

TO: Region F Water Planning Group

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FROM: Simone Kiel, Lissa Petry

SUBJECT: DRAFT Region F Draft Population and Demand Change Requests

DATE: June 27, 2013

PROJECT: SAN11472

In March 2013, the Texas Water Development Board (TWDB) released draft municipal population and water demand projections to each of the Regional Water Planning Groups for review and comment. This memo details the suggested changes to the population and demand projections that the Region F Water Planning group determined were necessary in order to more accurately reflect the upcoming water needs of the region. The Region F Water Planning Group identified three key factors impacting municipal water user groups that may not have been adequately accounted for in the TWDB draft projections. These factors include increased population growth due to the shale oil boom, insufficient water supply due to prolonged extreme drought conditions that resulted in restricted deliveries, and expected delay of plumbing code changes associated with rural communities.

POPULATION CHANGE REQUESTS

Errors and Corrections

Zephyr WSC

Zephyr Water Supply Corporation is the process of adding additional connections within the utility CCN boundaries. Approximately 150 new connections will be added within the next year. An assumed average of 3 people per connection was used and 450 people were added to the population projection for all decades. Consequently the Brown County-Other population was reduced by 450 people in all decades.

Zephyr WSC	Census 2000	Census 2010	2020	2030	2040	2050	2060	2070
TWDB Draft Population	3,450	3,983	4,156	4,256	4,256	4,256	4,256	4,256
Proposed Population	3,450	3,983	4,606	4,706	4,706	4,706	4,706	4,706
Brown County-Other								
TWDB Draft Population	3,484	2,730	2,847	2,915	2,915	2,915	2,915	2,915
Proposed Population	3,484	2,730	2,397	2,465	2,465	2,465	2,465	2,465

Active Permian Basin Shale Oil Boom

In the 2010 Census, Region F accounted for 623,000 people. From 2000 to 2010, the region as a whole experienced a 0.74% average annual growth rate. However, the area is currently experiencing a steep population increase due to the renewed interest in the exploration and production of shale oil. This population

boom was not captured by the 2010 Census. The Midland metropolitan area was named the number one fastest growing metropolitan area in America, growing 4.6% from 2011 to 2012 (Oil and Gas Boom, 2013). The City of Andrews was named the fourth fastest growing micropolitian area due to similar high growth rates. This aggressive population growth is expected to continue as the oil play develops in the near decades (2020-2030) and then taper off in subsequent decades. The following city’s populations have been adjusted to reflect their expected near term growth. A summary of the requested population changes is provided in Appendix.

Andrews

The City of Andrews is experiencing aggressive population growth due to the Permian Basin oil boom. The US Census rated Andrews the fourth fastest growing micropolitian area from July 2011 to July 2012. Between the 2000 and the 2010 Census, Andrews grew 1.39% annually. From 2011-2012, the growth rate more than tripled to 4.7% (Oil and Gas Boom, 2013). Based on input from the City of Andrews, a 3% average annual growth rate was used from 2010-2020, 2% from 2020-2030 and 1.5% in all subsequent decades.

City of Andrews	Census 2000	Census 2010	2020	2030	2040	2050	2060	2070
TWDB Draft Population	9,652	11,088	12,852	14,697	16,532	18,310	20,064	21,760
Proposed Population	9,652	11,088	14,967	18,281	21,239	24,676	28,669	33,309

Midland

Midland has experienced tremendous growth between 2005 and 2012, which is not reflected in the overall rate of growth between 2000 and 2010. The US Census Bureau ranked Midland as the fastest growing metro area and the third fastest growing city, having grown 4.87% between July 1, 2011 and July 1, 2012 (Oil and Gas Boom, 2013). Midland’s population in July of 2012 was estimated by the U.S. Census Bureau to be 119,385 persons. This is almost 8,000 persons greater than the 2010 census and only 5,000 less than the year 2020 projection. The proposed year 2020 population projection for Midland is 130,267 persons, an increase of 5,318 persons. This increase better reflects the near-term rapid growth of the City in response to the ongoing oil shale boom. All other decades in the draft TWDB projections are acceptable.

City of Midland	Census 2000	Census 2010	2020	2030	2040	2050	2060	2070
TWDB Draft Population	94,996	111,147	124,949	139,416	153,566	167,838	181,927	195,734
Proposed Population	94,996	111,147	130,267	139,416	153,566	167,838	181,927	195,734

Miles

The City of Miles is located approximately 20 miles northeast of the City of San Angelo and has been experiencing high growth rates from the increased oil exploration in the region. The 2012 State Data Center population estimate for Miles is equal to the draft 2020 projected value (Hoque, 2013). The City also reported that a new housing developing is underway and growth is expected to continue as the oil and gas activities continue in the area. Based on growth rates documented in 2011 and 2012 and the growth experienced in nearby communities, a 1.5% annual growth rate was used until 2030. After 2030, a no growth scenario was assumed to match TWDB’s rate.

City of Miles	Census 2000	Census 2010	2020	2030	2040	2050	2060	2070
TWDB Draft Population	850	829	851	873	873	873	873	873
Proposed Population	850	829	963	1,119	1,119	1,119	1,119	1,119

San Angelo

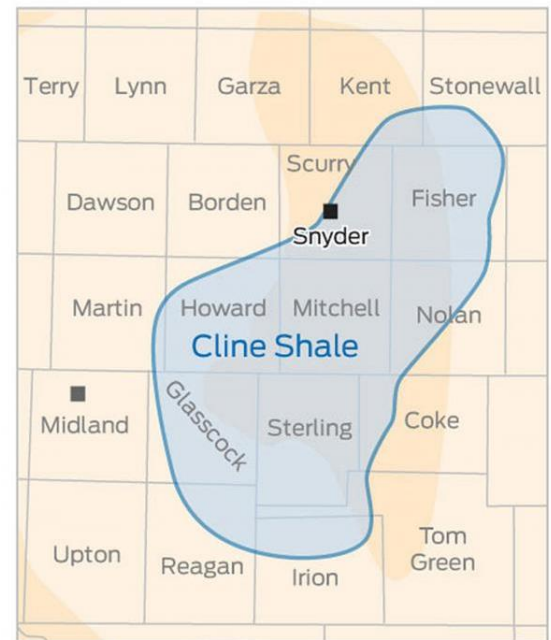
The City of San Angelo’s annual growth rates between 2008 and 2012 are not reflected in the overall rate of growth between 2000 and 2010 due to the ongoing shale oil boom. San Angelo’s population in July of 2012 was estimated by the U.S. Census Bureau to be 95,887 persons. This is only 2,491 persons less than the year 2020 projection. The city’s population was adjusted to reflect the near-term rapid growth rate of 1.2% per year through 2030, and reduced to 0.6% for 2040 – 2070.

City of San Angelo	Census 2000	Census 2010	2020	2030	2040	2050	2060	2070
TWDB Draft Population	88,439	93,200	98,378	104,053	108,831	113,024	116,984	120,578
Proposed Population	88,439	93,200	105,083	118,480	125,807	133,586	141,847	150,618

Expected Future Development in the Cline Shale

In addition to the ongoing development of shale oil in the Permian Basin, another boom of production is expected within the decade due to oil exploration and production in the Cline Shale formation. The Cline Shale covers all or part of nine Region F counties as shown in Figure 1. The growth in this region is too recent to be shown in the 2011-2012 published growth rates. Several water user groups provided comments on their population growth due to the expected development of the Cline Shale. For planning purposes, the population growth for these entities was modeled after the active boom in the Permian Basin. The Cline Shale is similarly expected to induce growth in the early decades and level off in later years. For 2010 -2020, a 2 percent average annual growth rate was used. From 2020-2030 an average of TWDB’s draft growth and the previous decades 2 percent growth rate was employed. All subsequent decades utilize the TWDB’s suggested growth rate.

Figure 1



Source: Keith Schaefer, Oil and Gas Investments Bulletin (4/19/12)

Colorado City

The City of Colorado City is located in Mitchell County in the heart of the Cline Shale. This City is expected to experience growth rates much higher than recent historical trends would project given the incoming oil development.

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City of Colorado City	Census 2000	Census 2010	2020	2030	2040	2050	2060	2070
TWDB Draft Population	4,281	4,146	4,312	4,451	4,547	4,612	4,660	4,695
Proposed Population	4,281	4,146	5,064	5,686	5,801	5,859	5,918	5,978

Snyder

Snyder is on the edge of the Cline Shale formation and is expected to experience rapid growth in the near future.

City of Snyder	Census 2000	Census 2010	2020	2030	2040	2050	2060	2070
TWDB Draft Population	10,783	11,202	12,201	13,240	14,272	15,433	16,606	17,824
Proposed Population	10,783	11,202	13,682	15,738	16,964	18,358	19,769	21,223

Summary of Population Change Request

Region F is suggesting changes to the draft population projections for eight municipal water user groups. Zephyr WSC and Brown County-Other population projections were adjusted to account for an expected transfer of service and resulted in no net change to the total Brown County population count. The other six entities are requesting population increases due to an increase in oil and gas production in the region. Population growth rates in these areas have drastically increased since the 2010 Census and were not accounted for in the draft TWDB projections. The development of shale oil attracts workers not only from Region F but from other regions in Texas and out of state. Thus, it is unreasonable to assume that the increased population in these cities is only from other places within Region F. With the proposed revisions, the total population for Region F should increase by 2% in 2020 and 5% in 2070 as shown in the table below. A summary table of the requested population changes and corresponding growth rates is included in Appendix.

Region F	Census 2000	Census 2010	Population 2020	Population 2030	Population 2040	Population 2050	Population 2060	Population 2070
TWDB Draft Total	578,814	623,354	684,450	744,622	799,506	853,205	905,663	956,830
Proposed Total	578,814	623,354	700,933	766,613	825,381	884,552	943,797	1,003,347
Numerical Difference	-	-	16,483	21,991	25,875	31,347	38,134	46,517
Percent Change	-	-	2%	3%	3%	4%	4%	5%

DEMAND CHANGE REQUESTS

Baseline GPCD Changes

Errors and Corrections

Colorado City

The City of Colorado City per capita usage calculated by the TWDB assumed that 61% of city’s intake water was used within city limits. The other 39% of their intake water was assumed to serve Mitchell County-Other. However, most homes outside of the city limits are served by individual wells, not the city system. Based on a phone conversation with city officials only 18 out of 2,168 meters (less than one percent) are located outside of the city. Using this information, the gallons per capita day usage for the City of Colorado City is 238. A corrected water use report is provided in the Appendix.

Alternate Dry Year

Year 2011 was an extreme drought year for Region F. As such, many entities were experiencing significant difficulty meeting demand and were implementing heavy water restrictions. Colorado River Municipal Water District (CRMWD) cut deliveries to their customers to winter use plus 10 percent. Thus, water use was significantly lower for several entities than in a typical dry year. Alternatively, the planning group proposes a base per capita value equal to the average of other recent dry years’ usage. The data used to develop the alternate per capita water use values were provided by the TWDB. A summary of the proposed baseline gpcd and resulting demand changes are included in the Appendix.

Big Spring

The City of Big Spring has not turned in a Water Use Survey to the TWDB over the past several years, thus the historical intake values on record are inaccurate. The City of Big Spring is entirely supplied by CRMWD. Per capita usage for the City of Big Spring was recalculated using CRMWD’s records of water delivery to the City. Historical industrial sales as recorded by the TWDB were included in the calculation below. Additionally, the City of Big Spring is the sole provider of water to the City of Coahoma (no municipal sales are shown in TWDB historical records). The City of Coahoma’s demand was used as the municipal sale and subtracted from Big Spring’s deliveries. The gpcd calculations for 2006-2010 are detailed in table below. Year 2011 was not used since deliveries from CRMWD were drastically cut and 2011 per capita use is not an accurate representation of future demands. An average of the corrected 2008 and 2009 gpcd values is suggested as the base year for Big Spring. Year 2006 was not included in the calculation because there is some uncertainty with the industrial sales and later years are likely more representative.

City of Big Spring Corrected Historical Use					
	2006	2007	2008	2009	2010
Intake (acre-feet/year)	6,760	6,527	6,938	7,767	7,288
Industrial Sales (acre-feet/year)	1,500*	1,565	1,296	1,588	1,413
Municipal Sales (acre-feet/year)**	303	241	227	178	182
Net Use (acre-feet/year)	4,957	4,722	5,415	6,001	5,693
Population	25,090	25,390	25,590	25,944	27,282
GPCD	176	166	189	206	186

*Estimated based on historical use in 2007-2010.

**City of Coahoma Demand obtained from TWDB Historical WUG Water Use Data sent 04-05-13

City of Big Spring ¹			
Year	GPCD	Hot/Dry Year GPCD	Average for Base GPCD
2006	176		<u>198</u>
2007	166		
2008	189	189	
2009	206	206	
2010	186		

¹ Data obtained from CRMWD recorded deliveries

Brownwood

Brownwood was in drought restrictions in 2011. While drought restrictions were only in place for part of the year, 2011 by itself is not a reliable indicator of Brownwood’s per capita water usage during times of no restrictions. The suggested base gpcd for Brownwood is 176 gallons per person per day, which is based on the average of years 2006, 2008 and 2011 and were all hot, dry years.

City of Brownwood ¹			
Year	GPCD	Hot/Dry Year GPCD	Average for Base GPCD
2006	185	185	<u>176</u>
2007	143		
2008	175	175	
2009	146		
2010	150		
2011	169	169	

¹ Data obtained from TWDB Historical WUG Water Use Data sent to FNI on 04-05-13

Midland

Midland was in drought restrictions in 2011 in response to the Colorado River Municipal Water District (CRMWD) limiting deliveries of water to the district’s member and customer cities. Therefore, 2011 by itself is not a reliable indicator of Midland’s per capita water usage. The suggested base gpcd for Midland is 234 gallons per person per day, which is based on the average of years 2006, 2008 and 2011 and were all hot, dry years.

City of Midland¹			
Year	GPCD	Hot/Dry Year GPCD	Average for Base GPCD
2006	241.8	241.8	<u>234</u>
2007	207.6		
2008	241.6	241.6	
2009	231.7		
2010	210.0		
2011	219.0	219.0	

¹Data provided by the City of Midland

Odessa

The City of Odessa is also a customer city of CRMWD and experienced limited water deliveries in 2011. As previously discussed, 2011 is not a good indicator of average dry year demand for CRMWD customers. An average of 2006 and 2008 demand is suggested as the base year gpcd.

City of Odessa¹			
Year	GPCD	Hot/Dry Year GPCD	Average for Base GPCD
2006	207	207	<u>195</u>
2007	174		
2008	182	182	
2009	174		
2010	167		

¹ Data obtained from TWDB Historical WUG Water Use Data sent to FNI on 04-05-13

Robert Lee

Robert Lee, another customer of CRMWD, was in severe drought restrictions in 2011. Thus the 2009 gpcd of 261 is suggested as more representative average dry year demand.

City of Robert Lee ¹			
Year	GPCD	Hot/Dry Year GPCD	Average for Base GPCD
2006	113		<u>261</u>
2007	127		
2008	79		
2009	261	261	
2010	242		
2011	161		

¹ Data obtained from TWDB Historical WUG Water Use Data sent to FNI on 04-05-13

² Historical use data for years 2006-2008 appear to be missing supplies.

Snyder

The City of Snyder as a CRMWD member city also had insufficient water supply in 2011. The suggested base gpcd for Snyder is 155, which is based on the average of years 2006 and 2008. This is a more accurate reflection of average dry year water demands.

City of Snyder ¹			
Year	GPCD	Hot/Dry Year GPCD	Average for Base GPCD
2006	161	161	<u>155</u>
2007	148		
2008	149	149	
2009	137		
2010	143		

¹ Data obtained from TWDB Historical WUG Water Use Data sent 04-05-13

Plumbing Code Implementation Rate Changes

Region F is mostly rural in nature, containing smaller communities, with generally lower incomes. Low flow plumbing fixtures are typically implemented as part of new construction and remodels. Based on survey responses from rural water providers, the renewal and fixture replacement process is generally slower in their service areas. Thus for some communities in Region F, the aggressive 9-10 gallons per capita day drop in usage within the first ten years is not expected to occur. To address these concerns, the reductions in water use due to plumbing code fixtures were reduced in the early decades. A summary of gpcd and resulting demand change

estimates are included in the Appendix.

Bangs

The City of Bangs is a small community of just over 1,000 people in Brown County. The median household income in Bangs is 36% lower than that of the state of Texas as a whole (American FactFinder and State Median Income, 2013). Installation of conserving fixtures will likely be slower than in more affluent, metropolitan areas. The planning group suggests the gallons per capita day be adjusted as shown in the table below.

City of Bangs	Base Dry Year GPCD	2020 GPCD	2030 GPCD	2040 GPCD	2050 GPCD	2060 GPCD	2070 GPCD
TWDB Draft GPCD	120	110	106	103	102	101	101
Proposed GPCD	120	115	111	108	107	106	106

Brookesmith SUD

The reductions in gpcd may be too aggressive for a rural special utility district such as Brookesmith SUD. Based on data received from the water user group, the following changes are suggested.

Brookesmith SUD	Base Dry Year GPCD	2020 GPCD	2030 GPCD	2040 GPCD	2050 GPCD	2060 GPCD	2070 GPCD
TWDB Draft GPCD	142	133	130	127	125	125	125
Proposed GPCD	142	140	137	135	130	127	127

Brownwood

The median household income in the City of Brownwood is 24% lower than the composite median household income of the state (American FactFinder and State Median Income, 2013). Lower income communities such as Brownwood, may experience slower implementation rates of the plumbing code since replacement of fixtures and appliances in generally slower due to financial constraints. The following changes are suggested to reduction in gpcd over time due to conservation based on input from City Brownwood. Additionally, as previously discussed, the average of 2006, 2008 and 2011 is suggested as the base year gpcd.

City of Brownwood	Base Dry Year GPCD	2020 GPCD	2030 GPCD	2040 GPCD	2050 GPCD	2060 GPCD	2070 GPCD
TWDB Draft GPCD	169	160	155	152	151	150	150
Proposed GPCD	176	170	164	161	159	157	157

SUMMARY OF MUNICIPAL GPCD AND DEMAND CHANGES

Region F is suggesting changes for fourteen municipal water user groups based on increased growth rates due to shale oil production not reflected in the 2010 Census, more representative dry year demands, and slower plumbing code implantation rates. A summary table of all Region F suggested demand changes is shown below. Further data, calculations and summary tables are available in the Appendix.

Suggested WUG Demand Changes	Demand 2020	Demand 2030	Demand 2040	Demand 2050	Demand 2060	Demand 2070
ANDREWS						
TWDB Draft Demand	3,684	4,142	4,607	5,075	5,555	6,023
Proposed Demand	4,292	5,160	5,924	6,827	7,932	9,216
BANGS						
TWDB Draft Demand	207	204	198	195	194	194
Proposed Demand	216	213	207	205	203	203
BIG SPRING						
TWDB Draft Demand	3,739	3,774	3,741	3,690	3,680	3,679
Proposed Demand	6,155	6,287	6,291	6,257	6,222	6,222
BROOKSMITH SUD						
TWDB Draft Demand	1,191	1,187	1,162	1,148	1,145	1,145
Proposed Demand	1,252	1,255	1,237	1,191	1,164	1,164
BROWN COUNTY-OTHER						
TWDB Draft Demand	241	243	242	242	240	240
Proposed Demand	204	204	204	204	204	204
BROWNWOOD						
TWDB Draft Demand	3,597	3,589	3,515	3,475	3,468	3,468
Proposed Demand	3,832	3,786	3,717	3,671	3,625	3,625
COLORADO CITY						
TWDB Draft Demand	663	662	658	664	669	674
Proposed Demand	1,293	1,427	1,429	1,444	1,452	1,466
MIDLAND						
TWDB Draft Demand	28,211	30,868	33,549	36,422	39,421	42,397
Proposed Demand	32,832	34,513	37,499	40,797	44,017	47,358
MILES						
TWDB Draft Demand	100	99	95	94	93	93
Proposed Demand	113	127	122	120	119	119
ODESSA						
TWDB Draft Demand	19,013	20,903	22,997	25,314	27,823	30,383
Proposed Demand	23,766	26,302	29,017	32,064	35,114	38,367
ROBERT LEE						
TWDB Draft Demand	180	174	170	170	169	169

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Suggested WUG Demand Changes	Demand 2020	Demand 2030	Demand 2040	Demand 2050	Demand 2060	Demand 2070
Proposed Demand	296	291	287	287	286	286
SAN ANGELO						
TWDB Draft Demand	17,145	17,653	18,087	18,581	19,191	19,775
Proposed Demand	18,362	20,040	20,856	21,996	23,198	24,632
SNYDER						
TWDB Draft Demand	1,515	1,575	1,644	1,766	1,895	2,032
Proposed Demand	2,222	2,468	2,603	2,797	3,012	3,233
ZEPHYR WSC						
TWDB Draft Demand	345	340	331	325	324	323
Proposed Demand	382	374	364	358	358	358

REGION F TOTAL

TWDB Draft Demand	128,028	136,067	143,762	152,284	161,286	170,216
Proposed Demand	143,414	153,101	162,523	173,341	184,325	196,074
Numerical Difference	15,386	17,034	18,761	21,057	23,039	25,858
Percent Change	12%	13%	13%	14%	14%	15%

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