevant regulatory, administrative, and legislative recommendations of the RWPG.
(b); (c)	If "Ecologically Unique River and Stream Segments" and "Unique Sites for Reservoir Construction" are designated by the RWPGs, the RWP should include relevant descriptions, value, and other relevant criteria, as described in this section.	Yes	Chapter 8 addresses ecologically unique river and stream segments and unique sites for reservoir construction.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
(f)	RWPGs may develop information as to the potential impacts of any proposed changes in law prior to or after changes are enacted as well as consider making legislative recommendations to facilitate more voluntary water transfers in the region	Yes	Chapter 8 includes relevant regulatory, administrative, and legislative recommendations of the RWPG.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
31 TAC §357.44			
	RWPGs shall assess and quantitatively report on how individual local governments, regional authorities, and other political subdivisions in their RWPA propose to finance recommended water management strategies. The assessment shall describe the role for the state in financing recommended WMSs.	Yes	The infrastructure financing report and survey were completed after submittal of the IPP. Chapter 9 and the associated Appendix summarize the proposed financing results.
31 TAC §357.45			
(a)	RWPGs shall describe the level of implementation of previously recommended water management strategies, recommended in the previous RWP, including conservation and drought management water management strategies; and the implementation of projects that have affected progress in meeting the state's future water needs.	Yes	The TWDB provided the Implementation Survey after submittal of the IPP. Chapter 11 summarizes the survey results reporting implementation progress for the 2016 Plan WMSs.
(b)(1)-(3)	RWPGs shall assess the progress of the RWPA in encouraging cooperation between WUGs to achieve economies of scale. The assessment of regionalization shall include: The number of WMSs in the previously adopted and current RWPs that serve more than one WUG, Number of recommended WMSs in the previously adopted RWP that serve more than one WUG, a description of efforts the RWPG has made to encourage WMSs and WMSPs that serve more than one WUG, and that benefit the entire region	Yes	Chapter 11 discusses the progress of the RWPA in encouraging cooperation between WUGs to achieve economies of scale.
(c)(1)-(4)	RWPGs shall provide a brief summary of how the RWP differs from the previously adopted RWP with regards to: water demand projections; drought of record and hydrologic and modeling assumptions used in planning for the region; groundwater and surface water availability, existing water supplies, and identified water needs for WUGs and WWPs; and recommended and alternative WMSs and WMSPs.	Yes	Chapter 11 provides a summary of how the 2021 Plan and the 2016 Plan differ.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
31 TAC §357.46			
(a)	The RWPGs shall prioritize recommended WMSPs in its respective RWP and submit the prioritization separately with its adopted RWP. The RWPG must prioritize the WMSPs in accordance with the uniform standards, developed by the stakeholders committee established under the Texas Water Code in effect at the time it adopts its RWP	Yes	Prioritization of WMSPs is provided in RWP.
31 TAC §357.50			
(a)	The RWPGs shall submit their adopted RWPs to the Board every five years on a date to be disseminated by the EA.	Yes	The 2021 Plan has been adopted in accordance with a schedule provided by the EA.
(b) - (c)	Prior to the adoption of the RWP, the RWPGs shall submit concurrently to the EA and the public an IPP. The IPP shall be distributed in accordance with Title 31 §357.21(d)(5).	Yes	The 2021 IPP was submitted to the TWDB as required.
(d)(1)-(3)	Within 60 days of the submission of IPPs to the EA, RWPGs shall submit to the EA the identification of potential Interregional Conflicts by: Identifying the specific recommended WMS from another RWPG's IPP; providing a statement of why the RWPG considers there to be a conflict; and providing any other information that is relevant to the board's decision.	Yes	The RWPG did not identify any potential Interregional Conflicts, so none were submitted.
(e)	The RWPGs shall seek to resolve conflicts with other RWPGs and participate in any Board sponsored efforts to resolve Interregional Conflicts	Yes	See comments above.
(f)(1)-(5)	When adopting a RWP the RWPGs shall solicit, and consider properly submitted written comments from the EA and from any federal or Texas state agency; and properly submitted written or oral comments from the public. The RWPG shall revise their IPPs to incorporate negotiated resolutions	See Comment	The RWPG considered comments from the EA, federal and state agencies, and the public in finalizing the 2021 Plan after the IPP was made available to the public and submitted to the TWDB.
(g)(1)-(2)	When submitted, RWP shall include: a technical report, an executive summary, and summaries of and responses to all comments (written and oral). The RWP shall be submitted on date disseminated by the EA unless an extension is approved and all relevant data shall be uploaded to Board's State Water Planning Database.	See Comment	The 2021 Plan includes a required technical report and executive summary. Responses to comments were incorporated after submittal of the IPP.

Appendix F
Title 31 Texas Administrative Code Chapters 357 and 358 Regulations Pertaining to the 2021 Plan

Regulatory Citation	Summary of Requirement	2021 Plan Compliance (Yes/No)	Location(s) in the Regional Plan and/or Other Commentary
31 TAC §358.3			
	Development of the state water plan shall be guided by the following principles:		
(2)	The regional water plans and state water plan shall serve as water supply plans under drought of record conditions.	Yes	The supply availability and existing water supplies evaluated in Chapter 3 assume drought of record conditions. Chapters 3 and 7 describe this evaluation.
(4)	Regional water plans shall provide for the orderly development, management, and conservation of water resources and preparation for and response to drought conditions so that sufficient water will be available at a reasonable cost to satisfy a reasonable projected use of water to ensure public health, safety, and welfare; further economic development; and protect the agricultural and natural resources of the regional water planning area.	Yes	Chapter 5 presents WMS evaluations developed in response to projected demands and potential drought conditions.
(5)	Regional water plans shall include identification of those policies and action that may be needed to meet Texas' water supply needs and prepare for and respond to drought conditions.	Yes	The Chapter 5 WMS evaluations identify policies and actions that may be required in drought conditions.
(6)	RWPG decision-making shall be open to and accountable to the public with decisions based on accurate, objective and reliable information with full dissemination of planning results except for those matters made confidential by law.	Yes	Chapter 10 summarizes public notice requirements and provides examples of how these requirements were met during the planning cycle.
(7)	The RWPG shall establish terms of participation in its water planning efforts that shall be equitable and shall not unduly hinder participation.	Yes	Chapter 10 summarizes how participation was encouraged as a part of water planning efforts in the RWP area.
(27)	RWPGs shall conduct their planning to achieve efficient use of existing water supplies, explore opportunities for and the benefits of developing regional water supply facilities or providing regional management of water facilities, coordinate the actions of local and regional water resource management agencies, provide substantial involvement by the public in the decision-making process, and provide full dissemination of planning results.	Yes	Chapter 3 discusses the evaluations of existing water supplies, Chapter 1 summarizes local and regional plans considered in the planning process, and Chapter 10 summarizes public involvement in the region.
(28)	RWPGs must consider existing regional water planning efforts when developing their plans.	Yes	Chapter 1 summarizes existing regional water plans that were considered in development of the 2021 Plan.

APPENDIX G

DB22 REPORTS

2021 FINAL PLAN

REGION B

OCTOBER 2020

APPENDIX G

DB22 REPORTS
2021 FINAL PLAN
REGION B

As required by regional water planning rules and guidelines, the data used in developing the regional water plans must be reported by water user, source, county and basin. These data are incorporated into the state water planning database, hence forward called "DB22".

Data tables are developed by water user group (WUG), wholesale water provider (WWP), and water source. Unfortunately, not all of the data easily fits into the structure of DB22. Specifically, groundwater sources are not constrained by political boundaries (county and regional lines), nor by river basin divides. However, this water source is represented as such.

Water supplies must be identified by source. This includes source type (surface water, groundwater, reuse, aquifer storage and recovery or precipitation enhancement), location (reservoir, county, basin), and river basin. Water users that utilize multiple sources of water must account for the quantity and end user of each source. This structure is very difficult to represent systems that blend multiple sources of water prior to distribution. It also poses challenges to accurately represent conjunctive use strategies that use different volumes of water from each source, pending annual availability. Generally, for conjunctive use operations, the decadal averages are represented in DB22.

The following data tables represent, to the best of the consultant's ability, the essence of the regional water plan. For some water user groups, the entity sells water to other users. These sales are included in the projected water needs for the water users in the regional plan. This relationship between seller and customer are represented in DB22, but may not be reflected in the following data reports. As a result, there may be differences in projected water needs between the regional water plan chapter tables and the data reports.

Also, the report tables were developed for each user group as a whole, regardless of county or basin splits. The splitting of these data by counties and basin can result in rounding differences between

the report tables and following data tables. Differences of less than 10 on a county basis are considered consistent with the regional water plan report.

While the DB22 data adequately represents the regional water plan within the constraints of the data structure, it is highly recommended that the user of this data refer to the written plan for clarification and description of the water needs and water management strategies.

There are some reports that are blank related to inter-basin transfers or alternative water management strategies and projects. No inter-basin transfers or alternative water management strategies or projects were identified in the 2021 Plan.

Region B Water User Group (WUG) Population

	WUG POPULATION					
	2020	2030	2040	2050	2060	2070
BAYLOR SUD*	19	19	19	20	20	20
COUNTY-OTHER	39	34	32	32	32	32
BRAZOS BASIN TOTAL	**58**	**53**	**51**	**52**	**52**	**52**
ARCHER CITY	1,727	1,727	1,727	1,727	1,727	1,727
ARCHER COUNTY MUD 1	806	807	817	817	817	817
BAYLOR SUD*	111	113	113	114	115	116
HOLLIDAY	1,606	1,832	1,920	1,920	1,920	1,920
LAKESIDE CITY	937	971	971	971	971	971
SCOTLAND	552	698	698	698	698	698
WICHITA VALLEY WSC	1,877	1,962	1,998	1,998	1,998	1,998
WINDTHORST WSC	988	1,033	1,045	1,045	1,045	1,045
COUNTY-OTHER	677	585	558	556	555	554
RED BASIN TOTAL	**9,281**	**9,728**	**9,847**	**9,846**	**9,846**	**9,846**
BAYLOR SUD*	22	22	22	23	23	23
COUNTY-OTHER	48	42	40	39	39	39
TRINITY BASIN TOTAL	**70**	**64**	**62**	**62**	**62**	**62**
ARCHER COUNTY TOTAL	**9,409**	**9,845**	**9,960**	**9,960**	**9,960**	**9,960**
BAYLOR SUD*	625	637	642	646	649	653
SEYMOUR	2,712	2,712	2,712	2,712	2,712	2,712
COUNTY-OTHER	110	95	88	83	78	74
BRAZOS BASIN TOTAL	**3,447**	**3,444**	**3,442**	**3,441**	**3,439**	**3,439**
BAYLOR SUD*	268	273	275	277	279	280
COUNTY-OTHER	11	9	9	8	8	7
RED BASIN TOTAL	**279**	**282**	**284**	**285**	**287**	**287**
BAYLOR COUNTY TOTAL	**3,726**	**3,726**	**3,726**	**3,726**	**3,726**	**3,726**
DEAN DALE SUD	2,150	2,218	2,218	2,218	2,218	2,218
HENRIETTA	3,321	3,425	3,425	3,425	3,425	3,425
RED RIVER AUTHORITY OF TEXAS*	1,542	1,542	1,542	1,542	1,542	1,542
WINDTHORST WSC	469	480	480	480	480	480
COUNTY-OTHER	3,184	3,328	3,328	3,328	3,328	3,328
RED BASIN TOTAL	**10,666**	**10,993**	**10,993**	**10,993**	**10,993**	**10,993**
COUNTY-OTHER	488	510	510	510	510	510
TRINITY BASIN TOTAL	**488**	**510**	**510**	**510**	**510**	**510**
CLAY COUNTY TOTAL	**11,154**	**11,503**	**11,503**	**11,503**	**11,503**	**11,503**
PADUCAH	1,196	1,196	1,196	1,196	1,196	1,196
RED RIVER AUTHORITY OF TEXAS*	49	49	49	49	49	49
COUNTY-OTHER	307	307	307	307	307	307
RED BASIN TOTAL	**1,552**	**1,552**	**1,552**	**1,552**	**1,552**	**1,552**
COTTLE COUNTY TOTAL	**1,552**	**1,552**	**1,552**	**1,552**	**1,552**	**1,552**
CROWELL	986	995	995	995	995	995
RED RIVER AUTHORITY OF TEXAS*	363	363	363	363	363	363
COUNTY-OTHER	40	43	43	43	43	43
RED BASIN TOTAL	**1,389**	**1,401**	**1,401**	**1,401**	**1,401**	**1,401**
FOARD COUNTY TOTAL	**1,389**	**1,401**	**1,401**	**1,401**	**1,401**	**1,401**
QUANAH	2,728	2,797	2,821	2,876	2,905	2,927
RED RIVER AUTHORITY OF TEXAS*	524	584	637	690	741	789
COUNTY-OTHER	1,022	1,002	962	941	906	871

*A single asterisk next to a WUG's name denotes that the WUG is split by two or more planning regions.

Region B Water User Group (WUG) Population

	WUG POPULATION					
	2020	2030	2040	2050	2060	2070
RED BASIN TOTAL	**4,274**	**4,383**	**4,420**	**4,507**	**4,552**	**4,587**
HARDEMAN COUNTY TOTAL	**4,274**	**4,383**	**4,420**	**4,507**	**4,552**	**4,587**
COUNTY-OTHER	29	35	35	35	35	35
BRAZOS BASIN TOTAL	**29**	**35**	**35**	**35**	**35**	**35**
RED RIVER AUTHORITY OF TEXAS*	217	217	217	217	217	217
COUNTY-OTHER	54	64	64	64	64	64
RED BASIN TOTAL	**271**	**281**	**281**	**281**	**281**	**281**
KING COUNTY TOTAL	**300**	**316**	**316**	**316**	**316**	**316**
NOCONA	3,155	3,271	3,323	3,381	3,419	3,446
NOCONA HILLS WSC	536	556	565	575	581	586
RED RIVER AUTHORITY OF TEXAS*	316	352	385	417	447	476
COUNTY-OTHER	3,776	3,905	3,957	4,016	4,051	4,073
RED BASIN TOTAL	**7,783**	**8,084**	**8,230**	**8,389**	**8,498**	**8,581**
BOWIE	5,828	6,042	6,139	6,247	6,316	6,367
SAINT JO	1,051	1,089	1,107	1,126	1,139	1,148
COUNTY-OTHER	5,845	6,045	6,124	6,217	6,270	6,305
TRINITY BASIN TOTAL	**12,724**	**13,176**	**13,370**	**13,590**	**13,725**	**13,820**
MONTAGUE COUNTY TOTAL	**20,507**	**21,260**	**21,600**	**21,979**	**22,223**	**22,401**
BURKBURNETT	11,004	11,405	11,721	11,941	12,153	12,331
DEAN DALE SUD	1,066	1,103	1,134	1,156	1,176	1,194
ELECTRA	2,694	2,793	2,869	2,924	2,975	3,019
HARROLD WSC	43	45	47	48	49	50
IOWA PARK	6,492	6,728	6,913	7,044	7,168	7,274
SHEPPARD AIR FORCE BASE	6,088	6,088	6,088	6,088	6,088	6,088
WICHITA FALLS	104,830	108,653	111,648	113,752	115,762	117,471
WICHITA VALLEY WSC	3,145	3,256	3,343	3,404	3,462	3,512
COUNTY-OTHER	265	502	685	814	938	1,043
RED BASIN TOTAL	**135,627**	**140,573**	**144,448**	**147,171**	**149,771**	**151,982**
WICHITA COUNTY TOTAL	**135,627**	**140,573**	**144,448**	**147,171**	**149,771**	**151,982**
HARROLD WSC	333	348	359	368	375	381
RED RIVER AUTHORITY OF TEXAS*	1,050	1,171	1,279	1,386	1,487	1,584
VERNON	11,758	12,398	12,785	13,175	13,447	13,653
COUNTY-OTHER	1,324	1,335	1,305	1,279	1,233	1,178
RED BASIN TOTAL	**14,465**	**15,252**	**15,728**	**16,208**	**16,542**	**16,796**
WILBARGER COUNTY TOTAL	**14,465**	**15,252**	**15,728**	**16,208**	**16,542**	**16,796**
BAYLOR SUD*	195	198	200	201	203	204
OLNEY	3,370	3,485	3,568	3,655	3,740	3,822
COUNTY-OTHER*	336	432	502	576	647	717
BRAZOS BASIN TOTAL	**3,901**	**4,115**	**4,270**	**4,432**	**4,590**	**4,743**
COUNTY-OTHER*	3	4	4	5	6	6
TRINITY BASIN TOTAL	**3**	**4**	**4**	**5**	**6**	**6**
YOUNG COUNTY TOTAL	**3,904**	**4,119**	**4,274**	**4,437**	**4,596**	**4,749**
REGION B POPULATION TOTAL	**206,307**	**213,930**	**218,928**	**222,760**	**226,142**	**228,973**

*A single asterisk next to a WUG's name denotes that the WUG is split by two or more planning regions.

Region B Water User Group (WUG) Demand

	WUG DEMAND (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
BAYLOR SUD*	4	4	4	4	4	4
COUNTY-OTHER	7	6	6	5	5	5
MINING	8	10	7	6	4	4
LIVESTOCK	10	10	10	10	10	10
BRAZOS BASIN TOTAL	**29**	**30**	**27**	**25**	**23**	**23**
ARCHER CITY	263	255	248	244	244	244
ARCHER COUNTY MUD 1	147	144	143	141	141	141
BAYLOR SUD*	24	24	24	24	24	24
HOLLIDAY	231	255	262	259	258	258
LAKESIDE CITY	125	125	121	120	119	119
SCOTLAND	194	242	240	239	239	239
WICHITA VALLEY WSC	221	222	220	216	215	215
WINDTHORST WSC	294	303	303	301	301	301
COUNTY-OTHER	118	101	95	95	94	94
MANUFACTURING	3	3	3	3	3	3
MINING	348	415	295	239	183	183
LIVESTOCK	2,102	2,102	2,102	2,102	2,102	2,102
IRRIGATION	1,251	1,251	1,251	1,251	1,251	1,251
RED BASIN TOTAL	**5,321**	**5,442**	**5,307**	**5,234**	**5,174**	**5,174**
BAYLOR SUD*	5	5	5	5	5	5
COUNTY-OTHER	8	7	7	7	7	7
MINING	49	58	42	34	26	26
LIVESTOCK	53	53	53	53	53	53
TRINITY BASIN TOTAL	**115**	**123**	**107**	**99**	**91**	**91**
ARCHER COUNTY TOTAL	**5,465**	**5,595**	**5,441**	**5,358**	**5,288**	**5,288**
BAYLOR SUD*	138	137	136	136	136	137
SEYMOUR	490	476	465	464	463	463
COUNTY-OTHER	15	12	11	10	10	9
MINING	6	6	6	6	6	6
LIVESTOCK	1,059	1,059	1,059	1,059	1,059	1,059
IRRIGATION	3,650	3,650	3,650	3,650	3,650	3,650
BRAZOS BASIN TOTAL	**5,358**	**5,340**	**5,327**	**5,325**	**5,324**	**5,324**
BAYLOR SUD*	59	59	58	59	59	59
COUNTY-OTHER	1	1	1	1	1	1
MINING	8	8	7	7	7	7
LIVESTOCK	131	131	131	131	131	131
IRRIGATION	1,299	1,299	1,299	1,299	1,299	1,299
RED BASIN TOTAL	**1,498**	**1,498**	**1,496**	**1,497**	**1,497**	**1,497**
BAYLOR COUNTY TOTAL	**6,856**	**6,838**	**6,823**	**6,822**	**6,821**	**6,821**
DEAN DALE SUD	163	159	151	149	149	149
HENRIETTA	664	669	657	650	649	649
RED RIVER AUTHORITY OF TEXAS*	379	372	366	365	364	364
WINDTHORST WSC	140	141	139	138	138	138
COUNTY-OTHER	391	395	383	377	376	376
MINING	539	691	514	414	314	314
LIVESTOCK	1,855	1,855	1,855	1,855	1,855	1,855
IRRIGATION	1,304	1,304	1,304	1,304	1,304	1,304
RED BASIN TOTAL	**5,435**	**5,586**	**5,369**	**5,252**	**5,149**	**5,149**

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Region B Water User Group (WUG) Demand

	WUG DEMAND (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
COUNTY-OTHER	60	60	59	58	58	58
MINING	74	95	70	57	43	43
LIVESTOCK	246	246	246	246	246	246
IRRIGATION	325	325	325	325	325	325
TRINITY BASIN TOTAL	**705**	**726**	**700**	**686**	**672**	**672**
CLAY COUNTY TOTAL	**6,140**	**6,312**	**6,069**	**5,938**	**5,821**	**5,821**
PADUCAH	290	283	282	281	281	281
RED RIVER AUTHORITY OF TEXAS*	12	12	12	12	12	12
COUNTY-OTHER	42	41	40	40	40	40
MINING	41	41	38	34	31	31
LIVESTOCK	551	551	551	551	551	551
IRRIGATION	3,926	3,926	3,926	3,926	3,926	3,926
RED BASIN TOTAL	**4,862**	**4,854**	**4,849**	**4,844**	**4,841**	**4,841**
COTTLE COUNTY TOTAL	**4,862**	**4,854**	**4,849**	**4,844**	**4,841**	**4,841**
CROWELL	138	133	131	131	131	130
RED RIVER AUTHORITY OF TEXAS*	89	87	86	86	86	86
COUNTY-OTHER	7	8	8	8	8	8
MINING	12	12	12	12	11	11
LIVESTOCK	401	401	401	401	401	401
IRRIGATION	3,213	3,213	3,213	3,213	3,213	3,213
RED BASIN TOTAL	**3,860**	**3,854**	**3,851**	**3,851**	**3,850**	**3,849**
FOARD COUNTY TOTAL	**3,860**	**3,854**	**3,851**	**3,851**	**3,850**	**3,849**
QUANAH	396	391	387	394	397	400
RED RIVER AUTHORITY OF TEXAS*	129	141	151	163	175	186
COUNTY-OTHER	163	154	144	141	135	130
MANUFACTURING	440	483	483	483	483	483
MINING	17	17	18	18	18	18
LIVESTOCK	646	646	646	646	646	646
IRRIGATION	12,498	12,498	12,498	12,498	12,498	12,498
RED BASIN TOTAL	**14,289**	**14,330**	**14,327**	**14,343**	**14,352**	**14,361**
HARDEMAN COUNTY TOTAL	**14,289**	**14,330**	**14,327**	**14,343**	**14,352**	**14,361**
COUNTY-OTHER	8	9	9	9	9	9
MINING	141	123	107	93	81	81
LIVESTOCK	155	155	155	155	155	155
BRAZOS BASIN TOTAL	**304**	**287**	**271**	**257**	**245**	**245**
RED RIVER AUTHORITY OF TEXAS*	53	52	52	51	51	51
COUNTY-OTHER	14	16	16	16	16	16
MINING	239	208	182	158	138	138
LIVESTOCK	264	264	264	264	264	264
RED BASIN TOTAL	**570**	**540**	**514**	**489**	**469**	**469**
KING COUNTY TOTAL	**874**	**827**	**785**	**746**	**714**	**714**
NOCONA	740	751	750	758	765	771
NOCONA HILLS WSC	105	106	106	107	108	108
RED RIVER AUTHORITY OF TEXAS*	78	85	91	99	106	112
COUNTY-OTHER	457	456	449	449	451	454
MANUFACTURING	1	1	1	1	1	1
MINING	1,747	1,237	771	332	373	373

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Region B Water User Group (WUG) Demand

	WUG DEMAND (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
LIVESTOCK	1,278	1,278	1,278	1,278	1,278	1,278
IRRIGATION	292	292	292	292	292	292
RED BASIN TOTAL	**4,698**	**4,206**	**3,738**	**3,316**	**3,374**	**3,389**
BOWIE	995	1,003	997	1,002	1,011	1,019
SAINT JO	155	156	155	155	157	158
COUNTY-OTHER	707	706	695	695	699	702
MINING	1,892	1,340	835	359	404	404
LIVESTOCK	426	426	426	426	426	426
IRRIGATION	292	292	292	292	292	292
TRINITY BASIN TOTAL	**4,467**	**3,923**	**3,400**	**2,929**	**2,989**	**3,001**
MONTAGUE COUNTY TOTAL	**9,165**	**8,129**	**7,138**	**6,245**	**6,363**	**6,390**
BURKBURNETT	1,461	1,460	1,457	1,462	1,483	1,505
DEAN DALE SUD	81	79	77	78	79	80
ELECTRA	884	902	916	932	947	961
HARROLD WSC	12	13	13	13	13	14
IOWA PARK	884	884	882	885	898	911
SHEPPARD AIR FORCE BASE	979	951	929	919	917	917
WICHITA FALLS	16,873	16,987	17,055	17,159	17,422	17,677
WICHITA VALLEY WSC	370	369	368	368	373	379
COUNTY-OTHER	33	61	84	99	114	127
MANUFACTURING	1,025	1,100	1,100	1,100	1,100	1,100
MINING	62	61	55	49	44	44
STEAM ELECTRIC POWER	31	31	31	31	31	31
LIVESTOCK	975	975	975	975	975	975
IRRIGATION	39,156	39,156	39,156	39,156	39,156	39,156
RED BASIN TOTAL	**62,826**	**63,029**	**63,098**	**63,226**	**63,552**	**63,877**
WICHITA COUNTY TOTAL	**62,826**	**63,029**	**63,098**	**63,226**	**63,552**	**63,877**
HARROLD WSC	94	97	98	101	102	104
RED RIVER AUTHORITY OF TEXAS*	258	282	304	328	351	374
VERNON	1,882	1,922	1,933	1,981	2,018	2,048
COUNTY-OTHER	210	204	196	192	185	176
MANUFACTURING	958	1,048	1,048	1,048	1,048	1,048
MINING	20	20	19	19	18	18
STEAM ELECTRIC POWER	7,711	7,711	7,711	7,711	7,711	7,711
LIVESTOCK	965	965	965	965	965	965
IRRIGATION	29,289	29,289	29,289	29,289	29,289	29,289
RED BASIN TOTAL	**41,387**	**41,538**	**41,563**	**41,634**	**41,687**	**41,733**
WILBARGER COUNTY TOTAL	**41,387**	**41,538**	**41,563**	**41,634**	**41,687**	**41,733**
BAYLOR SUD*	43	43	42	42	43	43
OLNEY	556	558	558	566	577	590
COUNTY-OTHER*	41	51	57	65	73	81
LIVESTOCK*	122	122	122	122	122	122
IRRIGATION*	3	3	3	3	3	3
BRAZOS BASIN TOTAL	**765**	**777**	**782**	**798**	**818**	**839**
COUNTY-OTHER*	0	0	1	1	1	1
TRINITY BASIN TOTAL	**0**	**0**	**1**	**1**	**1**	**1**
YOUNG COUNTY TOTAL	**765**	**777**	**783**	**799**	**819**	**840**
REGION B DEMAND TOTAL	**156,489**	**156,083**	**154,727**	**153,806**	**154,108**	**154,535**

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Region B Water User Group (WUG) Demand

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Region B Water User Group (WUG) Category Summary

MUNICIPAL	2020	2030	2040	2050	2060	2070
POPULATION	188,749	195,653	200,375	203,907	207,092	209,787
DEMAND (acre-feet per year)	31,098	31,339	31,374	31,587	32,011	32,426
EXISTING SUPPLIES (acre-feet per year)	37,877	36,178	35,219	34,113	33,089	29,851
NEEDS (acre-feet per year)*	225	513	1,285	2,123	3,138	6,017

COUNTY-OTHER	2020	2030	2040	2050	2060	2070
POPULATION	17,558	18,277	18,553	18,853	19,050	19,186
DEMAND (acre-feet per year)	2,282	2,288	2,261	2,268	2,282	2,294
EXISTING SUPPLIES (acre-feet per year)	3,203	3,208	3,201	3,187	3,177	3,134
NEEDS (acre-feet per year)*	38	19	13	12	11	11

MANUFACTURING	2020	2030	2040	2050	2060	2070
DEMAND (acre-feet per year)	2,427	2,635	2,635	2,635	2,635	2,635
EXISTING SUPPLIES (acre-feet per year)	2,657	2,768	2,739	2,672	2,622	2,490
NEEDS (acre-feet per year)*	0	0	0	0	13	145

MINING	2020	2030	2040	2050	2060	2070
DEMAND (acre-feet per year)	5,203	4,342	2,978	1,837	1,701	1,701
EXISTING SUPPLIES (acre-feet per year)	3,628	3,743	2,502	1,704	1,661	1,661
NEEDS (acre-feet per year)*	1,616	678	556	201	137	137

STEAM ELECTRIC POWER	2020	2030	2040	2050	2060	2070
DEMAND (acre-feet per year)	7,742	7,742	7,742	7,742	7,742	7,742
EXISTING SUPPLIES (acre-feet per year)	6,042	5,439	4,837	4,236	3,633	3,029
NEEDS (acre-feet per year)*	1,701	2,303	2,905	3,506	4,109	4,713

LIVESTOCK	2020	2030	2040	2050	2060	2070
DEMAND (acre-feet per year)	11,239	11,239	11,239	11,239	11,239	11,239
EXISTING SUPPLIES (acre-feet per year)	11,365	11,365	11,365	11,365	11,365	11,365
NEEDS (acre-feet per year)*	0	0	0	0	0	0

IRRIGATION	2020	2030	2040	2050	2060	2070
DEMAND (acre-feet per year)	96,498	96,498	96,498	96,498	96,498	96,498
EXISTING SUPPLIES (acre-feet per year)	76,082	74,263	72,445	70,527	68,710	66,891
NEEDS (acre-feet per year)*	21,165	22,979	24,793	26,606	28,419	30,233

*WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The needs shown in the WUG Category Summary report are calculated by first deducting the WUG split's projected demand from its total existing water supply volume. If the WUG split has a greater existing supply volume than projected demand in any given decade, this amount is considered a surplus volume. Before aggregating the difference between supplies and demands to the WUG category level, calculated surpluses are updated to zero so that only the WUGs with needs in the decade are included with the Needs totals.

Region B Source Availability

GROUNDWATER SOURCE TYPE				SOURCE AVAILABILITY (ACRE-FEET PER YEAR)					
SOURCE NAME	COUNTY	BASIN	SALINITY *	2020	2030	2040	2050	2060	2070
BLAINE AQUIFER	COTTLE	RED	FRESH	14,766	11,621	11,653	11,621	11,653	11,621
BLAINE AQUIFER	FOARD	RED	FRESH	6,582	6,564	6,582	6,564	6,582	6,564
BLAINE AQUIFER	HARDEMAN	RED	FRESH	8,488	8,465	8,488	8,465	8,488	8,465
BLAINE AQUIFER	KING	BRAZOS	FRESH	0	0	0	0	0	0
BLAINE AQUIFER	KING	RED	FRESH	400	400	400	400	400	400
CROSS TIMBERS AQUIFER	ARCHER	BRAZOS	FRESH	20	20	20	20	20	20
CROSS TIMBERS AQUIFER	ARCHER	RED	FRESH	585	585	585	585	585	585
CROSS TIMBERS AQUIFER	ARCHER	TRINITY	FRESH	20	20	20	20	20	20
CROSS TIMBERS AQUIFER	BAYLOR	BRAZOS	FRESH	25	25	25	25	25	25
CROSS TIMBERS AQUIFER	BAYLOR	RED	FRESH	35	35	35	35	35	35
CROSS TIMBERS AQUIFER	CLAY	RED	FRESH	1,495	1,495	1,495	1,495	1,495	1,495
CROSS TIMBERS AQUIFER	CLAY	TRINITY	FRESH	505	505	505	505	505	505
CROSS TIMBERS AQUIFER	MONTAGUE	RED	FRESH	2,280	2,280	2,280	2,280	2,280	2,280
CROSS TIMBERS AQUIFER	MONTAGUE	TRINITY	FRESH	1,720	1,720	1,720	1,720	1,720	1,720
CROSS TIMBERS AQUIFER	WICHITA	RED	FRESH	840	840	840	840	840	840
CROSS TIMBERS AQUIFER	YOUNG	BRAZOS	FRESH	650	650	650	650	650	650
CROSS TIMBERS AQUIFER	YOUNG	TRINITY	FRESH	50	50	50	50	50	50
OTHER AQUIFER	COTTLE	RED	FRESH	1,800	1,800	1,800	1,800	1,800	1,800
OTHER AQUIFER	FOARD	RED	FRESH	200	200	200	200	200	200
OTHER AQUIFER	HARDEMAN	RED	FRESH	50	50	50	50	50	50
OTHER AQUIFER	KING	BRAZOS	FRESH	250	250	250	250	250	250
OTHER AQUIFER	KING	RED	FRESH	400	400	400	400	400	400
OTHER AQUIFER	WILBARGER	RED	FRESH	3,050	3,050	3,050	3,050	3,050	3,050
SEYMOUR AQUIFER	ARCHER	RED	FRESH	35	35	35	35	35	35
SEYMOUR AQUIFER	BAYLOR	BRAZOS	FRESH	6,921	7,036	6,683	6,437	6,313	6,636
SEYMOUR AQUIFER	BAYLOR	RED	FRESH	294	294	294	294	294	294
SEYMOUR AQUIFER	CLAY	RED	FRESH	787	787	787	787	787	787
SEYMOUR AQUIFER	FOARD	RED	FRESH	11,897	4,945	5,389	8,066	7,815	3,943
SEYMOUR AQUIFER	HARDEMAN	RED	FRESH	20,378	13,040	18,885	17,520	20,002	32,868
SEYMOUR AQUIFER	WICHITA	RED	FRESH	2,295	2,295	2,288	2,291	2,291	2,291
SEYMOUR AQUIFER	WILBARGER	RED	FRESH	30,000	30,000	30,000	30,000	30,000	30,000
TRINITY AQUIFER	MONTAGUE	RED	FRESH	154	154	154	154	154	154
TRINITY AQUIFER	MONTAGUE	TRINITY	FRESH	3,732	3,721	3,732	3,721	3,732	3,721
			GROUNDWATER SOURCE AVAILABILITY TOTAL	**120,704**	**103,332**	**109,345**	**110,330**	**112,521**	**121,754**

REUSE SOURCE TYPE				SOURCE AVAILABILITY (ACRE-FEET PER YEAR)					
SOURCE NAME	COUNTY	BASIN	SALINITY *	2020	2030	2040	2050	2060	2070
DIRECT REUSE	BAYLOR	BRAZOS	FRESH	63	63	63	63	63	63
DIRECT REUSE	MONTAGUE	RED	FRESH	16	16	16	16	16	16
DIRECT REUSE	MONTAGUE	TRINITY	FRESH	348	351	349	0	0	0
DIRECT REUSE	WICHITA	RED	FRESH	357	357	357	357	357	357
DIRECT REUSE	YOUNG	BRAZOS	FRESH	5	5	5	5	5	5
INDIRECT REUSE	WICHITA	RED	FRESH	8,968	8,968	8,968	8,968	8,968	8,968
			REUSE SOURCE AVAILABILITY TOTAL	**9,757**	**9,760**	**9,758**	**9,409**	**9,409**	**9,409**

* Salinity field indicates whether the source availability is considered 'fresh' (less than 1,000 mg/L), 'brackish' (1,000 to 10,000 mg/L), 'saline' (10,001 mg/L to 34,999 mg/L), or 'seawater' (35,000 mg/L or greater). Sources can also be labeled as 'fresh/brackish' or 'brackish/saline', if a combination of the salinity types is appropriate.

** Since reservoir sources can exist across multiple counties, the county field value, 'reservoir' is applied to all reservoir sources.

Region B Source Availability

SURFACE WATER SOURCE TYPE				SOURCE AVAILABILITY (ACRE-FEET PER YEAR)					
SOURCE NAME	COUNTY	BASIN	SALINITY *	2020	2030	2040	2050	2060	2070
AMON G. CARTER LAKE/RESERVOIR	RESERVOIR**	TRINITY	FRESH	1,270	1,182	1,094	1,006	918	830
BRAZOS LIVESTOCK LOCAL SUPPLY	ARCHER	BRAZOS	FRESH	10	10	10	10	10	10
BRAZOS LIVESTOCK LOCAL SUPPLY	BAYLOR	BRAZOS	FRESH	843	843	843	843	843	843
BRAZOS LIVESTOCK LOCAL SUPPLY	KING	BRAZOS	FRESH	55	55	55	55	55	55
BRAZOS LIVESTOCK LOCAL SUPPLY	YOUNG	BRAZOS	FRESH	122	122	122	122	122	122
BRAZOS RUN-OF-RIVER	BAYLOR	BRAZOS	FRESH	17	17	17	17	17	17
ELECTRA CITY LAKE/RESERVOIR	RESERVOIR**	RED	FRESH	0	0	0	0	0	0
FARMERS CREEK/NOCONA LAKE/RESERVOIR	RESERVOIR**	RED	FRESH	1,260	1,260	1,260	1,260	1,260	1,260
KEMP-DIVERSION LAKE/RESERVOIR SYSTEM	RESERVOIR**	RED	FRESH	29,000	26,100	23,200	20,300	17,400	14,500
LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	RESERVOIR**	RED	FRESH	16,900	15,720	15,120	14,520	13,920	11,000
NORTH FORK BUFFALO CREEK LAKE/RESERVOIR	RESERVOIR**	RED	FRESH	0	0	0	0	0	0
OLNEY-COOPER LAKE/RESERVOIR SYSTEM	RESERVOIR**	RED	FRESH	194	181	168	156	143	130
RED LIVESTOCK LOCAL SUPPLY	ARCHER	RED	FRESH	2,029	2,029	2,029	2,029	2,029	2,029
RED LIVESTOCK LOCAL SUPPLY	BAYLOR	RED	FRESH	104	104	104	104	104	104
RED LIVESTOCK LOCAL SUPPLY	CLAY	RED	FRESH	1,580	1,580	1,580	1,580	1,580	1,580
RED LIVESTOCK LOCAL SUPPLY	COTTLE	RED	FRESH	171	171	171	171	171	171
RED LIVESTOCK LOCAL SUPPLY	FOARD	RED	FRESH	370	370	370	370	370	370
RED LIVESTOCK LOCAL SUPPLY	HARDEMAN	RED	FRESH	400	400	400	400	400	400
RED LIVESTOCK LOCAL SUPPLY	KING	RED	FRESH	87	87	87	87	87	87
RED LIVESTOCK LOCAL SUPPLY	MONTAGUE	RED	FRESH	1,221	1,221	1,221	1,221	1,221	1,221
RED LIVESTOCK LOCAL SUPPLY	WICHITA	RED	FRESH	916	916	916	916	916	916
RED LIVESTOCK LOCAL SUPPLY	WILBARGER	RED	FRESH	790	790	790	790	790	790
RED OTHER LOCAL SUPPLY	HARDEMAN	RED	FRESH	7	7	7	7	7	7
RED RUN-OF-RIVER	ARCHER	RED	FRESH	285	285	285	285	285	285
RED RUN-OF-RIVER	CLAY	RED	FRESH	3,836	3,836	3,836	3,836	3,836	3,836
RED RUN-OF-RIVER	COTTLE	RED	FRESH	11	11	11	11	11	11
RED RUN-OF-RIVER	HARDEMAN	RED	FRESH	146	146	146	146	146	146
RED RUN-OF-RIVER	MONTAGUE	RED	FRESH	108	108	108	108	108	108
RED RUN-OF-RIVER	WICHITA	RED	FRESH	3,607	3,607	3,607	3,607	3,607	3,607
RED RUN-OF-RIVER	WILBARGER	RED	FRESH	952	952	952	952	952	952
SANTA ROSA LAKE/RESERVOIR	RESERVOIR**	RED	FRESH	50	50	50	50	50	50
TRINITY LIVESTOCK LOCAL SUPPLY	ARCHER	TRINITY	FRESH	51	51	51	51	51	51
TRINITY LIVESTOCK LOCAL SUPPLY	CLAY	TRINITY	FRESH	221	221	221	221	221	221
TRINITY LIVESTOCK LOCAL SUPPLY	MONTAGUE	TRINITY	FRESH	407	407	407	407	407	407
SURFACE WATER SOURCE AVAILABILITY TOTAL				**67,020**	**62,839**	**59,238**	**55,638**	**52,037**	**46,116**

REGION B SOURCE AVAILABILITY TOTAL				**197,481**	**175,931**	**178,341**	**175,377**	**173,967**	**177,279**

* Salinity field indicates whether the source availability is considered 'fresh' (less than 1,000 mg/L), 'brackish' (1,000 to 10,000 mg/L), 'saline' (10,001 mg/L to 34,999 mg/L), or 'seawater' (35,000 mg/L or greater). Sources can also be labeled as 'fresh/brackish' or 'brackish/saline', if a combination of the salinity types is appropriate.

** Since reservoir sources can exist across multiple counties, the county field value, 'reservoir' is applied to all reservoir sources.

Region B Water User Group (WUG) Existing Water Supply

WUG NAME	SOURCE REGION	SOURCE DESCRIPTION	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
			2020	2030	2040	2050	2060	2070
BAYLOR SUD*	B	SEYMOUR AQUIFER | BAYLOR COUNTY	6	6	6	6	6	6
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	7	6	6	5	5	5
MINING	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	8	10	7	6	4	4
LIVESTOCK	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	1	1	1	1	1	1
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	10	10	10	10	10	10
		BRAZOS BASIN TOTAL	**32**	**33**	**30**	**28**	**26**	**26**
ARCHER CITY	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	194	186	177	168	158	123
ARCHER CITY	B	RED INDIRECT REUSE	102	106	105	104	101	101
ARCHER COUNTY MUD 1	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	55	53	50	47	44	35
ARCHER COUNTY MUD 1	B	RED INDIRECT REUSE	29	30	30	29	29	28
BAYLOR SUD*	B	SEYMOUR AQUIFER | BAYLOR COUNTY	32	32	32	32	32	32
HOLLIDAY	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	157	160	156	146	138	107
HOLLIDAY	B	RED INDIRECT REUSE	84	91	93	91	89	87
LAKESIDE CITY	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	117	112	107	102	95	74
LAKESIDE CITY	B	RED INDIRECT REUSE	62	64	63	63	61	61
SCOTLAND	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	132	127	121	114	107	84
SCOTLAND	B	RED INDIRECT REUSE	70	72	72	71	69	68
WICHITA VALLEY WSC	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	466	451	428	402	373	288
WICHITA VALLEY WSC	B	RED INDIRECT REUSE	249	257	253	247	241	235
WINDTHORST WSC	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	186	181	172	163	153	120
WINDTHORST WSC	B	RED INDIRECT REUSE	99	102	102	101	99	98
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	80	82	82	83	83	83
MANUFACTURING	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	3	3	3	3	3	3
MINING	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	64	64	64	64	64	64
LIVESTOCK	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	190	190	190	190	190	190
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	2,029	2,029	2,029	2,029	2,029	2,029
IRRIGATION	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	200	200	200	200	200	200
IRRIGATION	B	KEMP-DIVERSION LAKE/RESERVOIR SYSTEM	574	517	459	402	345	287
IRRIGATION	B	RED RUN-OF-RIVER	7	7	7	7	7	7
		RED BASIN TOTAL	**5,181**	**5,116**	**4,995**	**4,858**	**4,710**	**4,404**
BAYLOR SUD*	B	SEYMOUR AQUIFER | BAYLOR COUNTY	7	7	7	7	7	7
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	8	7	7	7	7	7
MINING	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	8	8	8	8	8	8
LIVESTOCK	B	CROSS TIMBERS AQUIFER | ARCHER COUNTY	4	4	4	4	4	4
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	51	51	51	51	51	51
		TRINITY BASIN TOTAL	**78**	**77**	**77**	**77**	**77**	**77**
		ARCHER COUNTY TOTAL	**5,291**	**5,226**	**5,102**	**4,963**	**4,813**	**4,507**
BAYLOR SUD*	G	MILLERS CREEK LAKE/RESERVOIR	6	5	4	2	1	0
BAYLOR SUD*	B	SEYMOUR AQUIFER | BAYLOR COUNTY	138	138	138	138	138	138
SEYMOUR	B	DIRECT REUSE	63	63	63	63	63	63
SEYMOUR	B	SEYMOUR AQUIFER | BAYLOR COUNTY	600	600	600	600	600	600
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | BAYLOR COUNTY	5	5	5	5	5	5
COUNTY-OTHER	B	SEYMOUR AQUIFER | BAYLOR COUNTY	19	19	19	19	19	19
MINING	B	SEYMOUR AQUIFER | BAYLOR COUNTY	10	10	10	10	10	10
LIVESTOCK	B	CROSS TIMBERS AQUIFER | BAYLOR COUNTY	13	13	13	13	13	13
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	800	800	800	800	800	800
LIVESTOCK	B	SEYMOUR AQUIFER | BAYLOR COUNTY	246	246	246	246	246	246
IRRIGATION	B	BRAZOS RUN-OF-RIVER	17	17	17	17	17	17

*A single asterisk next to a WUG's name denotes that the WUG is split by two or more planning regions.

Region B Water User Group (WUG) Existing Water Supply

WUG NAME	SOURCE REGION	SOURCE DESCRIPTION	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
			2020	2030	2040	2050	2060	2070
IRRIGATION	B	SEYMOUR AQUIFER | BAYLOR COUNTY	3,688	3,688	3,688	3,688	3,688	3,688
		BRAZOS BASIN TOTAL	**5,605**	**5,604**	**5,603**	**5,601**	**5,600**	**5,599**
BAYLOR SUD*	B	SEYMOUR AQUIFER | BAYLOR COUNTY	66	66	66	66	66	66
COUNTY-OTHER	B	SEYMOUR AQUIFER | BAYLOR COUNTY	1	1	1	1	1	1
MINING	B	CROSS TIMBERS AQUIFER | BAYLOR COUNTY	10	10	10	10	10	10
LIVESTOCK	B	CROSS TIMBERS AQUIFER | BAYLOR COUNTY	2	2	2	2	2	2
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	99	99	99	99	99	99
LIVESTOCK	B	SEYMOUR AQUIFER | BAYLOR COUNTY	30	30	30	30	30	30
IRRIGATION	B	SEYMOUR AQUIFER | BAYLOR COUNTY	1,312	1,312	1,312	1,312	1,312	1,312
		RED BASIN TOTAL	**1,520**	**1,520**	**1,520**	**1,520**	**1,520**	**1,520**
		BAYLOR COUNTY TOTAL	**7,125**	**7,124**	**7,123**	**7,121**	**7,120**	**7,119**
DEAN DALE SUD	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	211	194	183	172	161	125
DEAN DALE SUD	B	RED INDIRECT REUSE	112	111	108	106	104	102
HENRIETTA	B	RED RUN-OF-RIVER	1,090	1,090	1,090	1,090	1,090	1,090
RED RIVER AUTHORITY OF TEXAS*	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	415	409	395	380	364	313
WINDTHORST WSC	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	89	83	79	75	71	55
WINDTHORST WSC	B	RED INDIRECT REUSE	47	48	47	46	45	45
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | CLAY COUNTY	324	324	324	324	324	324
COUNTY-OTHER	B	SEYMOUR AQUIFER | CLAY COUNTY	80	80	80	80	80	80
MINING	B	CROSS TIMBERS AQUIFER | CLAY COUNTY	526	655	528	440	352	352
MINING	B	RED RUN-OF-RIVER	1	1	1	1	1	1
MINING	B	SEYMOUR AQUIFER | CLAY COUNTY	25	35	0	0	0	0
LIVESTOCK	B	CROSS TIMBERS AQUIFER | CLAY COUNTY	225	225	225	225	225	225
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	1,580	1,580	1,580	1,580	1,580	1,580
LIVESTOCK	B	SEYMOUR AQUIFER | CLAY COUNTY	50	50	50	50	50	50
IRRIGATION	B	CROSS TIMBERS AQUIFER | CLAY COUNTY	275	275	275	275	275	275
IRRIGATION	B	KEMP-DIVERSION LAKE/RESERVOIR SYSTEM	46	41	37	32	28	23
IRRIGATION	B	RED RUN-OF-RIVER	529	529	529	529	529	529
IRRIGATION	B	SEYMOUR AQUIFER | CLAY COUNTY	500	500	500	500	500	500
		RED BASIN TOTAL	**6,125**	**6,230**	**6,031**	**5,905**	**5,779**	**5,669**
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | CLAY COUNTY	60	60	60	60	60	60
MINING	B	CROSS TIMBERS AQUIFER | CLAY COUNTY	74	95	72	60	48	48
LIVESTOCK	B	CROSS TIMBERS AQUIFER | CLAY COUNTY	25	25	25	25	25	25
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	221	221	221	221	221	221
IRRIGATION	B	CROSS TIMBERS AQUIFER | CLAY COUNTY	325	325	325	325	325	325
		TRINITY BASIN TOTAL	**705**	**726**	**703**	**691**	**679**	**679**
		CLAY COUNTY TOTAL	**6,830**	**6,956**	**6,734**	**6,596**	**6,458**	**6,348**
PADUCAH	B	BLAINE AQUIFER | COTTLE COUNTY	494	494	494	494	494	494
RED RIVER AUTHORITY OF TEXAS*	B	OTHER AQUIFER | COTTLE COUNTY	14	14	14	14	14	14
COUNTY-OTHER	B	OTHER AQUIFER | COTTLE COUNTY	200	200	200	200	200	200
MINING	B	BLAINE AQUIFER | COTTLE COUNTY	41	41	38	34	31	31
LIVESTOCK	B	BLAINE AQUIFER | COTTLE COUNTY	380	380	380	380	380	380
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	171	171	171	171	171	171
IRRIGATION	B	BLAINE AQUIFER | COTTLE COUNTY	2,700	2,700	2,700	2,700	2,700	2,700
IRRIGATION	B	OTHER AQUIFER | COTTLE COUNTY	1,400	1,400	1,400	1,300	1,300	1,300
IRRIGATION	B	RED RUN-OF-RIVER	11	11	11	11	11	11
		RED BASIN TOTAL	**5,411**	**5,411**	**5,408**	**5,304**	**5,301**	**5,301**

*A single asterisk next to a WUG's name denotes that the WUG is split by two or more planning regions.

Region B Water User Group (WUG) Existing Water Supply

WUG NAME	SOURCE REGION	SOURCE DESCRIPTION	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
			2020	2030	2040	2050	2060	2070
		COTTLE COUNTY TOTAL	**5,411**	**5,411**	**5,408**	**5,304**	**5,301**	**5,301**
CROWELL	A	GREENBELT LAKE/RESERVOIR	103	103	105	90	84	77
CROWELL	A	OGALLALA AQUIFER | DONLEY COUNTY	63	57	52	41	34	29
RED RIVER AUTHORITY OF TEXAS*	A	GREENBELT LAKE/RESERVOIR	195	203	210	181	169	154
RED RIVER AUTHORITY OF TEXAS*	A	OGALLALA AQUIFER | DONLEY COUNTY	119	111	104	81	69	58
COUNTY-OTHER	B	SEYMOUR AQUIFER | FOARD COUNTY	20	20	20	20	20	20
MINING	B	OTHER AQUIFER | FOARD COUNTY	12	12	12	12	11	11
LIVESTOCK	B	BLAINE AQUIFER | FOARD COUNTY	23	23	23	23	23	23
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	370	370	370	370	370	370
LIVESTOCK	B	SEYMOUR AQUIFER | FOARD COUNTY	8	8	8	8	8	8
IRRIGATION	B	SEYMOUR AQUIFER | FOARD COUNTY	3,300	3,300	3,300	3,300	3,300	3,300
		RED BASIN TOTAL	**4,213**	**4,207**	**4,204**	**4,126**	**4,088**	**4,050**
		FOARD COUNTY TOTAL	**4,213**	**4,207**	**4,204**	**4,126**	**4,088**	**4,050**
QUANAH	A	GREENBELT LAKE/RESERVOIR	295	303	310	272	256	236
QUANAH	A	OGALLALA AQUIFER | DONLEY COUNTY	180	166	154	122	105	88
RED RIVER AUTHORITY OF TEXAS*	A	GREENBELT LAKE/RESERVOIR	104	108	112	97	90	83
RED RIVER AUTHORITY OF TEXAS*	A	OGALLALA AQUIFER | DONLEY COUNTY	64	60	56	43	37	31
COUNTY-OTHER	A	GREENBELT LAKE/RESERVOIR	30	31	32	28	26	24
COUNTY-OTHER	A	OGALLALA AQUIFER | DONLEY COUNTY	18	17	16	12	11	9
COUNTY-OTHER	B	SEYMOUR AQUIFER | HARDEMAN COUNTY	175	175	175	175	175	175
MANUFACTURING	A	GREENBELT LAKE/RESERVOIR	142	147	152	131	123	112
MANUFACTURING	A	OGALLALA AQUIFER | DONLEY COUNTY	86	81	76	59	50	42
MANUFACTURING	B	SEYMOUR AQUIFER | HARDEMAN COUNTY	300	300	300	300	300	300
MINING	B	BLAINE AQUIFER | HARDEMAN COUNTY	12	12	12	12	12	12
MINING	B	OTHER AQUIFER | HARDEMAN COUNTY	7	7	7	7	7	7
LIVESTOCK	B	BLAINE AQUIFER | HARDEMAN COUNTY	158	158	158	158	158	158
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	400	400	400	400	400	400
LIVESTOCK	B	OTHER AQUIFER | HARDEMAN COUNTY	34	34	34	34	34	34
LIVESTOCK	B	SEYMOUR AQUIFER | HARDEMAN COUNTY	57	57	57	57	57	57
IRRIGATION	B	BLAINE AQUIFER | HARDEMAN COUNTY	6,350	6,350	6,350	6,350	6,350	6,350
IRRIGATION	B	RED RUN-OF-RIVER	146	146	146	146	146	146
IRRIGATION	B	SEYMOUR AQUIFER | HARDEMAN COUNTY	6,002	6,002	6,002	6,002	6,002	6,002
		RED BASIN TOTAL	**14,560**	**14,554**	**14,549**	**14,405**	**14,339**	**14,266**
		HARDEMAN COUNTY TOTAL	**14,560**	**14,554**	**14,549**	**14,405**	**14,339**	**14,266**
COUNTY-OTHER	B	OTHER AQUIFER | KING COUNTY	12	12	12	12	12	12
MINING	B	OTHER AQUIFER | KING COUNTY	141	123	107	93	81	81
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	55	55	55	55	55	55
LIVESTOCK	B	OTHER AQUIFER | KING COUNTY	100	100	100	100	100	100
		BRAZOS BASIN TOTAL	**308**	**290**	**274**	**260**	**248**	**248**
RED RIVER AUTHORITY OF TEXAS*	O	OTHER AQUIFER | DICKENS COUNTY	64	62	62	61	61	61
COUNTY-OTHER	B	BLAINE AQUIFER | KING COUNTY	30	30	30	30	30	30
MINING	B	OTHER AQUIFER | KING COUNTY	239	208	182	158	138	138
LIVESTOCK	B	BLAINE AQUIFER | KING COUNTY	150	150	150	150	150	150
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	87	87	87	87	87	87
LIVESTOCK	B	OTHER AQUIFER | KING COUNTY	30	30	30	30	30	30

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Region B Water User Group (WUG) Existing Water Supply

WUG NAME	SOURCE REGION	SOURCE DESCRIPTION	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
			2020	2030	2040	2050	2060	2070
		RED BASIN TOTAL	**600**	**567**	**541**	**516**	**496**	**496**
		KING COUNTY TOTAL	**908**	**857**	**815**	**776**	**744**	**744**
NOCONA	B	FARMERS CREEK/NOCONA LAKE/RESERVOIR	1,112	1,101	1,098	1,113	1,113	1,113
NOCONA HILLS WSC	B	TRINITY AQUIFER | MONTAGUE COUNTY	118	118	118	118	118	118
RED RIVER AUTHORITY OF TEXAS*	B	TRINITY AQUIFER | MONTAGUE COUNTY	94	102	109	119	127	134
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | MONTAGUE COUNTY	410	410	410	410	410	410
COUNTY-OTHER	B	FARMERS CREEK/NOCONA LAKE/RESERVOIR	47	46	46	46	46	46
MANUFACTURING	B	FARMERS CREEK/NOCONA LAKE/RESERVOIR	1	1	1	1	1	1
MINING	B	CROSS TIMBERS AQUIFER | MONTAGUE COUNTY	960	960	480	336	384	384
LIVESTOCK	B	CROSS TIMBERS AQUIFER | MONTAGUE COUNTY	57	57	57	57	57	57
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	1,221	1,221	1,221	1,221	1,221	1,221
IRRIGATION	B	CROSS TIMBERS AQUIFER | MONTAGUE COUNTY	200	200	200	200	200	200
IRRIGATION	B	DIRECT REUSE	16	16	16	16	16	16
IRRIGATION	B	FARMERS CREEK/NOCONA LAKE/RESERVOIR	100	100	100	100	100	100
IRRIGATION	B	RED RUN-OF-RIVER	108	108	108	108	108	108
		RED BASIN TOTAL	**4,444**	**4,440**	**3,964**	**3,845**	**3,901**	**3,908**
BOWIE	B	AMON G. CARTER LAKE/RESERVOIR	1,154	1,066	980	892	803	714
SAINT JO	B	TRINITY AQUIFER | MONTAGUE COUNTY	211	211	211	211	211	211
COUNTY-OTHER	B	AMON G. CARTER LAKE/RESERVOIR	116	116	114	114	115	116
COUNTY-OTHER	B	CROSS TIMBERS AQUIFER | MONTAGUE COUNTY	290	290	290	290	290	290
COUNTY-OTHER	B	TRINITY AQUIFER | MONTAGUE COUNTY	500	500	500	500	500	500
MINING	B	CROSS TIMBERS AQUIFER | MONTAGUE COUNTY	1,040	1,040	520	364	416	416
MINING	B	DIRECT REUSE	348	351	349	0	0	0
LIVESTOCK	B	CROSS TIMBERS AQUIFER | MONTAGUE COUNTY	19	19	19	19	19	19
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	407	407	407	407	407	407
IRRIGATION	B	CROSS TIMBERS AQUIFER | MONTAGUE COUNTY	150	150	150	150	150	150
IRRIGATION	B	TRINITY AQUIFER | MONTAGUE COUNTY	315	315	315	315	315	315
		TRINITY BASIN TOTAL	**4,550**	**4,465**	**3,855**	**3,262**	**3,226**	**3,138**
		MONTAGUE COUNTY TOTAL	**8,994**	**8,905**	**7,819**	**7,107**	**7,127**	**7,046**
BURKBURNETT	B	DIRECT REUSE	167	167	167	167	167	167
BURKBURNETT	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	1,190	1,140	1,083	1,026	964	749
BURKBURNETT	B	RED INDIRECT REUSE	631	580	643	634	620	610
BURKBURNETT	B	SEYMOUR AQUIFER | WICHITA COUNTY	968	968	968	968	968	968
DEAN DALE SUD	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	105	96	94	90	85	67
DEAN DALE SUD	B	RED INDIRECT REUSE	55	55	55	56	55	55
ELECTRA	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	490	470	448	424	400	312
ELECTRA	B	RED INDIRECT REUSE	261	268	266	262	257	254
HARROLD WSC	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	7	7	6	6	5	4
HARROLD WSC	B	RED INDIRECT REUSE	3	4	4	4	4	4
IOWA PARK	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	766	728	692	658	618	483
IOWA PARK	B	RED INDIRECT REUSE	406	416	411	406	398	393
SHEPPARD AIR FORCE BASE	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	668	597	555	520	489	381
SHEPPARD AIR FORCE BASE	B	RED INDIRECT REUSE	354	340	329	321	315	311
WICHITA FALLS	B	KEMP-DIVERSION LAKE/RESERVOIR SYSTEM	2,948	2,652	2,357	2,063	1,768	1,474
WICHITA FALLS	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	9,494	8,620	8,359	8,100	7,872	6,209
WICHITA FALLS	B	RED INDIRECT REUSE	5,556	5,538	5,508	5,555	5,620	5,661
WICHITA VALLEY WSC	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	740	708	675	646	611	479

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Region B Water User Group (WUG) Existing Water Supply

WUG NAME	SOURCE REGION	SOURCE DESCRIPTION	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
			2020	2030	2040	2050	2060	2070
WICHITA VALLEY WSC	B	RED INDIRECT REUSE	391	404	401	399	394	391
COUNTY-OTHER	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	230	222	212	202	190	148
COUNTY-OTHER	B	RED INDIRECT REUSE	124	127	127	124	122	121
COUNTY-OTHER	B	SEYMOUR AQUIFER | WICHITA COUNTY	100	100	100	100	100	100
MANUFACTURING	B	DIRECT REUSE	190	190	190	190	190	190
MANUFACTURING	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	554	554	528	501	472	373
MANUFACTURING	B	RED INDIRECT REUSE	294	315	312	310	306	305
MANUFACTURING	B	SEYMOUR AQUIFER | WICHITA COUNTY	129	129	129	129	129	129
MINING	B	SEYMOUR AQUIFER | WICHITA COUNTY	62	61	55	49	44	44
STEAM ELECTRIC POWER	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	21	19	18	18	16	13
STEAM ELECTRIC POWER	B	RED INDIRECT REUSE	11	11	11	11	11	11
LIVESTOCK	B	CROSS TIMBERS AQUIFER | WICHITA COUNTY	59	59	59	59	59	59
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	916	916	916	916	916	916
IRRIGATION	B	CROSS TIMBERS AQUIFER | WICHITA COUNTY	600	600	600	600	600	600
IRRIGATION	B	KEMP-DIVERSION LAKE/RESERVOIR SYSTEM	17,561	15,804	14,048	12,292	10,536	8,780
IRRIGATION	B	RED RUN-OF-RIVER	300	300	300	300	300	300
		RED BASIN TOTAL	**46,351**	**43,165**	**40,626**	**38,106**	**35,601**	**31,061**
		WICHITA COUNTY TOTAL	**46,351**	**43,165**	**40,626**	**38,106**	**35,601**	**31,061**
HARROLD WSC	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	52	50	48	46	43	34
HARROLD WSC	B	RED INDIRECT REUSE	28	29	28	28	28	27
RED RIVER AUTHORITY OF TEXAS*	B	SEYMOUR AQUIFER | WILBARGER COUNTY	310	338	365	394	421	444
VERNON	B	SEYMOUR AQUIFER | WILBARGER COUNTY	2,232	2,114	2,087	2,058	2,031	2,022
COUNTY-OTHER	B	RED RUN-OF-RIVER	115	115	115	115	115	115
COUNTY-OTHER	B	SEYMOUR AQUIFER | WILBARGER COUNTY	150	150	150	150	150	149
MANUFACTURING	B	SEYMOUR AQUIFER | WILBARGER COUNTY	958	1,048	1,048	1,048	1,048	1,035
MINING	B	OTHER AQUIFER | WILBARGER COUNTY	10	10	10	10	10	10
MINING	B	RED RUN-OF-RIVER	30	30	30	30	30	30
STEAM ELECTRIC POWER	B	KEMP-DIVERSION LAKE/RESERVOIR SYSTEM	6,010	5,409	4,808	4,207	3,606	3,005
LIVESTOCK	B	LOCAL SURFACE WATER SUPPLY	790	790	790	790	790	790
LIVESTOCK	B	SANTA ROSA LAKE/RESERVOIR	50	50	50	50	50	50
LIVESTOCK	B	SEYMOUR AQUIFER | WILBARGER COUNTY	125	125	125	125	125	125
IRRIGATION	B	OTHER AQUIFER | WILBARGER COUNTY	3,040	3,040	3,040	3,040	3,040	3,040
IRRIGATION	B	RED RUN-OF-RIVER	807	807	807	807	807	807
IRRIGATION	B	SEYMOUR AQUIFER | WILBARGER COUNTY	25,500	25,500	25,500	25,500	25,500	25,500
		RED BASIN TOTAL	**40,207**	**39,605**	**39,001**	**38,398**	**37,794**	**37,183**
		WILBARGER COUNTY TOTAL	**40,207**	**39,605**	**39,001**	**38,398**	**37,794**	**37,183**
BAYLOR SUD*	B	SEYMOUR AQUIFER | BAYLOR COUNTY	52	52	52	52	52	52
OLNEY	B	DIRECT REUSE	5	5	5	5	5	5
OLNEY	B	LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	561	553	534	514	491	424
OLNEY	B	OLNEY-COOPER LAKE/RESERVOIR SYSTEM	169	156	143	131	118	105
COUNTY-OTHER*	B	CROSS TIMBERS AQUIFER | YOUNG COUNTY	7	10	11	15	18	20
COUNTY-OTHER*	G	CROSS TIMBERS AQUIFER | YOUNG COUNTY	23	27	28	29	30	31
COUNTY-OTHER*	G	GRAHAM/EDDLEMAN LAKE/RESERVOIR	22	26	28	30	32	33
LIVESTOCK*	B	LOCAL SURFACE WATER SUPPLY	122	122	122	122	122	122
IRRIGATION*	B	CROSS TIMBERS AQUIFER | YOUNG COUNTY	3	3	3	3	3	3
		BRAZOS BASIN TOTAL	**964**	**954**	**926**	**901**	**871**	**795**
COUNTY-OTHER*	B	CROSS TIMBERS AQUIFER | YOUNG COUNTY	0	0	1	1	1	1

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Region B Water User Group (WUG) Existing Water Supply

WUG NAME	SOURCE REGION	SOURCE DESCRIPTION	EXISTING SUPPLY (ACRE-FEET PER YEAR)					
			2020	2030	2040	2050	2060	2070
COUNTY-OTHER*	G	CROSS TIMBERS AQUIFER | YOUNG COUNTY	0	0	0	0	0	0
COUNTY-OTHER*	G	GRAHAM/EDDLEMAN LAKE/RESERVOIR	0	0	0	0	0	0
TRINITY BASIN TOTAL			**0**	**0**	**1**	**1**	**1**	**1**
YOUNG COUNTY TOTAL			**964**	**954**	**927**	**902**	**872**	**796**
REGION B EXISTING WATER SUPPLY TOTAL			**140,854**	**136,964**	**132,308**	**127,804**	**124,257**	**118,421**

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Region B Water User Group (WUG) Needs/Surplus

WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The needs shown in the WUG Needs/Surplus report are calculated by first deducting the WUG split's projected demand from its total existing water supply volume. If the WUG split has a greater existing supply volume than projected demand in any given decade, this amount is considered a surplus volume. Surplus volumes are shown as positive values, and needs are shown as negative values in parentheses.

	(NEEDS)/SURPLUS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
ARCHER COUNTY - BRAZOS BASIN						
BAYLOR SUD*	2	2	2	2	2	2
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	1	1	1	1	1	1
ARCHER COUNTY - RED BASIN						
ARCHER CITY	33	37	34	28	15	(20)
ARCHER COUNTY MUD 1	(63)	(61)	(63)	(65)	(68)	(78)
BAYLOR SUD*	8	8	8	8	8	8
HOLLIDAY	10	(4)	(13)	(22)	(31)	(64)
LAKESIDE CITY	54	51	49	45	37	16
SCOTLAND	8	(43)	(47)	(54)	(63)	(87)
WICHITA VALLEY WSC	494	486	461	433	399	308
WINDTHORST WSC	(9)	(20)	(29)	(37)	(49)	(83)
COUNTY-OTHER	(38)	(19)	(13)	(12)	(11)	(11)
MANUFACTURING	0	0	0	0	0	0
MINING	(284)	(351)	(231)	(175)	(119)	(119)
LIVESTOCK	117	117	117	117	117	117
IRRIGATION	(470)	(527)	(585)	(642)	(699)	(757)
ARCHER COUNTY - TRINITY BASIN						
BAYLOR SUD*	2	2	2	2	2	2
COUNTY-OTHER	0	0	0	0	0	0
MINING	(41)	(50)	(34)	(26)	(18)	(18)
LIVESTOCK	2	2	2	2	2	2
BAYLOR COUNTY - BRAZOS BASIN						
BAYLOR SUD*	6	6	6	4	3	1
SEYMOUR	173	187	198	199	200	200
COUNTY-OTHER	9	12	13	14	14	15
MINING	4	4	4	4	4	4
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	55	55	55	55	55	55
BAYLOR COUNTY - RED BASIN						
BAYLOR SUD*	7	7	8	7	7	7
COUNTY-OTHER	0	0	0	0	0	0
MINING	2	2	3	3	3	3
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	13	13	13	13	13	13
CLAY COUNTY - RED BASIN						
DEAN DALE SUD	160	146	140	129	116	78
HENRIETTA	426	421	433	440	441	441
RED RIVER AUTHORITY OF TEXAS*	36	37	29	15	0	(51)
WINDTHORST WSC	(4)	(10)	(13)	(17)	(22)	(38)
COUNTY-OTHER	13	9	21	27	28	28
MINING	13	0	15	27	39	39

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Region B Water User Group (WUG) Needs/Surplus

LIVESTOCK	0	0	0	0	0	0
IRRIGATION	46	41	37	32	28	23
CLAY COUNTY - TRINITY BASIN						
COUNTY-OTHER	0	0	1	2	2	2
MINING	0	0	2	3	5	5
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
COTTLE COUNTY - RED BASIN						
PADUCAH	204	211	212	213	213	213
RED RIVER AUTHORITY OF TEXAS*	2	2	2	2	2	2
COUNTY-OTHER	158	159	160	160	160	160
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	185	185	185	85	85	85
FOARD COUNTY - RED BASIN						
CROWELL	28	27	26	0	(13)	(24)
RED RIVER AUTHORITY OF TEXAS*	225	227	228	176	152	126
COUNTY-OTHER	13	12	12	12	12	12
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	87	87	87	87	87	87
HARDEMAN COUNTY - RED BASIN						
QUANAH	79	78	77	0	(36)	(76)
RED RIVER AUTHORITY OF TEXAS*	39	27	17	(23)	(48)	(72)
COUNTY-OTHER	60	69	79	74	77	78
MANUFACTURING	88	45	45	7	(10)	(29)
MINING	2	2	1	1	1	1
LIVESTOCK	3	3	3	3	3	3
IRRIGATION	0	0	0	0	0	0
KING COUNTY - BRAZOS BASIN						
COUNTY-OTHER	4	3	3	3	3	3
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
KING COUNTY - RED BASIN						
RED RIVER AUTHORITY OF TEXAS*	11	10	10	10	10	10
COUNTY-OTHER	16	14	14	14	14	14
MINING	0	0	0	0	0	0
LIVESTOCK	3	3	3	3	3	3
MONTAGUE COUNTY - RED BASIN						
NOCONA	372	350	348	355	348	342
NOCONA HILLS WSC	13	12	12	11	10	10
RED RIVER AUTHORITY OF TEXAS*	16	17	18	20	21	22
COUNTY-OTHER	0	0	7	7	5	2
MANUFACTURING	0	0	0	0	0	0
MINING	(787)	(277)	(291)	4	11	11
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	132	132	132	132	132	132
MONTAGUE COUNTY - TRINITY BASIN						
BOWIE	159	63	(17)	(110)	(208)	(305)
SAINT JO	56	55	56	56	54	53

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Region B Water User Group (WUG) Needs/Surplus

COUNTY-OTHER	199	200	209	209	206	204
MINING	(504)	51	34	5	12	12
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	173	173	173	173	173	173
WICHITA COUNTY - RED BASIN						
BURKBURNETT	1,495	1,395	1,404	1,333	1,236	989
DEAN DALE SUD	79	72	72	68	61	42
ELECTRA	(133)	(164)	(202)	(246)	(290)	(395)
HARROLD WSC	(2)	(2)	(3)	(3)	(4)	(6)
IOWA PARK	288	260	221	179	118	(35)
SHEPPARD AIR FORCE BASE	43	(14)	(45)	(78)	(113)	(225)
WICHITA FALLS	1,125	(177)	(831)	(1,441)	(2,162)	(4,333)
WICHITA VALLEY WSC	761	743	708	677	632	491
COUNTY-OTHER	421	388	355	327	298	242
MANUFACTURING	142	88	59	30	(3)	(103)
MINING	0	0	0	0	0	0
STEAM ELECTRIC POWER	1	(1)	(2)	(2)	(4)	(7)
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	(20,695)	(22,452)	(24,208)	(25,964)	(27,720)	(29,476)
WILBARGER COUNTY - RED BASIN						
HARROLD WSC	(14)	(18)	(22)	(27)	(31)	(43)
RED RIVER AUTHORITY OF TEXAS*	52	56	61	66	70	70
VERNON	350	192	154	77	13	(26)
COUNTY-OTHER	55	61	69	73	80	88
MANUFACTURING	0	0	0	0	0	(13)
MINING	20	20	21	21	22	22
STEAM ELECTRIC POWER	(1,701)	(2,302)	(2,903)	(3,504)	(4,105)	(4,706)
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	58	58	58	58	58	58
YOUNG COUNTY - BRAZOS BASIN						
BAYLOR SUD*	9	9	10	10	9	9
OLNEY	179	156	124	84	37	(56)
COUNTY-OTHER*	11	12	10	9	7	3
LIVESTOCK*	0	0	0	0	0	0
IRRIGATION*	0	0	0	0	0	0
YOUNG COUNTY - TRINITY BASIN						
COUNTY-OTHER*	0	0	0	0	0	0

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Region B Water User Group (WUG) Second-Tier Identified Water Needs

Second-tier needs are WUG split needs adjusted to include the implementation of recommended demand reduction and direct reuse water management strategies.

	WUG SECOND-TIER NEEDS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
ARCHER COUNTY - BRAZOS BASIN						
BAYLOR SUD*	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
ARCHER COUNTY - RED BASIN						
ARCHER CITY	0	0	0	0	0	8
ARCHER COUNTY MUD 1	0	57	58	58	61	71
BAYLOR SUD*	0	0	0	0	0	0
HOLLIDAY	0	0	3	8	18	51
LAKESIDE CITY	0	0	0	0	0	0
SCOTLAND	0	0	38	42	51	75
WICHITA VALLEY WSC	0	0	0	0	0	0
WINDTHORST WSC	0	0	17	22	34	68
COUNTY-OTHER	37	17	9	8	6	6
MANUFACTURING	0	0	0	0	0	0
MINING	195	247	155	113	72	72
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	470	521	572	623	674	726
ARCHER COUNTY - TRINITY BASIN						
BAYLOR SUD*	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MINING	29	35	24	18	12	12
LIVESTOCK	0	0	0	0	0	0
BAYLOR COUNTY - BRAZOS BASIN						
BAYLOR SUD*	0	0	0	0	0	0
SEYMOUR	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
BAYLOR COUNTY - RED BASIN						
BAYLOR SUD*	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
CLAY COUNTY - RED BASIN						
DEAN DALE SUD	0	0	0	0	0	0
HENRIETTA	0	0	0	0	0	0
RED RIVER AUTHORITY OF TEXAS*	0	0	0	0	0	0
WINDTHORST WSC	0	0	8	10	15	31
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0

*A single asterisk next to a WUG's name denotes that the WUG is split by two or more planning regions.

Region B Water User Group (WUG) Second-Tier Identified Water Needs

	WUG SECOND-TIER NEEDS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
CLAY COUNTY - RED BASIN						
IRRIGATION	0	0	0	0	0	0
CLAY COUNTY - TRINITY BASIN						
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
COTTLE COUNTY - RED BASIN						
PADUCAH	0	0	0	0	0	0
RED RIVER AUTHORITY OF TEXAS*	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
FOARD COUNTY - RED BASIN						
CROWELL	0	0	0	0	8	18
RED RIVER AUTHORITY OF TEXAS*	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
HARDEMAN COUNTY - RED BASIN						
QUANAH	0	0	0	0	16	56
RED RIVER AUTHORITY OF TEXAS*	0	0	0	9	32	56
COUNTY-OTHER	0	0	0	0	0	0
MANUFACTURING	0	0	0	0	10	29
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
KING COUNTY - BRAZOS BASIN						
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
KING COUNTY - RED BASIN						
RED RIVER AUTHORITY OF TEXAS*	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MINING	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
MONTAGUE COUNTY - RED BASIN						
NOCONA	0	0	0	0	0	0
NOCONA HILLS WSC	0	0	0	0	0	0
RED RIVER AUTHORITY OF TEXAS*	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MANUFACTURING	0	0	0	0	0	0
MINING	350	0	98	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0

*A single asterisk next to a WUG's name denotes that the WUG is split by two or more planning regions.

Region B Water User Group (WUG) Second-Tier Identified Water Needs

	WUG SECOND-TIER NEEDS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
MONTAGUE COUNTY - TRINITY BASIN						
BOWIE	0	0	0	53	152	249
SAINT JO	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MINING	31	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
WICHITA COUNTY - RED BASIN						
BURKBURNETT	0	0	0	0	0	0
DEAN DALE SUD	0	0	0	0	0	0
ELECTRA	124	147	173	208	243	347
HARROLD WSC	2	2	3	3	3	5
IOWA PARK	0	0	0	0	0	0
SHEPPARD AIR FORCE BASE	0	0	16	39	69	181
WICHITA FALLS	0	0	419	855	1,391	3,549
WICHITA VALLEY WSC	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MANUFACTURING	0	0	0	0	3	103
MINING	0	0	0	0	0	0
STEAM ELECTRIC POWER	0	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	14,065	14,744	15,520	13,329	13,431	12,747
WILBARGER COUNTY - RED BASIN						
HARROLD WSC	13	16	19	23	26	38
RED RIVER AUTHORITY OF TEXAS*	0	0	0	0	0	0
VERNON	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MANUFACTURING	0	0	0	0	0	13
MINING	0	0	0	0	0	0
STEAM ELECTRIC POWER	1,701	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	0	0	0	0	0	0
YOUNG COUNTY - BRAZOS BASIN						
BAYLOR SUD*	0	0	0	0	0	0
OLNEY	0	0	0	0	0	0
COUNTY-OTHER*	0	0	0	0	0	0
LIVESTOCK*	0	0	0	0	0	0
IRRIGATION*	0	0	0	0	0	0
YOUNG COUNTY - TRINITY BASIN						
COUNTY-OTHER*	0	0	0	0	0	0

*A single asterisk next to a WUG's name denotes that the WUG is split by two or more planning regions.

Region B Water User Group (WUG) Second-Tier Identified Water Needs Summary

Second-tier needs are WUG split needs adjusted to include the implementation of recommended demand reduction and direct reuse water management strategies.

WUG CATEGORY	NEEDS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
MUNICIPAL	139	222	754	1,330	2,119	4,803
COUNTY-OTHER	37	17	9	8	6	6
MANUFACTURING	0	0	0	0	13	145
MINING	605	282	277	131	84	84
STEAM ELECTRIC POWER	1,701	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	14,535	15,265	16,092	13,952	14,105	13,473

Region B Source Water Balance (Availability - WUG Supply)

GROUNDWATER SOURCE TYPE				SOURCE WATER BALANCE (ACRE-FEET PER YEAR)					
SOURCE NAME	COUNTY	BASIN	SALINITY*	2020	2030	2040	2050	2060	2070
BLAINE AQUIFER	COTTLE	RED	FRESH	11,151	8,006	8,041	8,013	8,048	8,016
BLAINE AQUIFER	FOARD	RED	FRESH	6,559	6,541	6,559	6,541	6,559	6,541
BLAINE AQUIFER	HARDEMAN	RED	FRESH	1,968	1,945	1,968	1,945	1,968	1,945
BLAINE AQUIFER	KING	BRAZOS	FRESH	0	0	0	0	0	0
BLAINE AQUIFER	KING	RED	FRESH	220	220	220	220	220	220
CROSS TIMBERS AQUIFER	ARCHER	BRAZOS	FRESH	4	2	5	6	8	8
CROSS TIMBERS AQUIFER	ARCHER	RED	FRESH	48	46	46	45	45	45
CROSS TIMBERS AQUIFER	ARCHER	TRINITY	FRESH	0	1	1	1	1	1
CROSS TIMBERS AQUIFER	BAYLOR	BRAZOS	FRESH	7	7	7	7	7	7
CROSS TIMBERS AQUIFER	BAYLOR	RED	FRESH	23	23	23	23	23	23
CROSS TIMBERS AQUIFER	CLAY	RED	FRESH	145	16	143	231	319	319
CROSS TIMBERS AQUIFER	CLAY	TRINITY	FRESH	21	0	23	35	47	47
CROSS TIMBERS AQUIFER	MONTAGUE	RED	FRESH	653	653	1,133	1,277	1,229	1,229
CROSS TIMBERS AQUIFER	MONTAGUE	TRINITY	FRESH	221	221	741	897	845	845
CROSS TIMBERS AQUIFER	WICHITA	RED	FRESH	181	181	181	181	181	181
CROSS TIMBERS AQUIFER	YOUNG	BRAZOS	FRESH	606	596	590	582	574	566
CROSS TIMBERS AQUIFER	YOUNG	TRINITY	FRESH	50	50	49	49	49	49
OTHER AQUIFER	COTTLE	RED	FRESH	186	186	186	286	286	286
OTHER AQUIFER	FOARD	RED	FRESH	188	188	188	188	189	189
OTHER AQUIFER	HARDEMAN	RED	FRESH	9	9	9	9	9	9
OTHER AQUIFER	KING	BRAZOS	FRESH	0	18	34	48	60	60
OTHER AQUIFER	KING	RED	FRESH	128	159	185	209	229	229
OTHER AQUIFER	WILBARGER	RED	FRESH	0	0	0	0	0	0
SEYMOUR AQUIFER	ARCHER	RED	FRESH	35	35	35	35	35	35
SEYMOUR AQUIFER	BAYLOR	BRAZOS	FRESH	813	926	573	327	203	526
SEYMOUR AQUIFER	BAYLOR	RED	FRESH	163	165	165	165	165	165
SEYMOUR AQUIFER	CLAY	RED	FRESH	132	122	157	157	157	157
SEYMOUR AQUIFER	FOARD	RED	FRESH	8,569	1,617	2,061	4,738	4,487	615
SEYMOUR AQUIFER	HARDEMAN	RED	FRESH	13,844	6,506	12,351	10,986	13,468	26,334
SEYMOUR AQUIFER	WICHITA	RED	FRESH	1,036	1,037	1,036	1,045	1,050	1,050
SEYMOUR AQUIFER	WILBARGER	RED	FRESH	725	725	725	725	725	725
TRINITY AQUIFER	MONTAGUE	RED	FRESH	60	52	45	35	27	20
TRINITY AQUIFER	MONTAGUE	TRINITY	FRESH	2,588	2,577	2,588	2,577	2,588	2,577
GROUNDWATER SOURCE WATER BALANCE TOTAL				**50,333**	**32,830**	**40,068**	**41,583**	**43,801**	**53,019**

REUSE SOURCE TYPE				SOURCE WATER BALANCE (ACRE-FEET PER YEAR)					
SOURCE NAME	COUNTY	BASIN	SALINITY*	2020	2030	2040	2050	2060	2070
DIRECT REUSE	BAYLOR	BRAZOS	FRESH	0	0	0	0	0	0
DIRECT REUSE	MONTAGUE	RED	FRESH	0	0	0	0	0	0
DIRECT REUSE	MONTAGUE	TRINITY	FRESH	0	0	0	0	0	0
DIRECT REUSE	WICHITA	RED	FRESH	0	0	0	0	0	0
DIRECT REUSE	YOUNG	BRAZOS	FRESH	0	0	0	0	0	0
INDIRECT REUSE	WICHITA	RED	FRESH	0	0	0	0	0	0
REUSE SOURCE WATER BALANCE TOTAL				**0**	**0**	**0**	**0**	**0**	**0**

* Salinity field indicates whether the source availability is considered 'fresh' (less than 1,000 mg/L), 'brackish' (1,000 to 10,000 mg/L), 'saline' (10,001 mg/L to 34,999 mg/L), or 'seawater' (35,000 mg/L or greater). Sources can also be labeled as 'fresh/brackish' or 'brackish/saline', if a combination of the salinity types is appropriate.

** Since reservoir sources can exist across multiple counties, the county field value, 'reservoir' is applied to all reservoir sources.

Region B Source Water Balance (Availability - WUG Supply)

SURFACE WATER SOURCE TYPE				SOURCE WATER BALANCE (ACRE-FEET PER YEAR)					
SOURCE NAME	COUNTY	BASIN	SALINITY*	2020	2030	2040	2050	2060	2070
AMON G. CARTER LAKE/RESERVOIR	RESERVOIR**	TRINITY	FRESH	0	0	0	0	0	0
BRAZOS LIVESTOCK LOCAL SUPPLY	ARCHER	BRAZOS	FRESH	0	0	0	0	0	0
BRAZOS LIVESTOCK LOCAL SUPPLY	BAYLOR	BRAZOS	FRESH	43	43	43	43	43	43
BRAZOS LIVESTOCK LOCAL SUPPLY	KING	BRAZOS	FRESH	0	0	0	0	0	0
BRAZOS LIVESTOCK LOCAL SUPPLY	YOUNG	BRAZOS	FRESH	0	0	0	0	0	0
BRAZOS RUN-OF-RIVER	BAYLOR	BRAZOS	FRESH	0	0	0	0	0	0
ELECTRA CITY LAKE/RESERVOIR	RESERVOIR**	RED	FRESH	0	0	0	0	0	0
FARMERS CREEK/NOCONA LAKE/RESERVOIR	RESERVOIR**	RED	FRESH	0	12	15	0	0	0
KEMP-DIVERSION LAKE/RESERVOIR SYSTEM	RESERVOIR**	RED	FRESH	1,860	1,676	1,490	1,303	1,117	930
LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	RESERVOIR**	RED	FRESH	0	0	0	0	0	0
NORTH FORK BUFFALO CREEK LAKE/RESERVOIR	RESERVOIR**	RED	FRESH	0	0	0	0	0	0
OLNEY-COOPER LAKE/RESERVOIR SYSTEM	RESERVOIR**	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	ARCHER	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	BAYLOR	RED	FRESH	5	5	5	5	5	5
RED LIVESTOCK LOCAL SUPPLY	CLAY	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	COTTLE	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	FOARD	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	HARDEMAN	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	KING	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	MONTAGUE	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	WICHITA	RED	FRESH	0	0	0	0	0	0
RED LIVESTOCK LOCAL SUPPLY	WILBARGER	RED	FRESH	0	0	0	0	0	0
RED OTHER LOCAL SUPPLY	HARDEMAN	RED	FRESH	7	7	7	7	7	7
RED RUN-OF-RIVER	ARCHER	RED	FRESH	278	278	278	278	278	278
RED RUN-OF-RIVER	CLAY	RED	FRESH	2,216	2,216	2,216	2,216	2,216	2,216
RED RUN-OF-RIVER	COTTLE	RED	FRESH	0	0	0	0	0	0
RED RUN-OF-RIVER	HARDEMAN	RED	FRESH	0	0	0	0	0	0
RED RUN-OF-RIVER	MONTAGUE	RED	FRESH	0	0	0	0	0	0
RED RUN-OF-RIVER	WICHITA	RED	FRESH	3,307	3,307	3,307	3,307	3,307	3,307
RED RUN-OF-RIVER	WILBARGER	RED	FRESH	0	0	0	0	0	0
SANTA ROSA LAKE/RESERVOIR	RESERVOIR**	RED	FRESH	0	0	0	0	0	0
TRINITY LIVESTOCK LOCAL SUPPLY	ARCHER	TRINITY	FRESH	0	0	0	0	0	0
TRINITY LIVESTOCK LOCAL SUPPLY	CLAY	TRINITY	FRESH	0	0	0	0	0	0
TRINITY LIVESTOCK LOCAL SUPPLY	MONTAGUE	TRINITY	FRESH	0	0	0	0	0	0
SURFACE WATER SOURCE WATER BALANCE TOTAL				**7,716**	**7,544**	**7,361**	**7,159**	**6,973**	**6,786**

REGION B SOURCE WATER BALANCE TOTAL	**58,049**	**40,374**	**47,429**	**48,742**	**50,774**	**59,805**

* Salinity field indicates whether the source availability is considered 'fresh' (less than 1,000 mg/L), 'brackish' (1,000 to 10,000 mg/L), 'saline' (10,001 mg/L to 34,999 mg/L), or 'seawater' (35,000 mg/L or greater). Sources can also be labeled as 'fresh/brackish' or 'brackish/saline', if a combination of the salinity types is appropriate.

** Since reservoir sources can exist across multiple counties, the county field value, 'reservoir' is applied to all reservoir sources.

Region B Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
ARCHER COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	179	95	-46.9%	172	95	-44.8%
PROJECTED DEMAND TOTAL (acre-feet per year)	74	133	79.7%	36	106	194.4%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	38	100.0%	0	11	100.0%
ARCHER COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	726	781	7.6%	370	494	33.5%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,214	1,251	3.0%	1,106	1,251	13.1%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	488	470	-3.7%	736	757	2.9%
ARCHER COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,589	2,285	-11.7%	2,356	2,285	-3.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	2,096	2,165	3.3%	2,096	2,165	3.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
ARCHER COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1	3	200.0%	1	3	200.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	1	3	200.0%	1	3	200.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
ARCHER COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	150	80	-46.7%	146	76	-47.9%
PROJECTED DEMAND TOTAL (acre-feet per year)	405	405	0.0%	213	213	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	255	325	27.5%	67	137	104.5%
ARCHER COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,109	2,047	84.6%	939	1,554	65.5%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,525	1,508	-1.1%	1,580	1,550	-1.9%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	535	72	-86.5%	693	332	-52.1%
BAYLOR COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	342	25	-92.7%	223	25	-88.8%
PROJECTED DEMAND TOTAL (acre-feet per year)	131	16	-87.8%	121	10	-91.7%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
BAYLOR COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,922	5,017	71.7%	2,899	5,017	73.1%
PROJECTED DEMAND TOTAL (acre-feet per year)	3,310	4,949	49.5%	3,018	4,949	64.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	388	0	-100.0%	119	0	-100.0%
BAYLOR COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,054	1,190	12.9%	1,054	1,190	12.9%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,184	1,190	0.5%	1,184	1,190	0.5%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	130	0	-100.0%	130	0	-100.0%
BAYLOR COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	15	20	33.3%	15	20	33.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	14	14	0.0%	13	13	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
BAYLOR COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	600	873	45.5%	600	867	44.5%
PROJECTED DEMAND TOTAL (acre-feet per year)	496	687	38.5%	469	659	40.5%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%

*WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The needs shown in the WUG Data Comparison to 2016 RWP report are calculated by first deducting the WUG split's projected demand from its total existing water supply volume. If the WUG split has a greater existing supply volume than projected demand in any given decade, this amount is considered a surplus volume. Before aggregating the difference between supplies and demands to the WUG county and category level, calculated surpluses are updated to zero so that only the WUGs with needs in the decade are included with the Needs totals.

Region B Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
CLAY COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	643	464	-27.8%	609	464	-23.8%
PROJECTED DEMAND TOTAL (acre-feet per year)	577	451	-21.8%	547	434	-20.7%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
CLAY COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,459	1,675	14.8%	1,433	1,652	15.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,438	1,629	13.3%	1,324	1,629	23.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
CLAY COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,092	2,101	0.4%	2,092	2,101	0.4%
PROJECTED DEMAND TOTAL (acre-feet per year)	2,092	2,101	0.4%	2,092	2,101	0.4%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
CLAY COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	786	626	-20.4%	401	401	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	613	613	0.0%	357	357	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
CLAY COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,384	1,964	41.9%	1,350	1,730	28.1%
PROJECTED DEMAND TOTAL (acre-feet per year)	962	1,346	39.9%	927	1,300	40.2%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	45	4	-91.1%	64	89	39.1%
COTTLE COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	200	200	0.0%	200	200	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	46	42	-8.7%	43	40	-7.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
COTTLE COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	4,013	4,111	2.4%	3,713	4,011	8.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	4,004	3,926	-1.9%	3,655	3,926	7.4%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
COTTLE COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	544	551	1.3%	544	551	1.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	544	551	1.3%	544	551	1.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
COTTLE COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	41	41	0.0%	31	31	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	41	41	0.0%	31	31	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
COTTLE COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	494	508	2.8%	494	508	2.8%
PROJECTED DEMAND TOTAL (acre-feet per year)	297	302	1.7%	288	293	1.7%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
FOARD COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	85	20	-76.5%	85	20	-76.5%
PROJECTED DEMAND TOTAL (acre-feet per year)	75	7	-90.7%	72	8	-88.9%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%

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Region B Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
FOARD COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	4,511	3,300	-26.8%	4,511	3,300	-26.8%
PROJECTED DEMAND TOTAL (acre-feet per year)	3,939	3,213	-18.4%	3,595	3,213	-10.6%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
FOARD COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	399	401	0.5%	399	401	0.5%
PROJECTED DEMAND TOTAL (acre-feet per year)	399	401	0.5%	399	401	0.5%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
FOARD COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	12	12	0.0%	11	11	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	12	12	0.0%	11	11	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
FOARD COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	138	480	247.8%	131	318	142.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	138	227	64.5%	131	216	64.9%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	24	100.0%
HARDEMAN COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	140	223	59.3%	140	208	48.6%
PROJECTED DEMAND TOTAL (acre-feet per year)	130	163	25.4%	131	130	-0.8%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
HARDEMAN COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	5,448	12,498	129.4%	5,448	12,498	129.4%
PROJECTED DEMAND TOTAL (acre-feet per year)	7,939	12,498	57.4%	7,246	12,498	72.5%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	2,491	0	-100.0%	1,798	0	-100.0%
HARDEMAN COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	631	649	2.9%	631	649	2.9%
PROJECTED DEMAND TOTAL (acre-feet per year)	631	646	2.4%	631	646	2.4%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
HARDEMAN COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	276	528	91.3%	332	454	36.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	276	440	59.4%	332	483	45.5%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	29	100.0%
HARDEMAN COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	19	19	0.0%	19	19	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	17	17	0.0%	18	18	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
HARDEMAN COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	507	643	26.8%	507	438	-13.6%
PROJECTED DEMAND TOTAL (acre-feet per year)	462	525	13.6%	462	586	26.8%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	148	100.0%
KING COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	281	42	-85.1%	281	42	-85.1%
PROJECTED DEMAND TOTAL (acre-feet per year)	79	22	-72.2%	80	25	-68.8%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%

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Region B Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
KING COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	28	0	-100.0%	28	0	-100.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	28	0	-100.0%	28	0	-100.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
KING COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	394	422	7.1%	394	422	7.1%
PROJECTED DEMAND TOTAL (acre-feet per year)	394	419	6.3%	394	419	6.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
KING COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	380	380	0.0%	219	219	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	380	380	0.0%	219	219	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
KING COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	0	64	100.0%	0	61	100.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	0	53	100.0%	0	51	100.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
MONTAGUE COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,383	1,363	-1.4%	1,385	1,362	-1.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,312	1,164	-11.3%	1,320	1,156	-12.4%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
MONTAGUE COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	873	889	1.8%	873	889	1.8%
PROJECTED DEMAND TOTAL (acre-feet per year)	872	584	-33.0%	872	584	-33.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
MONTAGUE COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,715	1,704	-0.6%	1,715	1,704	-0.6%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,591	1,704	7.1%	1,591	1,704	7.1%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
MONTAGUE COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	6	1	-83.3%	12	1	-91.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	5	1	-80.0%	10	1	-90.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
MONTAGUE COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,324	2,348	1.0%	800	800	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	3,639	3,639	0.0%	777	777	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	1,315	1,291	-1.8%	0	0	0.0%
MONTAGUE COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,548	2,689	5.5%	2,274	2,290	0.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,828	2,073	13.4%	1,884	2,168	15.1%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	305	100.0%
WICHITA COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	282	454	61.0%	253	369	45.8%
PROJECTED DEMAND TOTAL (acre-feet per year)	333	33	-90.1%	367	127	-65.4%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	51	0	-100.0%	114	0	-100.0%

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Region B Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
WICHITA COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	27,198	18,461	-32.1%	14,739	9,680	-34.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	45,267	39,156	-13.5%	42,927	39,156	-8.8%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	18,069	20,695	14.5%	28,188	29,476	4.6%
WICHITA COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	956	975	2.0%	956	975	2.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	917	975	6.3%	917	975	6.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
WICHITA COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,489	1,167	-21.6%	1,476	997	-32.5%
PROJECTED DEMAND TOTAL (acre-feet per year)	2,743	1,025	-62.6%	3,162	1,100	-65.2%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	1,254	0	-100.0%	1,686	103	-93.9%
WICHITA COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	62	62	0.0%	44	44	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	62	62	0.0%	44	44	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
WICHITA COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	14,201	25,200	77.5%	12,543	18,972	51.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	21,163	21,544	1.8%	22,154	22,444	1.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	7,429	135	-98.2%	9,778	4,994	-48.9%
WICHITA COUNTY | STEAM ELECTRIC POWER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	185	32	-82.7%	156	24	-84.6%
PROJECTED DEMAND TOTAL (acre-feet per year)	360	31	-91.4%	360	31	-91.4%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	175	0	-100.0%	204	7	-96.6%
WILBARGER COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	515	265	-48.5%	512	264	-48.4%
PROJECTED DEMAND TOTAL (acre-feet per year)	430	210	-51.2%	471	176	-62.6%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
WILBARGER COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	30,521	29,347	-3.8%	29,015	29,347	1.1%
PROJECTED DEMAND TOTAL (acre-feet per year)	31,603	29,289	-7.3%	28,843	29,289	1.5%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	1,082	0	-100.0%	0	0	0.0%
WILBARGER COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	913	965	5.7%	913	965	5.7%
PROJECTED DEMAND TOTAL (acre-feet per year)	913	965	5.7%	913	965	5.7%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
WILBARGER COUNTY | MANUFACTURING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	1,133	958	-15.4%	1,368	1,035	-24.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,133	958	-15.4%	1,511	1,048	-30.6%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	143	13	-90.9%
WILBARGER COUNTY | MINING WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	40	40	0.0%	40	40	0.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	20	20	0.0%	18	18	0.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%

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Region B Water User Group (WUG) Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
WILBARGER COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	2,087	2,622	25.6%	1,855	2,527	36.2%
PROJECTED DEMAND TOTAL (acre-feet per year)	1,883	2,234	18.6%	2,049	2,526	23.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	14	100.0%	194	69	-64.4%
WILBARGER COUNTY | STEAM ELECTRIC POWER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	8,886	6,010	-32.4%	4,663	3,005	-35.6%
PROJECTED DEMAND TOTAL (acre-feet per year)	10,000	7,711	-22.9%	10,000	7,711	-22.9%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	1,114	1,701	52.7%	5,337	4,706	-11.8%
YOUNG COUNTY | COUNTY-OTHER WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	90	52	-42.2%	100	85	-15.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	65	41	-36.9%	105	82	-21.9%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	5	0	-100.0%
YOUNG COUNTY | IRRIGATION WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	0	3	100.0%	0	3	100.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	0	3	100.0%	0	3	100.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
YOUNG COUNTY | LIVESTOCK WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	0	122	100.0%	0	122	100.0%
PROJECTED DEMAND TOTAL (acre-feet per year)	0	122	100.0%	0	122	100.0%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	0	0.0%
YOUNG COUNTY | MUNICIPAL WUG TYPE						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	908	787	-13.3%	863	586	-32.1%
PROJECTED DEMAND TOTAL (acre-feet per year)	557	599	7.5%	590	633	7.3%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	0	0	0.0%	0	56	100.0%
REGION B						
EXISTING WUG SUPPLY TOTAL (acre-feet per year)	132,907	140,854	6.0%	109,333	118,421	8.3%
PROJECTED DEMAND TOTAL (acre-feet per year)	162,659	156,489	-3.8%	154,279	154,535	0.2%
WATER SUPPLY NEEDS TOTAL (acre-feet per year)*	34,821	24,745	-28.9%	49,256	41,256	-16.2%

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Region B Source Data Comparison to 2016 Regional Water Plan (RWP)

	2020 PLANNING DECADE			2070 PLANNING DECADE		
	2016 RWP	2021 RWP	DIFFERENCE (%)	2016 RWP	2021 RWP	DIFFERENCE (%)
ARCHER COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	660	660	0.0%	660	660	0.0%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	2,724	2,375	-12.8%	2,724	2,375	-12.8%
BAYLOR COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	3,870	7,275	88.0%	3,847	6,990	81.7%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	916	964	5.2%	916	964	5.2%
CLAY COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	2,787	2,787	0.0%	2,787	2,787	0.0%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	6,096	5,637	-7.5%	6,096	5,637	-7.5%
COTTLE COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	6,269	16,566	164.3%	6,269	13,421	114.1%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	462	182	-60.6%	462	182	-60.6%
FOARD COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	5,129	18,679	264.2%	4,914	10,707	117.9%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	368	370	0.5%	368	370	0.5%
HARDEMAN COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	5,678	28,916	409.3%	5,679	41,383	628.7%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	555	553	-0.4%	555	553	-0.4%
KING COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	11,490	1,050	-90.9%	11,490	1,050	-90.9%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	694	142	-79.5%	694	142	-79.5%
MONTAGUE COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	6,674	7,886	18.2%	6,674	7,875	18.0%
REUSE AVAILABILITY TOTAL (acre-feet per year)	324	364	12.3%	0	16	100.0%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	1,773	1,736	-2.1%	1,773	1,736	-2.1%
RESERVOIR* COUNTY						
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	59,412	48,674	-18.1%	38,771	27,770	-28.4%
WICHITA COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	3,135	3,135	0.0%	3,131	3,131	0.0%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	10,672	4,523	-57.6%	10,672	4,523	-57.6%
WILBARGER COUNTY						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	34,021	33,050	-2.9%	33,525	33,050	-1.4%
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	2,587	1,742	-32.7%	2,587	1,742	-32.7%
YOUNG COUNTY						
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	321	122	-62.0%	321	122	-62.0%
REGION B						
GROUNDWATER AVAILABILITY TOTAL (acre-feet per year)	79,713	120,004	50.5%	78,976	121,054	53.3%
REUSE AVAILABILITY TOTAL (acre-feet per year)	324	364	12.3%	0	16	∞
SURFACE WATER AVAILABILITY TOTAL (acre-feet per year)	86,580	67,020	-22.6%	65,939	46,116	-30.1%

* Since reservoir sources can exist across multiple counties, the county field value, ‘reservoir’ is applied to all reservoir sources.

Region B Water User Group (WUG) Unmet Needs

WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The unmet needs shown in the WUG Unmet Needs report are calculated by first deducting the WUG split's projected demand from the sum of its total existing water supply volume and all associated recommended water management strategy water volumes. If the WUG split has a greater future supply volume than projected demand in any given decade, this amount is considered a surplus volume. In order to display only unmet needs associated with the WUG split, these surplus volumes are updated to a zero and the unmet needs water volumes are shown as absolute values.

	WUG UNMET NEEDS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
ARCHER COUNTY - RED BASIN						
MINING	195	247	155	113	72	72
IRRIGATION	470	521	572	623	674	726
ARCHER COUNTY - TRINITY BASIN						
MINING	29	35	24	18	12	12
MONTAGUE COUNTY - RED BASIN						
MINING	350	0	98	0	0	0
MONTAGUE COUNTY - TRINITY BASIN						
MINING	31	0	0	0	0	0
WICHITA COUNTY - RED BASIN						
IRRIGATION	14,065	14,744	15,520	13,329	13,431	12,747
WILBARGER COUNTY - RED BASIN						
STEAM ELECTRIC POWER	1,701	0	0	0	0	0

*A single asterisk next to a WUG's name denotes that the WUG is split by two or more planning regions.

Region B Water User Group (WUG) Unmet Needs Summary

WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. The unmet needs shown in the WUG Unmet Needs Summary report are calculated by first deducting the WUG split's projected demand from the sum of its total existing water supply volume and all associated recommended water management strategy water volumes. If the WUG split has a greater future supply volume than projected demand in any given decade, this amount is considered a surplus volume. Before aggregating the difference between supplies and demands to the WUG category level, calculated surpluses are updated to zero so that only the WUGs with unmet needs in the decade are included with the Needs totals. Unmet needs water volumes are shown as absolute values.

WUG CATEGORY	NEEDS (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
MUNICIPAL	0	0	0	0	0	0
COUNTY-OTHER	0	0	0	0	0	0
MANUFACTURING	0	0	0	0	0	0
MINING	605	282	277	131	84	84
STEAM ELECTRIC POWER	1,701	0	0	0	0	0
LIVESTOCK	0	0	0	0	0	0
IRRIGATION	14,535	15,265	16,092	13,952	14,105	13,473

Region B Recommended Water User Group (WUG) Water Management Strategies (WMS)

						WATER MANAGEMENT STRATEGY SUPPLY (ACRE-FEET PER YEAR)					
WUG ENTITY NAME	WMS SPONSOR REGION	WMS NAME	SOURCE NAME	UNIT COST 2020	UNIT COST 2070	2020	2030	2040	2050	2060	2070
ARCHER CITY	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	283	283	280	277
ARCHER CITY	B	MUNICIPAL CONSERVATION - ARCHER CITY	DEMAND REDUCTION	$438	$407	3	6	9	12	12	12
ARCHER COUNTY MUD 1	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	71	71	70	71
ARCHER COUNTY MUD 1	B	MUNICIPAL CONSERVATION - ARCHER COUNTY MUD 1	DEMAND REDUCTION	$368	$403	2	4	5	7	7	7
ARCHER COUNTY MUD 1	B	MUNICIPAL CONSERVATION - WICHITA FALLS	B | RED INDIRECT REUSE	$1140	N/A	61	0	0	0	0	0
ARCHER COUNTY MUD 1	B	WICHITA FALLS VOLUNTARY TRANSFER (ARCHER COUNTY MUD 1)	B | LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	N/A	N/A	0	57	0	0	0	0
BAYLOR SUD*	B	ADDITIONAL GROUNDWATER SUPPLY - BAYLOR SUD	B | SEYMOUR AQUIFER | BAYLOR COUNTY	$355	$32	26	26	25	28	29	31
BAYLOR SUD*	B	MUNICIPAL CONSERVATION - BAYLOR SUD	DEMAND REDUCTION	$430	$389	2	5	7	9	11	14
BAYLOR SUD*	G	MUNICIPAL WATER CONSERVATION - BAYLOR SUD	DEMAND REDUCTION	N/A	$560	0	19	40	60	69	67
BOWIE	B	INDIRECT REUSE - BOWIE	B | TRINITY INDIRECT REUSE	$1178	$524	550	550	550	550	550	550
BOWIE	B	MUNICIPAL CONSERVATION - BOWIE	DEMAND REDUCTION	$404	$401	35	55	55	57	56	56
BURKBURNETT	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	1,579	1,574	1,560	1,546
COUNTY-OTHER, ARCHER	B	LAKESIDE CITY VOLUNTARY TRANSFER	B | LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	$1140	$1140	37	17	9	8	6	6
COUNTY-OTHER, ARCHER	B	MUNICIPAL CONSERVATION - ARCHER COUNTY OTHER	DEMAND REDUCTION	$483	$415	1	2	4	4	5	5
COUNTY-OTHER, CLAY	B	MUNICIPAL CONSERVATION - CLAY COUNTY OTHER	DEMAND REDUCTION	$387	$405	7	12	16	22	21	21
COUNTY-OTHER, HARDEMAN	A	DEVELOP OGALLALA AQUIFER IN DONLEY COUNTY - GREENBELT MIWA	A | OGALLALA AQUIFER | DONLEY COUNTY	N/A	$743	0	0	0	0	3	7
COUNTY-OTHER, MONTAGUE	B	MUNICIPAL CONSERVATION - MONTAGUE COUNTY OTHER	DEMAND REDUCTION	$395	$402	11	25	37	44	63	63
COUNTY-OTHER, WICHITA	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	236	235	233	231
COUNTY-OTHER, YOUNG*	B	MUNICIPAL CONSERVATION - YOUNG COUNTY OTHER	DEMAND REDUCTION	N/A	$425	0	1	2	4	4	4
CROWELL	A	DEVELOP OGALLALA AQUIFER IN DONLEY COUNTY - GREENBELT MIWA	A | OGALLALA AQUIFER | DONLEY COUNTY	N/A	$743	0	0	0	0	13	24
CROWELL	B	MUNICIPAL CONSERVATION - CROWELL	DEMAND REDUCTION	$419	$419	1	3	3	4	5	6
DEAN DALE SUD	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	390	389	385	382

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Region B Recommended Water User Group (WUG) Water Management Strategies (WMS)

						WATER MANAGEMENT STRATEGY SUPPLY (ACRE-FEET PER YEAR)					
WUG ENTITY NAME	WMS SPONSOR REGION	WMS NAME	SOURCE NAME	UNIT COST 2020	UNIT COST 2070	2020	2030	2040	2050	2060	2070
ELECTRA	B	IOWA PARK VOLUNTARY TRANSFER	B | LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	$1629	N/A	124	147	0	0	0	0
ELECTRA	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	687	681	672	651
ELECTRA	B	MUNICIPAL CONSERVATION - ELECTRA	DEMAND REDUCTION	$395	$399	9	17	29	38	47	48
HARROLD WSC	B	IOWA PARK VOLUNTARY TRANSFER	B | LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	$1629	N/A	15	18	0	0	0	0
HARROLD WSC	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	22	26	29	43
HARROLD WSC	B	MUNICIPAL CONSERVATION - HARROLD WSC	DEMAND REDUCTION	$451	$400	1	2	3	4	6	6
HOLLIDAY	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	221	218	215	213
HOLLIDAY	B	MUNICIPAL CONSERVATION - HOLLIDAY	DEMAND REDUCTION	$338	$395	3	7	10	14	13	13
IOWA PARK	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	1,182	1,178	1,167	1,157
IOWA PARK	B	MUNICIPAL CONSERVATION - IOWA PARK	DEMAND REDUCTION	$413	$403	11	25	30	41	47	47
IRRIGATION, ARCHER	B	IRRIGATION CONSERVATION - ARCHER	DEMAND REDUCTION	N/A	$10	0	6	13	19	25	31
IRRIGATION, WICHITA	B	CHLORIDE CONTROL PROJECT - RRA	DEMAND REDUCTION	$987	$227	5,800	5,220	4,640	4,060	3,480	2,900
IRRIGATION, WICHITA	B	IRRIGATION CONSERVATION - WCWID NO. 2	DEMAND REDUCTION	$56	$56	830	2,292	3,656	7,988	10,026	12,850
IRRIGATION, WICHITA	B	IRRIGATION CONSERVATION - WICHITA	DEMAND REDUCTION	N/A	$10	0	196	392	587	783	979
IRRIGATION, YOUNG*	G	IRRIGATION WATER CONSERVATION	DEMAND REDUCTION	N/A	N/A	0	0	0	0	0	0
LAKESIDE CITY	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	151	151	149	148
LAKESIDE CITY	B	MUNICIPAL CONSERVATION - LAKESIDE CITY	DEMAND REDUCTION	$460	$392	1	2	4	5	6	6
MANUFACTURING, HARDEMAN	A	DEVELOP OGALLALA AQUIFER IN DONLEY COUNTY - GREENBELT MIWA	A | OGALLALA AQUIFER | DONLEY COUNTY	N/A	$743	0	0	0	0	17	36
MANUFACTURING, WICHITA	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	557	555	550	545
MANUFACTURING, WILBARGER	B	ADDITIONAL GROUNDWATER SUPPLY - CITY OF VERNON	B | SEYMOUR AQUIFER | WILBARGER COUNTY	$400	$270	192	210	210	210	210	223
MINING, ARCHER	B	MINING CONSERVATION - ARCHER	DEMAND REDUCTION	$2800	$2800	101	121	86	70	53	53
MINING, BAYLOR	B	MINING CONSERVATION - BAYLOR	DEMAND REDUCTION	$2800	$2800	4	4	3	3	3	3
MINING, CLAY	B	MINING CONSERVATION - CLAY	DEMAND REDUCTION	$2800	$2800	153	197	146	118	89	89
MINING, COTTLE	B	MINING CONSERVATION - COTTLE	DEMAND REDUCTION	$2800	$2800	10	10	10	9	8	8
MINING, FOARD	B	MINING CONSERVATION - FOARD	DEMAND REDUCTION	$2800	$2800	3	3	3	3	3	3
MINING, HARDEMAN	B	MINING CONSERVATION - HARDEMAN	DEMAND REDUCTION	$2800	$2800	4	4	5	5	5	5

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Region B Recommended Water User Group (WUG) Water Management Strategies (WMS)

						WATER MANAGEMENT STRATEGY SUPPLY (ACRE-FEET PER YEAR)					
WUG ENTITY NAME	WMS SPONSOR REGION	WMS NAME	SOURCE NAME	UNIT COST 2020	UNIT COST 2070	2020	2030	2040	2050	2060	2070
MINING, KING	B	MINING CONSERVATION - KING	DEMAND REDUCTION	$2800	$2800	95	83	72	63	55	55
MINING, MONTAGUE	B	MINING CONSERVATION - MONTAGUE	DEMAND REDUCTION	$2800	$2800	910	644	402	173	194	194
MINING, WICHITA	B	MINING CONSERVATION - WICHITA	DEMAND REDUCTION	$2800	$2800	16	15	14	12	11	11
MINING, WILBARGER	B	MINING CONSERVATION - WILBARGER	DEMAND REDUCTION	$2800	$2800	5	5	5	5	5	5
NOCONA HILLS WSC	B	MUNICIPAL CONSERVATION - NOCONA HILLS WSC	DEMAND REDUCTION	$453	$373	1	2	3	3	5	6
OLNEY	B	MUNICIPAL CONSERVATION - OLNEY	DEMAND REDUCTION	$400	$399	122	152	142	140	141	145
OLNEY	B	WICHITA FALLS VOLUNTARY TRANSFER (OLNEY)	B | LITTLE WICHITA RIVER LAKE/RESERVOIR SYSTEM	N/A	$815	0	0	0	4	60	150
QUANAH	A	DEVELOP OGALLALA AQUIFER IN DONLEY COUNTY - GREENBELT MIWA	A | OGALLALA AQUIFER | DONLEY COUNTY	N/A	$743	0	0	0	0	36	76
QUANAH	B	MUNICIPAL CONSERVATION - QUANNAH	DEMAND REDUCTION	$396	$394	8	12	20	20	20	20
RED RIVER AUTHORITY OF TEXAS*	A	DEVELOP OGALLALA AQUIFER IN DONLEY COUNTY - GREENBELT MIWA	A | OGALLALA AQUIFER | DONLEY COUNTY	N/A	$743	0	0	0	9	56	106
RED RIVER AUTHORITY OF TEXAS*	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	350	349	346	343
RED RIVER AUTHORITY OF TEXAS*	B	MUNICIPAL CONSERVATION - RED RIVER AUTHORITY	DEMAND REDUCTION	N/A	$124	0	92	95	98	102	105
RED RIVER AUTHORITY OF TEXAS*	B	MUNICIPAL CONSERVATION - WICHITA FALLS	B | RED INDIRECT REUSE	N/A	$1656	0	100	100	100	100	100
SCOTLAND	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	170	170	168	167
SCOTLAND	B	MUNICIPAL CONSERVATION - SCOTLAND	DEMAND REDUCTION	$464	$409	2	6	9	12	12	12
SCOTLAND	B	MUNICIPAL CONSERVATION - WICHITA FALLS	B | RED INDIRECT REUSE	N/A	N/A	0	37	0	0	0	0
SHEPPARD AIR FORCE BASE	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	784	773	764	757
SHEPPARD AIR FORCE BASE	B	MUNICIPAL CONSERVATION - SHEPPARD AIR FORCE BASE	DEMAND REDUCTION	$387	$401	11	17	29	39	44	44
STEAM ELECTRIC POWER, WICHITA	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$482	0	0	26	26	26	26
STEAM ELECTRIC POWER, WICHITA	B	STEAM ELECTRIC POWER CONSERVATION	DEMAND REDUCTION	$3235	$3235	3	4	5	6	7	10
STEAM ELECTRIC POWER, WILBARGER	B	ALTERNATIVE COOLING TECHNOLOGY - STEAM ELECTRIC POWER WILBARGER COUNTY	DEMAND REDUCTION	N/A	$160	0	2,302	2,903	3,504	4,105	4,706
VERNON	B	ADDITIONAL GROUNDWATER SUPPLY - CITY OF VERNON	B | SEYMOUR AQUIFER | WILBARGER COUNTY	$400	$270	408	390	390	390	390	377

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Region B Recommended Water User Group (WUG) Water Management Strategies (WMS)

						WATER MANAGEMENT STRATEGY SUPPLY (ACRE-FEET PER YEAR)					
WUG ENTITY NAME	**WMS SPONSOR REGION**	**WMS NAME**	**SOURCE NAME**	**UNIT COST 2020**	**UNIT COST 2070**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
VERNON	B	MUNICIPAL CONSERVATION - VERNON	DEMAND REDUCTION	N/A	$402	0	0	24	49	76	102
VERNON	B	WATER CONSERVATION (REPLACE TRANSMISSION PIPELINE) - VERNON	DEMAND REDUCTION	N/A	$185	0	313	313	313	313	313
WICHITA FALLS	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	14,389	14,426	14,514	14,591
WICHITA FALLS	B	MUNICIPAL CONSERVATION - WICHITA FALLS	DEMAND REDUCTION	$399	$400	100	185	412	586	771	784
WICHITA VALLEY WSC	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	1,524	1,520	1,505	1,492
WINDTHORST WSC	B	LAKE RINGGOLD	B | RINGGOLD LAKE/RESERVOIR	N/A	$384	0	0	355	353	350	347
WINDTHORST WSC	B	MUNICIPAL CONSERVATION - WICHITA FALLS	B | RED INDIRECT REUSE	$1140	N/A	8	18	0	0	0	0
WINDTHORST WSC	B	MUNICIPAL CONSERVATION - WINDTHORST WSC	DEMAND REDUCTION	$382	$404	5	12	17	22	22	22
					REGION B RECOMMENDED WMS SUPPLY TOTAL	9,691	13,652	37,934	42,509	45,183	48,503

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Region B Recommended Projects Associated with Water Management Strategies

SPONSOR NAME	SPONSOR IS WWP?	ONLINE DECADE	PROJECT NAME	PROJECT DESCRIPTION	CAPITAL COST
BAYLOR SUD	NO	2020	ADDITIONAL GROUNDATER SUPPLY - BAYLOR COUNTY SUD	SINGLE WELL	$138,000
BOWIE	NO	2020	INDIRECT REUSE - BOWIE	CONVEYANCE/TRANSMISSION PIPELINE; NEW WATER TREATMENT PLANT	$5,123,000
MINING, ARCHER	NO	2020	MINING CONSERVATION - ARCHER	CONSERVATION - MINING	$1,137,000
MINING, BAYLOR	NO	2020	MINING CONSERVATION - BAYLOR	CONSERVATION - MINING	$38,000
MINING, CLAY	NO	2020	MINING CONSERVATION - CLAY	CONSERVATION - MINING	$1,852,000
MINING, COTTLE	NO	2020	MINING CONSERVATION - COTTLE	CONSERVATION - MINING	$94,000
MINING, FOARD	NO	2020	MINING CONSERVATION - FOARD	CONSERVATION - MINING	$28,000
MINING, HARDEMAN	NO	2020	MINING CONSERVATION - HARDEMAN	CONSERVATION - MINING	$47,000
MINING, KING	NO	2020	MINING CONSERVATION - KING	CONSERVATION - MINING	$893,000
MINING, MONTAGUE	NO	2020	MINING CONSERVATION - MONTAGUE	CONSERVATION - MINING	$8,554,000
MINING, WICHITA	NO	2020	MINING CONSERVATION - WICHITA	CONSERVATION - MINING	$150,000
MINING, WILBARGER	NO	2020	MINING CONSERVATION - WILBARGER	CONSERVATION - MINING	$47,000
RED RIVER AUTHORITY OF TEXAS	NO	2030	AUTOMATED METER INFRASTRUCTURE (AMI) - RED RIVER AUTHORITY	DATA GATHERING/MONITORING TECHNOLOGY	$1,430,000
RED RIVER AUTHORITY OF TEXAS	NO	2020	CHLORIDE CONTROL PROJECT	CONVEYANCE/TRANSMISSION PIPELINE; DIVERSION AND CONTROL STRUCTURE; PUMP STATION	$69,430,000
RED RIVER AUTHORITY OF TEXAS	NO	2020	TREATED WATER LINE - RRA CLAY COUNTY	CONVEYANCE/TRANSMISSION PIPELINE	$3,546,000
STEAM ELECTRIC POWER, WILBARGER	NO	2020	ALTERNATIVE COOLING TECHNOLOGY - STEAM ELECTRIC POWER WILBARGER COUNTY	CONSERVATION - INDUSTRIAL	$101,500,000
VERNON	YES	2020	ADDITIONAL SEYMOUR AQUIFER - VERNON	CONVEYANCE/TRANSMISSION PIPELINE; MULTIPLE WELLS/WELL FIELD	$1,115,000
VERNON	YES	2020	WATER CONSERVATION (REPLACE TRANSMISSION PIPELINE) - VERNON	WATER LOSS CONTROL	$8,820,000
WICHITA FALLS	YES	2040	LAKE RINGGOLD	CONVEYANCE/TRANSMISSION PIPELINE; RESERVOIR CONSTRUCTION	$442,867,000
WICHITA WCID #2	YES	2020	WCWID NO. 2 CANAL CONVERSION TO PIPELINE	CONVEYANCE/TRANSMISSION PIPELINE	$9,713,000

REGION B RECOMMENDED CAPITAL COST TOTAL	**$656,522,000**

Region B Alternative Water User Group (WUG) Water Management Strategies (WMS)

						WATER MANAGEMENT STRATEGY SUPPLY (ACRE-FEET PER YEAR)					
WUG ENTITY NAME	WMS SPONSOR REGION	WMS NAME	SOURCE NAME	UNIT COST 2020	UNIT COST 2070	2020	2030	2040	2050	2060	2070
REGION B ALTERNATIVE WMS SUPPLY TOTAL											

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Region B Alternative Projects Associated with Water Management Strategies

SPONSOR NAME	SPONSOR IS WWP?	ONLINE DECADE	PROJECT NAME	PROJECT DESCRIPTION	CAPITAL COST
				REGION B ALTERNATIVE CAPITAL COST TOTAL	

Region B Water User Group (WUG) Management Supply Factor

WUG supplies and projected demands are entered for each of a WUG's region-county-basin divisions. To calculate the Management Supply Factor for each WUG as a whole, not split by region-county-basin, the combined total of existing and future supply is divided by the total projected demand. If a WUG is split by more than one planning region, the whole WUG's management supply factor will show up in each of its planning region's management supply factor reports.

	WUG MANAGEMENT SUPPLY FACTOR					
WUG NAME	2020	2030	2040	2050	2060	2070
ARCHER CITY	1.1	1.2	2.3	2.3	2.3	2.1
ARCHER COUNTY MUD 1	1.0	1.0	1.1	1.1	1.1	1.0
BAYLOR SUD*	1.2	1.3	1.4	1.5	1.5	1.5
BOWIE	1.7	1.7	1.6	1.5	1.4	1.3
BURKBURNETT	2.0	2.0	3.0	3.0	2.9	2.7
COUNTY-OTHER, ARCHER	1.0	1.0	1.0	1.0	1.0	1.0
COUNTY-OTHER, BAYLOR	1.6	1.9	2.1	2.3	2.3	2.5
COUNTY-OTHER, CLAY	1.0	1.0	1.1	1.1	1.1	1.1
COUNTY-OTHER, COTTLE	4.8	4.9	5.0	5.0	5.0	5.0
COUNTY-OTHER, FOARD	2.9	2.5	2.5	2.5	2.5	2.5
COUNTY-OTHER, HARDEMAN	1.4	1.4	1.5	1.5	1.6	1.7
COUNTY-OTHER, KING	1.9	1.7	1.7	1.7	1.7	1.7
COUNTY-OTHER, MONTAGUE	1.2	1.2	1.2	1.2	1.2	1.2
COUNTY-OTHER, WICHITA	13.8	7.4	8.0	6.7	5.7	4.7
COUNTY-OTHER, WILBARGER	1.3	1.3	1.4	1.4	1.4	1.5
COUNTY-OTHER, YOUNG*	1.3	1.2	1.2	1.1	1.1	1.0
CROWELL	1.2	1.2	1.2	1.0	1.0	1.0
DEAN DALE SUD	2.0	1.9	3.6	3.6	3.5	3.2
ELECTRA	1.0	1.0	1.6	1.5	1.5	1.3
HARROLD WSC	1.0	1.0	1.0	1.0	1.0	1.0
HENRIETTA	1.6	1.6	1.7	1.7	1.7	1.7
HOLLIDAY	1.1	1.0	1.8	1.8	1.8	1.6
IOWA PARK	1.2	1.1	2.6	2.6	2.5	2.3
IRRIGATION, ARCHER	0.6	0.6	0.5	0.5	0.5	0.4
IRRIGATION, BAYLOR	1.0	1.0	1.0	1.0	1.0	1.0
IRRIGATION, CLAY	1.0	1.0	1.0	1.0	1.0	1.0
IRRIGATION, COTTLE	1.0	1.0	1.0	1.0	1.0	1.0
IRRIGATION, FOARD	1.0	1.0	1.0	1.0	1.0	1.0
IRRIGATION, HARDEMAN	1.0	1.0	1.0	1.0	1.0	1.0
IRRIGATION, MONTAGUE	1.5	1.5	1.5	1.5	1.5	1.5
IRRIGATION, WICHITA	0.6	0.6	0.6	0.7	0.7	0.7
IRRIGATION, WILBARGER	1.0	1.0	1.0	1.0	1.0	1.0
IRRIGATION, YOUNG*	1.0	1.0	1.1	1.1	1.1	1.1
LAKESIDE CITY	1.1	1.3	2.6	2.6	2.6	2.4
LIVESTOCK, ARCHER	1.1	1.1	1.1	1.1	1.1	1.1
LIVESTOCK, BAYLOR	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, CLAY	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, COTTLE	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, FOARD	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, HARDEMAN	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, KING	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, MONTAGUE	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, WICHITA	1.0	1.0	1.0	1.0	1.0	1.0
LIVESTOCK, WILBARGER	1.0	1.0	1.0	1.0	1.0	1.0

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Region B Water User Group (WUG) Management Supply Factor

	WUG MANAGEMENT SUPPLY FACTOR					
WUG NAME	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
LIVESTOCK, YOUNG*	1.0	1.0	1.0	1.0	1.0	1.0
MANUFACTURING, ARCHER	1.0	1.0	1.0	1.0	1.0	1.0
MANUFACTURING, HARDEMAN	1.2	1.1	1.1	1.0	1.0	1.0
MANUFACTURING, MONTAGUE	1.0	1.0	1.0	1.0	1.0	1.0
MANUFACTURING, WICHITA	1.1	1.1	1.6	1.5	1.5	1.4
MANUFACTURING, WILBARGER	1.2	1.2	1.2	1.2	1.2	1.2
MINING, ARCHER	0.4	0.4	0.5	0.5	0.6	0.6
MINING, BAYLOR	1.7	1.7	1.8	1.8	1.8	1.8
MINING, CLAY	1.3	1.3	1.3	1.3	1.4	1.4
MINING, COTTLE	1.2	1.2	1.3	1.3	1.3	1.3
MINING, FOARD	1.3	1.3	1.3	1.3	1.3	1.3
MINING, HARDEMAN	1.4	1.4	1.3	1.3	1.3	1.3
MINING, KING	1.3	1.3	1.2	1.3	1.3	1.3
MINING, MONTAGUE	0.9	1.2	1.1	1.3	1.3	1.3
MINING, WICHITA	1.3	1.2	1.3	1.2	1.3	1.3
MINING, WILBARGER	2.3	2.3	2.4	2.4	2.5	2.5
NOCONA	1.5	1.5	1.5	1.5	1.5	1.4
NOCONA HILLS WSC	1.1	1.1	1.1	1.1	1.1	1.1
OLNEY	1.5	1.6	1.5	1.4	1.4	1.4
PADUCAH	1.7	1.7	1.8	1.8	1.8	1.8
QUANAH	1.2	1.2	1.3	1.1	1.1	1.1
RED RIVER AUTHORITY OF TEXAS*	1.2	1.3	1.4	1.3	1.3	1.3
SAINT JO	1.4	1.4	1.4	1.4	1.3	1.3
SCOTLAND	1.1	1.0	1.6	1.5	1.5	1.4
SEYMOUR	1.4	1.4	1.4	1.4	1.4	1.4
SHEPPARD AIR FORCE BASE	1.1	1.0	1.8	1.8	1.8	1.6
STEAM ELECTRIC POWER, WICHITA	1.1	1.1	1.9	2.0	1.9	1.9
STEAM ELECTRIC POWER, WILBARGER	0.8	1.0	1.0	1.0	1.0	1.0
VERNON	1.4	1.5	1.5	1.4	1.4	1.4
WICHITA FALLS	1.1	1.0	1.8	1.8	1.7	1.6
WICHITA VALLEY WSC	3.1	3.0	5.6	5.5	5.3	4.9
WINDTHORST WSC	1.0	1.0	1.7	1.7	1.7	1.6

*A single asterisk next to a WUG's name denotes that the WUG is split by more than one planning region.

Region B Recommended Water Management Strategy (WMS) Supply Associated with a New or Amended Inter-Basin Transfer (IBT) Permit

IBT WMS supply is the portion of the total WMS benefitting WUGs that will require a new or amended IBT permit that is not considered exempt under the Texas Water Code § 11.085.

			IBT WMS SUPPLY (ACRE-FEET PER YEAR)					
WMS NAME	SOURCE BASIN	RECIPIENT WUG BASIN	2020	2030	2040	2050	2060	2070

Region B Water User Groups (WUGs)
Recommended Water Management Strategy (WMS) Supply Associated with a New or Amended Inter-Basin Transfer (IBT) Permit and Total Recommended Conservation WMS Supply

IBT WMS supply is the portion of the total WMS benefitting the WUG basin split listed that will require a new or amended IBT permit that is not considered exempt under the Texas Water Code § 11.085. Total conservation supply represents all conservation WMS volumes recommended within the WUG's region-basin geographic split.

BENEFITTING WUG NAME | BASIN	WMS SOURCE ORIGIN BASIN | WMS NAME	WMS SUPPLY (ACRE-FEET PER YEAR)					
		2020	2030	2040	2050	2060	2070

Region B Sponsored Recommended Water Management Strategy (WMS) Supplies Unallocated* to Water User Groups (WUG)

WMS NAME	WMS SPONSOR	SOURCE NAME	UNALLOCATED STRATEGY SUPPLY (ACRE-FEET PER YEAR)					
			2020	2030	2040	2050	2060	2070
TOTAL UNALLOCATED STRATEGY SUPPLIES								

* Strategy supplies created through the WMS that have not been assigned to a WUG will be allocated to the entity responsible for the water through an ‘unassigned water volumes’ entity. Only strategy supplies associated with an 'unassigned water volume' entity are shown in this report, and may not represent all strategy supplies associated with the listed WMS.

Region B Water User Group (WUG) Strategy Supplies by Water Management Strategy (WMS) Type

WMS TYPE *	STRATEGY SUPPLY (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
GROUNDWATER WELLS & OTHER	626	626	625	637	754	880
INDIRECT REUSE	619	705	650	650	650	650
IRRIGATION CONSERVATION	6,630	7,714	8,701	12,654	14,314	16,760
MUNICIPAL CONSERVATION	336	976	1,318	1,607	1,878	1,928
NEW MAJOR RESERVOIR	0	0	22,977	22,978	22,983	22,987
OTHER CONSERVATION	1,304	3,392	3,654	3,971	4,538	5,142
OTHER SURFACE WATER	176	239	9	12	66	156
DIRECT POTABLE REUSE	0	0	0	0	0	0
CONJUNCTIVE USE	0	0	0	0	0	0
OTHER DIRECT REUSE	0	0	0	0	0	0
GROUNDWATER DESALINATION	0	0	0	0	0	0
DROUGHT MANAGEMENT	0	0	0	0	0	0
OTHER STRATEGIES	0	0	0	0	0	0
AQUIFER STORAGE & RECOVERY	0	0	0	0	0	0
SEAWATER DESALINATION	0	0	0	0	0	0
TOTAL STRATEGY SUPPLIES	**9,691**	**13,652**	**37,934**	**42,509**	**45,183**	**48,503**

* WMS type descriptions can be found on the interactive state water plan website at http://texasstatewaterplan.org/ using the 'View data for' drop-down menus to navigate to a specific WMS Type page. The data used to create each WMS type value is available in Appendix 3 of the Guidelines for Regional Water Planning Data Deliverable (Exhibit D) document at http://www.twdb.texas.gov/waterplanning/rwp/planningdocu/2021/doc/current_docs/contract_docs/ExhibitD.pdf.

Region B Water User Group (WUG)
Recommended Water Management Strategy (WMS) Supplies by Source Type

SOURCE SUBTYPE*	STRATEGY SUPPLY (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
AQUIFER STORAGE & RECOVERY	0	0	0	0	0	0
GROUNDWATER	626	626	625	637	754	880
GROUNDWATER TOTAL STRATEGY SUPPLIES	**626**	**626**	**625**	**637**	**754**	**880**
DIRECT NON-POTABLE REUSE	0	0	0	0	0	0
DIRECT POTABLE REUSE	0	0	0	0	0	0
INDIRECT NON-POTABLE REUSE	0	0	0	0	0	0
INDIRECT POTABLE REUSE	619	705	650	650	650	650
REUSE TOTAL STRATEGY SUPPLIES	**619**	**705**	**650**	**650**	**650**	**650**
ATMOSPHERE	0	0	0	0	0	0
GULF OF MEXICO	0	0	0	0	0	0
LIVESTOCK LOCAL SUPPLY	0	0	0	0	0	0
OTHER LOCAL SUPPLY	0	0	0	0	0	0
RAINWATER HARVESTING	0	0	0	0	0	0
RESERVOIR	0	0	22,977	22,978	22,983	22,987
RESERVOIR SYSTEM	176	239	9	12	66	156
RUN-OF-RIVER	0	0	0	0	0	0
SURFACE WATER TOTAL STRATEGY SUPPLIES	**176**	**239**	**22,986**	**22,990**	**23,049**	**23,143**
REGION B TOTAL STRATEGY SUPPLIES	**1,421**	**1,570**	**24,261**	**24,277**	**24,453**	**24,673**

* A full list of source subtype definitions can be found in section 3 of the Guidelines for Regional Water Planning Data Deliverable (Exhibit D) document at http://www.twdb.texas.gov/waterplanning/rwp/planningdocu/2021/doc/current_docs/contract_docs/ExhibitD.pdf.

Region B Major Water Provider (MWP) Existing Sales and Transfers

Major Water Providers are entities of particular significance to a region's water supply as defined by the Regional Water Planning Group (RWPG), and may be a Water User Group (WUG) entity, Wholesale Water Provider (WWP) entity , or both (WUG/WWP).

Retail denotes WUG projected demands and existing water supplies used by the WUG. Wholesale denotes a WWP or WUG/WWP selling water to another entity.

WICHITA FALLS - WUG/WWP	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
PROJECTED RETAIL WUG DEMANDS	16,873	16,987	17,055	17,159	17,422	17,677
PROJECTED WHOLESALE CONTRACT DEMANDS	9,879	9,882	9,838	9,798	9,765	9,677
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**26,752**	**26,869**	**26,893**	**26,957**	**27,187**	**27,354**
REUSE SALES TO RETAIL CUSTOMERS	5,556	5,538	5,508	5,555	5,620	5,661
SURFACE WATER SALES TO RETAIL CUSTOMERS	12,442	11,272	10,716	10,163	9,640	7,683
REUSE SALES TO WHOLESALE CUSTOMERS	3,412	3,430	3,460	3,413	3,348	3,307
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	7,406	7,100	6,761	6,420	6,048	4,791
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**28,816**	**27,340**	**26,445**	**25,551**	**24,656**	**21,442**

WICHITA WCID #2 - WWP	WATER VOLUMES (ACRE-FEET PER YEAR)					
DATA DESCRIPTION	2020	2030	2040	2050	2060	2070
PROJECTED WHOLESALE CONTRACT DEMANDS	49,467	49,467	49,467	49,467	393,313	49,467
TOTAL PROJECTED WHOLESALE CONTRACT AND RETAIL DEMANDS	**49,467**	**49,467**	**49,467**	**49,467**	**393,313**	**49,467**
SURFACE WATER SALES TO WHOLESALE CUSTOMERS	24,191	21,772	19,353	16,934	14,515	12,095
TOTAL WHOLESALE AND RETAIL SALES TO CUSTOMERS	**24,191**	**21,772**	**19,353**	**16,934**	**14,515**	**12,095**

Region B Major Water Provider (MWP) Water Management Strategy (WMS) Summary

MWPs are entities of significance to a region's water supply as defined by the Regional Water Planning Group (RWPG) and may be a Water User Group (WUG) entity, Wholesale Water Provider (WWP) entity, or both (WUG/WWP). 'MWP Retail Customers' denotes recommended WMS supply used by the WUG. 'Transfers Related to Wholesale Customers' denotes a WWP or WUG/WWP selling or transferring recommended WMS supply to another entity. Supply associated with the MWP's wholesale transfers will only display if it is listed as the main seller in the State Water Planning database, even if multiple sellers are involved with the sale o water to WUGs. Unallocated water volumes represent MWP recommended WMS supply not currently allocated to a customer of the MWP. 'Total MWP Related WMS Supply' will display if the MWP's WMS is related to more than one WMS supply type (retail, wholesale, and/or unallocated). Associated WMS Projects are listed when the MWP is one of the project's sponsors. Report contains draft data and is subject to change.

WICHITA FALLS | LAKE RINGGOLD

DATA DESCRIPTION	WATER VOLUMES (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	0	0	14,389	14,426	14,514	14,591
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	0	0	7,332	7,303	7,235	7,188
TOTAL MWP RELATED WMS SUPPLY	0	0	21,721	21,729	21,749	21,779
WMS RELATED MWP SPONSORED PROJECTS	**PROJECT DESCRIPTION**					
LAKE RINGGOLD	CONVEYANCE/TRANSMISSION PIPELINE; RESERVOIR CONSTRUCTION					

WICHITA FALLS | MUNICIPAL CONSERVATION - WICHITA FALLS

DATA DESCRIPTION	WATER VOLUMES (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
MWP RETAIL CUSTOMERS	100	185	412	586	771	784
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	69	55	0	0	0	0
TOTAL MWP RELATED WMS SUPPLY	169	240	412	586	771	784

WICHITA FALLS | WICHITA FALLS VOLUNTARY TRANSFER (ARCHER COUNTY MUD 1)

DATA DESCRIPTION	WATER VOLUMES (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	0	57	0	0	0	0

WICHITA FALLS | WICHITA FALLS VOLUNTARY TRANSFER (OLNEY)

DATA DESCRIPTION	WATER VOLUMES (ACRE-FEET PER YEAR)					
	2020	2030	2040	2050	2060	2070
TRANSFERS RELATED TO WHOLESALE CUSTOMERS	0	0	0	4	60	150

WICHITA WCID #2 | NO RECOMMENDED WMS SUPPLY RELATED TO MWP

APPENDIX H

IMPLEMENTATION SURVEY FOR 2016 REGIONAL PLAN

2021 FINAL PLAN

REGION B

OCTOBER 2020

WMS or WMS Project Name	Database Online Decade	Related Sponsor Entity and/or Benefitting WUGs	Implementation Survey Record Type	Database ID	Has Sponsor taken affirmative vote or actions?* (TWC 16.053(h)(10))	If yes, in what year did this occur?	If yes, by what date is the action on schedule for implementation?	At what level of implementation is the project currently?*	If not implemented, why?* (When "If other, please describe" is selected, please add the descriptive text to that field)	What impediments presented to implementation?* (When "If other, please describe" is selected, please add the descriptive text to that field)
ADDITIONAL SEYMOUR AQUIFER - VERNON	2020	PROJECT SPONSOR(S): VERNON	RECOMMENDED WMS PROJECT	1177	Yes			Sponsor has taken official action to initiate project		Not applicable
ALTERNATIVE COOLING TECHNOLOGY - STEAM ELECTRIC POWER WILBARGER COUNTY	2020	PROJECT SPONSOR(S): STEAM ELECTRIC POWER (WILBARGER)	RECOMMENDED WMS PROJECT	1179	No	N/A	N/A	Not implemented	Financing	Not applicable
CHLORIDE CONTROL PROJECT	2020	PROJECT SPONSOR(S): COUNTY-OTHER (BAYLOR)	RECOMMENDED WMS PROJECT	1275	No	N/A	N/A	Not implemented	Financing	Access to funding
INDIRECT REUSE TO LAKE ARROWHEAD	2020	PROJECT SPONSOR(S): WICHITA FALLS	RECOMMENDED WMS PROJECT	1173	Yes	2014	Already Implemented	Currently operating		Not applicable
IRRIGATION CONSERVATION - ARCHER	2020	WUG REDUCING DEMAND: IRRIGATION, ARCHER	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12771	No	N/A	N/A	Not implemented	Financing	Access to funding
IRRIGATION CONSERVATION - BAYLOR	2020	WUG REDUCING DEMAND: IRRIGATION, BAYLOR	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12779	No	N/A	N/A	Not implemented	Financing	Access to funding
IRRIGATION CONSERVATION - CLAY	2020	WUG REDUCING DEMAND: IRRIGATION, CLAY	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12787	No	N/A	N/A	Not implemented	Financing	Access to funding
IRRIGATION CONSERVATION - COTTLE	2020	WUG REDUCING DEMAND: IRRIGATION, COTTLE	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12793	No	N/A	N/A	Not implemented	Financing	Access to funding
IRRIGATION CONSERVATION - FOARD	2020	WUG REDUCING DEMAND: IRRIGATION, FOARD	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12797	No	N/A	N/A	Not implemented	Financing	Access to funding
IRRIGATION CONSERVATION - HARDEMAN	2020	WUG REDUCING DEMAND: IRRIGATION, HARDEMAN	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12801	No	N/A	N/A	Not implemented	Financing	Access to funding
IRRIGATION CONSERVATION - KING	2020	WUG REDUCING DEMAND: IRRIGATION, KING	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12805	No	N/A	N/A	Not implemented	Financing	Access to funding
IRRIGATION CONSERVATION - MONTAGUE	2020	WUG REDUCING DEMAND: IRRIGATION, MONTAGUE	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12811	No	N/A	N/A	Not implemented	Financing	Access to funding
IRRIGATION CONSERVATION - WICHITA	2020	WUG REDUCING DEMAND: IRRIGATION, WICHITA	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12817	No	N/A	N/A	Not implemented	Financing	Access to funding
IRRIGATION CONSERVATION - WILBARGER	2020	WUG REDUCING DEMAND: IRRIGATION, WILBARGER	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12821	No	N/A	N/A	Not implemented	Financing	Access to funding
LOCAL SEYMOUR AQUIFER	2020	PROJECT SPONSOR(S): WICHITA FALLS	RECOMMENDED WMS PROJECT	1175	No	N/A	N/A	Not implemented	If other, please describe.	Not applicable
MINING CONSERVATION - ARCHER	2020	PROJECT SPONSOR(S): MINING (ARCHER)	RECOMMENDED WMS PROJECT	2764	No	N/A	N/A	Not implemented	Financing	Access to funding
MINING CONSERVATION - BAYLOR	2020	PROJECT SPONSOR(S): MINING (BAYLOR)	RECOMMENDED WMS PROJECT	2765	No	N/A	N/A	Not implemented	Financing	Access to funding
MINING CONSERVATION - CLAY	2020	PROJECT SPONSOR(S): MINING (CLAY)	RECOMMENDED WMS PROJECT	2766	No	N/A	N/A	Not implemented	Financing	Access to funding
MINING CONSERVATION - COTTLE	2020	PROJECT SPONSOR(S): MINING (COTTLE)	RECOMMENDED WMS PROJECT	2767	No	N/A	N/A	Not implemented	Financing	Access to funding
MINING CONSERVATION - FOARD	2020	PROJECT SPONSOR(S): MINING (FOARD)	RECOMMENDED WMS PROJECT	2768	No	N/A	N/A	Not implemented	Financing	Access to funding
MINING CONSERVATION - HARDEMAN	2020	PROJECT SPONSOR(S): MINING (HARDEMAN)	RECOMMENDED WMS PROJECT	2769	No	N/A	N/A	Not implemented	Financing	Access to funding
MINING CONSERVATION - KING	2020	PROJECT SPONSOR(S): MINING (KING)	RECOMMENDED WMS PROJECT	2770	No	N/A	N/A	Not implemented	Financing	Access to funding
MINING CONSERVATION - MONTAGUE	2020	PROJECT SPONSOR(S): MINING (MONTAGUE)	RECOMMENDED WMS PROJECT	2771	No	N/A	N/A	Not implemented	Financing	Access to funding
MINING CONSERVATION - WICHITA	2020	PROJECT SPONSOR(S): MINING (WICHITA)	RECOMMENDED WMS PROJECT	2772	No	N/A	N/A	Not implemented	Financing	Access to funding
MINING CONSERVATION - WILBARGER	2020	PROJECT SPONSOR(S): MINING (WILBARGER)	RECOMMENDED WMS PROJECT	2773	No	N/A	N/A	Not implemented	Financing	Access to funding
MUNICIPAL CONSERVATION - BOWIE	2020	WUG REDUCING DEMAND: BOWIE	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11585	No	N/A	N/A	Not implemented	Financing	Access to funding
MUNICIPAL CONSERVATION - BURKBURNETT	2020	WUG REDUCING DEMAND: BURKBURNETT	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11595	No	N/A	N/A	Not implemented	Financing	Access to funding
PRECIPITATION ENHANCEMENT - WICHITA FALLS	2020	WMS SUPPLY RECIPIENT: WICHITA FALLS	RECOMMENDED WMS SUPPLY WITHOUT WMS PROJECT	4732	No	N/A	N/A	Not implemented	If other, please describe.	Not applicable
WATER CONSERVATION (REPLACE TRANSMISSION PIPELINE) - VERNON	2020	PROJECT SPONSOR(S): VERNON	RECOMMENDED WMS PROJECT	2755	No	N/A	N/A	Not implemented	Financing	Not applicable
WATER CONSERVATION - WICHITA FALLS	2020	PROJECT SPONSOR(S): WICHITA FALLS	RECOMMENDED WMS PROJECT	2756	Yes	2019		Sponsor has taken official action to initiate project		Not applicable
WCWID NO. 2 CANAL CONVERSION TO PIPELINE	2020	PROJECT SPONSOR(S): WICHITA WCID #2	RECOMMENDED WMS PROJECT	2187	Yes	2019		Sponsor has taken official action to initiate project		Not applicable
WICHITA RIVER DIVERSION	2020	PROJECT SPONSOR(S): WICHITA FALLS	RECOMMENDED WMS PROJECT	1176	No	N/A	N/A	Not implemented	If other, please describe.	If other, please describe
MUNICIPAL CONSERVATION - ELECTRA	2030	WUG REDUCING DEMAND: ELECTRA	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11603	No	N/A	N/A	Not implemented	Financing	Access to funding
MUNICIPAL CONSERVATION - SCOTLAND	2030	WUG REDUCING DEMAND: SCOTLAND	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11541	No	N/A	N/A	Not implemented	Financing	Access to funding
MUNICIPAL CONSERVATION - WINDHORST WSC	2030	WUG REDUCING DEMAND: WINDTHORST WSC	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11545	No	N/A	N/A	Not implemented	Financing	Access to funding
DIRECT REUSE - VERNON	2040	PROJECT SPONSOR(S): VERNON	RECOMMENDED WMS PROJECT	1178	No	N/A	N/A	Not implemented	If other, please describe.	If other, please describe
LAKE RINGGOLD	2040	PROJECT SPONSOR(S): WICHITA FALLS	RECOMMENDED WMS PROJECT	1174	Yes	2019	2040	Permit application submitted/pending	Permit constraints	Permitting process
MUNICIPAL CONSERVATION - ARCHER CITY	2040	WUG REDUCING DEMAND: ARCHER CITY	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11529	No	N/A	N/A	Not implemented	Financing	Access to funding
MUNICIPAL CONSERVATION - CROWELL	2040	WUG REDUCING DEMAND: CROWELL	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11573	No	N/A	N/A	Not implemented	Financing	Access to funding
MUNICIPAL CONSERVATION - FOARD COUNTY OTHER	2040	WUG REDUCING DEMAND: COUNTY-OTHER, FOARD	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11569	No	N/A	N/A	Not implemented	Financing	Access to funding
MUNICIPAL CONSERVATION - HOLLIDAY	2040	WUG REDUCING DEMAND: HOLLIDAY	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11533	No	N/A	N/A	Not implemented	Financing	Access to funding
MUNICIPAL CONSERVATION - IOWA PARK	2040	WUG REDUCING DEMAND: IOWA PARK	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11607	No	N/A	N/A	Not implemented	Financing	Access to funding
MUNICIPAL CONSERVATION - LAKESIDE CITY	2040	WUG REDUCING DEMAND: LAKESIDE CITY	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11537	No	N/A	N/A	Not implemented	Financing	Access to funding
MUNICIPAL CONSERVATION - MONTAGUE COUNTY OTHER	2040	WUG REDUCING DEMAND: COUNTY-OTHER, MONTAGUE	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11589	No	N/A	N/A	Not implemented	Financing	Access to funding
MUNICIPAL CONSERVATION - QUANNAH	2040	WUG REDUCING DEMAND: QUANAH	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11581	No	N/A	N/A	Not implemented	Financing	Access to funding
MUNICIPAL CONSERVATION - WICHITA COUNTY OTHER	2040	WUG REDUCING DEMAND: COUNTY-OTHER, WICHITA	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11599	No	N/A	N/A	Not implemented	Financing	Access to funding
MUNICIPAL CONSERVATION - BAYLOR COUNTY OTHER	2050	WUG REDUCING DEMAND: COUNTY-OTHER, BAYLOR	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11551	No	N/A	N/A	Not implemented	Financing	Access to funding
MUNICIPAL CONSERVATION - CLAY COUNTY OTHER	2050	WUG REDUCING DEMAND: COUNTY-OTHER, CLAY	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11557	No	N/A	N/A	Not implemented	Financing	Not applicable
MUNICIPAL CONSERVATION - HARDEMAN COUNTY OTHER	2050	WUG REDUCING DEMAND: COUNTY-OTHER, HARDEMAN	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11577	No	N/A	N/A	Not implemented	Financing	Not applicable
MUNICIPAL CONSERVATION - VERNON	2050	WUG REDUCING DEMAND: VERNON	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11625	No	N/A	N/A	Not implemented	Financing	Not applicable
MUNICIPAL CONSERVATION - WILBARGER COUNTY OTHER	2050	WUG REDUCING DEMAND: COUNTY-OTHER, WILBARGER	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11621	No	N/A	N/A	Not implemented	Financing	Not applicable
MUNICIPAL CONSERVATION - WICHITA VALLEY WSC	2060	WUG REDUCING DEMAND: WICHITA VALLEY WSC	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11615	No	N/A	N/A	Not implemented	Financing	Not applicable
MUNICIPAL CONSERVATION - DEAN DALE SUD	2070	WUG REDUCING DEMAND: DEAN DALE SUD	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11563	No	N/A	N/A	Not implemented	Financing	Not applicable

WMS or WMS Project Name	Database Online Decade	Related Sponsor Entity and/or Benefitting WUGs	Implementation Survey Record Type	Database ID	Current water supply project yield (ac-ft/yr)	Funds expended to date ($)	Project Cost ($)	Year the project is online?*	Is this a phased project?*	(Phased) Ultimate volume (ac-ft/yr)	(Phased) Ultimate project cost ($)
ADDITIONAL SEYMOUR AQUIFER - VERNON	2020	PROJECT SPONSOR(S): VERNON	RECOMMENDED WMS PROJECT	1177			$9,810,000	2020	No	N/A	N/A
ALTERNATIVE COOLING TECHNOLOGY - STEAM ELECTRIC POWER WILBARGER COUNTY	2020	PROJECT SPONSOR(S): STEAM ELECTRIC POWER (WILBARGER)	RECOMMENDED WMS PROJECT	1179	0	$0	$89,740,000	2020	No	N/A	N/A
CHLORIDE CONTROL PROJECT	2020	PROJECT SPONSOR(S): COUNTY-OTHER (BAYLOR)	RECOMMENDED WMS PROJECT	1275	0	$0	$59,371,000	2020	No	N/A	N/A
INDIRECT REUSE TO LAKE ARROWHEAD	2020	PROJECT SPONSOR(S): WICHITA FALLS	RECOMMENDED WMS PROJECT	1173	8,968	$36,400,000	$36,400,000	2018	No	N/A	N/A
IRRIGATION CONSERVATION - ARCHER	2020	WUG REDUCING DEMAND: IRRIGATION, ARCHER	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12771	0	$0	N/A	2020	No	N/A	N/A
IRRIGATION CONSERVATION - BAYLOR	2020	WUG REDUCING DEMAND: IRRIGATION, BAYLOR	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12779	0	$0	N/A	2020	No	N/A	N/A
IRRIGATION CONSERVATION - CLAY	2020	WUG REDUCING DEMAND: IRRIGATION, CLAY	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12787	0	$0	N/A	2020	No	N/A	N/A
IRRIGATION CONSERVATION - COTTLE	2020	WUG REDUCING DEMAND: IRRIGATION, COTTLE	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12793	0	$0	N/A	2020	No	N/A	N/A
IRRIGATION CONSERVATION - FOARD	2020	WUG REDUCING DEMAND: IRRIGATION, FOARD	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12797	0	$0	N/A	2020	No	N/A	N/A
IRRIGATION CONSERVATION - HARDEMAN	2020	WUG REDUCING DEMAND: IRRIGATION, HARDEMAN	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12801	0	$0	N/A	2020	No	N/A	N/A
IRRIGATION CONSERVATION - KING	2020	WUG REDUCING DEMAND: IRRIGATION, KING	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12805	0	$0	N/A	2020	No	N/A	N/A
IRRIGATION CONSERVATION - MONTAGUE	2020	WUG REDUCING DEMAND: IRRIGATION, MONTAGUE	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12811	0	$0	N/A	2020	No	N/A	N/A
IRRIGATION CONSERVATION - WICHITA	2020	WUG REDUCING DEMAND: IRRIGATION, WICHITA	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12817	0	$0	N/A	2020	No	N/A	N/A
IRRIGATION CONSERVATION - WILBARGER	2020	WUG REDUCING DEMAND: IRRIGATION, WILBARGER	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12821	0	$0	N/A	2020	No	N/A	N/A
LOCAL SEYMOUR AQUIFER	2020	PROJECT SPONSOR(S): WICHITA FALLS	RECOMMENDED WMS PROJECT	1175	0	$0	$19,674,000	2020	No	N/A	N/A
MINING CONSERVATION - ARCHER	2020	PROJECT SPONSOR(S): MINING (ARCHER)	RECOMMENDED WMS PROJECT	2764	0	$0	$1,004,000	2020	No	N/A	N/A
MINING CONSERVATION - BAYLOR	2020	PROJECT SPONSOR(S): MINING (BAYLOR)	RECOMMENDED WMS PROJECT	2765	0	$0	$33,000	2020	No	N/A	N/A
MINING CONSERVATION - CLAY	2020	PROJECT SPONSOR(S): MINING (CLAY)	RECOMMENDED WMS PROJECT	2766	0	$0	$1,635,000	2020	No	N/A	N/A
MINING CONSERVATION - COTTLE	2020	PROJECT SPONSOR(S): MINING (COTTLE)	RECOMMENDED WMS PROJECT	2767	0	$0	$83,000	2020	No	N/A	N/A
MINING CONSERVATION - FOARD	2020	PROJECT SPONSOR(S): MINING (FOARD)	RECOMMENDED WMS PROJECT	2768	0	$0	$25,000	2020	No	N/A	N/A
MINING CONSERVATION - HARDEMAN	2020	PROJECT SPONSOR(S): MINING (HARDEMAN)	RECOMMENDED WMS PROJECT	2769	0	$0	$42,000	2020	No	N/A	N/A
MINING CONSERVATION - KING	2020	PROJECT SPONSOR(S): MINING (KING)	RECOMMENDED WMS PROJECT	2770	0	$0	$789,000	2020	No	N/A	N/A
MINING CONSERVATION - MONTAGUE	2020	PROJECT SPONSOR(S): MINING (MONTAGUE)	RECOMMENDED WMS PROJECT	2771	0	$0	$7,553,000	2020	No	N/A	N/A
MINING CONSERVATION - WICHITA	2020	PROJECT SPONSOR(S): MINING (WICHITA)	RECOMMENDED WMS PROJECT	2772	0	$0	$133,000	2020	No	N/A	N/A
MINING CONSERVATION - WILBARGER	2020	PROJECT SPONSOR(S): MINING (WILBARGER)	RECOMMENDED WMS PROJECT	2773	0	$0	$42,000	2020	No	N/A	N/A
MUNICIPAL CONSERVATION - BOWIE	2020	WUG REDUCING DEMAND: BOWIE	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11585	0	$0	N/A	2020	No	N/A	N/A
MUNICIPAL CONSERVATION - BURKBURNETT	2020	WUG REDUCING DEMAND: BURKBURNETT	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11595	0	$0	N/A	2020	No	N/A	N/A
PRECIPITATION ENHANCEMENT - WICHITA FALLS	2020	WMS SUPPLY RECIPIENT: WICHITA FALLS	RECOMMENDED WMS SUPPLY WITHOUT WMS PROJECT	4732	0	$0	N/A	2020	No	N/A	N/A
WATER CONSERVATION (REPLACE TRANSMISSION PIPELINE) - VERNON	2020	PROJECT SPONSOR(S): VERNON	RECOMMENDED WMS PROJECT	2755	0	$0	$7,807,000	2020	No	N/A	N/A
WATER CONSERVATION - WICHITA FALLS	2020	PROJECT SPONSOR(S): WICHITA FALLS	RECOMMENDED WMS PROJECT	2756	Unknown	Unknown	$36,656,000	2020	No	N/A	N/A
WCWID NO. 2 CANAL CONVERSION TO PIPELINE	2020	PROJECT SPONSOR(S): WICHITA WCID #2	RECOMMENDED WMS PROJECT	2187			$8,538,000	2020	No	N/A	N/A
WICHITA RIVER DIVERSION	2020	PROJECT SPONSOR(S): WICHITA FALLS	RECOMMENDED WMS PROJECT	1176	0	$0	$11,230,000	2020	No	N/A	N/A
MUNICIPAL CONSERVATION - ELECTRA	2030	WUG REDUCING DEMAND: ELECTRA	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11603	0	$0	N/A	2030	No	N/A	N/A
MUNICIPAL CONSERVATION - SCOTLAND	2030	WUG REDUCING DEMAND: SCOTLAND	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11541	0	$0	N/A	2030	No	N/A	N/A
MUNICIPAL CONSERVATION - WINDHORST WSC	2030	WUG REDUCING DEMAND: WINDTHORST WSC	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11545	0	$0	N/A	2030	No	N/A	N/A
DIRECT REUSE - VERNON	2040	PROJECT SPONSOR(S): VERNON	RECOMMENDED WMS PROJECT	1178	0	$0	$8,500,000	2040	No	N/A	N/A
LAKE RINGGOLD	2040	PROJECT SPONSOR(S): WICHITA FALLS	RECOMMENDED WMS PROJECT	1174	0	$600,000	$330,510,000	2040	No	N/A	N/A
MUNICIPAL CONSERVATION - ARCHER CITY	2040	WUG REDUCING DEMAND: ARCHER CITY	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11529	0	$0	N/A	2040	No	N/A	N/A
MUNICIPAL CONSERVATION - CROWELL	2040	WUG REDUCING DEMAND: CROWELL	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11573	0	$0	N/A	2040	No	N/A	N/A
MUNICIPAL CONSERVATION - FOARD COUNTY OTHER	2040	WUG REDUCING DEMAND: COUNTY-OTHER, FOARD	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11569	0	$0	N/A	2040	No	N/A	N/A
MUNICIPAL CONSERVATION - HOLLIDAY	2040	WUG REDUCING DEMAND: HOLLIDAY	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11533	0	$0	N/A	2040	No	N/A	N/A
MUNICIPAL CONSERVATION - IOWA PARK	2040	WUG REDUCING DEMAND: IOWA PARK	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11607	0	$0	N/A	2040	No	N/A	N/A
MUNICIPAL CONSERVATION - LAKESIDE CITY	2040	WUG REDUCING DEMAND: LAKESIDE CITY	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11537	0	$0	N/A	2040	No	N/A	N/A
MUNICIPAL CONSERVATION - MONTAGUE COUNTY OTHER	2040	WUG REDUCING DEMAND: COUNTY-OTHER, MONTAGUE	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11589	0	$0	N/A	2040	No	N/A	N/A
MUNICIPAL CONSERVATION - QUANNAH	2040	WUG REDUCING DEMAND: QUANAH	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11581	0	$0	N/A	2040	No	N/A	N/A
MUNICIPAL CONSERVATION - WICHITA COUNTY OTHER	2040	WUG REDUCING DEMAND: COUNTY-OTHER, WICHITA	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11599	0	$0	N/A	2040	No	N/A	N/A
MUNICIPAL CONSERVATION - BAYLOR COUNTY OTHER	2050	WUG REDUCING DEMAND: COUNTY-OTHER, BAYLOR	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11551	0	$0	N/A	2050	No	N/A	N/A
MUNICIPAL CONSERVATION - CLAY COUNTY OTHER	2050	WUG REDUCING DEMAND: COUNTY-OTHER, CLAY	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11557	0	$0	N/A	2050	No	N/A	N/A
MUNICIPAL CONSERVATION - HARDEMAN COUNTY OTHER	2050	WUG REDUCING DEMAND: COUNTY-OTHER, HARDEMAN	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11577	0	$0	N/A	2050	No	N/A	N/A
MUNICIPAL CONSERVATION - VERNON	2050	WUG REDUCING DEMAND: VERNON	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11625	0	$0	N/A	2050	No	N/A	N/A
MUNICIPAL CONSERVATION - WILBARGER COUNTY OTHER	2050	WUG REDUCING DEMAND: COUNTY-OTHER, WILBARGER	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11621	0	$0	N/A	2050	No	N/A	N/A
MUNICIPAL CONSERVATION - WICHITA VALLEY WSC	2060	WUG REDUCING DEMAND: WICHITA VALLEY WSC	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11615	0	$0	N/A	2060	No	N/A	N/A
MUNICIPAL CONSERVATION - DEAN DALE SUD	2070	WUG REDUCING DEMAND: DEAN DALE SUD	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11563	0	$0	N/A	2070	No	N/A	N/A

WMS or WMS Project Name	Database Online Decade	Related Sponsor Entity and/or Benefitting WUGs	Implementation Survey Record Type	Database ID	Year project reaches maximum capacity?*	What is the project funding source(s)?*	Funding Mechanism if Other?	Included in 2021 plan?*	Does the project or WMS involve reallocation of flood control?*	Does the project or WMS provide any measurable flood risk reduction?*	Optional Comments
ADDITIONAL SEYMOUR AQUIFER - VERNON	2020	PROJECT SPONSOR(S): VERNON	RECOMMENDED WMS PROJECT	1177	2070	Other	Local funds	Yes	No	No	
ALTERNATIVE COOLING TECHNOLOGY - STEAM ELECTRIC POWER WILBARGER COUNTY	2020	PROJECT SPONSOR(S): STEAM ELECTRIC POWER (WILBARGER)	RECOMMENDED WMS PROJECT	1179	2070	Other	Local funds	Yes	No	No	
CHLORIDE CONTROL PROJECT	2020	PROJECT SPONSOR(S): COUNTY-OTHER (BAYLOR)	RECOMMENDED WMS PROJECT	1275	2070	Federal - Other		Yes	No	Potentially, but no technical flood analysis performed	
INDIRECT REUSE TO LAKE ARROWHEAD	2020	PROJECT SPONSOR(S): WICHITA FALLS	RECOMMENDED WMS PROJECT	1173	2070	TWDB - SWIFT	N/A	No	No	No	Project has been fully implemented
IRRIGATION CONSERVATION - ARCHER	2020	WUG REDUCING DEMAND: IRRIGATION, ARCHER	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12771	2070	Other	Local funds	Yes	No	No	
IRRIGATION CONSERVATION - BAYLOR	2020	WUG REDUCING DEMAND: IRRIGATION, BAYLOR	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12779	2070	Other	Local funds	No	No	No	No need in the 2021 Plan
IRRIGATION CONSERVATION - CLAY	2020	WUG REDUCING DEMAND: IRRIGATION, CLAY	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12787	2070	Other	Local funds	No	No	No	No need in the 2021 Plan
IRRIGATION CONSERVATION - COTTLE	2020	WUG REDUCING DEMAND: IRRIGATION, COTTLE	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12793	2070	Other	Local funds	No	No	No	No need in the 2021 Plan
IRRIGATION CONSERVATION - FOARD	2020	WUG REDUCING DEMAND: IRRIGATION, FOARD	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12797	2070	Other	Local funds	No	No	No	No need in the 2021 Plan
IRRIGATION CONSERVATION - HARDEMAN	2020	WUG REDUCING DEMAND: IRRIGATION, HARDEMAN	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12801	2070	Other	Local funds	No	No	No	No need in the 2021 Plan
IRRIGATION CONSERVATION - KING	2020	WUG REDUCING DEMAND: IRRIGATION, KING	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12805	2070	Other	Local funds	No	No	No	No need in the 2021 Plan
IRRIGATION CONSERVATION - MONTAGUE	2020	WUG REDUCING DEMAND: IRRIGATION, MONTAGUE	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12811	2070	Other	Local funds	No	No	No	No need in the 2021 Plan
IRRIGATION CONSERVATION - WICHITA	2020	WUG REDUCING DEMAND: IRRIGATION, WICHITA	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12817	2070	Other	Local funds	Yes	No	No	
IRRIGATION CONSERVATION - WILBARGER	2020	WUG REDUCING DEMAND: IRRIGATION, WILBARGER	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	12821	2070	Other	Local funds	No	No	No	No need in the 2021 Plan
LOCAL SEYMOUR AQUIFER	2020	PROJECT SPONSOR(S): WICHITA FALLS	RECOMMENDED WMS PROJECT	1175	2070	Other	Local funds	No	No	No	Have decided not implement this strate
MINING CONSERVATION - ARCHER	2020	PROJECT SPONSOR(S): MINING (ARCHER)	RECOMMENDED WMS PROJECT	2764	2070	Other	Local funds	Yes	No	No	
MINING CONSERVATION - BAYLOR	2020	PROJECT SPONSOR(S): MINING (BAYLOR)	RECOMMENDED WMS PROJECT	2765	2070	Other	Local funds	Yes	No	No	
MINING CONSERVATION - CLAY	2020	PROJECT SPONSOR(S): MINING (CLAY)	RECOMMENDED WMS PROJECT	2766	2070	Other	Local funds	Yes	No	No	
MINING CONSERVATION - COTTLE	2020	PROJECT SPONSOR(S): MINING (COTTLE)	RECOMMENDED WMS PROJECT	2767	2070	Other	Local funds	Yes	No	No	
MINING CONSERVATION - FOARD	2020	PROJECT SPONSOR(S): MINING (FOARD)	RECOMMENDED WMS PROJECT	2768	2070	Other	Local funds	Yes	No	No	
MINING CONSERVATION - HARDEMAN	2020	PROJECT SPONSOR(S): MINING (HARDEMAN)	RECOMMENDED WMS PROJECT	2769	2070	Other	Local funds	Yes	No	No	
MINING CONSERVATION - KING	2020	PROJECT SPONSOR(S): MINING (KING)	RECOMMENDED WMS PROJECT	2770	2070	Other	Local funds	Yes	No	No	
MINING CONSERVATION - MONTAGUE	2020	PROJECT SPONSOR(S): MINING (MONTAGUE)	RECOMMENDED WMS PROJECT	2771	2070	Other	Local funds	Yes	No	No	
MINING CONSERVATION - WICHITA	2020	PROJECT SPONSOR(S): MINING (WICHITA)	RECOMMENDED WMS PROJECT	2772	2070	Other	Local funds	Yes	No	No	
MINING CONSERVATION - WILBARGER	2020	PROJECT SPONSOR(S): MINING (WILBARGER)	RECOMMENDED WMS PROJECT	2773	2070	Other	Local funds	Yes	No	No	
MUNICIPAL CONSERVATION - BOWIE	2020	WUG REDUCING DEMAND: BOWIE	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11585	2070	Other	Local funds	Yes	No	No	
MUNICIPAL CONSERVATION - BURKBURNETT	2020	WUG REDUCING DEMAND: BURKBURNETT	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11595	2070	Other	Local funds	No	No	No	No need in the 2021 Plan
PRECIPITATION ENHANCEMENT - WICHITA FALLS	2020	WMS SUPPLY RECIPIENT: WICHITA FALLS	RECOMMENDED WMS SUPPLY WITHOUT WMS PROJECT	4732	2070	Other	Local funds	No	No	No	Have decided not implement this strate
WATER CONSERVATION (REPLACE TRANSMISSION PIPELINE) - VERNON	2020	PROJECT SPONSOR(S): VERNON	RECOMMENDED WMS PROJECT	2755	2070	Other	Local funds	Yes	No	No	
WATER CONSERVATION - WICHITA FALLS	2020	PROJECT SPONSOR(S): WICHITA FALLS	RECOMMENDED WMS PROJECT	2756	2070	Other	Local funds	Yes	No	No	
WCWID NO. 2 CANAL CONVERSION TO PIPELINE	2020	PROJECT SPONSOR(S): WICHITA WCID #2	RECOMMENDED WMS PROJECT	2187	2070	Federal - Other	N/A	Yes	No	No	Have received some funding for Bureau
WICHITA RIVER DIVERSION	2020	PROJECT SPONSOR(S): WICHITA FALLS	RECOMMENDED WMS PROJECT	1176	2070	Other	Local funds	No	No	No	Have decided not implement this strate
MUNICIPAL CONSERVATION - ELECTRA	2030	WUG REDUCING DEMAND: ELECTRA	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11603	2070	Other	Local funds	Yes	No	No	
MUNICIPAL CONSERVATION - SCOTLAND	2030	WUG REDUCING DEMAND: SCOTLAND	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11541	2070	Other	Local funds	Yes	No	No	
MUNICIPAL CONSERVATION - WINDHORST WSC	2030	WUG REDUCING DEMAND: WINDTHORST WSC	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11545	2070	Other	Local funds	Yes	No	No	
DIRECT REUSE - VERNON	2040	PROJECT SPONSOR(S): VERNON	RECOMMENDED WMS PROJECT	1178	2070	Other	Local funds	No	No	No	Have decided not implement this strate
LAKE RINGGOLD	2040	PROJECT SPONSOR(S): WICHITA FALLS	RECOMMENDED WMS PROJECT	1174	2040	TWDB - SWIFT	N/A	Yes	No	Potentially, but no technical flood analysis performed	
MUNICIPAL CONSERVATION - ARCHER CITY	2040	WUG REDUCING DEMAND: ARCHER CITY	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11529	2070	Other	Local funds	Yes	No	No	
MUNICIPAL CONSERVATION - CROWELL	2040	WUG REDUCING DEMAND: CROWELL	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11573	2070	Other	Local funds	Yes	No	No	
MUNICIPAL CONSERVATION - FOARD COUNTY OTHER	2040	WUG REDUCING DEMAND: COUNTY-OTHER, FOARD	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11569	2070	Other	Local funds	No	No	No	No need in the 2021 Plan
MUNICIPAL CONSERVATION - HOLLIDAY	2040	WUG REDUCING DEMAND: HOLLIDAY	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11533	2070	Other	Local funds	Yes	No	No	
MUNICIPAL CONSERVATION - IOWA PARK	2040	WUG REDUCING DEMAND: IOWA PARK	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11607	2070	Other	Local funds	Yes	No	No	
MUNICIPAL CONSERVATION - LAKESIDE CITY	2040	WUG REDUCING DEMAND: LAKESIDE CITY	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11537	2070	Other	Local funds	Yes	No	No	
MUNICIPAL CONSERVATION - MONTAGUE COUNTY OTHER	2040	WUG REDUCING DEMAND: COUNTY-OTHER, MONTAGUE	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11589	2070	Other	Local funds	Yes	No	No	
MUNICIPAL CONSERVATION - QUANNAH	2040	WUG REDUCING DEMAND: QUANAH	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11581	2070	Other	Local funds	Yes	No	No	
MUNICIPAL CONSERVATION - WICHITA COUNTY OTHER	2040	WUG REDUCING DEMAND: COUNTY-OTHER, WICHITA	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11599	2070	Other	Local funds	No	No	No	No need in the 2021 Plan
MUNICIPAL CONSERVATION - BAYLOR COUNTY OTHER	2050	WUG REDUCING DEMAND: COUNTY-OTHER, BAYLOR	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11551	2070	Other	Local funds	No	No	No	No need in the 2021 Plan
MUNICIPAL CONSERVATION - CLAY COUNTY OTHER	2050	WUG REDUCING DEMAND: COUNTY-OTHER, CLAY	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11557	2070	Other	Local funds	Yes	No	No	
MUNICIPAL CONSERVATION - HARDEMAN COUNTY OTHER	2050	WUG REDUCING DEMAND: COUNTY-OTHER, HARDEMAN	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11577	2070	Other	Local funds	No	No	No	No need in the 2021 Plan
MUNICIPAL CONSERVATION - VERNON	2050	WUG REDUCING DEMAND: VERNON	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11625	2070	Other	Local funds	Yes	No	No	
MUNICIPAL CONSERVATION - WILBARGER COUNTY OTHER	2050	WUG REDUCING DEMAND: COUNTY-OTHER, WILBARGER	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11621	2070	Other	Local funds	No	No	No	No need in the 2021 Plan
MUNICIPAL CONSERVATION - WICHITA VALLEY WSC	2060	WUG REDUCING DEMAND: WICHITA VALLEY WSC	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11615	2070	Other	Local funds	No	No	No	No need in the 2021 Plan
MUNICIPAL CONSERVATION - DEAN DALE SUD	2070	WUG REDUCING DEMAND: DEAN DALE SUD	RECOMMENDED DEMAND REDUCTION STRATEGY WITHOUT WMS PROJECT	11563	2070	Other	Local funds	No	No	No	No need in the 2021 Plan

APPENDIX I

COMMENTS RECEIVED ON IPP AND RESPONSES

2021 FINAL PLAN

REGION B

OCTOBER 2020

APPENDIX I

COMMENTS RECEIVED ON IPP AND RESPONSES
2021 FINAL PLAN
REGION B

Comments were received on the 2021 Region B Initially Prepared Plan from the following agencies (Texas Water Development Board, Texas Park and Wildlife Department, Texas State Soil and Water Conservation Board) and 21 public comments. Agency comments are included as attachments along with the public comments received in writing. A summary of the public comments received during the public hearing on April 22, 2020 are included and a recording is available on the Region B website. Responses to comments are documented in this appendix.

I.1 Summary of Public Comments from the Public Hearing

During the public hearing on April 22, 2020, 11 speakers presented verbal public comments which are summarized in Table I-1 below by category of comment. All comments received were directly or indirectly regarding Lake Ringgold, which is a recommended strategy for the City of Wichita Falls. The categories of comments focused on support, need for the project, project cost, alternative strategies evaluated, environmental impacts, cultural impacts, flooding, and the loss of private property. There were 10 commenters that expressed concerns about the project and one commenter that expressed support of the project.

Table I-1 Summary of Public Comments from the Public Hearing

Commenter Name	Affiliated Organization	Comment Type Regarding Lake Ringgold						
		Supports	Need	Cost	Alternatives	Environmental Impacts	Cultural Impacts	Flooding
Daniel Nix	City of Wichita Falls	X						
Janice Bezanson	Texas Conservation Alliance		X	X	X			
Shane Cody	Landowner		X	X	X			
Deborah Clark	Landowner		X	X		X	X	
Randy Adams	Landowner		X	X			X	
Frank Douthit	Attorney			X		X	X	
Jason Overmeyer	Landowner						X	X
Catherine Webb King	Attorney for the Murray Family		X	X	X			
John Greer	Landowner			X			X	
William O'Malley			X	X	X		X	
Randy Shoffner	Landowner			X				

I-2 Summary of Written Public Comments

In addition to the verbal comments received at the public hearing, several written comments were also received from ten commenters. Similar to the verbal public comments the written public comments were directly or indirectly regarding Lake Ringgold, the recommended strategy for the City of Wichita Falls. I-2 is a summary of the written public comments which are attached in their entirety.

Table I-2 Summary of Written Public Comments

Commenter Name	Affiliated Organization	Comment Type Regarding Lake Ringgold								
		Supports	**Need**	**Cost**	**Alternatives**	**Environmental Impacts**	**Cultural Impacts**	**Water Quality**	**Flooding**	**Information/ Transparency**
Retha J. Cook	Citizen Petrolia			X				X		
Sharon Fitts	Landowner			X			X			
Stephen L. Santellana	Mayor, Wichita Falls	X								
Deborah Clark	Texoma Stewardship Coalition/Bird well and Clark Ranch		X	X			X			X
Janice Bezanson	Texas Conservation Alliance		X	X	X	X				
Catherine Webb King	Attorney for the Murray Family		X	X	X		X			
Frank Douthit	Attorney			X		X	X		X	
Darron Leiker	City Manager, Wichita Falls	X								
Glenn Barham	Former Mayor, Wichita Falls	X								
Henry Florsheim	Wichita Falls Chamber of Commerce	X								

I-3 Response to Public Comments

With the 21 public comments relating to Lake Ringgold the responses have been grouped into the same categories listed in the tables above. Some of the public comments relate to items outside the purview of the regional water planning process and will be addressed through future permitting efforts or outside studies.

- Support for the Reservoir – Five commenters expressed support for the reservoir and the need to secure additional supplies for Wichita Falls.
    - **Response:** Region B appreciates the comments. No changes were made to the plan.
- Need – Several comments asserted that the Lake Ringgold project is not needed, and that existing supplies are sufficient to meet future needs.
    - **Response:** The evaluations of existing supplies were developed in accordance with TWDB rules, adopted by the regional water planning group, and are documented in Chapter 3 and Appendix A. Following the TWDB methodology for needs assessment, Wichita Falls as a Major Water Provider (MWP) has a need of nearly 11,000 acre-feet by 2070. No changes were made to the Region B Plan.
- Cost – Multiple comments were received regarding the cost of the project, including the cost to ratepayers. One comment identified that the debt service for the reservoir is 40 years and should extend to 2060 and 2070.
    - **Response:** The costs for regional water planning strategies, including Lake Ringgold, were developed in accordance with TWDB rules and utilizing the TWDB approved Unified Costing Model (UCM). The regional planning process only evaluates the capital and unit cost and does not evaluate the impact to individual rate payers. Those analysis would be conducted as part of rate studies that are outside of the regional planning process. As part of the strategy evaluation process, the Lake Ringgold project was determined to be the most cost-effective alternative for Wichita Falls. The debt service for Lake Ringgold is for 40 years and Table 5-13 has been updated to reflect this change. No other changes were made.
- Alternatives – Several comments stated that other alternatives exist to Lake Ringgold.
    - **Response**: It is documented in Chapter 5 that Wichita Falls evaluated alternative water supplies, including Water Conservation, Local Seymour Aquifer, Wichita River Supply and Lake Ringgold. Water Conservation and Lake Ringgold are the

two recommended water management strategies for Wichita Falls based on the evaluation in Chapter 5. No changes were made to the Region B Plan.

- Environmental Impacts – Comments were received that the environmental impacts of the project have not been fully evaluated.
    - **Response**: Lake Ringgold has been evaluated according to TWDB rules regarding environmental impacts. This evaluation is documented in Chapter 5 and included in Appendix D. No changes were made to the Region B Plan.
- Cultural Impacts and Loss of Private Property– Several comments were received that indicated significant cultural losses such as archaeological sites and loss of private property will occur when Lake Ringgold is constructed.
    - **Response**: Lake Ringgold was evaluated according to TWDB rules regarding environmental impacts. This evaluation is documented in Chapter 5 and included in Appendix D. The assessment score for cultural resources was changed from "Low" to "Mid-High" in Appendix D. The land required for the project is considered during the project evaluations. No additional changes were made to the Region B Water Plan.
- Flooding – One comment asked about flooding impacts of Lake Ringgold.
    - **Response**: While flooding analyses are not specifically addressed in the regional water planning process, Wichita Falls plans to purchase or seek easements up to the 100-year floodplain around Lake Ringgold. No changes were made to the Region B Plan.
- Water Quality – One comment expressed concern about water quality.
    - **Response**: The water quality of Lake Ringgold should be similar to the quality of Lake Arrowhead. Water diverted for municipal purposes would be treated to meet federal and state drinking water standards. No changes were made to the Region B Plan.
- Information Transparency – One comment expressed concern about the lack of information or transparency
    - **Response**: The regional water planning process is a public process with regular planning group meetings with published notice. Table 10-2 in Chapter 10 documents the regional planning group meetings which were open to the public. In

addition, meeting materials were also posted on the Region B website. No changes were made to the Region B Plan.

I-4 Texas Parks and Wildlife Comments and Responses

The Texas Parks and Wildlife Department provided a single comment that is included below along with the associated response.

1. Table 1-13 lists species identified as threatened or endangered that are known to, or may potentially occur in Region B. There have been recent updates (March 30, 2020) to the list of federal and state listed species and Species of Greatest Conservation need, including species in Region B counties. We recommend that you update Table 1.13 with the latest information that is available at: https://tpwd.texas.gov/huntwild/wild/wildlifediversitv/nongame/listed-species/

    - **Response**: Table 1.13 was updated.

The TPWD also provided some concerns that are included below

1. DFCs have not been adopted to address the maintenance of spring flows or groundwater surface interactions. Ultimately TPWD would like to see DFCs adopted to protect these features.

    - **Response**: DFCs are set by the GMAs which provide the MAG values for regional planning. Regional planning groups do not have the authority to adopt different values. No changes made to the Region B Water Plan.

2. TPWD staff has concerns regarding the impact of chloride control projects on fish and wildlife resources and will remain engaged in regulatory, monitoring, and environmental response programs.

    - **Response**: Comment noted. No changes made to the Region B Water Plan.

3. TPWD has concerns regarding Lake Ringgold related to the lack of information regarding potential impacts to instream flows, habitat fragmentation, and dependent aquatic ecosystems.

    - **Response**: Comment noted. No changes made to the Region B Water Plan.

I-5 Texas State Soil and Water Conservation Board Comments and Responses

The Texas State Soil and Water Conservation Board (TSSWCB) provided a single comment regarding the Brush Control Water Management Strategy.

1. Page 5-10 "WSEP considers priority watersheds across the state, the need for conservation within the territory of a proposed projection based on the State Water Plan and if the Regional Water Planning Group has identified brush control as a strategy in the State Water Plan as part of their competitive grant, cost sharing program." Unfortunately, the Water Supply Enhancement Program is not a funded program at this time.

    - **Response**: Added a sentence to Section 5.15 on Page 5-10 "At the time of publication of this plan the WSEP is not a funded program."

I-6 Texas Water Development Board Comments and Responses

The Texas Water Development Board (TWDB) provided 26 Level 1 comments to meet statutory requirements and an additional 14 Level 2 comments to improve the readability and overall understanding. Responses to each commitment are included in bullets below the comment.

Level 1: Comments, questions, and data revisions that must be satisfactorily addressed in order to meet statutory, agency rule, and/or contract requirements.

1. Chapter 5 and the State Water Planning Database (DB22). The plan includes the following recommended water management strategies (WMS) by WMS type, providing supply in 2020 (not including demand management): two *groundwater wells & other* and one *indirect reuse*. **Strategy supply with an online decade of 2020 must be constructed and delivering water by January 5, 2023**. Please confirm that all strategies shown as providing supply in 2020 are expected to be providing water supply by January 5, 2023. *[31 § TAC 357.10(21); Contract Exhibit C, Section 5.2]*

    - **Response**: The sponsors indicated that the strategies identified would be online by January 5, 2023. A clarification sentence was added to Section 5.2 on Page 5-12.

2. Section 1.14, page 1-30. The plan appears to reference an old rule definition of wholesale water providers (WWP). Please revise the definition of WWPs in accordance with 31 Texas Administrative Code (TAC) § 357.10(44) and clarify whether the entities listed in Section 1.14 are also considered major water providers (MWP). Please include a description of MWPs within the region in Chapter 1 of the final, adopted regional water plan. [31 TAC § 357.30(4)]…

    - **Response**: The definition has been modified in Section 1.14 to clarify MWP. (Pg. 1-30).

3. Chapter 1. Please include a discussion of the historic drought(s) of record within the planning area in Chapter 1 of the final, adopted regional water plan. *[31 TAC § 357.30(9)]…*

    - **Response**: The recent drought (2011-2015) is now considered the new drought of record for Region B. Text was added in Section 1.5 to discuss historical droughts and the recent drought as the drought of record. (Pg. 1-21)

4. Chapter 1. Please include a discussion of the current preparation for drought within the planning area in Chapter 1 of the final, adopted regional water plan. *[31 TAC § 357.30(10)]…*

    - **Response**: Region B has endured the recent drought or record. Text was

added in Section 1.5 to discuss drought preparedness & response to the recent drought of record. (Pg. 1-21)

5. Chapter 1. Please include a discussion of compiled water loss audit information performed by retail public utilities in Chapter 1 of the final, adopted regional water plan. *[31 TAC § 357.30(11)]….*

    - **Response**: Water loss audit data from 2012-2017 was analyzed on a regional scale. Text was added to Chapter 1 to summarize water loss audit information on a regional basis.

6. Section 3.1.3, Table 3-3, page 3-14. The City of Henrietta relies entirely on run of river supply. According to the footnote on page 3-14, run-of-river surface water availability has been determined using minimum *annua*l diversion, which is prohibited by rule and contract guidance. Minimum *monthly* diversion amounts must be used to determine run-of-river water availability for the City of Henrietta in the final, adopted regional water plan. *[31 TAC § 357.32(c)(2); Contract Exhibit C, Section 3.6.2]*

    - **Response**: Henrietta supplies in Table 3-3 were updated to 1,315 acre-feet per year which is the minimum monthly diversion amounts. Footnote was also added and text in Appendix A has also be updated.

7. Section 3.1.3, page 3-15. Please confirm whether the local surface water supplies listed in Table 3-15 are firm supplies under drought conditions and document this information in the final, adopted regional water plan. *[31 TAC § 357.32(a); Contract Exhibit C, Section 3.7]*

    - **Response**: Local surface water supplies were evaluated on a firm supply basis under drought conditions. Clarification text was added to the footnote on Page 3-15.

8. Section 3.2.2, Table 3-4, page 3-21. Modeled available groundwater (MAG) values for the Seymour Aquifer in Baylor County are incorrect for the years 2030, 2050 and 2070. Each value is lower than the MAG value by 1 acre-foot per year. Please correct these values in the final, adopted regional water plan. *[31 TAC § 357.32(d)]*

    - **Response**: Corrected in Table 3-4.

9. Section 3.2.2, Table 3-5, page 3-21. The plan presents the methods used to estimate groundwater availability for aquifers without MAG values; however, it is not clear what information was considered for the Blaine Aquifer in King County. Please include additional details on what information the planning group considered in the final, adopted regional water plan. *[Contract Exhibit C, Section 3.5.2]*

    - **Response**: The Region B planning group appointed a groundwater technical committee to review groundwater availability for aquifers without MAG values. This committee provided those values for the Blaine Aquifer in King County. Clarification text was added to the footnote on Table 3-5.

10. Section 4.2.2, pages 4-8 and 4-9. The plan does not appear to include needs for MWPs reported by category of use including municipal, mining, manufacturing, irrigation, steam electric, mining, and livestock. Please report the results of the needs analysis for MWPs by categories of use as applicable in the region in the final, adopted regional water plan. *[31 TAC § 357.33(b)]*

    - **Response**: MWP needs reported by category (municipal, mining, manufacturing, irrigation, steam electric, mining, and livestock) has been added to Table 4-10 and Table 4-11. Only categories with needs are reported in these tables.

11. Section 4.6, page 4-16. The plan does not appear to include a secondary needs analysis for MWPs. Please present the results of the secondary needs analysis by decade for MWPs in the final, adopted regional water plan. *[31 TAC § 357.33(e)]*

    - **Response**: MWP secondary needs analysis after conservation and reuse has been added as Table 4-16 and Table 4-17.

12. Section 5.1.1, page 5.4. The plan does not appear to discuss the region's assessment of significant water needs relating to the assessment of aquifer storage and recovery potential for meeting the identified significant water needs. Please include at a minimum, how the region determined the threshold of significant water needs for this requirement in the final, adopted regional water plan. *[Texas Water Code (TWC) § 16.053(e)(10); 31 TAC § 357.34(h)]*

    - **Response**: The approach to selecting significant water needs will be presented at the September 2, 2020 water planning group. Text has been added to page 5-4 to reflect RWPG discussion and adoption of a 4,000 acre-feet threshold.

13. Section 5.4.1, pages 5-41 through 5-45. The plan does not clearly state if or how a quantitative analysis of environmental flow needs was taken into account in calculation of yield for the evaluation of Lake Ringgold. Please specify if an existing site-specific study or the state consensus environmental planning criteria was used in the evaluation of Lake Ringgold WMS and document this information, in the final, adopted regional water plan. [31 TAC § 357.34(e)(3)(B); 31 TAC § 358.3(22); 31 TAC § 358.3(23)]

    - **Response**. Clarification text was added to page 5-44. “In keeping consistent with the yield modeling submitted to TCEQ and the special conditions of the Draft Water Rights Permit, no instream flows were included for the Lake Ringgold project.”

14. Page 5-64, Table 5-41 and Table 5-42. The description of the Red River Authority Treated Water Line recommended WMS project appears to be presented as a separate Voluntary Transfer strategy in the text of the plan, however the Treated Water Line project appears to be related to a municipal

conservation strategy in DB22. Please ensure that the project description in the plan aligns with how the project is presented in DB22, in the final, adopted regional water plan. *[Contract Exhibit C, Section 5.6]*

- **Response**: The strategy is converting from a raw water contract with Wichita Falls to a treated water contract. Currently, RRA treats raw water from the Lake directly and the project will tie into Wichita Falls treated water system. There will be a slight increased in the overall availability by contract which is reflected in DB22 by voluntary transfer of Wichita Falls demand reduction. Clarification text has been added to section 5.5.3 and the footnote in Table 5-41 and supply have been updated to be consistent with DB22.

15. Section 5.8.5, page 5-73. The plan does not appear to include the WMS evaluation for the Bowie indirect reuse strategy, however the WMS is indicated as increasing the volume of water supply. Please include the strategy evaluation and make clear in the plan that project does not include reuse distribution lines directly to residences or commercial businesses in the final, adopted regional water plan. *[Contract Exhibit C, Section 5.5.3]*

    - **Response**: An evaluation of the indirect reuse project for the City of Bowie has been added to section 5.5.8. "The indirect reuse project includes a 6-inch pipeline from the existing wastewater treatment plant to Lake Amon Carter where it will be blended in the lake. Additional water treatment will be needed with 0.5 MGD water treatment plant expansion. Treated water will then be provided using the existing distribution system."

16. Chapter 5. Please clarify whether all potentially feasible WMSs were evaluated under drought of record conditions and document this information in the final, adopted regional water plan. *[31 TAC § 357.35(a)]*

    - **Response**: All potentially feasible WMS were evaluated under drought of record conditions. A sentence was added to Section 5.1 on Page 5-2. to clarify the evaluation under drought of record conditions.

17. Chapter 5. The plan does not appear to include the documented process used by the planning group to identify potentially feasible WMSs, as presented to the planning group in accordance with 31 TAC § 357.21(b). Please include this information in the final, adopted regional water plan. *[Contract Exhibit C, Section 5.1]*

    - **Response**: The RWPG went through a documented process to identify potentially feasible WMS at its January 10, 2018 water planning group meeting. The slides from the presentation that were also included as an attachment to the Technical Memorandum are included as an attachment to Chapter 5. Text describing the RWPG process has been added on Page 5-2 and a copy of the RWPG presentation has been added as Attachment 5-1.

18. Chapter 5. The plan does not appear to include the process of selecting

recommended WMSs and projects. Please include documentation of the process of selecting recommended WMSs and projects in the final, adopted regional water plan. *[Contract Scope of Work, Task 5A subtask 5]*

- **Response**: The RWPG went through a documented process to select recommended WMS and projects at its January 10, 2018 water planning group meeting. The slides from the presentation that were also included as an attachment to the Technical Memorandum are included as an attachment to Chapter 5. Text describing the RWPG process has been added on Page 5-2 and a copy of the RWPG presentation has been added as Attachment 5-1.

19. Chapter 5. Please include documentation of why seawater desalination was not selected as recommended WMSs in the final, adopted regional water plan. *[TWC § 16.053(e)(5)(j); Contract Exhibit C, Section 5.2; 31 § TAC 357.34(g)]*

    - **Response**: Seawater was not identified as a recommended strategy due to the cost and distance to the coast. A sentence has been added to Section 5.1.5 on Page 5-11 that seawater desal was not considered since the Gulf of Mexico is over 300 miles away.

20. Chapter 5. The plan does not appear to present management supply factors for MWPs. Please present management supply factors for MWPs by entity and decade in the final, adopted regional water plan. *[31 TAC § 357.35(g)(2)]*

    - **Response**: Management supply factors have been added for the MWP to Table 5-12 and Table 5-15.

21. Section 6.9, Table 6-1, pages 6-12 and 6-13. The plan does not appear to include a justification for unmet municipal needs. Please provide adequate justification of unmet needs for municipal WUGs as specified in rule and contract guidance. *[31 TAC § 357.50(j); Contract Exhibit C, Section 6.3]*

    - **Response**: The unmet municipal needs shown in Table 6-1 will be satisfied by voluntary transfers. Voluntary transfers will be added to DB22, so these unmet needs will be removed from Chapter 6. If any unmet needs remain a justification will be added.

22. Chapter 7. The plan does not appear to state how the region addressed recommendations from the Drought Preparedness Council, provided to planning groups on August 1, 2019. Please include a discussion on how the planning group considered the Drought Preparedness Council recommendations in the final, adopted regional water plan. *[31 TAC § 357.42(h)]*

    - **Response**: The second paragraph of Chapter 7, page 7-1 was revised to explicitly addresses the recommendations of the Drought Preparedness Council.

23. Chapter 7. The plan does not appear to include a discussion of recommendations to

the Drought Preparedness Council or recommendations regarding the State Drought Preparedness Plan. Please include any such recommendations in the final, adopted regional water plan. *[31 TAC § 357.42(i)(3)]*

- **Response**: Recommendations to the DPC and regarding the State Drought Preparedness Plan were added to Section 7.9, Other Drought Recommendations (page 7-29).

24. Chapter 11, Section 11.2.8. Please provide a brief summary of how the 2016 Plan differs from the 2021 Plan with regards to recommended and alternative WMS *projects* in the final, adopted regional water plan. *[31 TAC 357.45(c)(4)]*

    - **Response**: Section 11.2.8 has been updated in several instances to include a discussion of projects including the section heading, table captions and in the text. A sentence has also been added that the region does not have any alternative water management strategies or projects.

25. Chapter 11. Please include an assessment of the planning group's efforts at encouraging cooperation between water user groups for the purpose of achieving economies of scale and otherwise incentivizing strategies that benefit the entire region. *[TWC § 16.053(e)(12); 31 TAC § 357.45(b)]*

    - **Response**: The planning group process by its very nature encourages cooperation between water user groups. Text has been added to section 11.1 on Page 11-1 describing the process.

26. ES-Appendix. The plan includes some DB22 reports that appear blank due to the region not having relevant data for these reports. Please provide a cover page to the DB22 report appendix indicating the reason for these report contents being blank. *[Contract Exhibit C, Section 13.1.2]*

    - **Response**: Cover page has been added to Appendix G.

Level 2: Comments and suggestions for consideration that may improve the readability and overall understanding of the regional water plan.

1. Chapter 3, Section 3.1.2, p. 3-8, Lake Electra, second paragraph. Please consider clarifying the meaning of "poor performance" of Lake Electra during drought.

    - **Response**: Text has been edited to reflect "low lake levels".

2. Pages 3-12 and 3-13. Please consider adjusting the cell formatting for the reported firm yield values for Lake Kickapoo in Tables 3-1 and 3-2 so that the numbers in the yield columns align with the reservoir name.

    - **Response**: Formatting has been changed.

3. Section 3.1.3, Table 3-3, page 3-14. The run-of-river supply for the City of Henrietta is reported as 1,450 acre-feet/year (ac-ft/yr). However, the firm diversion from the

Water Availability Model (WAM) provided by Region B (TCEQ WAM dated 1/2/2013) is 1,280 ac-ft/yr, as simulated by FY card for water right A5152. Please review the firm yield reported for the City of Henrietta in Table 3-3 and revise as necessary or consider including a description of why this value might differ from the value obtained using the FY card for water right A5152.

- **Response**: The amount of supply for Henrietta has been updated based on the minimum monthly diversion, the FY record is not an appropriate approach to modeling run-of-river diversions.

4. Figure 3-2, page 3-17 shows the Cross Timbers Aquifer as individual groups. Please consider revising the image to show the entire Cross Timbers Aquifer official aquifer extent, being consistent with the display of the Blaine Aquifer.

    - **Response**: This figure will not be revised, the RWPG specifically asked for the Cross Timbers aquifer to be displayed this way. No change to the Region B plan will be made.

5. Section 3.2.1, page 3-18. The description of the Blaine Aquifer states that its outcrop area extends from Wheeler County to King County. The southernmost outcrop of the Blaine Aquifer is in Nolan County, rather than King Country. Please consider correcting or clarifying this in the final plan.

    - **Response**: Text changed from King to Nolan.

6. Section 5.1.2, page 5-5. For regional water planning purposes, reuse is considered a separate water source and water management strategy type. Please consider revising the statement that water conservation includes recycling and reuse of water in the context of regional planning.

    - **Response**: Text modified to eliminate reuse from the definition of water conservation.

7. In Section 5.3.1, pages 5-15 to 5-16, please consider including information that entities that have a financial obligation with that TWDB greater than $500,000 are also required to submit water conservation plans.

    - **Response**: Additional bullet has been added to Page 5-16.

8. Page 5-23. Please consider indicating that that 5-year water loss audits were last due to the TWDB in 2016 for the 2015 reporting year, not 2011.
    - **Response**: Corrected to 2016.
9. Section. 8.3.2, page 8-5. Please consider updating the text regarding the Lake Ringgold unique reservoir site to refer to the passage of House Bill 1042, 84th Legislative Session…
    - **Response**: Text to reference House Bill 1042 has been added. (Pg. 8-5).

10. Page 11-12 states that implementation of the municipal conservation strategy is discussed under Section 11.2.1, however this discussion does not appear to be included. Please consider revising as appropriate in the final plan.

    - **Response**: Corrected reference to 11.2.8.

11. Appendix F. Some references to regulatory citations appear incorrect, for example the references to 31 TAC § 357.34(d)(3)(A)-(d)(10) should be § 357.34(e)(3)(A)-(e)(10). Please consider correcting these references and ensure that the matrix reflects the most up to date rule references in the final plan.

    - **Response**: Appendix F updated as noted.

12. Appendix F. The matrix appears to omit rule § 357.34(e)(3)(B). Please consider adding this rule to the matrix in the final plan.

    - **Response**: Appendix F updated as noted.

13. Appendix F. Please consider updating the consistency matrix to reflect updated rule references, based on amendments to 31 TAC Chapter 357 adopted by the TWDB Board on June 4, 2020.

    - **Response**: Appendix F updated as noted.

14. The GIS files submitted for WMS projects do not include the minimum required metadata. Please include at a minimum, metadata about the data's projection, with the final GIS data submitted. *[Contract Exhibit D, Section 2.4.1]*

    - **Response**: Minimum required metadata will be provided with the final GIS submittal.

Texas Water Development Board

P.O. Box 13231, 1700 N. Congress Ave.
Austin, TX 78711-3231, www.twdb.texas.gov
Phone (512) 463-7847, Fax (512) 475-2053

Mr. Russell Schreiber, Chair
c/o City of Wichita Falls
P.O. Box 1431
Wichita Falls, Texas 76307

Mr. Randy Whiteman
Red River Authority of Texas
P.O. Box 240
Wichita Falls, Texas 76307

Re: Texas Water Development Board Comments for the Region B Regional Water Planning Group Initially Prepared Plan, Contract No. 1548301830

Dear Mr. Schreiber and Mr. Whiteman:

Texas Water Development Board (TWDB) staff have completed their review of the Initially Prepared Plan (IPP) submitted by March 3, 2020 on behalf of the Region B Regional Water Planning Group (RWPG). The attached comments follow this format:

- **Level 1:** Comments, questions, and data revisions that must be satisfactorily addressed in order to meet statutory, agency rule, and/or contract requirements; and,

- **Level 2:** Comments and suggestions for consideration that may improve the readability and overall understanding of the regional water plan.

Please note that rule references are based on recent revisions to 31 Texas Administrative Code (TAC) Chapter 357, adopted by the TWDB Board on June 4, 2020. 31 TAC § 357.50(f) requires the RWPG to consider timely agency and public comment. Section 357.50(g) requires the final adopted plan include summaries of all timely written and oral comments received, along with a response explaining any resulting revisions or why changes are not warranted. Copies of TWDB's Level 1 and 2 written comments and the region's responses must be included in the final, adopted regional water plan (*Contract Exhibit C, Section 13.1.2)*.

Standard to all planning groups is the need to include certain content in the final regional water plans that was not yet available at the time that IPPs were prepared and submitted. In your final regional water plan, please be sure to also incorporate the following:

a) Completed results from the RWPG's infrastructure financing survey for sponsors of recommended projects with capital costs, including an electronic version of the survey spreadsheet *[31 TAC § 357.44]*;
b) Completed results from the implementation survey, including an electronic version of the survey spreadsheet *[31 TAC § 357.45(a)]*;
c) Documentation that comments received on the IPP were considered in the development of the final plan *[31 TAC § 357.50(f)]*; and
d) Evidence, such as a certification in the form of a cover letter, that the final, adopted regional water plan is complete and adopted by the RWPG *[31 TAC § 357.50(h)(1)]*.

Please ensure that the final plan includes updated State Water Planning Database (DB22) reports, and that the numerical values presented in the tables throughout the final, adopted regional water plan are consistent with the data provided in DB22. For the purpose of development of the 2022 State Water Plan, water management strategy and other data entered by the RWPG in DB22 shall take precedence over any conflicting data presented in the final regional water plan *[Contract Exhibit C, Sections 13.1.3 and 13.2.2]*.

Additionally, subsequent review of DB22 data is being performed. If issues arise during our ongoing data review, they will be communicated promptly to the planning group to resolve. Please anticipate the need to respond to additional comments regarding data integrity, including any source overallocations, prior to the adoption of the final regional water plans.

The provision of certain content in an electronic-only form is permissible as follows: Internet links are permissible as a method for including model conservation and drought contingency plans within the final regional water plan; hydrologic modeling files may be submitted as electronic appendices, however all other regional water plan appendices should also be incorporated in hard copy format within each plan *[31 TAC § 357.50(g)(2)(C), Contract Exhibit C, Section 13.1.2 and 13.2.1]*.

The following items must accompany, the submission of the final, adopted regional water plan:

1. The prioritized list of all recommended projects in the regional water plan, including an electronic version of the prioritization spreadsheet *[31 TAC § 357.46];* and,
2. All hydrologic modeling files and GIS files, including any remaining files that may not have been provided at the time of the submission of the IPP but that were used in developing the final plan *[31 TAC § 357.50(g)(2)(C), Contract Exhibit C, Section 13.1.2, and 13.2.1].*

The following general requirements that apply to recommended water management strategies must be adhered to in all final regional water plans including:

1. Regional water plans must not include any recommended strategies or project costs that are associated with simply maintaining existing water supplies or replacing existing infrastructure. Plans may include only infrastructure costs that are associated with volumetric increases of treated water supplies delivered to water

user groups or that result in more efficient use of existing supplies *[31 TAC § 357.10(39), § 357.34(e)(3)(A), Contract Exhibit C, Sections 5.5.2 and 5.5.3]*; and,

2. Regional water plans must not include the costs of any retail distribution lines or other infrastructure costs that are not directly associated with the development of additional supply volumes (e.g., via treatment) other than those line replacement costs related to projects that are for the primary purpose of achieving conservation savings via water loss reduction *[§ 357.34(e)(3)(A), Contract Exhibit C, Section 5.5.3]*.

Please provide the TWDB with information on how you intend to address all Level 1 comments well in advance of your adoption the regional water plan to ensure that the response is adequate for the Executive Administrator to recommend the plan to the TWDB Board for consideration in a timely and efficient manner. Your TWDB project manager will review and provide feedback to ensure all IPP comments and associated plan revisions have been addressed adequately. Failure to adequately address any Level 1 comment may result in the delay of the TWDB Board approval of your final regional water plan.

As a reminder, the deadline to submit the final, adopted regional water plan and associated material to the TWDB is **October 14, 2020**. Any remaining data revisions to DB22 must be communicated to Sabrina Anderson at Sabrina.Anderson@twdb.texas.gov by **September 14, 2020.**

If you have any questions regarding these comments or would like to discuss your approach to addressing any of these comments, please do not hesitate to contact Kevin Smith at (512) 475-1561 or Kevin.Smith@twdb.texas.gov. TWDB staff will be available to assist you in any way possible to ensure successful completion of your final regional water plan.

Sincerely,

Jessica Zuba
Deputy Executive Administrator
Water Supply and Infrastructure

Date:

Attachment

c w/att.: Mr. Kerry Maroney, Biggs & Mathews

TWDB comments on the Initially Prepared 2021 Region B Regional Water Plan.

Level 1: Comments, questions, and data revisions that must be satisfactorily addressed in order to meet statutory, agency rule, and/or contract requirements.

1. Chapter 5 and the State Water Planning Database (DB22). The plan includes the following recommended water management strategies (WMS) by WMS type, providing supply in 2020 (not including demand management): two *groundwater wells & other* and one *indirect reuse*. **Strategy supply with an online decade of 2020 must be constructed and delivering water by January 5, 2023**. Please confirm that all strategies shown as providing supply in 2020 are expected to be providing water supply by January 5, 2023. *[31 § TAC 357.10(21); Contract Exhibit C, Section 5.2]*

2. Section 1.14, page 1-30. The plan appears to reference an old rule definition of wholesale water providers (WWP). Please revise the definition of WWPs in accordance with 31 Texas Administrative Code (TAC) § 357.10(44) and clarify whether the entities listed in Section 1.14 are also considered major water providers (MWP). Please include a description of MWPs within the region in Chapter 1 of the final, adopted regional water plan. *[31 TAC § 357.30(4)]*

3. Chapter 1. Please include a discussion of the historic drought(s) of record within the planning area in Chapter 1 of the final, adopted regional water plan. *[31 TAC § 357.30(9)]*

4. Chapter 1. Please include a discussion of the current preparation for drought within the planning area in Chapter 1 of the final, adopted regional water plan. *[31 TAC § 357.30(10)]*

5. Chapter 1. Please include a discussion of compiled water loss audit information performed by retail public utilities in Chapter 1 of the final, adopted regional water plan. *[31 TAC § 357.30(11)]*

6. Section 3.1.3, Table 3-3, page 3-14. The City of Henrietta relies entirely on run of river supply. According to the footnote on page 3-14, run-of-river surface water availability has been determined using minimum *annua*l diversion, which is prohibited by rule and contract guidance. Minimum *monthly* diversion amounts must be used to determine run-of-river water availability for the City of Henrietta in the final, adopted regional water plan. *[31 TAC § 357.32(c)(2); Contract Exhibit C, Section 3.6.2]*

7. Section 3.1.3, page 3-15. Please confirm whether the local surface water supplies listed in Table 3-15 are firm supplies under drought conditions and document this

information in the final, adopted regional water plan. *[31 TAC § 357.32(a); Contract Exhibit C, Section 3.7]*

8. Section 3.2.2, Table 3-4, page 3-21. Modeled available groundwater (MAG) values for the Seymour Aquifer in Baylor County are incorrect for the years 2030, 2050 and 2070. Each value is lower than the MAG value by 1 acre-foot per year. Please correct these values in the final, adopted regional water plan. *[31 TAC § 357.32(d)]*

9. Section 3.2.2, Table 3-5, page 3-21. The plan presents the methods used to estimate groundwater availability for aquifers without MAG values; however, it is not clear what information was considered for the Blaine Aquifer in King County. Please include additional details on what information the planning group considered in the final, adopted regional water plan. *[Contract Exhibit C, Section 3.5.2]*

10. Section 4.2.2, pages 4-8 and 4-9. The plan does not appear to include needs for MWPs reported by category of use including municipal, mining, manufacturing, irrigation, steam electric, mining, and livestock. Please report the results of the needs analysis for MWPs by categories of use as applicable in the region in the final, adopted regional water plan. *[31 TAC § 357.33(b)]*

11. Section 4.6, page 4-16. The plan does not appear to include a secondary needs analysis for MWPs. Please present the results of the secondary needs analysis by decade for MWPs in the final, adopted regional water plan. *[31 TAC § 357.33(e)]*

12. Section 5.1.1, page 5.4. The plan does not appear to discuss the region's assessment of significant water needs relating to the assessment of aquifer storage and recovery potential for meeting the identified significant water needs. Please include at a minimum, how the region determined the threshold of significant water needs for this requirement in the final, adopted regional water plan. *[Texas Water Code (TWC) § 16.053(e)(10); 31 TAC § 357.34(h)]*

13. Section 5.4.1, pages 5-41 through 5-45. The plan does not clearly state if or how a quantitative analysis of environmental flow needs was taken into account in calculation of yield for the evaluation of Lake Ringgold. Please specify if an existing site-specific study or the state consensus environmental planning criteria was used in the evaluation of Lake Ringgold WMS and document this information, in the final, adopted regional water plan. *[31 TAC § 357.34(e)(3)(B); 31 TAC § 358.3(22); 31 TAC § 358.3(23)]*

14. Page 5-64, Table 5-41 and Table 5-42. The description of the Red River Authority Treated Water Line recommended WMS project appears to be presented as a separate Voluntary Transfer strategy in the text of the plan, however the Treated Water Line project appears to be related to a municipal conservation strategy in DB22. Please ensure that the project description in the plan aligns with how the project is presented in DB22, in the final, adopted regional water plan. *[Contract Exhibit C, Section 5.6]*

15. Section 5.8.5, page 5-73. The plan does not appear to include the WMS evaluation for the Bowie indirect reuse strategy, however the WMS is indicated as increasing the volume of water supply. Please include the strategy evaluation and make clear in the plan that project does not include reuse distribution lines directly to residences or commercial businesses in the final, adopted regional water plan. *[Contract Exhibit C, Section 5.5.3]*

16. Chapter 5. Please clarify whether all potentially feasible WMSs were evaluated under drought of record conditions and document this information in the final, adopted regional water plan. *[31 TAC § 357.35(a)]*

17. Chapter 5. The plan does not appear to include the documented process used by the planning group to identify potentially feasible WMSs, as presented to the planning group in accordance with 31 TAC § 357.21(b). Please include this information in the final, adopted regional water plan. *[Contract Exhibit C, Section 5.1]*

18. Chapter 5. The plan does not appear to include the process of selecting recommended WMSs and projects. Please include documentation of the process of selecting recommended WMSs and projects in the final, adopted regional water plan. *[Contract Scope of Work, Task 5A subtask 5]*

19. Chapter 5. Please include documentation of why seawater desalination was not selected as recommended WMSs in the final, adopted regional water plan. *[TWC § 16.053(e)(5)(j); Contract Exhibit C, Section 5.2; 31 § TAC 357.34(g)]*

20. Chapter 5. The plan does not appear to present management supply factors for MWPs. Please present management supply factors for MWPs by entity and decade in the final, adopted regional water plan. *[31 TAC § 357.35(g)(2)]*

21. Section 6.9, Table 6-1, pages 6-12 and 6-13. The plan does not appear to include a justification for unmet municipal needs. Please provide adequate justification of unmet needs for municipal WUGs as specified in rule and contract guidance. *[31 TAC § 357.50(j); Contract Exhibit C, Section 6.3]*

22. Chapter 7. The plan does not appear to state how the region addressed recommendations from the Drought Preparedness Council, provided to planning groups on August 1, 2019. Please include a discussion on how the planning group considered the Drought Preparedness Council recommendations in the final, adopted regional water plan. *[31 TAC § 357.42(h)]*

23. Chapter 7. The plan does not appear to include a discussion of recommendations to the Drought Preparedness Council or recommendations regarding the State Drought Preparedness Plan. Please include any such recommendations in the final, adopted regional water plan. *[31 TAC § 357.42(i)(3)]*

24. Chapter 11, Section 11.2.8. Please provide a brief summary of how the 2016 Plan differs from the 2021 Plan with regards to recommended and alternative WMS *projects* in the final, adopted regional water plan. *[31 TAC 357.45(c)(4)]*

25. Chapter 11. Please include an assessment of the planning group's efforts at encouraging cooperation between water user groups for the purpose of achieving economies of scale and otherwise incentivizing strategies that benefit the entire region. *[TWC § 16.053(e)(12); 31 TAC § 357.45(b)]*

26. ES-Appendix. The plan includes some DB22 reports that appear blank due to the region not having relevant data for these reports. Please provide a cover page to the DB22 report appendix indicating the reason for these report contents being blank. *[Contract Exhibit C, Section 13.1.2]*

Level 2: Comments and suggestions for consideration that may improve the readability and overall understanding of the regional water plan.

1. Chapter 3, Section 3.1.2, p. 3-8, Lake Electra, second paragraph. Please consider clarifying the meaning of "poor performance" of Lake Electra during drought.

2. Pages 3-12 and 3-13. Please consider adjusting the cell formatting for the reported firm yield values for Lake Kickapoo in Tables 3-1 and 3-2 so that the numbers in the yield columns align with the reservoir name.

3. Section 3.1.3, Table 3-3, page 3-14. The run-of-river supply for the City of Henrietta is reported as 1,450 acre-feet/year (ac-ft/yr). However, the firm diversion from the Water Availability Model (WAM) provided by Region B (TCEQ WAM dated 1/2/2013) is 1,280 ac-ft/yr, as simulated by FY card for water right A5152. Please review the firm yield reported for the City of Henrietta in Table 3-3 and revise as necessary or consider including a description of why this value might differ from the value obtained using the FY card for water right A5152.

4. Figure 3-2, page 3-17 shows the Cross Timbers Aquifer as individual groups. Please consider revising the image to show the entire Cross Timbers Aquifer official aquifer extent, being consistent with the display of the Blaine Aquifer.

5. Section 3.2.1, page 3-18. The description of the Blaine Aquifer states that its outcrop area extends from Wheeler County to King County. The southernmost outcrop of the Blaine Aquifer is in Nolan County, rather than King Country. Please consider correcting or clarifying this in the final plan.

6. Section 5.1.2, page 5-5. For regional water planning purposes, reuse is considered a separate water source and water management strategy type. Please consider revising the statement that water conservation includes recycling and reuse of water in the context of regional planning.

7. In Section 5.3.1, pages 5-15 to 5-16, please consider including information that entities that have a financial obligation with that TWDB greater than $500,000 are also required to submit water conservation plans.

8. Page 5-23. Please consider indicating that that 5-year water loss audits were last due to the TWDB in 2016 for the 2015 reporting year, not 2011.

9. Section. 8.3.2, page 8-5. Please consider updating the text regarding the Lake Ringgold unique reservoir site to refer to the passage of House Bill 1042, 84th Legislative Session.

10. Page 11-12 states that implementation of the municipal conservation strategy is discussed under Section 11.2.1, however this discussion does not appear to be included. Please consider revising as appropriate in the final plan.

11. Appendix F. Some references to regulatory citations appear incorrect, for example the references to 31 TAC § 357.34(d)(3)(A)-(d)(10) should be § 357.34(e)(3)(A)-(e)(10). Please consider correcting these references and ensure that the matrix reflects the most up to date rule references in the final plan.

12. Appendix F. The matrix appears to omit rule § 357.34(e)(3)(B). Please consider adding this rule to the matrix in the final plan.

13. Appendix F. Please consider updating the consistency matrix to reflect updated rule references, based on amendments to 31 TAC Chapter 357 adopted by the TWDB Board on June 4, 2020.

14. The GIS files submitted for WMS projects do not include the minimum required metadata. Please include at a minimum, metadata about the data's projection, with the final GIS data submitted. *[Contract Exhibit D, Section 2.4.1]*

TEXAS PARKS & WILDLIFE

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June 22, 2020

Mr. Russel Schreiber, P.E., RWPG-B Chair
Red River Authority of Texas
P.O. Box 240
Wichita Falls, TX 76307

Re: 2021 Region B Initially Prepared Plan

Dear Mr. Schreiber,

Thank you for seeking review and comment from the Texas Parks and Wildlife Department ("TPWD") on the 2021 Initially Prepared Regional Water Plan (IPP) for the Region B Water Planning Area. Water impacts every aspect of TPWD's mission to manage and conserve the natural and cultural resources of Texas. Although TPWD has limited regulatory authority over the use of state waters, we are the agency charged with primary responsibility for protecting the state's fish and wildlife resources. To that end, TPWD offers these comments intended to help avoid or minimize impacts to state fish and wildlife resources.

TPWD understands that regional water planning groups are guided by 31 TAC §357 when preparing regional water plans. These water planning rules spell out requirements related to natural resource and environmental protection. Accordingly, TPWD staff reviewed the IPP with a focus on the following questions:

- Does the IPP include a quantitative reporting of environmental factors including the effects on environmental water needs and habitat?
- Does the IPP include a description of natural resources and threats to natural resources due to water quantity or quality problems?
- Does the IPP discuss how these threats will be addressed?
- Does the IPP describe how it is consistent with long-term protection of natural resources?
- Does the IPP include water conservation as a water management strategy?
- Does the IPP include Drought Contingency Plans?
- Does the IPP recommend any stream segments be nominated as ecologically unique?
- Does the IPP address concerns raised by TPWD in connection with the 2016 Water Plan?

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512.389.4800
www.tpwd.texas.gov

TPWD appreciates changes that were made to the 2016 Region B Regional Water Plan in response to our comments at that time. However, several concerns remain and will be reiterated here. The 2021 Region B IPP is similar to the 2016 Region B Water Plan. Population projections remain unchanged, with a total expected population of 229,000 by 2070. The water demands in the Region B 2021 plan decreased in 2020 in comparison to the 2016 plan by approximately 4 percent with essentially no change by 2070. Irrigation comprises the majority of future water needs, making up 73 percent of the total.

Water conservation, the most environmentally benign water management strategy, is expected to meet nearly half of future water needs in the region by 2070. Per capita municipal water use is predicted to gradually decline from 144 gallons per capita per day (gpcd) in 2020 to 135 gpcd in 2070, exceeding the State water conservation goal of 140 gpcd. Other strategies include construction of Lake Ringgold, new and/or expanded use of groundwater, and wastewater reuse projects. In addition, the continued operation and funding of Red River Chloride Control Project is recommended. Some strategies considered in the 2016 Plan were in response to the then on-going drought and were considered potential short-term emergency supplies to meet immediate needs but would not be long-term sustainable supplies. For example, the Wichita River supply project considered to meet water needs for the City of Wichita Falls is no longer recommended, thus avoiding potential instream habitat impacts.

As in previous plans, Chapter 1 includes a description of natural resources in the region. The Region B IPP recognizes the importance of natural resources and discusses the importance of this region to migrating and wintering waterfowl. Ten major waterbodies in the region include Lake Kemp/Diversion, Lake Kickapoo/Arrowhead, Amon Carter Lake, Lake Electra, Lake Nocona, Olney Lake, Santa Rosa Lake, and North Fork Buffalo Creek. Lake Wichita is discussed on page 3-9 and described as being used for recreational purposes. Major rivers in the region include the Pease, Little Wichita, Wichita, and Beaver Rivers. Major aquifers in the region include the Seymour and Trinity aquifers. Based on the 1981 "Springs of Texas" report by Gunnar Brune the IPP identifies the following major springs in the region as of 1970: Buffalo Springs, Barrel Springs, China Springs, Doans Springs and Condon Springs. At least one of these springs, Barrel Springs, has ceased flowing. According to the IPP, at one time there were roughly 150 natural springs in the region, but many have ceased to flow due to over-pumping of groundwater. The few small springs that continue to flow feed ponds and creeks that provide habitat for a number of plant and animal species. The Region B Plan acknowledges the increased use of groundwater can decrease instream flows if the base flow is supported by spring flow, which can negatively impact rare aquatic species. TWDB planning rules now require that groundwater supplies not exceed the Modeled Available Groundwater (MAG) values that were determined to meet the desired future conditions (DFCs) of the groundwater source. However, DFCs have not been adopted to address the maintenance of spring flows or groundwater surface interactions. Ultimately TPWD would like to see DFCs adopted to protect these features.

Increased use of groundwater also has the potential to increase TDS concentrations in area streams if the groundwater sources have higher concentrations of TDS. The IPP proposes to dispose of reverse osmosis reject water via discharge to surface streams rather than deep well injection, which could cause further impacts to sensitive species.

Chapter 1 also includes a discussion of freshwater mussels and minnows, noting their usefulness as water quality indicators. In addition, these species are also important indicators of instream habitat, natural flow regimes, stream connectivity, and geomorphic processes. Prairie stream fishes native to the Red River Basin (including the Wichita and Pease rivers) include Red River Pupfish, Plains Minnow, Silver Chub, Prairie Chub, Chub Shiner, Silverband Shiner, and Red River Shiner and are emblematic of these unique and ecologically significant ecosystems. However, these species have shown serious declines in abundance and reductions in distribution and are now threatened with imperilment. In fact, on March 30, 2020, TPWD added Red River Pupfish, Chub Shiner, and Prairie Chub to the State Threatened Species List; the Smalleye Shiner and Sharpnose Shiner were also added to the State Endangered Species List (these two shiners occur in the Brazos River upstream of Possum Kingdom Lake). Currently the Prairie Chub is being considered for listing by the US Fish and Wildlife Service. Plains Minnow is recommended for addition to the Species of Greatest Conservation Needs list.

Threats to prairie stream fishes includes hydrologic alteration, fragmentation of stream habitats caused by reservoir construction and changes in water quality. For example, all of the minnows are short-lived (~2-3 years) and require long reaches of river and natural flow regimes to support annual reproduction and recruitment. Projects that further fragment and alter hydrology and water quality negatively impact these species, potentially leading to further imperilment and eventually extirpation. In addition, groundwater pumping has negatively impacted the natural flow regime, fragmenting river reaches and altering water quality. Chloride control projects constructed in the Red River Basin including the Wichita River system by design alter natural salinity regimes, alter habitats, reduce connectivity, and can dewater downstream habitats. Natural brine springs play an important role in these prairie river ecosystems since they contribute a strong salinity gradient, structuring fish assemblages whereby only tolerant species such as State Threatened Red River Pupfish occur in high salinity headwater reaches.

Table 1-13 lists species identified as threatened or endangered that are known to, or may potentially occur in Region B. There have been recent updates (March 30, 2020) to the list of federal and state listed species and Species of Greatest Conservation need, including species in Region B counties. We recommend that you update Table 1.13 with the latest information that is available at: https://tpwd.texas.gov/huntwild/wild/wildlife_diversity/nongame/listed-species/

The IPP includes a discussion of water-related threats to natural resources. According to the IPP excessive concentrations of Total Dissolved Solids (TDS), sulfate, and chloride are a general problem in most streams of the Red River Basin under low flow conditions. The high salt concentrations are caused, in large part, by the presence of saltwater springs, seeps, and gypsum outcrops. Saltwater springs are generally located in the western portion of the (Red River) basin in the upper reaches of the Wichita River, the North and South Forks of the Pease River, and the Little Red, which is a tributary to the Prairie Dog Town Fork of the Red River. The plan also mentions that Diversion and Kemp lakes have high chloride levels. The IPP proposes to address these water quality issues through continued support of the Red River Chloride Control Project (RRCCP). TPWD staff continues to have concerns regarding the impact of chloride control projects on fish and wildlife resources and will remain engaged in regulatory, monitoring, and environmental response programs.

Each of the water management strategies discussed in Chapter 5 has a short description of associated environmental issues. Potential impacts to sensitive environmental factors including wetlands, threatened and endangered species, unique wildlife habitats, and cultural resources are considered. In most cases, a detailed evaluation could not be completed because previous studies have not been conducted or the specific location of the new source (such as a groundwater well field) was not identified. Therefore, it is reported that a more detailed environmental assessment will be required before a strategy is implemented. Appendix D includes a Strategy Evaluation Matrix and Quantified Environmental Impact Matrix. Environmental categories including number of habitat acres impacted, environmental water needs, threatened and endangered species, water quality, bays and estuaries, and cultural resources are quantitatively assessed and assigned a ranking from 1 to 5, with 1 being most impact and 5 being least or positive impact. Lake Ringgold, proposed to be built on the Little Wichita River received an environmental score of 3 (low impact). According to the IPP, Lake Ringgold will impact approximately 120 acres of existing ponds and stock tanks and approximately 165 miles of streams. At the conservation elevation of 844 feet, approximately 910 acres of wetlands will be impacted. As previously discussed, TPWD continues to have concerns related to the lack of information regarding potential impacts to instream flows, habitat fragmentation, and dependent aquatic ecosystems.

The plan does not recommend nomination of any stream segments as ecologically unique. As in the 2016 plan, the IPP states that the planning group is "committed to the protection and conservation of unique and sensitive areas within the region" and a "more comprehensive study with supporting data is necessary to accurately characterize and evaluate … stream segments." At this time, no studies have been defined or proposed. TPWD is available to assist with this effort.

Thank you for your consideration of these comments. TPWD looks forward to continuing to work with the planning group to develop water supply strategies that not only meet the future water supply needs of the region but also preserve the ecological health of the region's aquatic resources. Please contact me at (512) 389-8715 or Cindy.Loeffler@TPWD.Texas.gov if you have any questions or comments.

Sincerely,

Cindy Loeffler

Cindy Loeffler, Chief
Water Resources Branch

CL:lc

Cc: Craig Bonds, Division Director, Inland Fisheries Division, TPWD
Robert Mauk, Inland Fisheries Division, TPWD

TEXAS STATE SOIL AND WATER CONSERVATION BOARD

Protecting and Enhancing Natural Resources for Tomorrow

June 18, 2020

Mr. Russell Schreiber, P.E.
Region B Chair

Dear Mr. Schreiber;

For the past 2 years the Texas State Soil and Water Conservation Board (TSSWCB) has been participating in the Texas Water Development Board's (TWDB) Regional Water Planning meetings as directed by Senate Bill 1511, passed in the 2017 legislative session. We appreciate being included in the process and offer these constructive comments to the regional water plans and ultimately the State water plan. Attached you will find some specific comments to the Region B water plan as they pertain to the TSSWCB.

As you may know 82% of Texas' land area is privately-owned and are working lands, involved in agricultural, timber, and wildlife operations. These lands are important as they provide substantial economic, environmental, and recreational resources that benefit both the landowners and public. They also provide ecosystem services that we all rely on for everyday necessities, such as air and water quality, carbon sequestration, and wildlife habitat.

With that said, these working lands are where the vast majority of our rain falls and ultimately supply the water for all of our needs, such as municipal, industrial, wildlife, and agricultural to name a few. Texas' private working lands are a valuable resource for all Texans.

Over the years, the private landowners of these working lands have been good stewards of their property. In an indirect way they have been assisting the 16 TWDB's Regional Water Planning Groups in achieving their goals through voluntary incentive-based land conservation practices.

It has been proven over time if a raindrop is controlled where it hits the ground there can be a benefit to both water quality and water quantity. Private landowners have been providing benefits to our water resources by implementing Best Management Practices (BMP) that slow water runoff and provide for soil stabilization, which also slows the sedimentation of our reservoirs and allows for more water infiltration into our aquifers.

1497 Country View Lane • Temple, TX 76504-8806
Phone: 254-773-2250 • Fax: 254-773-3311
http://www.tsswcb.texas.gov

Some common BMPs include brush management, prescribed grazing, fencing, grade stabilization, irrigation land leveling, terrace, contour farming, cover crop, residue and tillage management, and riparian herbaceous cover.

The TSSWCB has been active with agricultural producers since 1939 as the lead agency for planning, implementing, and managing coordinated natural resource conservation programs for preventing and abating agricultural and sivicultural nonpoint sources of water pollution.

The TSSWCB also works to ensure that the State's network of over 2,000 flood control dams are protecting lives and property by providing operation, maintenance, and structural repair grants to local government sponsors.

The TSSWCB successfully delivers technical and financial assistance to private landowners of Texas through Texas' 216 local Soil and Water Conservation Districts (SWCD) which are led by 1,080 locally elected district directors who are active in agriculture. Through the TSSWCB Water Quality Management Plan Program (WQMP), farmers, ranchers, and silviculturalists receive technical and financial assistance to voluntarily conserve and protect our natural resources. Participants receive assistance with conservation practices, BMPs, that address water quality, water quantity, and soil erosion while promoting the productivity of agricultural lands. This efficient locally led conservation delivery system ensures that those most affected by conservation programs can make decisions on how and what programs will be implemented voluntarily on their private lands.

Over time, lands change ownership and many larger tracts are broken up into smaller parcels. Most new landowners did not grow up on working lands and therefore may not have a knowledge of land management techniques. The TSSWCB is writing new WQMPs for these new landowners who are implementing BMPs on their land. Education and implementation of proper land management and BMPs continues to be essential. Voluntary incentive-based programs are essential to continue to address soil and water conservation in Texas.

These BMPs implemented for soil and water conservation provide benefits not only to the landowner but ultimately to all Texans and our water supply.

Respectfully,

Barry Mahler
Chairman

Rex Isom
Executive Director

Attachment

1497 Country View Lane • Temple, TX 76504-8806
Phone: 254-773-2250 • Fax: 254-773-3311
http://www.tsswcb.texas.gov

Region B

- Page 5-10

"WSEP considers priority watersheds across the state, the need for conservation within the territory of a proposed projection based on the State Water Plan and if the Regional Water Planning Group has identified brush control as a strategy in the State Water Plan as part of their competitive grant, cost sharing program."

    - Unfortunately, the Water Supply Enhancement Program is not a funded program at this time.

1497 Country View Lane • Temple, TX 76504-8806
Phone: 254-773-2250 • Fax: 254-773-3311
http://www.tsswcb.texas.gov

Mr. Russell Schreiber, P.E., RWPG-B Chair
c/o Red River Authority of Texas
PO Box 240
Wichita Falls, Texas 76307
rwpg-b@rra.texas.gov

Mr. Russell Schreiber and all other involved parties;

I read your report concerning the proposed Ringgold Reservoir, and as you did invite opinions, I'd like to give you mine. I am a voting citizen of Petrolia Texas and although I'll not be living by the time this reservoir is built I don't believe anything should happen to improve anybody's water, now or in the future, until something is done about the water in the city of Petrolia. If you start on it now it can be finished by that time.

Petrolia has got the worst water I've ever seen in my life. I feel like I'm living in a third world country. Had I known about the water situation I never ever would have bought a house in this town. In my opinion, it's disgusting. I don;t know if any of you have ever lived in Petrolia or lives here currently but if not, you really ought to come down and try the water.

I can't use my dishwasher because there is dirt on my dishes when it's done. When it gets real bad you need to call the water department so they can flush the hydrant. This is ridiculous. You can't wash your car with it, otherwise you can't see out the windows when it's dry. I learned that the hard way. I'm sure eventually I'll have to replace all my clothes because I wash them in this water. I'm also sure I'll prematurely have to replace all the pipes in my water ran appliances due to corrosion. And nobody is going to reimburse us for that! I don't feel comfortable showering in it. And cleaning the toilet is nearly impossible. You have to use a pumice stone to get the hard water ring out. I wonder if any of you would deal with this? You can't cook with it or drink it so you have the added expense of having water delivered or buying it at the dollar store. But we don't get reimbursed for that nor do we get any consideration on the water bill, which is higher than it should be. I pay an extra $40.00 a month for drinkable water.

I was told by the ladies at the church when I first moved here that they voted down an offer to connect Petrolia to Wichita Falls water because obviously no one talked to them about it and they believed that the next time Wichita Falls had a drought, Petrolia would be the first ones to have the water shut off. I hope that would never happen!

And now you want to tax the people of Petrolia in the future to build a reservoir that will, according to the report, benefit everyone but the people of Petrolia. I myself, will not vote to pay extra taxes to improve everyone else's water! Petrolia was not listed as one of the towns to get more and better water. The way that report reads Petrolia is being treated like a stepchild. We might be small but we count! Petrolia needs to be tied into a town with decent water, NOW! In

this country we are concerned about third world countries that do not have clean water. And the poor children and all that stuff. We need to concern ourselves with our own residents who don't have decent drinking water.

I received a report a while back concerning the water in Petrolia from the city of Petrolia. It showed a consumer confidence report for the public water system - city of Petrolia. It also showed a couple of instances when the water was not inspected as it should have been. We don't believe the water is clean enough to drink and they want to skip inspections!! I certainly think those inspections should be a top priority. I understand this is a little off subject but if we're going to talk about water then let's talk about water.
The plan is to put that reservoir in Clay County. Well, Petrolia is part of Clay County. I was always taught that you take care of your own first. And this is how and why I will vote if the reservoir ever makes it to a ballot. And I would like to think I am not the only one in Petrolia who thinks this way.

Respectfully,

Retha J.Cook
309 N. Belmont Ave.
Petrolia, Texas 76377-0363

From: Sharon Fitts
To: rwpg-b@rra.texas.gov
Subject: Lake Ringgold project
Date: Thursday, April 16, 2020 4:10:05 PM

April 16, 2020

Dear Mr. Schreiber and Committee Members,

My name is Sharon Fitts. My husband, children and I own land that will be inundated by Lake Ringgold. This land has been in my family for many years and will be greatly impacted by the building of Lake Ringgold. It is used for hay production, cattle feeding and hunting. While I understand that I may not be able to stop the Lake Ringgold project, I think it is only fair for the landowners to keep the property up to the actual waterbank. Therefore, please do not allow the City of Wichita Falls to purchase the land surrounding the lake. It would not benefit my family or the residents in Clay County/Henrietta.

Additionally, the building of the lake will put burden upon the taxpayers and residents of Clay County who have to maintain the surrounding area. I see no reason why there would needs to be a pipeline from Lake Ringgold to Lake Arrowhead either. With the conservative operations put into practice by Wichita Falls during the last drought, it is not necessary to build Lake Ringgold.

My contact information is below. I am happy to discuss this matter with you. I am sending this letter by mail as well.

Sincerely,

Sharon Fitts

402 Kay Street

Henrietta, Texas 76365

940 704-8448

Wichita Falls
TEXAS
Blue Skies. Golden Opportunities.

OFFICE OF THE MAYOR

RECEIVED
APR 15 2020
BY:

April 15, 2020

Mr. Russell Schreiber P.E. RWPG-B Chair
c/o Red River Authority of Texas
P.O. Box 240
Wichita Falls, Texas 76307

Re: 2021 Region B Initially Prepared Plan

Dear Mr. Schreiber,

Planning for the future water supply for the State of Texas is of the utmost importance, particularly in the Wichita Falls area. Wichita Falls is the largest municipal water supplier in the entire North Central Texas region, supplying water to more than 150,000 residents that call the region home.

Wichita Falls understands better than any other municipality or water supplier how critical planning for a future water supply is. From the fall of 2010 through the spring of 2015, our region experienced a new Drought of Record that had debilitating and extreme effects on our citizens, businesses, and communities. Record high temperatures coupled with record low rainfall caused our water supply reservoirs to drop below 19% combined remaining supply. The impact of these severe drought conditions tested the continued viability of our region—with residents selling homes and moving away, businesses closing, and Sheppard Air Force Base preparing to move missions to other bases. As such, no one can question that Wichita Falls, more than any other city in Texas, truly grasps the importance of water supply.

In light of Wichita Falls' understanding of the crucial importance of water supply planning, I want to express Wichita Falls' full support for the Region B Initially Prepared Plan (the "Plan"). The Plan reflects the lessons learned from the most recent Drought of Record and the reality that there could be an even worse drought of record in the future. Furthermore, the Plan evaluates and fully addresses the future water supply needs of not only Wichita Falls, but the entire North Central Texas region. In particular, the Plan's recommendation for Wichita Falls to pursue the development of Lake Ringgold recognizes Lake Ringgold as the only reasonable water supply option available to Wichita Falls and the customers it serves. The Plan also appropriately recognizes the unique value of the reservoir site for Lake Ringgold consistent with the Texas Legislature's 2015 re-designation of Lake Ringgold as a "unique" reservoir site, meaning the site is of unique value for reservoir construction. The Plan's recommendation for Wichita Falls to pursue the development of Lake Ringgold as its next water supply fully aligns with the City's goals of ensuring a viable water supply for generations to come.

On behalf of Wichita Falls, I fully recommend the 2021 Region B Initially Prepared Plan be adopted and included as part of the overall 2022 State Water Plan.

Respectfully,

Stephen L. Santellana
Mayor, City of Wichita Falls.

CITY OF WICHITA FALLS
1300 7th Street • P.O.Box 1431 • Wichita Falls, Texas 76307 • t: (940) 761-7404 • f: (940) 761-8833
www.wichitafallstx.gov

TEXOMA STEWARDSHIP COALITION

RECEIVED

JUN 23 2020

BY:

June 22, 2020

Mr. Russell Schreiber, Region B Chair
c/o Red River Authority of Texas
P.O. Box 240
Wichita Falls, TX 76307
(940) 723-2236

Re: Public Comments – Draft Revision on the Region B Initially Prepared Plan
Submitted via email at: rwpg-b@rra.texas.gov

Dear Mr. Schreiber and the Region B Planning Committee,

On behalf of the Texoma Stewardship Coalition, I appreciate making these written comments regarding the construction of proposed Lake Ringgold. These comments reflect the verbal comments made during the public hearing held on Wednesday, April 22, at 6:00pm via telephone conference.

Please note the following:

1. ***There is NO need to build another reservoir***
    a. The City of Wichita Falls, citizens and businesses are to be commended for their excellent conservation efforts. The Potable Water Reuse Project is efficient, resourceful, and cost-effective. This endeavor set a global standard for water conservation and availability.
    b. The City of Wichita Falls has enough existing water supply to meet demands far into the future. Current demand is approximately 31,329 acre feet per year (AFY). Demand is anticipated to increase slightly to 32,306 AFY in 2070.
    c. The City of Wichita Falls was the ***only*** city out of the 25 largest Texas cities to decline in population in the last decade.
2. ***The COST of the project***
    a. In 2017, the cost of the project was estimated at approximately $322 million.
    b. In the latest proposal, the cost ballooned in just three years to an estimate of $443 million.
    c. With interest, the cost will approximate $1 billion.
    d. Certainly, there are more pressing needs for the citizens of Wichita Falls.
3. ***The Transparency or Lack of Transparency of the proposed project***
    a. There is a critical need to educate the citizens and businesses of Wichita Falls about all aspects of the planned reservoir.
    b. Myths abound including
        i. The City already owns the land for the reservoir. Truth is, the City only owns approximately 6,000 acres out of the 23,000 acres needed to construct and mitigate the building of the reservoir.

ii. Nothing is happening; it's been talked about for decades; it will never get built. Truth is, as these public comments allow, the City of Wichita Falls is silently moving into the last round in the permit application process.

iii. No money is being spent on the project. Truth is, the City has incurred expenses for exploratory engineering, feasibility, and environmental studies. How much has been spent? Where are the expenses itemized in the city's budget? Who are the partners?

4. ***Unanswered Questions Remain***
   a. What is the current plan to take water back to Wichita Falls from proposed Lake Ringgold? In the original plan a pipeline was to be built from the reservoir to the City of Wichita Falls. In the revised plan, there is a new pipeline that goes from the proposed reservoir back to Lake Arrowhead. What property owners are impacted? What is the cost of this revision?
   b. Impacted landowners want to know if they will have access to the water. Can they develop lakefront property?
   c. Who will pay the costs incurred by the City of Henrietta and Clay County resulting from the construction and maintenance of the proposed reservoir? These costs are not identified in the current budget.
   d. What are the environmental impacts? What are the impacts to wildlife, riparian areas, native grasslands, historical and cultural sites? Impacted property owners have not allowed representatives of Freese and Nichols or other entities access to their lands. How can there be evaluation and answers to these questions without access?
5. ***The Citizens of Wichita Falls do NOT get to vote on the project***. Businesses and citizens will get to pay for the reservoir through increased water rates; but they do not have an option to approve the project through an open public discussion and a vote.

Yes, there is a critical need to educate the citizens and property owners impacted by this proposed reservoir. There is a lack of transparency. There is no need to build another reservoir in the same watershed as existing water sources. The cost is exorbitant and continues to increase. The effort and funds could be redirected to more worthy community projects including schools and existing infrastructure. And last, the City effectively addressed water needs with the building of the Potable Water Reuse Project.

Thank you for this opportunity to speak out on behalf of Texoma Stewardship Coalition which represents the impacted land owners, ranches, and farms that would be destroyed from the building of this reservoir. My husband and I, Emry Birdwell and Deborah Clark, own the Birdwell and Clark Ranch, one of the properties in the footprint of the project. We live at 578 N. Bryant Edwards Road in Clay County.

Regards,

Deborah Clark

Deborah Clark
Texoma Stewardship Coalition
P.O. Box 283 | Henrietta, TX | 76365
940-448-0803
info@texomastewardshipcoalition.com
www. texomastewardshipcoalition.com

BIRDWELL & CLARK
RANCH
est. 2004

OWNERS
Emry Birdwell
Deborah Clark

June 22, 2020

Mr. Russell Schreiber, Region B Chair
c/o Red River Authority of Texas
P.O. Box 240
Wichita Falls, TX 76307
(940) 723-2236

Re: Public Comments – Draft Revision on the Region B Initially Prepared Plan
Submitted via email at: rwpg-b@rra.texas.gov

Dear Mr. Schreiber and the Region B Planning Committee,

I appreciate the opportunity to make these written comments regarding the construction of proposed Lake Ringgold. These comments reflect the verbal comments made during the public hearing held on Wednesday, April 22, at 6:00pm via telephone conference. My husband, Emry Birdwell, and I own the Birdwell and Clark Ranch located at 578 N. Bryant Edwards Road in Clay County. We are one of the impacted landowners in the footprint of the proposed Lake Ringgold.

Please note the following:

1. ***There is NO need to build another reservoir***
    a. The City of Wichita Falls, citizens and businesses are to be commended for their excellent conservation efforts. The Potable Water Reuse Project is efficient, resourceful, and cost-effective. This endeavor set a global standard for water conservation and availability.
    b. The City of Wichita Falls has enough existing water supply to meet demands far into the future. Current demand is approximately 31,329 acre feet per year (AFY). Demand is anticipated to increase slightly to 32,306 AFY in 2070.
    c. The City of Wichita Falls was the ***only*** city out of the 25 largest Texas cities to decline in population in the last decade.
2. ***The COST of the project***
    a. In 2017, the cost of the project was estimated at approximately $322 million.
    b. In the latest proposal, the cost ballooned in just three years to an estimate of $443 million.
    c. With interest, the cost will approximate $1 billion.
    d. Certainly, there are more pressing needs for the citizens of Wichita Falls.
3. ***The Transparency or Lack of Transparency of the proposed project***
    a. There is a critical need to educate the citizens and businesses of Wichita Falls about all aspects of the planned reservoir.
    b. Myths abound including
        i. The City already owns the land for the reservoir. Truth is, the City only owns approximately 6,000 acres out of the 23,000 acres needed to construct and mitigate the building of the reservoir.
        ii. Nothing is happening; it's been talked about for decades; it will never get built. Truth is, as these public comments allow, the City of Wichita Falls is silently moving into the last round in the permit application process.

P.O. Box 90 • 578 N. Bryant Edwards Road • Henrietta, Texas 76365
940.538.4051 Office • 940.452.0626 Emry • 940.328.5542 Deborah
emry@birdwellandclarkranch.com • deborah@birdwellandclarkranch.com
www.birdwellandclarkranch.com

iii. No money is being spent on the project. Truth is, the City has incurred expenses for exploratory engineering, feasibility, and environmental studies. How much has been spent? Where are the expenses itemized in the city's budget? Who are the partners?

4. ***Landowner Concerns***
    a. What is the current plan to take water back to Wichita Falls from proposed Lake Ringgold? In the original plan a pipeline was to be built from the reservoir to the City of Wichita Falls. In the revised plan, there is a new pipeline that goes from the proposed reservoir back to Lake Arrowhead. What property owners are impacted? What is the cost of this revision?
    b. Family legacies and businesses will be destroyed. What is the economic impact of this loss of revenue to the individuals? To the county economy?
    c. Impacted landowners want to know if they will have access to the water. Can they develop lakefront property?
    d. Who will pay the costs incurred by the City of Henrietta and Clay County resulting from the construction and maintenance of the proposed reservoir? These costs are not identified in the current budget.
    e. What is the anticipated loss in tax revenue to Clay County and the Henrietta Independent School District?
    f. What are the environmental impacts? What are the impacts to wildlife, riparian areas, native grasslands, historical and cultural sites? Impacted property owners have not allowed representatives of Freese and Nichols or other entities access to their lands. How can there be evaluation and answers to these questions without access?
5. ***The Citizens of Wichita Falls do NOT get to vote on the project***. Businesses and citizens will get to pay for the reservoir through increased water rates; but they do not have an option to approve the project through an open public discussion and a vote.

Yes, there is a critical need to educate the citizens and property owners impacted by this proposed reservoir. There is a lack of transparency. There is no need to build another reservoir in the same watershed as existing water sources. The cost is exorbitant and continues to increase. The effort and funds could be redirected to more worthy community projects including schools and existing infrastructure. And last, the City effectively addressed water needs with the building of the Potable Water Reuse Project.

Thank you for this opportunity to submit written comments.

Regards,

Deborah Clark

RECEIVED
JUN 29 2020
BY:

Serving Texas Conservation for Nearly Fifty Years

June 22, 2020

Comments on the Region B Initially Prepared Plan

To: Mr. Russell Schreiber, P. E., RWPG-B Chair
c/o Red River Authority of Texas
P.O. Box 240
Wichita Falls, TX 76307
rwpg-b@rra.texas.gov

Thank you for the opportunity for Texas Conservation Alliance (TCA), a fifty-year-old conservation organization focused on protecting wildlife habitat and water resources, to comment more fully on the Region B Initially Prepared Plan (IPP) here in writing than there was time for during the public hearing by teleconference.

TCA urges the Region B Water Planning Group to remove Lake Ringgold from the Region B Initially Prepared Plan as a Recommended Water Management Strategy. Among the many reasons not to build Lake Ringgold are the following:

1. The City of Wichita Falls does not need Lake Ringgold to meet the projected demand for water for its residents and customers anytime between now and 2070. The firm yield of Wichita Falls' current water supply lakes, even in a repeat of the worst drought of record, plus its established indirect reuse program, meet the City's projected demands for 2070 with a significant safety margin. If additional water ever were needed, the City of Wichita Falls has additional water in Lake Kemp that could be developed, for a total water supply well over 40,000 acre-feet per year (AFY) to meet a projected demand in 2070 of 32,306 AFY. Wichita Falls was the only one of Texas' top 25 cities (by population) to *lose* population in the last decade and its water use is projected in the IPP us projected to increase by just over 3% in the next fifty years.

2. In alleging a "need" for building Lake Ringgold, the Region B IPP does not use the usual procedure for determining available water supply when calculating Wichita Falls' water supply. The standard procedure for assessing water supply employs the concept of firm yield, which is the amount of water which could be withdrawn from a water supply reservoir during a repeat of the historical worst drought of record (for this region the drought of 2011-2015). Firm yield assumes a repeat of the hydrological conditions during the drought of record. Firm yield is the usual definition of water supply and the only one that corresponds to historical reality. The

Region B IPP, however, counts the water supply for Wichita Falls differently. The IPP chooses an arbitrary number of less than 29,000 AFY as what is counted as the supply. For that number to be correct, the climate would have to be dramatically drier and the worst drought of record last years longer. On this purely speculative number, the Region B Plan is recommending construction of Lake Ringgold. The IPP's recommendations should be based on a firm yield calculation, to avoid the costs and negative impacts of developing water that is not needed.

It is significant to note that in calculating the amount of water that would be produced by Lake Ringgold, the IPP does *not* use the same method used for counting the yield from Wichita Falls' water supply lakes. Since the bulk of Wichita Falls' water supply comes from lakes in the same river basin as Lake Ringgold, and the City's primary water supply lake is in the same county, any discrepancy in how the yield of the various lakes is calculated would be purely arbitrary.

3. The recommendation of Lake Ringgold in the Region B IPP is based on Wichita Falls' *Long-Range Water Supply Plan.* Texas Conservation Alliance has reviewed the alternatives in Wichita Falls *Long-Range Plan* and what we found is that the list of alternatives in the study omits some of the most promising alternatives.

   Among the alternatives not included:

   a. First, the City of Wichita Falls has water rights in Lake Kemp and out of the Wichita River which they are only counting as water supply during a drought. Full use of that water would require additional desalination facilities, but this would be much cheaper than building lake Ringgold.

   b. If desalination capacity were expanded, it could potentially also be used to develop some water from the Red River, which is only half a mile farther away than the Lake Ringgold damsite.

   c. The majority of the water that flows into Lakes Arrowhead and Kickapoo is lost to evaporation. Storing a portion of that water in an underground aquifer would prevent those losses and be a great source of water during a drought. The pipeline to the most likely groundwater storage location would probably need to be longer than the pipeline to Lake Ringgold, but it would avoid the high cost and huge social and environmental impacts of building a new lake. The overall cost would be much less.

4. According to the Region B IPP, the cost of constructing Lake Ringgold and its attendant pump stations and pipelines has risen substantially since the 2016 Region B Water Plan, currently estimated at $442,867,000. By the time interest is paid on the loan and the operating costs are added, the total cost will be close to a billion dollars. For a service area of roughly 150,000 people, such a crippling debt is detrimental to the public welfare.

5. Since Wichita Falls' reuse program could in principle meet virtually all of its non-consumptive uses, construction of Lake Ringgold becomes primarily for such consumptive uses as lawn and landscape watering. Such a high price tag for a less-than-essential use is unjustifiable and Lake Ringgold should be removed from the IPP.

6. The leadership of the City of Wichita Falls has given the public an estimated figure for how much current water rates will go up if Lake Ringgold is built, but that figure does not reflect the full cost of Lake Ringgold. Wichita Falls water customers are currently paying off a debt for past water infrastructure. We are told that that debt will be paid off in approximately eight years. If Lake Ringgold is *not* built, water rates can go down once that debt is paid. The price of Ringgold is the amount water rates will go up *plus* the amount they would have gone down.

7. The environmental impacts of constructing Lake Ringgold would be enormous, including the following:

    a. More than 1,000 acres of the land to be inundated is native tallgrass prairie that has never been plowed, one of the most endangered ecosystems in the country. This ecosystem once sustained millions of bison on which the lives of the Native American populations of the US plains depended. Scientists estimate that only about 1% of the country's original tallgrass prairie remains.

    b. The area to be impacted by Lake Ringgold is primarily grassland with wooded river and stream bottomlands. Most of the trees in this area are in the river and creek bottoms that will be inundated. Since the Little Wichita River is the dominant watershed in Clay County, Lake Ringgold will destroy a substantial percentage of the trees in the county.

    c. More than half the inflows to Lake Ringgold will be lost to evaporation. These evaporative losses will reduce stream flows downstream in the Little Wichita and Red Rivers. Because the Little Wichita River is one of the few streams in the area with fresh water, it will degrade water quality in the Red River and Lake Texoma. It is very wasteful to make the large increase in evaporation that an additional lake will incur.

    d. Lake Ringgold will permanently inundate 16,000 acres and periodically inundate an additional 8,000 acres. Loss of 24,000 acres of wildlife habitat, including native tallgrass prairie and a significant percentage of the wooded bottomlands in the county, will have a major impact on the resident wildlife, migratory birds, and aquatic organisms that live on or are supported by these lands and waters. The habitat is a potential migration stop-over for the severely-endangered whooping crane and known habitat for two state-listed species, the Texas horned lizard and Texas kangaroo rat. It is important habitat for quail, dove, turkey, deer, ducks, and other wildlife which attract hunters and generate economic activity for the region and its residents. According to Quail Coalition, the native prairie that would be inundated is the optimal landscape for quail, which have been declining in recent decades. Texas Parks and Wildlife Department has identified 112 Species of Greatest Conservation Need in the Cross Timbers ecoregion. Loss of habitat is the primary contributing factor to most of these species being at risk for becoming endangered. Lake Ringgold would exacerbate Texas' wildlife crisis.

8. The economic impacts on rural Clay County will be significant and should be part of the public welfare calculation. Clay County has already lost land from its tax rolls for Lake Arrowhead, Wichita Falls' primary water supply reservoir. If Lake Ringgold is built, the county will lose the tax revenues from 24,000 acres at the lake site and an estimated additional 17,000 acres for mitigation of the project. County officials estimate substantial increases in cost for road maintenance and law enforcement.

Part of the justification for Lake Ringgold offered by the City of Wichita Falls is to support economic development in the city. Countering that hypothetical gain is the lost economic activity of taking more than 40,000 acres out of production.

There is a seeming discrepancy between the annual cost listed for Lake Ringgold on Page C-13 in Appendix C and the summary of annual cost in Table ES-12 on Page ES-15. The cost estimate on C-13 lists a 20-year debt service of $13,175,000 plus a 40-year reservoir debt service of $11,970,000 plus operations, maintenance and pumping energy costs which together add up to $8,994,000. Since O&M and pumping presumably remain the same for the full 40-year period, the annual cost for the *second* twenty years should be $8,994,000 (O&M + pumping) ***plus*** $11,970,000 (the 40-year reservoir debt service annual cost), once the 20-year debt service has dropped off. That would total $20,964,000 for Year 20 through Year 40. Yet Table ES-12 shows annual costs in Year 20 through Year 40 (that is, the years between 2050 and 2070) as only the O&M cost of $8,994,000.

The "reservoir debt service" is listed on Page C-13 as a 40-year cost. If this is accurate, why doesn't the reservoir debt service show up on the summary Table ES-13? If this is an error, please resolve. If not, please add text to explain what happened to Years 20 through 40 of the reservoir debt service.

Another discrepancy occurs between the $442,867,000 total capital costs in the table on Page C-13, which rounds to $443 million and the $453 million price tag referred to on Page 5-42. Mostly like a typo – please resolve.

Sincerely,

Janice Bezanson

Janice Bezanson
Executive Director

2021 REGION B INITIALLY PREPARED REGIONAL WATER PLAN

COMMENTS AND REQUESTS FOR ADDITIONAL INFORMATION FOR APRIL 22, 2020 PUBLIC HEARING

SUBMITTED ON BEHALF OF THE MURRAY FAMILY

I. Appreciate the opportunity to provide comments on behalf of the Murray family in Clay County Texas.

The Murray's property would be bisected with inundation if under the current proposed plans for Lake Ringgold

The proposed plans for Lake Ringgold would forever alter significant portions of Clay County. We simply ask that this group revisit the projected water needs in this Report before issuing a final recommendation in support of that Project.

II. The proposed project would heavily burden Clay County but is not projected to be necessary to satisfy the water needs of Clay County. In fact, the projected water need is largely dependent on a projected irrigation demand that far exceeds the current water used for irrigation in Wichita County.

III. Looking at Figure 11-5 for example, it shows that in comparison with the 2016 plan that showed irrigation at 64% of the long-term water needs for the region, this current preliminary plan shows irrigation to be 73% of the water needs of the region in 2070. This is based on an essentially flat demand for irrigation projected through 2070. This demand far exceeds the current irrigation uses and we do not see the detail necessary to support the additional estimated demand for irrigation water for the region.

IV. Lake Kemp – which is higher in elevation than the area proposed for Lake Ringgold seems like the logical place for focused resources to address the chloride issue for that lake. Lake Kemp water can reach the areas of need by gravity flow, whereas, any water used out of proposed Lake Ringgold would require pumping through a pipeline to reach users in Wichita County.

V. The cost projections for Lake Ringgold in this study do not appear to match the most recent cost projections which are still being analyzed. Even at this lower cost estimate the cost per thousand gallons per minute is $4.47 which is substantially higher than the current cost of water.

For example in the 2016 plan the cost estimate was $330 million whereas the cost estimate in this preliminary plan is $442,867.

VI. The specific land that would be taken by inundation is pristine property that is engaged in ongoing ranching operations. These ranching operations would be severely interrupted by the proposed lake.

VII. Additional items in question regarding need include the OklaUnion AEP plant which is scheduled to be shutdown. We ask you to scrutinize each projected use in this plan before recommending support for Lake Ringgold.

REQUESTS FOR ADDITIONAL INFORMATION

1. The Feasibility Study for Lake Ringgold is from 2012, what are the plans to update that feasibility study?

2. Does the cost of the Lake Ringgold project include reimbursing the City of Henrietta for impacts to its small lake and intake structure?

3. The Initially Prepared Plan states that more than 17000 acres of land will need to be purchased for mitigation – who would hold title to these mitigation lands and how much will it cost?

4. The projected additional water needs for Wichita Falls is 2040 are 5,134, but the Lake Ringgold supply is projected as 23,450. Can the Lake Ringgold Project be scaled back to better match the projected need?

5. How much of the projected shortage for Wichita Falls is related to wholesale contracts with other entities?

6. Your projection for current water needs for Wichita County show a shortage for irrigation. If irrigation needs are held to current usage levels, what is the amount of the projected shortage, if any, for Wichita County?

7. What cost threshold for Lake Ringgold would make it infeasible according to the Regional Water Planning Group B?

FRANK J. DOUTHITT, LAWYER
102 S. FANNIN STREET
HENRIETTA, TEXAS 76365

TELEPHONE: 940.538.4750
CELL: 940.704.8274
frank@douthittLaw.com
www.douthittLaw.com

April 21, 2020

Russell Schreiber
c/o Red River Authority of Texas
P.O. Box 240
Wichita Falls, TX 76307
rwpg-b@rra.texas.gov

Re: Region B Water Plan Public Hearing by Teleconference on April 22, 2020 at 6:00 P.M. on Region B's Initially Prepared Plan – Proposed "Lake Ringgold"

Mr. Schreiber

I represent Clay County, Texas. This is a formal request by Clay County for Region B to discontinue its support for the "Lake Ringgold" Project by the City of Wichita Falls. I also request that this letter be made a part of the official minutes of this meeting. My address and contact information are above. I do not have a fax. The address for Clay County is:

Mike Campbell, County Judge
212 N. Main Street
Henrietta, TX 76365
Mike.Campbell@co.clay.tx.us
940.538.4651
Fax: 940-538-5597

Mr. Schreiber, this is not personal, but I submit that you wear too many hats in connection with this proposed "Lake Ringgold" project and you should not participate in any influential position with the Red River Authority or Region B considering you position as Director of Public Works with the City of Wichita Falls.

Clay County opposes the construction of proposed "Lake Ringgold" for the reasons, and perhaps others, articulated in this letter. Here follow some bullet points that cause Clay County great concern.

1. The effect of taking substantial land value from Clay County's tax base
2. The additional burden on Clay County's law enforcement
3. Additional road maintenance to fall on Clay County

4. Ownership of water front property and the effect on law enforcement and on road maintenance as a burden on Clay County
5. The effect on wildlife
6. The effect on threatened species and cultural resources
7. The effect on Clay County and its citizens due to expected lake watershed enforcement
8. The effect of likely flooding upstream on areas in the town of Henrietta, county road reconstruction, and additional road maintenance

The arrogance of the City of Wichita Falls in using the name "Lake Ringgold" for the proposed lake is noted. It is bad enough to try to impose this burden on Clay County and its citizens, but to name a lake after a shrinking town several miles away and located completely in another county is the height of arrogance.

Please note that Wichita Falls does not have any water supply lake located in Wichita County. Where is Lake Kickapoo? Where is Lake Kemp? Where is Lake Arrowhead? Wichita Falls should get its water in its own backyard. Wichita Falls has already imposed enough on Clay County with Lake Arrowhead.

Prior Experience – Lake Arrowhead

Clay County cannot ignore the negative prior experience that Wichita Falls imposed on Clay County with its Lake Arrowhead project. Clay County has prior experience dealing with Wichita Falls lake property. Lake Arrowhead was constructed by Wichita Falls about 50 - 60 years ago. Lake Arrowhead is also on the Little Wichita River upstream from proposed "Lake Ringgold." At the outset, Wichita Falls acquired ownership of much of the waterfront property at Lake Arrowhead and offered long term leases hoping to develop a residential area around the lake. It attempted to annex the lake and adjacent land to the City of Wichita Falls. Defeated in court multiple times, Wichita Falls finally accomplished the annexation. The protracted litigation taught them how to annex.

Several years later lake area residents petitioned Wichita Falls to either provide promised and legally required services and roads or de-annex the property. Wichita Falls did de-annex the area and shirked its duty to its citizens and lot holders in the previously annexed area around the lake. That dumped that responsibility on Clay County. As a result, law enforcement and some road maintenance fell to Clay County. This substantially increased Clay County's burden to provide both adequate roads and law enforcement. Lake Arrowhead has not been a good experience for Clay County.

Reduction of Tax Base

Clay County is largely agricultural. Its tax base is land and related personal property such as livestock. Taking the land for a lake removes that property and the livestock it now supports, from the tax base which will likely require increased taxes on other county property and will burden Clay County's citizens only to benefit Wichita Falls.

Burden on Clay County Law Enforcement

The only law enforcement agency in Clay County is the Clay County Sheriff. The Sheriff provides law enforcement to all of Clay County, including our largest town and county seat, Henrietta. Based on prior experience with Lake Arrowhead, we expect the installation of proposed "Lake Ringgold" will require a minimum of two additional deputies and all the related equipment such as vehicles, radios, etc. Furthermore, even with additional deputies, wait time for responding to calls in the far reaches of the county will likely be increased. This will impair law enforcement to our citizens.

Increased Road Maintenance

During construction, existing county roads will be seriously damaged. Additional roads will likely be required to access the proposed "Lake Ringgold" at various places around the proposed lake. Based on prior experience, we expect that expense burden to fall on Clay County. It should be a burden on Wichita Falls.

Waterfront Property

Again, based on prior experience at Lake Arrowhead, Wichita Falls will likely pass the burden to Clay County of providing roads and other services if proposed "Lake Ringgold" is ever built.

Effect on Wildlife – Turkey Fest & Dove Salute

The area to be inundated by proposed "Lake Ringgold" abounds with native wildlife. Turkey specifically. Clay County hosts an annual "Turkey Fest." It is known both nationally and internationally. Hunting teams come from all over, many from out of state. Most teams film their activity in our county and those films are shown on television nationwide emphasizing our turkey population and making Clay County known for its friendliness and hunting opportunities. Multiple Clay County ranches will be inundated and that property lost for hunting. Proposed "Lake Ringgold" will handicap our hunting of turkey and other wildlife

and maybe destroy Clay County's Turkey Fest.

Dove Salute is an annual hunt for personnel at Sheppard Air Force Base. It is hosted by several Clay County ranchers. About two hundred (200) air force personnel are provided an opportunity to hunt dove in the area of proposed "Lake Ringgold" and nearby ranches. The hunting day is followed by a steak feed at the Birdwell-Clark Ranch. All this is free to our Sheppard AFB personnel and is praised by the folks at Sheppard.

Watershed Enforcement

Proposed "Lake Ringgold" will interfere with the land owners' use of adjacent and nearby property. Regulations will undoubtedly restrict ranchers and farmers use of their land that is part of the watershed area of the proposed lake. That will damage the general economy in Clay County and certainly harm the ranchers and farmers in the watershed.

Upstream Flooding

Dry Fork and East Fork are tributaries flowing into the Little Wichita River downstream from Henrietta. There is a commercial area developed along U S Highway 287 South of Henrietta and a residential area on SH 148 South. Businesses and homes in those areas suffer from flooding from time to time. That flooding is expected to increase and be more severe if the proposed "Lake Ringgold" is constructed. Likely, if the proposed "Lake Ringgold" is full and there is exceptional rain in the area, Red River will also be at flood stage and it will be difficult to empty enough water out of proposed "Lake Ringgold" to prevent back up water from flooding upstream. This increased flooding will impact the areas along US 287 and SH 148 South. In addition, impoundment of the lake area north of Henrietta will likely cause significant reconstruction of FM 1197, north of Henrietta. The residential area known as Country Club may be impacted by this increased flooding.

Threatened Species and Cultural Resources

The Feasibility Study for Proposed Lake Ringgold, Clay County, Texas, October 2013, addresses endangered species and cultural resources in the area to be inundated by proposed "Lake Ringgold." This is a near seven year old study. It states:

> "There are two state-listed threatened species that have a moderate potential to be impacted. These include the Texas horned lizard and the Texas kangaroo rat. Both of these species are known to be present in the region and habitat types at the reservoir could be favorable for their presence. Field surveys would be needed to confirm if

> these species or their preferred habitats are present within the footprint of the proposed reservoir." See page ES-2.
>
> "The proposed Lake Ringgold site does have a moderate to high potential for the presence of cultural resources. The site is located in an area with known American Indian activities. The archeological potential analysis shows approximately two-thirds of the reservoir site with high potential for cultural resources. A cultural resource survey would need to be conducted to determine the number and frequency of historic and pre-historic sites." See page ES-2.

It is noted that the study states that surveys would be needed to confirm the endangered species presence in the area. Clearly this has not been done. The survey also says surveys would be needed to determine the number and frequency of historic and prehistoric sites. Texas Horned Lizards were plentiful in Clay County seventy years ago. They could be found even in city lots in Henrietta back then.

Summary

Clay County opposes the construction of this lake. The additional water supply is not needed in Wichita Falls. The Wichita Falls water users, the rate payers, if they are properly informed, will not be willing to bear that additional financial burden caused by the proposed lake. We expect Wichita Falls to escape the burden of submitting a bond issue to its voters as it likely cannot convince those voters to sign up for that huge tax bill. Instead, they will likely borrow the money from the SWIFT fund, or other sources, and increase water rates to its water users to foot the bill for the $442,000,000.00 dollar project. The cost may well increase substantially before the project is shovel ready.

We in Clay County have had enough with mishandled Lake Arrowhead. We do not want another large lake in Clay County to be mishandled as Lake Arrowhead has been.

We in Clay County do not want our wildlife adversely impacted by this unnecessary proposed "Lake Ringgold."

We in Clay County do not believe this lake project is in the best interests of the citizens of North Texas, including Wichita Falls.

Clay County objects to this project for many reasons including the likely expected negative impact of the proposed "Lake Ringgold" on endangered species and historic and prehistoric sites.

We respectfully request that Region B discontinue its support for the construction of "Lake Ringgold." Clay County will oppose the construction of the proposed "Lake Ringgold" in Clay County.

Very truly yours,

Frank J. Douthitt

xc: Mike Campbell, Clay County Judge

Wichita Falls
TEXAS
Blue Skies. Golden Opportunities.

OFFICE OF THE CITY MANAGER
RECEIVED
APR 29 2020
BY:

April 27, 2020

Mr. Russell Schreiber P.E. RWPG-B Chair
c/o Red River Authority of Texas
P.O. Box 240
Wichita Falls, Texas 76307

Re: 2021 Region B Initially Prepared Plan

Dear Mr. Schreiber,

As the City Manager of the largest city in the Region B water planning area, and having the responsibility to supply water to over 150,000 residents that call North Texas home, I am well aware of the need for an adequate water supply. I was ultimately responsible for guiding our community thorough a new Drought of Record from 2010 through 2015. During those unprecedented times we came very close to running completely out of water, with reservoirs dropping to historic lows.

Therefore, I want to express my full support, for the Region B Initially Prepared Plan (the "Plan"). The Plan reflects the lessons learned from the most recent Drought of Record and the reality that there could be an even worse drought of record in the future. In particular, the Plan's recommendation for Wichita Falls to pursue the development of Lake Ringgold recognizes Lake Ringgold as the only reasonable water supply option available to Wichita Falls and the customers it serves. The Plan's recommendation for Wichita Falls to pursue the development of Lake Ringgold as its next water supply fully aligns with the City's goals of ensuring viable water supplies for generations to come.

On behalf of Wichita Falls, I fully recommend the 2021 Region B Initially Prepared Plan be adopted and included as part of the overall 2022 State Water Plan.

Respectfully,

Darron Leiker
Manager City of Wichita Falls.

CITY OF WICHITA FALLS
1300 7th Street, P.O. Box 1431, Wichita Falls, TX 76307 t: (940) 761.7404 f: (940) 761.8833
www.wichitafallstx.gov

Glenn Barham
3506 Copperas Cove
Wichita Falls, Texas 76310

April 15, 2020

Mr. Russell Schreiber P. E. RWPG-B Chair
c/o Red River Authority of Texas
P. O. Box 240
Wichita Falls, TX 76307

Re: 2021 Region B Initially Prepared Plan

Dear Mr. Schreiber,

As we all know, planning for the future water supply is critical, particularly for the Wichita Falls area. Being the largest municipal water supplier in the entire North Central Texas region, Wichita Falls supplies water to more than 150,000 residents.

As the Mayor of Wichita Falls during the 2010 – 2015 drought, I fully understand the importance for critical planning of a water supply. From the fall of 2010 through the spring of 2015, our region experienced a new Drought of Record having debilitating and extreme effects on our citizens, businesses, and communities. Record high temperatures along with record low rainfall ultimately caused the water supply to drop below 19% of capacity. The continued viability – with residents selling homes and moving away, businesses closing, and Sheppard Air Force Base preparing to move missions to other bases – of our region was tested. Wichita Falls truly grasps the importance of water supply.

In light of this understanding and as the Chairman of the Wichita Falls Water Resource Commission, I wish to express the Commission's full support for the Region B Initially Prepared Plan (the Plan). The Plan reflects the lessons learned from Wichita Falls' new Drought of Record and the reality that it is possible there could be a worse drought of record in the future. The Plan evaluates and addresses the future water supply needs of Wichita Falls and the entire North Central Texas region. Specifically, the Plan's recommendation that Wichita Falls move forward on the development of Lake Ringgold as the only reasonable water supply option available to Wichita Falls and the customers it serves is crucial. The Lake Ringgold site is consistent with the Texas Legislature's 2015 re-designation of the area as a "unique" reservoir site. The Plan's recommendation for Wichita Falls to pursue the development of Lake Ringgold as its next water supply aligns with the Wichita Falls Water Resource Commission's and the City's goals of ensuring a water supply for generations to come.

On behalf of the Wichita Falls Water Resource Commission, I fully recommend the 2021 Region B Initially Prepared Plan be adopted and included as part of the overall 2022 State Water Plan.

Sincerely,

Glenn Barham

Glenn Barham, Chairman
WF Water Resource Commission

RECEIVED
2 2 2020
BY:

Wichita Falls
CHAMBER OF COMMERCE & INDUSTRY

April 22, 2020

Mr. Russell Schreiber, P. E., RWPG-B Chair
c/o Red River Authority of Texas
P.O. Box 240
Wichita Falls, TX 76307

Mr. Schreiber,

As the CEO of the Wichita Falls Chamber of Commerce, I interact with hundreds of business owners every year. They share their hopes and fears with me as I work to create a stronger economy for Wichita Falls. The single biggest fear I've heard about during the seven years I've been in Wichita Falls (other than over the last six weeks) is the fear of running out of water. All of our largest employers require large amounts of water to function, and the prospects of that supply running dry would force them to consider alternative plans for expansion and investment.

The City of Wichita Falls did amazing work to conserve and grow our water supply during the drought. City leadership should continue to focus on extending our supply into the future. The plan as presented helps us do that, and I encourage you to continue down the path that you're on. If I can do anything to help you in this venture, please call on me anytime.

Sincerely,

Henry Florsheim
President & CEO
Wichita Falls Chamber of Commerce

WICHITA FALLS CHAMBER OF COMMERCE AND INDUSTRY
900 8th Street, Suite 100 Wichita Falls, TX 76301
T: (940) 723-2741 F: (940) 723-8773
wichitafallschamber.com

APPENDIX J

INFRASTRUCTURE FINANCING REPORT DATA COLLECTION SPREADSHEET

FINAL PLAN

REGION B

OCTOBER 2020

Sponsor Entity Name	Sponsor Entity Primary Region	Project Name	WMS Project Sponsor Region	IFR Element Name	IFR Element Value	Year Of Need	IFR Project Data ID	Entity RWP ID	WMS Project ID	IFR Project Elements ID
BAYLOR SUD	B	ADDITIONAL GROUNDWATER SUPPLY - BAYLOR COUNTY SUD	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	N/A	N/A		12926	3793	1
BAYLOR SUD	B	ADDITIONAL GROUNDWATER SUPPLY - BAYLOR COUNTY SUD	B	CONSTRUCTION FUNDING	N/A	N/A		12926	3793	2
BAYLOR SUD	B	ADDITIONAL GROUNDWATER SUPPLY - BAYLOR COUNTY SUD	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	N/A	N/A		12926	3793	3
BAYLOR SUD	B	MUNICIPAL WATER CONSERVATION - BAYLOR SUD	G	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	N/A	N/A		12926	3910	1
BAYLOR SUD	B	MUNICIPAL WATER CONSERVATION - BAYLOR SUD	G	CONSTRUCTION FUNDING	N/A	N/A		12926	3910	2
BAYLOR SUD	B	MUNICIPAL WATER CONSERVATION - BAYLOR SUD	G	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	N/A	N/A		12926	3910	3
BOWIE	B	INDIRECT REUSE - BOWIE	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	$500,000.00	2040		259	3794	1
BOWIE	B	INDIRECT REUSE - BOWIE	B	CONSTRUCTION FUNDING	$4,623,000.00	2040		259	3794	2
BOWIE	B	INDIRECT REUSE - BOWIE	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	$0.00	N/A		259	3794	3
MINING, ARCHER	B	MINING CONSERVATION - ARCHER	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	$0.00	N/A		2902	2764	1
MINING, ARCHER	B	MINING CONSERVATION - ARCHER	B	CONSTRUCTION FUNDING	$0.00	N/A		2902	2764	2
MINING, ARCHER	B	MINING CONSERVATION - ARCHER	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	$0.00	N/A		2902	2764	3
MINING, BAYLOR	B	MINING CONSERVATION - BAYLOR	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	N/A	N/A		1735	2765	1
MINING, BAYLOR	B	MINING CONSERVATION - BAYLOR	B	CONSTRUCTION FUNDING	N/A	N/A		1735	2765	2
MINING, BAYLOR	B	MINING CONSERVATION - BAYLOR	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	N/A	N/A		1735	2765	3
MINING, CLAY	B	MINING CONSERVATION - CLAY	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	N/A	N/A		1760	2766	1
MINING, CLAY	B	MINING CONSERVATION - CLAY	B	CONSTRUCTION FUNDING	N/A	N/A		1760	2766	2
MINING, CLAY	B	MINING CONSERVATION - CLAY	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	N/A	N/A		1760	2766	3
MINING, COTTLE	B	MINING CONSERVATION - COTTLE	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	$25,000.00	2023		1770	2767	1
MINING, COTTLE	B	MINING CONSERVATION - COTTLE	B	CONSTRUCTION FUNDING	$69,000.00	2023		1770	2767	2
MINING, COTTLE	B	MINING CONSERVATION - COTTLE	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	$0.00	N/A		1770	2767	3
MINING, FOARD	B	MINING CONSERVATION - FOARD	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	$0.00	N/A		1792	2768	1
MINING, FOARD	B	MINING CONSERVATION - FOARD	B	CONSTRUCTION FUNDING	$0.00	N/A		1792	2768	2
MINING, FOARD	B	MINING CONSERVATION - FOARD	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	$0.00	N/A		1792	2768	3
MINING, HARDEMAN	B	MINING CONSERVATION - HARDEMAN	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	N/A	N/A		1812	2769	1
MINING, HARDEMAN	B	MINING CONSERVATION - HARDEMAN	B	CONSTRUCTION FUNDING	N/A	N/A		1812	2769	2
MINING, HARDEMAN	B	MINING CONSERVATION - HARDEMAN	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	N/A	N/A		1812	2769	3
MINING, KING	B	MINING CONSERVATION - KING	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	N/A	N/A		2897	2770	1
MINING, KING	B	MINING CONSERVATION - KING	B	CONSTRUCTION FUNDING	N/A	N/A		2897	2770	2
MINING, KING	B	MINING CONSERVATION - KING	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	N/A	N/A		2897	2770	3
MINING, MONTAGUE	B	MINING CONSERVATION - MONTAGUE	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	$0.00	N/A		1874	2771	1
MINING, MONTAGUE	B	MINING CONSERVATION - MONTAGUE	B	CONSTRUCTION FUNDING	$0.00	N/A		1874	2771	2
MINING, MONTAGUE	B	MINING CONSERVATION - MONTAGUE	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	$0.00	N/A		1874	2771	3
MINING, WICHITA	B	MINING CONSERVATION - WICHITA	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	$0.00	N/A		1940	2772	1
MINING, WICHITA	B	MINING CONSERVATION - WICHITA	B	CONSTRUCTION FUNDING	$0.00	N/A		1940	2772	2
MINING, WICHITA	B	MINING CONSERVATION - WICHITA	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	$0.00	N/A		1940	2772	3
MINING, WILBARGER	B	MINING CONSERVATION - WILBARGER	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	N/A	N/A		1941	2773	1
MINING, WILBARGER	B	MINING CONSERVATION - WILBARGER	B	CONSTRUCTION FUNDING	N/A	N/A		1941	2773	2
MINING, WILBARGER	B	MINING CONSERVATION - WILBARGER	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	N/A	N/A		1941	2773	3
Sponsor Entity Name	**Sponsor Entity Primary Region**	**Project Name**	**WMS Project Sponsor Region**	**IFR Element Name**	**IFR Element Value**	**Year Of Need**	**IFR Project Data ID**	**Entity RWP ID**	**WMS Project ID**	**IFR Project Elements ID**
RED RIVER AUTHORITY OF TEXAS	B	AUTOMATED METER INFRASTRUCTURE (AMI) - RED RIVER AUTHORITY	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	$0.00	N/A		13215	3967	1
RED RIVER AUTHORITY OF TEXAS	B	AUTOMATED METER INFRASTRUCTURE (AMI) - RED RIVER AUTHORITY	B	CONSTRUCTION FUNDING	$1,430,000.00	2022		13215	3967	2
RED RIVER AUTHORITY OF TEXAS	B	AUTOMATED METER INFRASTRUCTURE (AMI) - RED RIVER AUTHORITY	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	$0.00	N/A		13215	3967	3
RED RIVER AUTHORITY OF TEXAS	B	CHLORIDE CONTROL PROJECT	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	$0.00	N/A		13215	1275	1
RED RIVER AUTHORITY OF TEXAS	B	CHLORIDE CONTROL PROJECT	B	CONSTRUCTION FUNDING	$0.00	N/A		13215	1275	2
RED RIVER AUTHORITY OF TEXAS	B	CHLORIDE CONTROL PROJECT	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	$0.00	N/A		13215	1275	3
RED RIVER AUTHORITY OF TEXAS	B	CONSERVATION, WATER LOSS CONTROL - RED RIVER AUTHORITY OF TEXAS	C	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	$0.00	N/A		13215	2949	1
RED RIVER AUTHORITY OF TEXAS	B	CONSERVATION, WATER LOSS CONTROL - RED RIVER AUTHORITY OF TEXAS	C	CONSTRUCTION FUNDING	$0.00	N/A		13215	2949	2

APPENDIX J
INFRASTRUCTURE FINANCING REPORT
2021 FINAL PLAN, REGION B

Sponsor Entity Name	Sponsor Entity Primary Region	Project Name	WMS Project Sponsor Region	IFR Element Name	IFR Element Value	Year Of Need	IFR Project Data ID	Entity RWP ID	WMS Project ID	IFR Project Elements ID
RED RIVER AUTHORITY OF TEXAS	B	CONSERVATION, WATER LOSS CONTROL - RED RIVER AUTHORITY OF TEXAS	C	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	$0.00	N/A		13215	2949	3
RED RIVER AUTHORITY OF TEXAS	B	MUNICIPAL WATER CONSERVATION - RED RIVER AUTHORITY OF TEXAS	G	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	$0.00	N/A		13215	3897	1
RED RIVER AUTHORITY OF TEXAS	B	MUNICIPAL WATER CONSERVATION - RED RIVER AUTHORITY OF TEXAS	G	CONSTRUCTION FUNDING	$0.00	N/A		13215	3897	2
RED RIVER AUTHORITY OF TEXAS	B	MUNICIPAL WATER CONSERVATION - RED RIVER AUTHORITY OF TEXAS	G	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	$0.00	N/A		13215	3897	3
RED RIVER AUTHORITY OF TEXAS	B	TREATED WATER LINE - RRA CLAY COUNTY	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	$0.00	N/A		13215	3817	1
RED RIVER AUTHORITY OF TEXAS	B	TREATED WATER LINE - RRA CLAY COUNTY	B	CONSTRUCTION FUNDING	$0.00	N/A		13215	3817	2
RED RIVER AUTHORITY OF TEXAS	B	TREATED WATER LINE - RRA CLAY COUNTY	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	$0.00	N/A		13215	3817	3
STEAM ELECTRIC POWER, WILBARGER	B	ALTERNATIVE COOLING TECHNOLOGY - STEAM ELECTRIC POWER WILBARGER COUNTY	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	N/A	N/A		2327	1179	1
STEAM ELECTRIC POWER, WILBARGER	B	ALTERNATIVE COOLING TECHNOLOGY - STEAM ELECTRIC POWER WILBARGER COUNTY	B	CONSTRUCTION FUNDING	N/A	N/A		2327	1179	2
STEAM ELECTRIC POWER, WILBARGER	B	ALTERNATIVE COOLING TECHNOLOGY - STEAM ELECTRIC POWER WILBARGER COUNTY	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	N/A	N/A		2327	1179	3
VERNON	B	ADDITIONAL SEYMOUR AQUIFER - VERNON	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	$115,000.00	2022		2408	1177	1
VERNON	B	ADDITIONAL SEYMOUR AQUIFER - VERNON	B	CONSTRUCTION FUNDING	$1,000,000.00	2023		2408	1177	2
VERNON	B	ADDITIONAL SEYMOUR AQUIFER - VERNON	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	$0.00	N/A		2408	1177	3
VERNON	B	WATER CONSERVATION (REPLACE TRANSMISSION PIPELINE) - VERNON	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	$820,000.00	2022		2408	2755	1
VERNON	B	WATER CONSERVATION (REPLACE TRANSMISSION PIPELINE) - VERNON	B	CONSTRUCTION FUNDING	$8,000,000.00	2023		2408	2755	2
VERNON	B	WATER CONSERVATION (REPLACE TRANSMISSION PIPELINE) - VERNON	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	$0.00	N/A		2408	2755	3
WICHITA FALLS	B	LAKE RINGGOLD	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	$45,000,000.00	2022		151	1174	1
WICHITA FALLS	B	LAKE RINGGOLD	B	CONSTRUCTION FUNDING	$397,867,000.00	2032		151	1174	2
WICHITA FALLS	B	LAKE RINGGOLD	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	$0.00	N/A		151	1174	3
WICHITA WCID #2	B	WCWID NO. 2 CANAL CONVERSION TO PIPELINE	B	PLANNING, DESIGN, PERMITTING & ACQUISITION FUNDING	$1,630,787.00	2022		2976	2187	1
WICHITA WCID #2	B	WCWID NO. 2 CANAL CONVERSION TO PIPELINE	B	CONSTRUCTION FUNDING	$7,429,138.00	2022		2976	2187	2
WICHITA WCID #2	B	WCWID NO. 2 CANAL CONVERSION TO PIPELINE	B	PERCENT STATE PARTICIPATION IN OWNING EXCESS CAPACITY	$0.00	N/A		2976	2187	3