

DRAFT TECHNICAL MEMORANDUM



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TO: Region K Water Planning Group

CC: File

FROM: Adam Conner, Neil Deeds

SUBJECT: Region K Draft Population and Municipal Demand Revision Requests

DATE: July 6, 2023

PROJECT: ITA21936

In January 2023, 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. Plumbing Code Savings assumptions were revised and new projections were provided in May 2023. Since the 2020 Census data was released subsequent to the publication of the 2021 Plans, regional and county population totals were altered in the projections provided by TWDB. Individual water user groups (WUGs) were adjusted to be representative of retail water service area boundaries rather than political city limit boundaries, as was done in the 2021 Plans. TWDB determined to allow populations of some WUGs whose historic population has been decreasing to continue to decrease. Finally, TWDB has begun using Commercial Plumbing Code Savings for the first time this planning cycle.

This memo details the suggested changes to the population and demand projections that the Region K Water Planning group determined were necessary to more accurately reflect the upcoming water needs of the region. The Region K Water Planning Group identified two key factors impacting municipal water user groups that may not have been adequately accounted for in the TWDB draft population projections. These factors include errors and inaccuracies in the service area boundaries and individual communities growing at significantly different rates than was projected in the 2021 Plan. Baseline per capita water usage adjustments reflect corrected historical populations served, increased conservation, and more recent data. Projected per capita water usage incorporates the TWDB reductions for water efficiencies savings (Plumbing code implementation).

[Section 1](#) of this memo provides a summary of all population revision requests (with key supporting documentation found in Attachments), by WUG. [Section 2](#) highlights the revision requests for baseline GPCD (with key supporting documentation in Attachments), by WUG. [Section 3](#) describes

the product of any population and/or baseline GPCD revisions for each WUG requesting one or both, in acre-feet per year.

1.00 POPULATION REVISION REQUESTS

1.01 NAMED WUG POPULATION REVISION REQUESTS

Austin

Austin Water is in the process of updating its Austin Water Forward Plan, the community's 100-year integrated water resource plan. Draft population projections developed for the plan update indicate near-term growth rates that are higher than the draft 1.0 migration scenario projections. [Attachment A](#) provides supporting documentation for the requested higher growth rates in Travis and Williamson County and justifies the addition of population in Hays County for the Austin WUG. This WUG is entirely in Region K, so this value comprises the total population for Austin.

This population revision request associated with the Austin WUG exceeds the draft 1.0 migration scenario projections and will not be balanced by a corresponding decrease to the Travis County-Other population. Therefore, **this population revision request associated with the Austin WUG will increase both the Travis and Williamson County total population above the draft 1.0 migration scenario and the Region K total population.** Since the Hays County revision is due to an error in service area boundaries, a corresponding decrease to Hays County is recommended.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Hays County	-	-	-	-	-	-
Travis County	1,053,682	1,175,496	1,311,393	1,463,000	1,632,134	1,820,821
Williamson County	92,210	124,095	161,645	202,917	249,744	302,802
Proposed Revised Population						
Hays County	129	152	176	200	224	249
Travis County	1,166,122	1,362,937	1,561,206	1,758,318	1,941,307	2,132,924
Williamson County	94,844	124,153	163,421	203,844	258,328	304,309

Buda

Communications with Buda revealed that the City is currently undergoing an update to its Comprehensive Plan. The City keeps accurate records of the number of connections/population within its water service area (see [Attachment B](#)), and comparing the City's 2020 estimate to the 2020 Census data demonstrates how closely they correlate. Applying the growth rates projected

for the entire city to its water service area yields population projections identified in the table below. Buda's requests effectively increase its population growth in the near decades and reduce it in the outer decades compared to the Draft 1.0 Migration Scenario. This WUG is entirely in Region K, so this value comprises the total population for Buda. A corresponding near-term decrease and long-term increase to the Hays County-Other population is recommended, as described in [Section 1.02](#). Combined with the baseline GPCD revision request in [Section 2](#), this will make Buda's total dry year demand more accurate. Should the baseline GPCD revision request be rejected, this population revision request should be withdrawn.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Hays County	18,055	26,040	36,554	50,826	67,000	85,329
Proposed Revised Population						
Hays County	20,475	28,665	34,156	39,620	45,959	53,312

Canyon Lake Water Service

Canyon Lake Water Service Company (now called Texas Water Company) developed detailed population and demand projections using robust housing analysis. Population and GPCD were developed for 2030-2070, for each of Canyon Lake's systems. A Lower and Higher scenario was analyzed for population, with the Lower assuming no growth in service area and the Higher assuming growth into adjacent areas with no CCN. For the three systems within Region K, no growth in service area was assumed, so the two projections are the same. Finally, the 2080 population is kept the same as the 2070 population.

The report can be found in [Attachment C](#) and the projections from that report are rolled up by County here for regional water planning purposes. It should be noted that the majority of Canyon Lake's population and service area fall within Region L, and this memo only outlines the population and demand for the Region K portion of Canyon Lake Water Service. The only systems that lie within Region K are the Rust Ranch system (entirely within Blanco County) and the Deer Creek system (split between Travis and Hays County). For the Deer Creek system, total population is split evenly between Travis and Hays County.

Corresponding changes to the Blanco County-Other, Hays County-Other, and Travis County-Other populations are recommended, as described in [Section 1.02](#). Combined with the baseline GPCD revision request in [Section 2](#), this will make Canyon Lake's total dry year demand more accurate. Should the baseline GPCD revision request be rejected, this population revision request should be withdrawn.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Blanco County	802	809	794	779	763	743
Hays County	666	960	1,349	1,876	2,473	3,151
Travis County	3,293	4,542	5,620	6,674	7,872	9,233
Proposed Revised Population						
Blanco County	536	536	536	536	536	536
Hays County	1,266	1,301	1,326	1,345	1,358	1,358
Travis County	1,266	1,301	1,327	1,345	1,359	1,359

Corix

In discussions with Corix leadership, it was discovered that the utility's projected 2030 population is much higher than the draft 1.0 migration scenario (and draft 0.5 migration scenario for their Mills and San Saba systems). Due to the confidential nature of their development agreements, the utility was not able to provide any supporting documentation. However, it was determined to keep projected population constant at the 2030 population.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Blanco County	1	1	1	1	1	1
Burnet County	1,677	1,877	2,050	2,242	2,459	2,704
Colorado County	285	259	236	215	196	178
Llano County	1,584	1,622	1,652	1,696	1,747	1,805
Matagorda County	22	22	21	20	19	17
Proposed Revised Population						
Blanco County	322	322	322	322	322	322
Burnet County	5,856	5,856	5,856	5,856	5,856	5,856
Colorado County	375	375	375	375	375	375
Llano County	4,001	4,001	4,001	4,001	4,001	4,001
Matagorda County	525	525	525	525	525	525

	2030	2040	2050	2060	2070	2080
Draft 0.5 Migration Scenario						
Mills County	75	75	75	76	78	80
San Saba County	80	76	71	68	65	61
Proposed Revised Population						
Mills County	735	735	735	735	735	735
San Saba County	140	140	140	140	140	140

Cottonwood Creek MUD 1

In discussions with Cottonwood Creek MUD 1 leadership, it was discovered that the utility is roughly built out and land locked (see [Attachment D](#)). It is estimated that buildout population is roughly 5,000. Therefore, it is proposed to cap population at 5,000. Aerial view of the WUG service area can be found in [Attachment D](#). This WUG is entirely in Region K, so this value comprises the total population for Cottonwood Creek MUD 1. A corresponding increase to the Travis County-Other population is recommended, as described in [Section 1.02](#).

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Travis County	5,056	6,929	8,545	10,126	11,923	13,965
Proposed Revised Population						
Travis County	5,000	5,000	5,000	5,000	5,000	5,000

Dripping Springs WSC

Leadership at Dripping Springs WSC indicated that the draft 2030 population is lower than what they plan for. They provided a detailed breakdown showing their 2022 residential connections to be 3,644 and 2022 multi family connections to be 250. Applying a 2.9 persons per connection ratio to their 2022 connection count of 3,894 yields a population of 11,293. The utility also indicated that it is planning for 1,750 new connections by 2030. Applying a 2.9 persons per connection ratio to those planned connections brings the 2030 population to 16,368. For projected population in 2040 through 2080, the same decadal growth rates from the draft 1.0 migration scenario projections were used, with an assumption that the 2080 population from the draft 1.0 migration scenario (40,673) is the build-out population. This WUG is entirely in Region K, so this value comprises the total population for Dripping Springs WSC.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Hays County	8,631	12,496	18,092	26,194	31,942	40,673
Proposed Revised Population						
Hays County	16,368	23,698	34,310	40,673	40,673	40,673

Elgin

City of Elgin provided a map showing all proposed and applied for plats within the City's city limits and ETJ ([Attachment E](#)). These future lots/units total roughly 15,000 and the City is confident that a good number of them will be developed within the next 10-20 years. It should be noted that Elgin's city limits are different from its water Certificate of Convenience and Necessity (CCN).

Using a persons per connection ratio of 2.5 and assuming that one-quarter of the units are developed between Elgin's 2020 Census estimate of 9,784 and 2030, and one-quarter are developed in each subsequent decade, results in population projections that are much higher than the draft 1.0 migration scenario. It is assumed that the total population distribution between Bastrop and Travis County will be the same as the proportions found in the Draft 1.0 Migration Scenario. It is also assumed that full build-out is reached in 2060.

The draft and proposed revised population projections for Elgin are found below. This WUG is entirely in Region K, so this value comprises the total population for Elgin. Corresponding decreases to the Bastrop County-Other and Travis County-Other populations are recommended, as described in [Section 1.02](#).

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Bastrop County	8,712	9,455	10,311	11,293	12,409	13,678
Travis County	1,492	1,955	2,356	2,748	3,195	3,703
Proposed Revised Population						
Bastrop County	16,358	21,324	24,989	27,638	27,638	27,638
Travis County	8,004	14,401	19,354	23,106	23,106	23,106

Goldthwaite

The City of Goldthwaite indicated that they do not believe a declining trend in population is appropriate, and in fact some growth has occurred since 2020 that was not captured in the historical data used for projections. A townhome complex was added in 2021, increasing the number of residential connections. The city also stated that some large parcels are expected to be subdivided, but documentation was not available to support this prediction. Therefore, it is recommended to

maintain a constant population of 1,738, which is the population submitted in the 2021 Water Use Survey. The 2010 and 2021 water use surveys are included in [Attachment F](#), illustrating the increases in both residential and commercial connections. This WUG is entirely in Region K, so this value comprises the total population for Goldthwaite. A corresponding decrease to the Mills County-Other population is recommended, as described in [Section 1.02](#). Note that we recommend adopting the **0.5 Migration Scenario for the Mills County total population**. Goldthwaite is also requesting a revision to its baseline GPCD, which can be found in [Section 2](#).

	2030	2040	2050	2060	2070	2080
Draft 0.5 Migration Scenario						
Mills County	1,624	1,551	1,495	1,472	1,498	1,610
Proposed Revised Population						
Mills County	1,738	1,738	1,738	1,738	1,738	1,738

Hays County WCID 2

Hays County WCID 2 has experienced rapid growth over the past decade, but the utility indicated that this service area is built out and landlocked. The buildout population is estimated to be 3,390 based on a total connection count of 1,130 times 3 persons per connection. Therefore, it is proposed to maintain a constant population of 3,390. An aerial view of the WUG service area can be found in [Attachment G](#). This WUG is entirely in Region K, so this value comprises the total population for Hays County WCID 2. A corresponding increase in the Hays County-Other population is recommended, as described in [Section 1.02](#).

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Hays County	4,998	7,213	10,130	14,091	18,578	23,664
Proposed Revised Population						
Hays County	3,390	3,390	3,390	3,390	3,390	3,390

Hurst Creek MUD

Hurst Creek MUD's CCN aligns almost exactly with the city limit of Village of the Hills, with the exception of the areas identified in [Attachment H](#). Village of the Hills' 2020 Census estimate was 2,613. Page 1 of [Attachment H](#) shows 67 lots that fully lie outside of Village of the Hills' city limits and fully within Hurst Creek MUD's CCN. Page 2 of [Attachment H](#) shows only non-residential connections within those same parameters. Applying a 2.5 persons per connection ratio yields an additional 168 people, for a total estimated population in 2020 of 2,781.

In reviewing aerials of Hurst Creek MUD's CCN, it was determined that the service area is fully built-out. Therefore, the proposed revised population shown below maintains population at 2,781. This

WUG is entirely in Region K, so this value comprises the total population for Hurst Creek MUD. A corresponding increase to the Travis County-Other population is recommended, as described in [Section 1.02](#). Hurst Creek MUD is also requesting a revision to its baseline GPCD, which can be found in [Section 2](#).

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Travis County	3,095	3,095	3,095	3,095	3,095	3,095
Proposed Revised Population						
Travis County	2,781	2,781	2,781	2,781	2,781	2,781

Johnson City

The City of Johnson City has stated that a declining trend in population does not accurately reflect historical trends or expected future growth. The utility has seen growth in connections over the last decade, as shown in the 2010 and 2020 water use survey reports included as [Attachment I](#).

Connections have increased from 833 to 884, for an average annual growth rate of approximately 0.6%. We propose the following projections based on a starting 2020 population of two times the 2020 connection count (1,768) and a growth rate of 0.6% per year. A corresponding decrease to the Blanco County-Other population is recommended, as described in [Section 1.02](#).

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Blanco County	1,631	1,645	1,616	1,589	1,559	1,524
Proposed Revised Population						
Blanco County	1,877	1,993	2,116	2,246	2,384	2,531

La Ventana WSC

In discussions with La Ventana WSC leadership, it was discovered that the utility currently has a total of 307 lots available, of which 260 are currently serviced by the utility. Therefore, it is proposed to cap population at 825, assuming it reaches buildout by 2030. Aerial view of the WUG service area can be found in [Attachment J](#). This WUG is entirely in Region K, so this value comprises the total population for La Ventana WSC. A corresponding increase to the Hays County-Other population is recommended, as described in [Section 1.02](#).

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Hays County	825	1,191	1,673	2,326	3,067	3,906
Proposed Revised Population						
Hays County	825	825	825	825	825	825

Lago Vista

The City of Lago Vista has indicated that recent growth trends warrant a higher growth projection. The draft 2026 projections show a growth rate of 2.3% (at 1.0 Migration Scenario), but the population growth for Lago Vista from 2010 to 2020 was 4.2% according to historical population data provided by TWDB. Much of the growth in connections has occurred in recent years, with an average growth rate in connections of roughly 5% from 2014 to 2021. Additionally, a buildout capacity of 49,000 people has been estimated for the city based on available land, as described in the Comprehensive Plan (which due to its size can be provided upon request). The City also noted that the current population has nearly reached the draft 2030 projection. The 2020 population is estimated to be 11,315, which is equal to the 2020 connection count of 4,526 times 2.5 people per connection. The 2020 water use survey showing this connection count is also included in [Attachment K](#). Therefore, a population growth rate of 4% is proposed, beginning from a 2020 population of 11,315, and capped at a buildout population of 49,000. This WUG is entirely in Region K, so this value comprises the total population for Lago Vista. A corresponding decrease to the Travis County-Other population is recommended, as described in [Section 1.02](#).

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Travis County	11,892	14,972	18,850	23,732	29,879	37,618
Proposed Revised Population						
Travis County	16,749	24,793	36,700	49,000	49,000	49,000

Lakeway MUD

In discussions with Lakeway MUD leadership, it was discovered that the utility's current population exceeds its projected 2030 population. The utility also provided its buildout population of 11,242 by 2044. Lakeway MUD's requests effectively increase its population growth rate in the near decades and reduce it in the later decades compared to the draft projections. A more detailed description of the revision request can be found in [Attachment L](#). This WUG is entirely in Region K, so this value comprises the total population for Lakeway MUD. A corresponding near-term decrease and long-term increase to the Travis County-Other population is recommended, as described in [Section 1.02](#). Combined with the baseline GPCD revision request in [Section 2](#), this will make Lakeway MUD's total dry year demand more accurate. Should the baseline GPCD revision request be rejected, this population revision request should be withdrawn.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Travis County	9,779	10,776	11,632	12,436	13,025	13,025
Proposed Revised Population						
Travis County	10,726	11,095	11,242	11,242	11,242	11,242

Leander

Since the Leander WUG is primarily in Region G, information supporting its population revision request was sent to the Region G Technical Consultant. However, through regular coordination with that Region G team, Region K became aware of this request of a shared WUG. The utility provided system-wide population projections not parsed out by Water Planning Region. Region K is parsing out its portion of Leander's population based on the proportions presented in the draft 1.0 migration scenario projections. The percentage of the Leander WUG's population found within Region K in the draft 1.0 migration scenario projections in 2030, 2040, 2050, 2060, 2070 and 2080 are 18.9%, 18.8%, 17.7%, 16.7%, 16.0%, and 15.6%, respectively. Furthermore, the utility estimates its buildout population to be reached in the 2040s at 225,000, so it is assumed that 18.8% of the 225,000 would lie within Region K and would result in a Region K buildout population of 42,300. Therefore, the population revision requests submitted for the Leander WUG, based on system-wide population projections found in [Attachment M](#) and using the methodology explained above, are as follows:

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Travis County	19,679	27,769	34,750	41,563	49,311	58,119
Proposed Revised Population						
Travis County	31,916	40,221	42,300	42,300	42,300	42,300

Marble Falls

The City of Marble Falls has indicated that recent growth trends warrant a higher growth projection. This has been echoed by members of the Region K planning group. The City provided draft 2023-2033 population projections from the Impact Fee Study it is currently developing ([Attachment N](#)). They indicated that Scenario C is what is being planned for in the Impact Fee Study. It was determined to use the City Limits populations in Scenario C to determine the 2030 population and near-term trend line, which was projected out logarithmically to 2080. Therefore, the following population projections for Marble Falls are proposed. This WUG is entirely in Region K, so this value comprises the total population for Marble Falls. A corresponding decrease to the Burnet County-Other population is recommended, as described in [Section 1.02](#).

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Burnet County	7,655	8,823	10,169	11,720	13,508	15,569
Proposed Revised Population						
Burnet County	13,287	17,072	17,079	17,086	17,093	17,101

Ruby Ranch WSC

In discussions with Ruby Ranch WSC leadership, it was discovered that the utility is roughly built out. Therefore, it is proposed to cap population at 1,122, assuming it reaches buildout by 2030. Aerial view of the WUG service area can be found in [Attachment O](#). This WUG is entirely in Region K, so this value comprises the total population for Ruby Ranch WSC. A corresponding increase to the Hays County-Other population is recommended, as described in [Section 1.02](#).

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Hays County	1,122	1,620	2,275	3,164	4,172	5,314
Proposed Revised Population						
Hays County	1,122	1,122	1,122	1,122	1,122	1,122

San Saba

It was determined that the **draft 0.5 migration scenario** should be adopted for the San Saba County total. In discussions with City of San Saba leadership, it was discovered that the utility's current population exceeds its projected 2030 population and that the City does not anticipate any reduction in population. Water Use Surveys submitted over the past few years ([Attachment P](#)) indicate a slightly increasing population above 3,000, with a population per residential connection of roughly 3. Therefore, it is proposed to maintain San Saba's population at 3,000 for all planning decades. This WUG is entirely in Region K, so this value comprises the total population for San Saba. A corresponding decrease to the San Saba County-Other population is recommended, as described in [Section 1.02](#). San Saba is also requesting a revision to its Baseline GPCD, which can be found in [Section 2](#).

	2030	2040	2050	2060	2070	2080
Draft 0.5 Migration Scenario						
San Saba County	2,170	2,143	2,143	2,167	2,237	2,381
Proposed Revised Population						
San Saba County	3,000	3,000	3,000	3,000	3,000	3,000

Schulenburg

In discussions with Schulenburg leadership, it was discovered that the utility's current population exceeds its projected 2030 population and that the City does not anticipate any reduction in population. Water Use Surveys submitted over the past few years indicate a population slightly below 3,000, and documentation from the City's Economic Development Corporation indicate a strong growth in jobs and development interest growing west of the Houston metroplex ([Attachment Q](#)). Therefore, it is proposed to maintain Schulenburg's population at 3,000 for all planning decades. This WUG is entirely in Region K, so this value comprises the total population for Schulenburg. A corresponding decrease to the Fayette County-Other population is recommended, as described in [Section 1.02](#).

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Fayette County	2,438	2,395	2,347	2,337	2,326	2,314
Proposed Revised Population						
Fayette County	3,000	3,000	3,000	3,000	3,000	3,000

Sunset Valley

City of Sunset Valley is located in south Austin and is fully surrounded by Austin city limits. It is in the heart of a rapidly growing urban center and should not show a decrease in population. Therefore, the proposed revised population shown below maintains population at 737. This WUG is entirely in Region K, so this value comprises the total population for Sunset Valley. A corresponding decrease to the Travis County-Other population is recommended, as described in [Section 1.02](#).

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Travis County	737	611	507	424	354	295
Proposed Revised Population						
Travis County	737	737	737	737	737	737

Travis County MUD 18

Travis County MUD 18 is a new WUG for the 2026 regional planning cycle, and the utility indicated that this service area is built out and landlocked. The buildout population is estimated by the utility to be 1,449 based on a total connection count of 483 times 3 persons per connection. Therefore, it is proposed to maintain a constant population of 1,449. An aerial view of the WUG service area can be found in [Attachment R](#). This WUG is entirely in Region K, so this value comprises the total population for Travis County MUD 18. A corresponding increase to the Travis County-Other population is recommended, as described in [Section 1.02](#).

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Travis County	2,455	3,387	4,192	4,979	5,873	6,889
Proposed Revised Population						
Travis County	1,449	1,449	1,449	1,449	1,449	1,449

Travis County WCID 18

Travis County WCID 18 is located in west Austin and purchases water from LCRA. It is in the heart of a rapidly growing urban center and should not show a decrease in population. Additionally, the utility provided a report to its Board ([Attachment S](#)) showing the total connection count in April 2023 to be 1,920, for a total population of 5,523. Therefore, the proposed revised population shown below maintains population at 5,523. This WUG is entirely in Region K, so this value comprises the total population for Travis County WCID 18. A corresponding decrease to the Travis County-Other population is recommended, as described in [Section 1.02](#).

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Travis County	3,048	2,318	1,766	1,354	1,037	794
Proposed Revised Population						
Travis County	5,523	5,523	5,523	5,523	5,523	5,523

Undine Development

A representative at Undine LLC communicated that the system currently has 232 active connections and uses a multiplier of 3 people per connection, so requested that its 2030 population be shown as 696. The utility also explained that it is at build-out, and therefore should be shown as having a static population throughout the planning horizon.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Travis County	372	381	389	400	411	424
Proposed Revised Population						
Travis County	696	696	696	696	696	696

Wells Branch MUD

Communications with Wells Branch MUD revealed that the utility's current population exceeds its projected 2030 population. [Attachment T](#) shows the utility's 2021 Water Use Survey, reporting a

population of 19,377, as well as documentation of the utility’s total multifamily units. Additionally, [Attachment T](#) documents the numbers of future units in various stages of development/planning, which totals 1,239 units (Generational Housing Multifamily should not be included as future development). While it is very likely that the utility will have more growth in the future than what is known today, it was decided to limit future growth to what is known today. It was assumed that all future units will be developed by 2040. Wells Branch MUD directed that all population in addition to the Draft 1.0 Migration Scenario be assumed to occur in Travis County. This WUG is entirely in Region K, so this value comprises the total population for Wells Branch MUD. A corresponding decrease to the Travis County-Other population is recommended, as described in [Section 1.02](#). Wells Branch MUD is not requesting a change to the Williamson County portion of its service area, just the Travis County portion.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario						
Travis County	15,366	17,093	18,576	18,750	18,750	18,750
Williamson County	500	734	1,012	1,073	1,073	1,073
Proposed Revised Population						
Travis County	21,073	21,907	21,907	21,907	21,907	21,907
Williamson County	500	734	1,012	1,073	1,073	1,073

1.02 COUNTY-OTHER POPULATION REVISION REQUESTS

In order to balance the County total populations with the various revisions within the County, changes in County-Other populations are proposed, as identified in the following subsections. In Travis and Williamson County, ***an increase above the 1.0 migration scenario County total is requested***, and those increases are entirely attributed to the increase requested by Austin. Travis County-Other population is balanced by the revision requests of all WUGs within Travis County except for Austin.

Bastrop County-Other

It was determined that the draft 1.0 migration scenario should be used for the Bastrop County total. In order to maintain the county total to this population, the Bastrop County-Other population has been adjusted as described in the proposed revisions in the table below. It should be noted that the “Proposed All Named WUGs in Bastrop County” incorporates all of the proposed revisions in [Section 1.01](#). It should also be noted that all populations are for Region K portion only.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario - All Named WUGs in Bastrop County	111,046	136,189	165,955	199,775	238,106	281,553
Draft 1.0 Migration Scenario – Bastrop County-Other	9,855	13,829	18,565	23,936	30,020	36,908
Draft 1.0 Migration Scenario – Bastrop County Total	120,901	150,018	184,520	223,711	268,126	318,461
Proposed All Named WUGs in Bastrop County	118,692	148,058	180,633	216,120	253,335	295,513
Proposed Revised Population – Bastrop County-Other	2,209	1,960	3,887	7,591	14,791	22,948
Proposed Bastrop County Total	120,901	150,018	184,520	223,711	268,126	318,461

Blanco County-Other

It was determined that the draft 1.0 migration scenario should be used for the Blanco County total. In order to maintain the county total to this population, the Blanco County-Other population has been adjusted as described in the proposed revisions in the table below. The “Proposed All Named WUGs in Blanco County” incorporates all of the proposed revisions in [Section 1.01](#). It should also be noted that all populations are for Region K portion only.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario - All Named WUGs in Blanco County	4,465	4,504	4,422	4,344	4,257	4,154
Draft 1.0 Migration Scenario – Blanco County-Other	7,386	7,447	7,309	7,174	7,020	6,850
Draft 1.0 Migration Scenario – Blanco County Total	11,851	11,951	11,731	11,518	11,277	11,004
Proposed All Named WUGs in Blanco County	4,766	4,900	4,985	5,079	5,176	5,275
Proposed Revised Population – Blanco County-Other	7,085	7,051	6,746	6,439	6,101	5,729
Proposed Blanco County Total	11,851	11,951	11,731	11,518	11,277	11,004

Burnet County-Other

It was determined that the draft 1.0 migration scenario should be used for the Burnet County total. In order to maintain the county total to this population, the Burnet County-Other population has been adjusted as described in the proposed revisions in the table below. It should be noted that the “Proposed All Named WUGs in Burnet County” incorporates all of the proposed revisions in [Section 1.01](#). It should also be noted that all populations are for Region K portion only.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario - All Named WUGs in Burnet County	33,702	37,806	41,765	46,238	51,374	57,163
Draft 1.0 Migration Scenario – Burnet County-Other	21,560	22,821	23,492	24,085	24,690	25,407
Draft 1.0 Migration Scenario – Burnet County Total	55,262	60,627	65,257	70,323	76,064	82,570
Proposed All Named WUGs in Burnet County	43,513	50,034	52,481	55,218	58,356	61,847
Proposed Revised Population – Burnet County-Other	11,749	10,593	12,776	15,105	17,708	20,723
Proposed Burnet County Total	55,262	60,627	65,257	70,323	76,064	82,570

Colorado County-Other

It was determined that the draft 1.0 migration scenario should be used for the Colorado County total. In order to maintain the county total to this population, the Colorado County-Other population has been adjusted as described in the proposed revisions in the table below. It should be noted that the “Proposed All Named WUGs in Colorado County” incorporates all of the proposed revisions in [Section 1.01](#). It should also be noted that all populations are for Region K portion only.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario - All Named WUGs in Colorado County	8,505	8,180	7,843	7,574	7,268	6,918
Draft 1.0 Migration Scenario – Colorado County-Other	11,480	11,216	10,899	10,571	10,200	9,783
Draft 1.0 Migration Scenario – Colorado County Total	19,985	19,396	18,742	18,145	17,468	16,701
Proposed All Named WUGs in Colorado County	8,595	8,296	7,982	7,734	7,447	7,115
Proposed Revised Population – Colorado County-Other	11,390	11,100	10,760	10,411	10,021	9,586
Proposed Colorado County Total	19,985	19,396	18,742	18,145	17,468	16,701

Fayette County-Other

It was determined that the draft 1.0 migration scenario should be used for the Fayette County total. In order to maintain the county total to this population, the Fayette County-Other population has been adjusted as described in the proposed revisions in the table below. It should be noted that the “Proposed All Named WUGs in Fayette County” incorporates all of the proposed revisions in [Section 1.01](#). It should also be noted that all populations are for Region K portion only.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario - All Named WUGs in Fayette County	19,027	19,391	19,771	20,380	21,038	21,738
Draft 1.0 Migration Scenario – Fayette County-Other	5,243	4,391	3,466	2,741	1,952	1,104
Draft 1.0 Migration Scenario – Fayette County Total	24,270	23,782	23,237	23,121	22,990	22,842
Proposed All Named WUGs in Fayette County	19,589	19,996	20,424	21,043	21,712	22,424
Proposed Revised Population – Fayette County-Other	4,681	3,786	2,813	2,078	1,278	418
Proposed Fayette County Total	24,270	23,782	23,237	23,121	22,990	22,842

Hays County-Other

It was determined that the draft 1.0 migration scenario should be used for the Hays County total. In order to maintain the county total to this population, the Hays County-Other population has been adjusted as described in the proposed revisions in the table below. It should be noted that the “Proposed All Named WUGs in Hays County” incorporates all of the proposed revisions in [Section 1.01](#). It should also be noted that all populations are for Region K portion only.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario - All Named WUGs in Hays County	64,764	90,931	125,891	173,853	224,773	284,695
Draft 1.0 Migration Scenario – Hays County-Other	30,703	46,786	67,462	95,015	129,676	166,742
Draft 1.0 Migration Scenario – Hays County Total	95,467	137,717	193,353	268,868	354,449	451,437
Proposed All Named WUGs in Hays County	74,042	100,564	131,123	162,551	191,092	223,587
Proposed Revised Population – Hays County-Other	21,425	37,153	62,230	106,317	163,357	227,850
Proposed Hays County Total	95,467	137,717	193,353	268,868	354,449	451,437

Llano County-Other

It was determined that the draft 1.0 migration scenario should be used for the Llano County total. In order to maintain the county total to this population, the Llano County-Other population has been adjusted as described in the proposed revisions in the table below. It should be noted that the “Proposed All Named WUGs in Llano County” incorporates all of the proposed revisions in [Section 1.01](#). It should also be noted that the Hays County-Other population in 2080 is reduced by 55 to serve to increase the Llano County-Other population in 2080 by 55. Finally, it should also be noted that all populations are for Region K portion only.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario - All Named WUGs in Llano County	17,105	18,544	20,080	22,015	24,244	26,802
Draft 1.0 Migration Scenario – Llano County-Other	5,984	5,348	4,319	3,714	2,992	2,142
Draft 1.0 Migration Scenario – Llano County Total	23,089	23,892	24,399	25,729	27,236	28,944
Proposed All Named WUGs in Llano County	19,522	20,923	22,429	24,320	26,498	28,998
Proposed Revised Population – Llano County-Other	3,567	2,969	1,970	1,409	738	1
Proposed Llano County Total	23,089	23,892	24,399	25,729	27,236	28,999

Matagorda County-Other

It was determined that the draft 1.0 migration scenario should be used for the Matagorda County total. In order to maintain the county total to this population, the Matagorda County-Other population has been adjusted as described in the proposed revisions in the table below. It should be noted that the “Proposed All Named WUGs in Matagorda County” incorporates all of the proposed revisions in [Section 1.01](#). It should also be noted that all populations are for Region K portion only.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario - All Named WUGs in Matagorda County	25,973	25,945	25,981	25,980	25,952	25,890
Draft 1.0 Migration Scenario – Matagorda County-Other	9,239	8,116	6,724	5,135	3,361	1,381
Draft 1.0 Migration Scenario – Matagorda County Total	35,212	34,061	32,705	31,115	29,313	27,271
Proposed All Named WUGs in Matagorda County	26,476	26,448	26,485	26,485	26,458	26,398
Proposed Revised Population – Matagorda County-Other	8,736	7,613	6,220	4,630	2,855	873
Proposed Matagorda County Total	35,212	34,061	32,705	31,115	29,313	27,271

Mills County-Other

It was determined that the ***draft 0.5 migration scenario*** should be adopted for the Mills County total. In order to maintain the county total to this population, the Mills County-Other population has been adjusted as described in the proposed revisions in the table below. It should be noted that the “Proposed All Named WUGs in Mills County” incorporates all of the proposed revisions in [Section 1.01](#). It should also be noted that all populations are for Region K portion only.

	2030	2040	2050	2060	2070	2080
Draft 0.5 Migration Scenario - All Named WUGs in Mills County	1,699	1,626	1,570	1,548	1,576	1,690
Draft 0.5 Migration Scenario – Mills County-Other	2,478	2,244	1,980	1,802	1,564	1,229
Draft 0.5 Migration Scenario – Mills County Total	4,177	3,870	3,550	3,350	3,140	2,919
Proposed All Named WUGs in Mills County	2,473	2,473	2,473	2,473	2,473	2,473
Proposed Revised Population – Mills County-Other	1,704	1,397	1,077	877	667	446
Proposed Mills County Total	4,177	3,870	3,550	3,350	3,140	2,919

San Saba County-Other

It was determined that the ***draft 0.5 migration scenario*** should be adopted for the San Saba County total. In order to maintain the county total to this population, the San Saba County-Other population has been adjusted as described in the proposed revisions in the table below. It should be noted that the “Proposed All Named WUGs in San Saba County” incorporates all of the proposed revisions in [Section 1.01](#). It should also be noted that all populations are for Region K portion only.

	2030	2040	2050	2060	2070	2080
Draft 0.5 Migration Scenario - All Named WUGs in San Saba County	3,356	3,258	3,201	3,183	3,225	3,353
Draft 0.5 Migration Scenario – San Saba County-Other	2,083	1,901	1,705	1,553	1,332	1,016
Draft 0.5 Migration Scenario – San Saba County Total	5,439	5,159	4,906	4,736	4,557	4,369
Proposed All Named WUGs in San Saba County	4,246	4,179	4,127	4,088	4,063	4,051
Proposed Revised Population – San Saba County-Other	1,193	980	779	648	494	318
Proposed San Saba County Total	5,439	5,159	4,906	4,736	4,557	4,369

Travis County-Other

Due to the number of WUGs in Travis County requesting revisions, the magnitude of those revisions, and the quality of supporting documentation, it was determined that **a value greater than the draft 1.0 migration scenario** should be used for the Travis County total. It should be noted that the Travis County-Other population is recommended to remain at the draft 1.0 migration scenario and that the Travis County-Other population is balanced by the revision requests of all WUGs within Travis County other than Austin, and that the “Proposed All Named WUGs in Travis County” incorporates all of the proposed revisions in [Section 1.01](#) and [Section 1.02](#). It should also be noted that all populations are for Region K portion only.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario - All Named WUGs in Travis County	1,447,692	1,693,109	1,909,277	2,139,978	2,399,230	2,690,639
Draft 1.0 Migration Scenario – Travis County-Other	94,947	127,362	126,546	112,159	97,941	84,228
Draft 1.0 Migration Scenario – Travis County Total	1,572,639	1,820,417	2,035,823	2,252,137	2,497,171	2,774,867
Proposed All Named WUGs in Travis County	1,619,788	1,916,572	2,197,928	2,474,101	2,728,778	3,001,932
Proposed Revised Population – Travis County-Other	65,291	91,286	87,808	73,354	77,566	85,038
Proposed Travis County Total	1,685,079	2,007,858	2,285,736	2,547,455	2,806,344	3,086,970

Williamson County-Other

Austin is the only WUG that has requested revisions for the portion of Williamson County that is within the Lower Colorado Regional Water Planning Area. Due to the magnitude of these changes, a value greater than the draft 1.0 migration scenario is recommended for the Williamson County total in the year 2070. In other decades, the Williamson County-Other population for Region K has been adjusted to maintain the draft 1.0 migration scenario county total population. It should be noted that all populations are for Region K portion only.

	2030	2040	2050	2060	2070	2080
Draft 1.0 Migration Scenario - All Named WUGs in Williamson County	101,644	133,783	171,632	212,988	259,839	312,923
Draft 1.0 Migration Scenario – Williamson County-Other	2,634	2,529	2,392	2,288	2,188	2,087
Draft 1.0 Migration Scenario – Williamson County Total	104,278	136,312	174,024	215,276	262,027	315,010
Proposed All Named WUGs in Williamson County	104,278	133,841	173,408	213,915	268,423	314,430
Proposed Revised Population – Williamson County-Other	0	2,471	616	1,361	0	580
Proposed Revised Williamson County Total	104,278	136,312	174,024	215,276	268,423	315,010

1.03 SUMMARY OF POPULATION REVISION REQUESTS

The following table summarizes the totality of population revision requests, by WUG and Region-County. It should be noted that, with the exception of WUGs in San Saba and Mills Counties, all draft projections are 1.0 migration scenario.

Draft Population Projections									Proposed Population Projections					
Region	WUG	County	2030	2040	2050	2060	2070	2080	2030	2040	2050	2060	2070	2080
K	Austin	Hays	-	-	-	-	-	-	129	152	176	200	224	249
K	Austin	Travis	1,053,682	1,175,496	1,311,393	1,463,000	1,632,134	1,820,821	1,166,122	1,362,937	1,561,206	1,758,318	1,941,307	2,132,924
K	Austin	Williamson	92,210	124,095	161,645	202,917	249,744	302,802	94,844	124,153	163,421	203,844	258,328	304,309
K	Buda	Hays	18,055	26,040	36,554	50,826	67,000	85,329	20,475	28,665	34,156	39,620	45,959	53,312
K	Canyon Lake Water Service	Blanco	802	809	794	779	763	743	536	536	536	536	536	536
K	Canyon Lake Water Service	Hays	666	960	1,349	1,876	2,473	3,151	1,266	1,301	1,326	1,345	1,358	1,358
K	Canyon Lake Water Service	Travis	3,293	4,542	5,620	6,674	7,872	9,233	1,266	1,301	1,327	1,345	1,359	1,359
K	Corix	Blanco	1	1	1	1	1	1	322	322	322	322	322	322
K	Corix	Burnet	1,677	1,877	2,050	2,242	2,459	2,704	5,856	5,856	5,856	5,856	5,856	5,856
K	Corix	Colorado	285	259	236	215	196	178	375	375	375	375	375	375
K	Corix	Llano	1,584	1,622	1,652	1,696	1,747	1,805	4,001	4,001	4,001	4,001	4,001	4,001
K	Corix	Matagorda	22	22	21	20	19	17	525	525	525	525	525	525
K	Corix	Mills	75	75	75	76	78	80	735	735	735	735	735	735
K	Corix	San Saba	80	76	71	68	65	61	140	140	140	140	140	140
K	Cottonwood Creek MUD 1	Travis	5,056	6,929	8,545	10,126	11,923	13,965	5,000	5,000	5,000	5,000	5,000	5,000

K	County-Other, Bastrop	Bastrop	9,855	13,829	18,565	23,936	30,020	36,908	2,209	1,960	3,887	7,591	14,791	22,948
K	County-Other, Blanco	Blanco	7,386	7,447	7,309	7,174	7,020	6,850	7,085	7,051	6,746	6,439	6,101	5,729
K	County-Other, Burnet	Burnet	21,560	22,821	23,492	24,085	24,690	25,407	11,749	10,593	12,776	15,105	17,708	20,723
K	County-Other, Colorado	Colorado	11,480	11,216	10,899	10,571	10,200	9,783	11,390	11,100	10,760	10,411	10,021	9,586
K	County-Other, Fayette	Fayette	5,243	4,391	3,466	2,741	1,952	1,104	4,681	3,786	2,813	2,078	1,278	418
K	County-Other, Hays	Hays	30,703	46,786	67,462	95,015	129,676	166,742	21,425	37,153	62,230	106,317	163,357	227,850
K	County-Other, Llano	Llano	5,984	5,348	4,319	3,714	2,992	2,142	3,567	2,969	1,970	1,409	738	1
K	County-Other, Matagorda	Matagorda	9,239	8,116	6,724	5,135	3,361	1,381	8,736	7,613	6,220	4,630	2,855	873
K	County-Other, Mills	Mills	2,478	2,244	1,980	1,802	1,564	1,229	1,704	1,397	1,077	877	667	446
K	County-Other, San Saba	San Saba	2,083	1,901	1,705	1,553	1,332	1,016	1,193	980	779	648	494	318
K	County-Other, Travis	Travis	94,947	127,362	126,546	112,159	97,941	84,228	65,291	91,286	87,808	73,354	77,566	85,038
K	County-Other, Williamson	Williamson	2,634	2,529	2,392	2,288	2,188	2,087	0	2,471	616	1,361	0	580

K	Dripping Springs WSC	Hays	8,631	12,496	18,092	26,194	31,942	40,673	16,368	23,698	34,310	40,673	40,673	40,673
K	Elgin	Bastrop	8,712	9,455	10,311	11,293	12,409	13,678	16,358	21,324	24,989	27,638	27,638	27,638
		Travis	1,492	1,955	2,356	2,748	3,195	3,703	8,004	14,401	19,354	23,106	23,106	23,106
K	Goldthwaite	Mills	1,624	1,551	1,495	1,472	1,498	1,610	1,738	1,738	1,738	1,738	1,738	1,738
K	Hays County WCID 2	Hays	4,998	7,213	10,130	14,091	18,578	23,664	3,390	3,390	3,390	3,390	3,390	3,390
K	Hurst Creek MUD	Travis	3,095	3,095	3,095	3,095	3,095	3,095	2,781	2,781	2,781	2,781	2,781	2,781
K	Johnson City	Blanco	1,631	1,645	1,616	1,589	1,559	1,524	1,877	1,993	2,116	2,246	2,384	2,531
K	Lago Vista	Travis	11,892	14,972	18,850	23,732	29,879	37,618	16,749	24,793	36,700	49,000	49,000	49,000
K	Lakeway MUD	Travis	9,779	10,776	11,632	12,436	13,025	13,025	10,726	11,095	11,242	11,242	11,242	11,242
K	La Ventana WSC	Hays	825	1,191	1,673	2,326	3,067	3,906	825	825	825	825	825	825
K	Leander	Travis	19,679	27,769	34,750	41,563	49,311	58,119	31,916	40,221	42,300	42,300	42,300	42,300
K	Marble Falls	Burnet	7,655	8,823	10,169	11,720	13,508	15,569	13,287	17,072	17,079	17,086	17,093	17,101
K	Ruby Ranch WSC	Hays	1,122	1,620	2,275	3,164	4,172	5,314	1,122	1,122	1,122	1,122	1,122	1,122
K	San Saba	San Saba	2,170	2,143	2,143	2,167	2,237	2,381	3,000	3,000	3,000	3,000	3,000	3,000
K	Schulenburg	Fayette	2,438	2,395	2,347	2,337	2,326	2,314	3,000	3,000	3,000	3,000	3,000	3,000
K	Sunset Valley	Travis	737	611	507	424	354	295	737	737	737	737	737	737
K	Travis County MUD 18	Travis	2,455	3,387	4,192	4,979	5,873	6,889	1,449	1,449	1,449	1,449	1,449	1,449

K	Travis County WCID 18	Travis	3,048	2,318	1,766	1,354	1,037	794	5,523	5,523	5,523	5,523	5,523	5,523
K	Undine Development	Travis	372	381	389	400	411	424	696	696	696	696	696	696
K	Wells Branch MUD	Travis	15,366	17,093	18,576	18,750	18,750	18,750	21,073	21,907	21,907	21,907	21,907	21,907

2.00 BASELINE GPCD REVISION REQUESTS

After extensive outreach, multiple WUGs expressed their interest in revising their baseline GPCD. Section 2.2.2.1 of Exhibit C – First Amended General Guidelines for Development of 2026 Regional Water Plans allows the following criteria for adjustment of baseline GPCD:

1. Evidence that per capita water use from a more recent year (2015-2019) would be more appropriate as the baseline because that year was more representative of dry-year conditions.
2. Evidence of errors identified in the historical water use or GPCD for a utility or public water system, including evidence that volumes of reuse (potable reuse) water used for municipal purposes should be or should not be included in the draft projections.
3. Evidence that the base dry-year water use was abnormal due to temporary infrastructure constraints or water restriction triggered by utility's drought management plan.
4. Trends indicating that per capita water use for a utility or rural area of a county have increased substantially in recent years, and evidence that these trends will continue to rise in the short-term future due to commercial development.
5. Evidence that the most recent water efficiency and conservation savings that have already been implemented are not reflected in the default baseline GPCD.
6. Evidence that the number of installations of water-efficient fixtures and appliances between 2010 and 2020 is substantially different than the TWDB estimate or evidence that the projected replacement rate of water-efficient fixtures and appliances is substantially different than the TWDB projections.
7. Evidence that future water efficiency savings are projected much higher than the draft projections due to a utility's conservation plans that accelerate the replacement of the existing outdated plumbing fixtures and appliances.

2.01 ERRORS AND CORRECTIONS

Buda

After discussions with City of Buda, it was discovered that while the total production amount in its 2011 Water Use Survey was correct, the population was not. A more accurate population for Buda's service area in 2011 would be 7,242, which results in a 2011 GPCD of 145. More detail on Buda's historical estimates can be found in [Attachment B](#). Therefore, Buda is requesting a revision of its baseline GPCD to be 145 due to Criteria #2 above, or whatever that usage would be after applying plumbing code savings 2011-2020. Combined with the population revision request in [Section 1.01](#), this will make Buda's total dry year demand more accurate. Should the population revision request be rejected, this baseline GPCD revision request should be withdrawn.

Draft Baseline GPCD	161
Proposed Revised Baseline GPCD	145

Canyon Lake Water Service

Canyon Lake has developed detailed analysis on its historic water usage. That report used the methodology of taking the average of the three highest GPCDs to set the baseline GPCD. In 2011, Canyon Lake's Rust Ranch system in Blanco County used 76 GPCD and the Deer Creek system in Travis and Hays County used 70 GPCD. For the purpose of using a conservative estimate for the combination of the systems, a baseline GPCD of 76 is proposed. For more details on the baseline GPCD methodology, see [Attachment C](#).

Draft Baseline GPCD	113
Proposed Revised Baseline GPCD	76

Goldthwaite

The City of Goldthwaite provided evidence that it has experienced more commercial development in recent years, with increases in institutional and commercial connections from 2010-2020. The City indicated that it has a new 28-unit town home complex being built, as well as three new restaurants, a new large truck stop convenience store, expansion of its Family Dollar and Dollar General, expanded pecan processing facility, new law enforcement center, expanded medical clinic, new clinic under development, new high school and elementary school, and new EMS complex. As a result of this trend toward more commercial development, it is recommended to use a more recent year as the baseline GPCD, per Criteria #4 above. Therefore, Goldthwaite is requesting a revision of its baseline GPCD to be 321, which is what it experienced in 2020 with a total production amount of 201,307,039 gallons and a Census estimated population of 1,719. The water efficiency savings developed by TWDB can then be applied for subsequent decades. Goldthwaite is also requesting a revision to its population, which can be found in [Section 1.01](#).

Draft Baseline GPCD	173
Proposed Revised Baseline GPCD	321

Lakeway MUD

After discussions with Lakeway MUD, it was discovered that the utility has more accurate numbers to calculate its 2011 GPCD. More detail on Lakeway MUD's revision request on baseline GPCD can

be found in [Attachment L](#). Lakeway MUD is requesting a revision of its baseline GPCD to be 253 due to Criteria #2 above, or whatever that usage would be after applying plumbing code savings 2011-2020. Combined with the population revision request in [Section 1.01](#), this will make Lakeway MUD's total dry year demand more accurate. Should the population revision request be rejected, this baseline GPCD revision request should be withdrawn.

It should be noted that Lakeway MUD has a higher GPCD than is representative of their conservation ethic, due to the following reasons:

1. As the wholesale water provided by Lakeway MUD traverses within and to the far extent of Lakeway MUD's distribution system prior to delivery, the system water losses associated with the wholesale delivery portion remain within Lakeway MUD's baseline GPCD.
2. As the most recent 2-year wholesale deliveries have averaged roughly 10% of Lakeway MUD distributed flows and system water loss has been on the order of 15%, this inaccuracy is notable.
3. Lakeway MUD has a relatively high percentage of transient population, which artificially lowers its population and increases its GPCD.

Draft Baseline GPCD	226
Proposed Revised Baseline GPCD	253

Undine Development

A representative from Undine LLC provided historical production data for the system, 2020-2022. Comparing the net use data provided by the utility with their proposed population yields a GPCD of 159, 154, and 198 for 2020, 2021 and 2022, respectively. In order to align Undine's total demand closer to its projected dry year demand, the proposal is to use a baseline GPCD of 198.

Draft Baseline GPCD	350
Proposed Revised Baseline GPCD	198

2.02 CHANGES TO DRY YEAR

Hurst Creek MUD

In discussions with Hurst Creek MUD leadership, it was conveyed that they believe the draft baseline GPCD does not represent what their customers currently use in a dry year. They explained that 2022 was a very dry year for them and that they did not implement any drought stages, so it represents relatively unmitigated water usage. [Attachment U](#) shows Hurst Creek MUD's 2022

Water Use Survey, which equates to a GPCD of 375 (when not including reuse in production amount). Therefore, it is recommended to use this more recent and accurate number for Hurst Creek MUD's baseline GPCD. Hurst Creek MUD is also requesting a revision to its population, which can be found in [Section 1.01](#).

Draft Baseline GPCD	496
Proposed Revised Baseline GPCD	375

2.03 SUMMARY OF BASELINE GPCD REVISION REQUESTS

The following table summarizes the totality of baseline GPCD revision requests, by WUG and Region-County.

Region	WUG	County	Draft Baseline GPCD	Proposed Baseline GPCD
K	Buda	Hays	161	145
K	Canyon Lake Water Service	Blanco	113	76
K	Canyon Lake Water Service	Hays	113	76
K	Canyon Lake Water Service	Travis	113	76
K	Goldthwaite	Mills	173	321
K	Hurst Creek MUD	Travis	496	375
K	Lakeway MUD	Travis	226	253
K	Undine Development	Travis	350	198

3.00 TOTAL DEMAND REVISION REQUESTS

The following subsections describe the product of any population and/or baseline GPCD revisions for each WUG requesting one or both, shown in acre-feet per year. It should be noted that the total demand in decades subsequent to 2030 is not the product of the population in that decade times the baseline GPCD; instead, it is the product of the population in that decade times the baseline GPCD minus plumbing code savings.

Austin

Population revision requests are being recommended for Austin, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Hays County		129	152	176	200	224	249
Travis County		1,166,122	1,362,937	1,561,206	1,758,318	1,941,307	2,132,924
Williamson County		94,844	124,153	163,421	203,844	258,328	304,309
Draft GPCD	157	152	152	152	152	152	152
Proposed Total Demand (acre-feet per year)							
Hays County		22	26	30	34	38	42
Travis County		198,677	231,308	264,957	298,409	329,465	361,985
Williamson County		16,159	21,070	27,735	34,595	43,842	51,645

Buda

Both population and baseline GPCD revision requests are being recommended for Buda (see [Section 1.01](#) and [Section 2](#), respectively). Should either of those requests be denied, this subsection would need to be revised. Revised population, GPCD and Total Demand are shown in the table below.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Hays County		20,475	28,665	34,156	39,620	45,959	53,312
Proposed GPCD	145	141	141	141	141	141	141
Proposed Total Demand (acre-feet per year)							
Hays County		3,236	4,515	5,380	6,240	7,239	8,397

Canyon Lake Water Service

Both population and baseline GPCD revision requests are being recommended for Canyon Lake Water Service (see [Section 1.01](#) and [Section 2](#), respectively). Should either of those requests be denied, this subsection would need to be revised. Revised population, GPCD and Total Demand are shown in the table below.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Blanco County		536	536	536	536	536	536
Hays County		1,266	1,301	1,326	1,345	1,358	1,358
Travis County		1,266	1,301	1,327	1,345	1,359	1,359
Proposed GPCD	76	72	72	72	72	72	72
Proposed Total Demand (acre-feet per year)							
Blanco County		43	43	43	43	43	43
Hays County		102	104	106	108	109	109
Travis County		102	104	106	108	109	109

Corix

Population revision requests are being recommended for Corix, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Blanco County		322	322	322	322	322	322
Burnet County		5,856	5,856	5,856	5,856	5,856	5,856
Colorado County		375	375	375	375	375	375
Llano County		4,001	4,001	4,001	4,001	4,001	4,001
Matagorda County		525	525	525	525	525	525
Mills County		735	735	735	735	735	735
San Saba County		140	140	140	140	140	140
Draft GPCD	144	139	139	139	139	139	139
Proposed Total Demand (acre-feet per year)							
Blanco County		50	50	50	50	50	50
Burnet County		914	910	910	910	910	910
Colorado County		59	58	58	58	58	58
Llano County		624	622	622	622	622	622
Matagorda County		82	82	82	82	82	82
Mills County		115	114	114	114	114	114
San Saba County		22	22	22	22	22	22

Cottonwood Creek MUD 1

Population revision requests are being recommended for Cottonwood Creek MUD 1, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Travis County		5,000	5,000	5,000	5,000	5,000	5,000
Draft GPCD	60	60	60	60	60	60	60
Proposed Total Demand (acre-feet per year)							
Travis County		336	336	336	336	336	336

County-Other, Bastrop

Population revision requests are being recommended for County-Other, Bastrop, as described in [Section 1.02](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Bastrop County		2,209	1,960	3,887	7,591	14,791	22,948
Draft GPCD	163	160	159	159	159	159	159
Proposed Total Demand (acre-feet per year)							
Bastrop County		395	349	693	1,353	2,637	4,091

County-Other, Blanco

Population revision requests are being recommended for County-Other, Blanco, as described in [Section 1.02](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Blanco County		7,085	7,051	6,746	6,439	6,101	5,729
Draft GPCD	111	106	106	106	106	106	106
Proposed Total Demand (acre-feet per year)							
Blanco County		843	835	798	762	722	678

County-Other, Burnet

Population revision requests are being recommended for County-Other, Burnet, as described in [Section 1.02](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Burnet County		11,749	10,593	12,776	15,105	17,708	20,723
Draft GPCD	138	133	133	133	133	133	133
Proposed Total Demand (acre-feet per year)							
Burnet County		1,754	1,576	1,900	2,247	2,634	3,082

County-Other, Colorado

Population revision requests are being recommended for County-Other, Colorado, as described in [Section 1.02](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Colorado County		11,390	11,100	10,760	10,411	10,021	9,586
Draft GPCD	111	106	106	106	106	106	106
Proposed Total Demand (acre-feet per year)							
Colorado County		1,355	1,313	1,273	1,231	1,185	1,134

County-Other, Fayette

Population revision requests are being recommended for County-Other, Fayette, as described in [Section 1.02](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Fayette County		4,681	3,786	2,813	2,078	1,278	418
Draft GPCD	117	112	111	111	111	111	111
Proposed Total Demand (acre-feet per year)							
Fayette County		586	470	350	258	159	52

County-Other, Hays

Population revision requests are being recommended for County-Other, Hays, as described in [Section 1.02](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Hays County		21,425	37,153	62,230	106,317	163,357	227,850
Draft GPCD	111	107	106	106	106	106	106
Proposed Total Demand (acre-feet per year)							
Hays County		2,561	4,424	7,410	12,659	19,451	27,130

County-Other, Llano

Population revision requests are being recommended for County-Other, Llano, as described in [Section 1.02](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Llano County		3,567	2,969	1,970	1,409	738	1
Draft GPCD	95	90	89	89	89	89	89
Proposed Total Demand (acre-feet per year)							
Llano County		359	297	197	141	74	-

County-Other, Matagorda

Population revision requests are being recommended for County-Other, Matagorda, as described in [Section 1.02](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Matagorda County		8,736	7,613	6,220	4,630	2,855	873
Draft GPCD	94	89	88	88	88	88	88
Proposed Total Demand (acre-feet per year)							
Matagorda County		871	754	616	458	283	86

County-Other, Mills

Population revision requests are being recommended for County-Other, Mills, as described in [Section 1.02](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Mills County		1,704	1,397	1,077	877	667	446
Draft GPCD	116	111	111	111	111	111	111
Proposed Total Demand (acre-feet per year)							
Mills County		212	173	133	109	83	55

County-Other, San Saba

Population revision requests are being recommended for County-Other, San Saba, as described in [Section 1.02](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
San Saba County		1,193	980	779	648	494	318
Draft GPCD	140	135	134	134	134	134	134
Proposed Total Demand (acre-feet per year)							
San Saba County		180	147	117	97	74	48

County-Other, Travis

Population revision requests are being recommended for County-Other, Travis, as described in [Section 1.02](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Travis County		65,291	91,286	87,808	73,354	77,566	85,038
Draft GPCD	126	121	121	121	121	121	121
Proposed Total Demand (acre-feet per year)							
Travis County		8,863	12,347	11,877	9,922	10,491	11,502

County-Other, Williamson

Population revision requests are being recommended for County-Other, Williamson, as described in [Section 1.02](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Williamson County		0	2,471	616	1,361	0	580
Draft GPCD	140	136	136	136	136	136	136
Proposed Total Demand (acre-feet per year)							
Williamson County		-	375	94	207	-	88

Dripping Springs WSC

Population revision requests are being recommended for Dripping Springs WSC, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Hays County		16,368	23,698	34,310	40,673	40,673	40,673
Draft GPCD	157	153	152	152	152	152	152
Proposed Total Demand (acre-feet per year)							
Hays County		2,802	4,044	5,854	6,940	6,940	6,940

Elgin

Population revision requests are being recommended for Elgin, as described in [Section 1.01](#).

Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Bastrop County		16,358	21,324	24,989	27,638	27,638	27,638
Travis County		8,004	14,401	19,354	23,106	23,106	23,106
Draft GPCD	125	121	120	120	120	120	120
Proposed Total Demand (acre-feet per year)							
Bastrop County		2,209	2,867	3,360	3,716	3,716	3,716
Travis County		1,081	1,936	2,602	3,106	3,106	3,106

Goldthwaite

Both population and baseline GPCD revision requests are being recommended for Goldthwaite (see [Section 1.01](#) and [Section 2](#), respectively). Should either of those requests be denied, this subsection would need to be revised. Revised population, GPCD and Total Demand are shown in the table below.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Mills County		1,738	1,738	1,738	1,738	1,738	1,738
Proposed GPCD	321	316	315	315	315	315	315
Proposed Total Demand (acre-feet per year)							
Mills County		615	614	614	614	614	614

Hays County WCID 2

Population revision requests are being recommended for Hays County WCID 2, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Hays County		3,390	3,390	3,390	3,390	3,390	3,390
Draft GPCD	208	205	204	204	204	204	204
Proposed Total Demand (acre-feet per year)							
Hays County		777	775	775	775	775	775

Hurst Creek MUD

Both population and baseline GPCD revision requests are being recommended for Hurst Creek MUD (see [Section 1.01](#) and [Section 2](#), respectively). Should either of those requests be denied, this subsection would need to be revised. Revised population, GPCD and Total Demand are shown in the table below.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Travis County		2,781	2,781	2,781	2,781	2,781	2,781
Proposed GPCD	375	370	370	370	370	370	370
Proposed Total Demand (acre-feet per year)							
Travis County		1,154	1,152	1,152	1,152	1,152	1,152

Johnson City

Population revision requests are being recommended for Johnson City, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Blanco County		1,877	1,993	2,116	2,246	2,384	2,531
Draft GPCD	155	150	149	149	149	149	149
Proposed Total Demand (acre-feet per year)							
Blanco County		315	333	353	375	398	423

Lago Vista

Population revision requests are being recommended for Lago Vista, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Travis County		16,749	24,793	36,700	49,000	49,000	49,000
Draft GPCD	221	216	216	216	216	216	216
Proposed Total Demand (acre-feet per year)							
Travis County		4,061	5,999	8,880	11,856	11,856	11,856

Lakeway MUD

Both population and baseline GPCD revision requests are being recommended for Lakeway MUD (see [Section 1.01](#) and [Section 2](#), respectively). Should either of those requests be denied, this subsection would need to be revised. Revised population, GPCD and Total Demand are shown in the table below.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Travis County		10,726	11,095	11,242	11,242	11,242	11,242
Proposed GPCD	253	248	248	248	248	248	248
Proposed Total Demand (acre-feet per year)							
Travis County		2,984	3,081	3,122	3,122	3,122	3,122

Leander

Population revision requests are being recommended for Leander, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Travis County		31,916	40,221	42,300	42,300	42,300	42,300
Draft GPCD	124	120	120	120	120	120	120
Proposed Total Demand (acre-feet per year)							
Travis County		4,295	5,393	5,672	5,672	5,672	5,672

La Ventana WSC

Population revision requests are being recommended for La Ventana WSC, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Hays County		825	825	825	825	825	825
Draft GPCD	153	149	148	148	148	148	148
Proposed Total Demand (acre-feet per year)							
Hays County		138	137	137	137	137	137

Marble Falls

Population revision requests are being recommended for Marble Falls, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Burnet County		13,287	17,072	17,079	17,086	17,093	17,101
Draft GPCD	240	235	234	234	234	234	234
Proposed Total Demand (acre-feet per year)							
Burnet County		3,497	4,480	4,482	4,484	4,485	4,488

Ruby Ranch WSC

Population revision requests are being recommended for Ruby Ranch WSC, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Hays County		1,122	1,122	1,122	1,122	1,122	1,122
Draft GPCD	118	114	113	113	113	113	113
Proposed Total Demand (acre-feet per year)							
Hays County		143	142	142	142	142	142

San Saba

Population revision requests are being recommended for San Saba, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
San Saba County		3,000	3,000	3,000	3,000	3,000	3,000
Draft GPCD	311	306	306	306	306	306	306
Proposed Total Demand (acre-feet per year)							
San Saba County		1,029	1,027	1,027	1,027	1,027	1,027

Schulenburg

Population revision requests are being recommended for Schulenburg, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Fayette County		3,000	3,000	3,000	3,000	3,000	3,000
Draft GPCD	200	195	194	194	194	194	194
Proposed Total Demand (acre-feet per year)							
Fayette County		654	652	652	652	652	652

Sunset Valley

Population revision requests are being recommended for Sunset Valley, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Travis County		737	737	737	737	737	737
Draft GPCD	354	346	344	344	344	344	344
Proposed Total Demand (acre-feet per year)							
Travis County		286	284	284	284	284	284

Travis County MUD 18

Population revision requests are being recommended for Travis County MUD 18, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Travis County		1,449	1,449	1,449	1,449	1,449	1,449
Draft GPCD	145	141	141	141	141	141	141
Proposed Total Demand (acre-feet per year)							
Travis County		230	229	229	229	229	229

Travis County WCID 18

Population revision requests are being recommended for Travis County WCID 18, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Travis County		5,523	5,523	5,523	5,523	5,523	5,523
Draft GPCD	151	146	146	146	146	146	146
Proposed Total Demand (acre-feet per year)							
Travis County		906	902	902	902	902	902

Undine Development

Both population and baseline GPCD revision requests are being recommended for Undine Development (see [Section 1.01](#) and [Section 2](#), respectively). Should either of those requests be denied, this subsection would need to be revised. Revised population, GPCD and Total Demand are shown in the table below.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Travis County		696	696	696	696	696	696
Proposed GPCD	198	193	192	192	192	192	192
Proposed Total Demand (acre-feet per year)							
Travis County		151	150	150	150	150	150

Wells Branch MUD

Population revision requests are being recommended for Wells Branch MUD, as described in [Section 1.01](#). Combining the revised population with the draft baseline GPCD yields the Total Demand shown in the table below. Should the population revision request be denied, the draft Total Demand projections will be effective and this subsection is struck.

	Baseline GPCD	2030	2040	2050	2060	2070	2080
Proposed Revised Population							
Travis County		21,073	21,907	21,907	21,907	21,907	21,907
Williamson County		500	734	1,012	1,073	1,073	1,073
Draft GPCD	67	62	62	62	62	62	62
Proposed Total Demand (acre-feet per year)							
Travis County		1,464	1,511	1,511	1,511	1,511	1,511
Williamson County		35	51	70	74	74	74

3.01 SUMMARY OF TOTAL DEMAND REVISION REQUESTS

The following table summarizes the totality of total demand revision requests, by WUG and Region-County. It should be noted that, with the exception of WUGs in San Saba and Mills Counties, all draft projections are 1.0 migration scenario.

Region	WUG	County	Draft Demand Projections (ac-ft/yr)						Proposed Demand Projections (ac-ft/yr)					
			2030	2040	2050	2060	2070	2080	2030	2040	2050	2060	2070	2080
K	Austin	Hays	-	-	-	-	-	-	22	26	30	34	38	42
K	Austin	Travis	179,520	199,497	222,560	248,290	276,994	309,017	198,677	231,308	264,957	298,409	329,465	361,985
K	Austin	Williamson	15,710	21,061	27,433	34,438	42,385	51,389	16,159	21,070	27,735	34,595	43,842	51,645
K	Buda	Hays	3,177	4,568	6,413	8,916	11,754	14,969	3,236	4,515	5,380	6,240	7,239	8,397
K	Canyon Lake Water Service	Blanco	98	98	97	95	93	90	43	43	43	43	43	43
K	Canyon Lake Water Service	Hays	81	117	164	228	301	383	102	104	106	108	109	109
K	Canyon Lake Water Service	Travis	402	552	683	812	957	1,123	102	104	106	108	109	109
K	Corix	Blanco	-	-	-	-	-	-	50	50	50	50	50	50
K	Corix	Burnet	262	292	319	348	382	420	914	910	910	910	910	910
K	Corix	Colorado	44	40	37	33	30	28	59	58	58	58	58	58
K	Corix	Llano	247	252	257	264	272	281	624	622	622	622	622	622
K	Corix	Matagorda	3	3	3	3	3	3	82	82	82	82	82	82
K	Corix	Mills	12	11	11	10	9	8	115	114	114	114	114	114
K	Corix	San Saba	12	11	10	9	8	7	22	22	22	22	22	22
K	Cottonwood Creek MUD 1	Travis	340	466	574	681	801	939	336	336	336	336	336	336

K	County-Other, Bastrop	Bastrop	1,761	2,466	3,310	4,268	5,352	6,580	395	349	693	1,353	2,637	4,091
K	County-Other, Blanco	Blanco	879	881	865	849	831	811	843	835	798	762	722	678
K	County-Other, Burnet	Burnet	3,219	3,394	3,494	3,582	3,672	3,779	1,754	1,576	1,900	2,247	2,634	3,082
K	County-Other, Colorado	Colorado	1,366	1,327	1,289	1,250	1,207	1,157	1,355	1,313	1,273	1,231	1,185	1,134
K	County-Other, Fayette	Fayette	656	546	431	341	243	137	586	470	350	258	159	52
K	County-Other, Hays	Hays	3,670	5,571	8,033	11,314	15,441	19,854	2,561	4,424	7,410	12,659	19,451	27,130
K	County-Other, Llano	Llano	602	535	432	371	299	214	359	297	197	141	74	-
K	County-Other, Matagorda	Matagorda	921	803	666	508	333	137	871	754	616	458	283	86
K	County-Other, Mills	Mills	308	278	245	223	194	152	212	173	133	109	83	55
K	County-Other, San Saba	San Saba	315	286	256	234	200	153	180	147	117	97	74	48
K	County-Other, Travis	Travis	12,889	17,227	17,116	15,170	13,247	11,392	8,863	12,347	11,877	9,922	10,491	11,502

K	County-Other, Williamson	Williamson	401	384	363	347	332	317	-	375	94	207	-	88
K	Dripping Springs WSC	Hays	1,477	2,132	3,087	4,470	5,450	6,940	2,802	4,044	5,854	6,940	6,940	6,940
K	Elgin	Bastrop	1,176	1,271	1,386	1,518	1,668	1,839	2,209	2,867	3,360	3,716	3,716	3,716
		Travis	201	263	317	369	430	498	1,081	1,936	2,602	3,106	3,106	3,106
K	Goldthwaite	Mills	306	291	280	276	281	302	615	614	614	614	614	614
K	Hays County WCID 2	Hays	1,146	1,650	2,317	3,223	4,250	5,413	777	775	775	775	775	775
K	Hurst Creek MUD	Travis	1,704	1,702	1,702	1,702	1,702	1,702	1,154	1,152	1,152	1,152	1,152	1,152
K	Johnson City	Blanco	274	275	270	265	260	254	315	333	353	375	398	423
K	Lago Vista	Travis	2,884	3,623	4,561	5,742	7,230	9,102	4,061	5,999	8,880	11,856	11,856	11,856
K	Lakeway MUD	Travis	2,425	2,666	2,878	3,077	3,223	3,223	2,984	3,081	3,122	3,122	3,122	3,122
K	La Ventana WSC	Hays	138	198	278	387	510	649	138	137	137	137	137	137
K	Leander	Travis	2,648	3,724	4,660	5,573	6,612	7,793	4,295	5,393	5,672	5,672	5,672	5,672
K	Marble Falls	Burnet	2,014	2,315	2,669	3,076	3,545	4,086	3,497	4,480	4,482	4,484	4,485	4,488
K	Ruby Ranch WSC	Hays	143	206	289	402	529	674	143	142	142	142	142	142
K	San Saba	San Saba	745	734	734	742	766	815	1,029	1,027	1,027	1,027	1,027	1,027
K	Schulenburg	Fayette	532	520	510	508	505	503	654	652	652	652	652	652
K	Sunset Valley	Travis	286	236	196	164	137	114	286	284	284	284	284	284

K	Travis County MUD 18	Travis	389	535	663	787	928	1,089	230	229	229	229	229	229
K	Travis County WCID 18	Travis	500	379	288	221	169	130	906	902	902	902	902	902
K	Undine Development	Travis	144	147	150	154	159	164	151	150	150	150	150	150
K	Wells Branch MUD	Travis	1,068	1,179	1,281	1,293	1,293	1,293	1,464	1,511	1,511	1,511	1,511	1,511

ATTACHMENT A
AUSTIN WATER SUPPORTING
DOCUMENTATION

CITY OF AUSTIN

POPULATION AND DEMAND PROPOSED REVISION REQUEST

7/6/2023

The City of Austin (COA) has reviewed the Texas Water Development Board's (TWDB's) population projections and has several proposed revisions to request.

Population Revision Request

Austin has reviewed TWDB's draft population projections for this round of planning and, with the guidance of the Region K Population and Water Demand Committee, is requesting the addition of Austin population in Hays County consistent with the 2021 Regional Water Plan and utility service areas as well as increased population in the Austin WUGs to align with internal projections.

Service Area Extent

Austin Water serves customers in Travis, Hays, and Williamson Counties.

Hays County

The Austin Water service area extends into Hays County, and Table 1 shows the Hays County component to the Austin WUG that has been included in previous plans and the proposed additions for this planning cycle.

Table 1 Austin WUG Population in Hays County, 2021 RWP, TWDB Draft population, and proposed 2026 RWP revisions

County	2030	2040	2050	2060	2070	2080
Proposed 2026 RWP Austin Hays Population	129	152	176	200	224	249
2026 DRAFT TWDB Austin WUG/ Hays County Population	-	-	-	-	-	-
2021 RWP Austin WUG/ Hays County Population	74	796	1,560	3,957	9,535	17,255

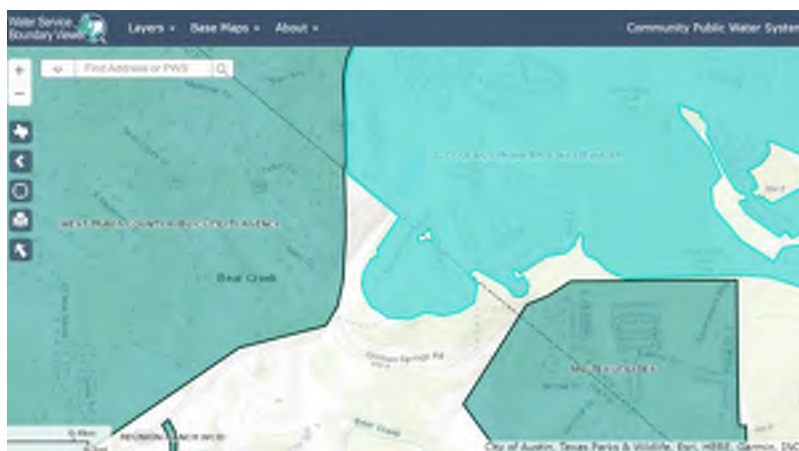


Figure 1 Water Service Boundary Viewer, Austin Service Area in Hays County

Austin Water Retail Population Served

The Austin WUG population estimate was developed as a part of Austin Water's Integrated Water Resource Plan, Water Forward, which is regularly updated with best available population and demand data. Water Forward population estimates are developed in coordination with the City of Austin Demographer and are typically based on the decennial Census population estimates. In reviewing the 2020 Census data, in consultation with Austin Water and other City departments, the City Demographer found that there were numerous discrepancies with the 2020 Census unit counts across the city and filed a County Question Resolution with the Census Bureau (Appendix A). As a result, significant data analysis took place within the City to ensure the quality of the 2020 population served estimate.

2020 Base Year

The estimate was developed with multiple data sources and cross-checked against water and wastewater billing data as a quality assurance measure. The population served by Austin Water's retail system was developed using the number of household units from AW billing data, COA Address Database, Austin Energy billing data, land use data, and development records. The 2020 Census block estimates of people per household for single- and multi-family households was used when there was a sufficient sample size, and the block-group was used when there were too few units to produce a reliable estimate. The water usage from April of 2020 (coincidental with the 2020 Census) was used alongside typical GPCD for that building typology to identify unoccupied homes and outliers.

Growth Rate and Population Projection

The estimated growth rates for Austin Water's population are based on a conservative projection of historical growth rates with a gradual decay over the planning period. These estimates also include the expectation that Austin Water will continue to expand our service area within the Impact Fee Boundary to meet the needs of future development.

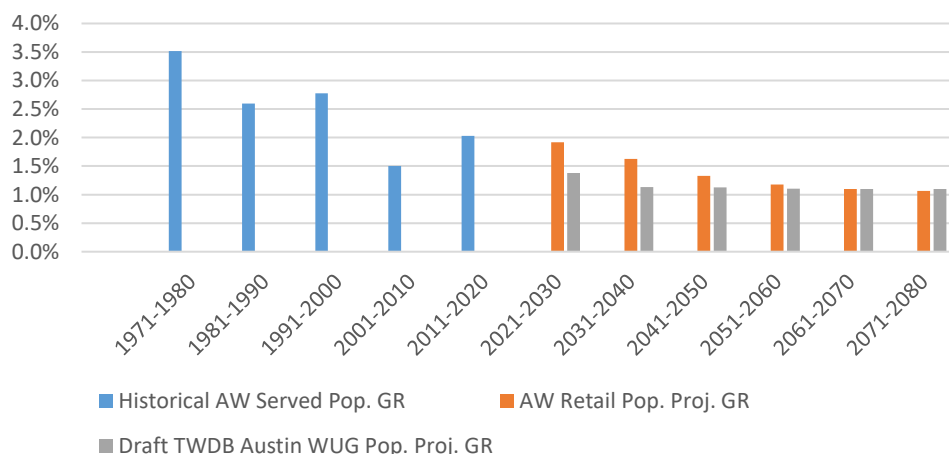


Figure 2 Comparison of historical and projected growth rates for Austin's retail (WUG) customers

The resulting population projection is provided in Table 2, including the 2020 base year for comparison.

Table 3 outlines the revised Austin WUG population distributed across the service area in Travis, Williamson, and Hays Counties. The portion of Williamson County that is included in Region K is entirely within the Austin Impact Fee Service Area Boundary and is currently served or planned to be served by Austin Water, either Austin WUG or wholesale customers of Austin.

Table 2 City of Austin WUG population estimate comparison between TWDB Draft, 1% Migration Scenario, and City of Austin planning estimate

	2020	2030	2040	2050	2060	2070	2080
TWDB Draft Austin WUG Population, 1% Migration Scenario	982,619	1,145,892	1,299,591	1,473,038	1,665,917	1,881,878	2,123,623
Austin WUG Population Estimate	1,034,947	1,261,095	1,487,242	1,724,802	1,962,362	2,199,922	2,437,482
Austin Pop Increase Proposed from TWDB Draft, 1% Migration Scenario	52,328	115,203	187,651	251,764	296,445	318,044	313,859

Table 3 City of Austin WUG population estimate distributed among counties

County	2030	2040	2050	2060	2070	2080
Austin WUG Travis County Population	1,166,122	1,362,937	1,561,206	1,758,318	1,941,370	2,132,924
Austin WUG Williamson County Population	94,844	124,153	163,421	203,844	258,328	304,309
Austin WUG Hays County Population	129	152	176	200	224	249

Count Question Resolution Housing Unit Case for Austin, TX: Summary Report

This summary accompanies the Count Question Resolution (CQR) tabulation of blocks where the housing unit count totals from the 2020 Census count differ from internal City of Austin housing unit counts. Below, we describe the internal data sources compared to the 2020 Census housing unit totals, a description of the accuracy and validity of the source materials, and a summary of suspected housing unit count errors.

Count Question Resolution Tabulation

Please see the file titled “cqr20_CityofAustin_PL4805000_UpdatedBCL.xlsx” for a list of blocks where differences in housing unit totals were found.

Method

The housing unit count comparison analysis was conducted using ESRI GIS software and Census Bureau decennial housing unit counts, City of Austin permitting data, 911 addressing data, utility connections data, and affordable housing data. Data on housing units from the various city departments were filtered to meet the following criteria: all addresses reviewed were valid on April 1, 2020; the permitting, addressing, utility connections, and affordable housing data were filtered to include only residential addresses that existed and were available for occupancy on April 1, 2020. Please see below for additional information on each of these data sources.

Data Sources:

1. Block level decennial housing unit counts were extracted from the CQR Block Count List Files provided by the Census Bureau.
2. Internal housing unit counts were derived from issued building permits data provided by the City of Austin Development Services Department (DSD). DSD issues permits for the construction of new buildings and improvements to existing structures. The building permit data are collected as new permit applications are received and are entered and updated in near real-time. The housing units dataset was extracted on February 24, 2022, from the city’s building permit database, AMANDA. Permits were filtered by type to only include residential properties available for occupancy on April 1, 2020.
3. Addresses for housing units were provided by the City of Austin Address Management Services (AMS) Office. AMS assigns an address to new structures using 911 addressing standards. The addresses dataset was extracted on February 24, 2022 and filtered to include only residential addresses existing on April 1, 2020.
4. Internal housing unit counts derived from utility connections were provided by Austin Water and Austin Energy. The utility connections data are used to monitor and charge for energy and water consumption. The housing unit dataset from Austin Water connections was extracted on March 4, 2022, and the dataset from Austin Energy was extracted on March 8, 2022. The utility connections datasets were filtered to include only residential customers with active connections on April 1, 2020.

5. The City of Austin Housing and Planning Department maintains an inventory of income restricted housing projects funded by the city or incentivized through development programs. All projects are added to the inventory at the time of project certification and are monitored through the development process. The affordable units dataset was extracted on March 1, 2022 and filtered to include only completed developments available for occupancy on April 1, 2020.

Summary of Findings

Total housing units from the 2020 Census count were compared to internal records of housing units. The 2020 Census count yielded a total of 444,426 total housing units compared to 451,755 identified in internal City of Austin records. This produced a potential net deficit of 7,329 housing units.

The tabulation file includes all blocks where internal records showed a deficit in the Census count of 50 or more units. Of the 10,913 blocks contained in the City of Austin, we identified 307 blocks potentially missing at least 50 units. These blocks included a total of 102,161 housing units per internal records and 78,656 per the 2020 Census count, with potentially 23,505 missing housing units.

Our review of blocks with discrepant unit counts indicated both potential coverage issues and potential geocoding issues. Potential coverage issues were most often found in blocks with multi-family developments. Additionally, potential coverage issues were also common in blocks with very recent development. Potential geocoding issues were found in a number of blocks. Many potential geocoding issues resulted in large deficits in one block and a high surplus in adjacent blocks.

Block-Level Examples

For those blocks with particularly large discrepancies, areal imagery was used to further explore the nature of the discrepancy. The following depicts a few examples of the types of discrepancies observed.

Figure 1 below depicts Block 484530003081004 located in the Mueller Development in Central Austin, a mixed-use neighborhood still under construction. This particular block includes The Jordan, a community of 132 units of affordable apartment homes. The project was completed in 2019. The Census Bureau enumerated 79 fewer housing units than shown in the City's internal data. The recent development of this project makes it probable the Census Bureau may not have adequately captured all the units at this site.

Figure 1. Block 484530003081004 in the Mueller Development



Figure 2 below depicts Block 484530024071006 in South Austin, represented by the outer area not including the inner portion in blue. This block includes a subdivision of single-family homes along with a multi-family development. The single-family homes were built between 2018 and 2020, and the multifamily project includes 312 units and was built in 2018. The Census Bureau enumerated 306 fewer housing units.

Figure 2. Block 484530024071006 in Estancia Development off IH-35 in South Austin



Figure 3 below depicts Block 484530009024026 in a central East Austin. This area of the city has undergone significant gentrification and redevelopment. Historically, this area had single family homes that would have been captured adequately by this block structure. However, single family homes have been replaced with block-sized multi-family developments that now embark Block 484530009024026 as well as the Block 484530009024032 to the south. The development being split between these blocks appears to result in discrepant housing unit figures for each of these blocks.

Figure 3. Block 484530009024026 in redeveloped East Austin



This detailed review of blocks with high discrepancy in units revealed many of the blocks with discrepancies were often in areas with recent development. At times, the new developments were multi-family projects, and other times, they were single-family subdivisions, but the commonality between these was the recent, and oftentimes ongoing, development in the area. Additionally, this detailed review helped us to identify numerous potential geocoding errors.

Conclusion

This study included an analysis comparing City of Austin internal records of housing units with housing units enumerated by the Census Bureau in the 2020 decennial census. The analysis uncovered housing unit discrepancies in 307 blocks where the Census Bureau enumerated fewer units than found in internal records. Many of the blocks with discrepancies were often blocks with recent development, recently developed multi-family projects, and geocoding errors.

Given the challenges of the 2020 Census, the fast pace of growth in the city of Austin, and research documenting historical undercounts, we believe these housing unit discrepancies would benefit from the Census Bureau's CQR review process. We recognize our 2020 Census count cannot be changed and adjustments will only impact subsequent population estimates. However, even a small adjustment to our housing unit count could significantly impact our population figure and translate into hundreds of thousands of dollars over the next ten years for critical services for the residents of Austin. Therefore, we appreciate the Census Bureau's review of the City of Austin housing unit count and associated population as enumerated in the 2020 Census.

2020 Housing Unit Discrepancies by Census Block, Austin

ENTITYID	STATEFP	COUNTYFP	TRACT	BLOCK	CENSUSHU	CENSUSGQ	CQRHU	CQRGQ
PL4805000	48	453	000204	1016	58	0	150	
PL4805000	48	453	000308	1004	53	0	132	
PL4805000	48	453	000308	1012	31	0	49	
PL4805000	48	453	000308	1013	10	0	27	
PL4805000	48	453	000308	1026	16	0	28	
PL4805000	48	453	000309	3005	0	0	322	
PL4805000	48	453	000309	3011	429	0	563	
PL4805000	48	453	000402	2006	57	0	163	
PL4805000	48	453	000601	1010	44	0	63	
PL4805000	48	453	000605	3000	648	0	720	
PL4805000	48	453	000605	1009	212	0	279	
PL4805000	48	453	000605	2000	92	0	128	
PL4805000	48	453	000605	2001	22	0	42	
PL4805000	48	453	000606	3000	188	0	293	
PL4805000	48	453	000606	4011	4	0	67	
PL4805000	48	453	000606	4002	50	0	106	
PL4805000	48	453	000606	3003	191	0	240	
PL4805000	48	453	000606	3001	151	0	191	
PL4805000	48	453	000606	4001	79	0	99	
PL4805000	48	453	000607	2002	44	0	152	
PL4805000	48	453	000607	3002	189	0	220	
PL4805000	48	453	000607	2000	124	0	146	
PL4805000	48	453	000608	2004	163	0	235	
PL4805000	48	453	000608	2003	308	0	361	
PL4805000	48	453	000608	1004	299	0	332	
PL4805000	48	453	000801	1003	8	0	57	
PL4805000	48	453	000802	3011	90	0	221	
PL4805000	48	453	000803	1001	46	0	81	
PL4805000	48	453	000803	3039	12	0	37	
PL4805000	48	453	000803	3035	5	0	24	
PL4805000	48	453	000804	2002	66	0	118	
PL4805000	48	453	000804	2036	65	0	106	
PL4805000	48	453	000902	1000	36	0	373	
PL4805000	48	453	000902	2014	87	0	184	
PL4805000	48	453	000902	4026	121	0	210	
PL4805000	48	453	000902	4023	435	0	519	
PL4805000	48	453	000902	4045	7	0	83	
PL4805000	48	453	000902	4022	338	0	378	
PL4805000	48	453	000902	4016	222	0	296	
PL4805000	48	453	000902	4027	346	0	407	
PL4805000	48	453	000902	3026	71	0	101	
PL4805000	48	453	000902	4032	5	0	4	
PL4805000	48	453	000902	4029	166	0	1	
PL4805000	48	453	001000	5004	291	0	334	
PL4805000	48	453	001101	2025	7	0	196	
PL4805000	48	453	001101	1005	32	0	135	

2020 Housing Unit Discrepancies by Census Block, Austin

ENTITYID	STATEFP	COUNTYFP	TRACT	BLOCK	CENSUSHU	CENSUSGQ	CQRHU	CQRGQ
PL4805000	48	453	001101	1024	89	0	135	
PL4805000	48	453	001102	3000	193	0	360	
PL4805000	48	453	001102	2009	175	0	274	
PL4805000	48	453	001102	3004	7	0	99	
PL4805000	48	453	001102	3001	156	0	186	
PL4805000	48	453	001102	1005	302	0	313	
PL4805000	48	453	001103	2012	99	0	188	
PL4805000	48	453	001103	2007	13	0	40	
PL4805000	48	453	001103	2017	46	0	58	
PL4805000	48	453	001200	4002	252	0	290	
PL4805000	48	453	001200	2015	94	0	113	
PL4805000	48	453	001304	1000	51	0	95	
PL4805000	48	453	001304	4011	21	0	34	
PL4805000	48	453	001307	3011	327	0	354	
PL4805000	48	453	001307	1000	289	0	314	
PL4805000	48	453	001308	1001	18	0	125	
PL4805000	48	453	001309	1005	119	0	155	
PL4805000	48	453	001309	1006	104	0	121	
PL4805000	48	453	001310	1002	168	0	207	
PL4805000	48	453	001310	3003	28	0	48	
PL4805000	48	453	001311	1015	2	0	74	
PL4805000	48	453	001311	1010	341	0	409	
PL4805000	48	453	001312	2026	257	0	368	
PL4805000	48	453	001312	3001	99	0	172	
PL4805000	48	453	001312	1007	225	0	269	
PL4805000	48	453	001401	3001	224	0	439	
PL4805000	48	453	001401	3008	285	0	363	
PL4805000	48	453	001401	3000	161	0	226	
PL4805000	48	453	001401	2000	335	0	274	
PL4805000	48	453	001402	3004	149	0	346	
PL4805000	48	453	001402	3000	176	0	224	
PL4805000	48	453	001402	3005	118	0	144	
PL4805000	48	453	001503	2000	285	0	517	
PL4805000	48	453	001504	4009	10	0	24	
PL4805000	48	453	001602	1007	165	0	222	
PL4805000	48	453	001602	3000	186	0	236	
PL4805000	48	453	001606	1001	28	0	107	
PL4805000	48	453	001910	1034	334	0	404	
PL4805000	48	453	001910	3009	275	0	306	
PL4805000	48	453	001911	3015	411	0	481	
PL4805000	48	453	001911	1003	249	0	280	
PL4805000	48	453	001912	1004	151	0	217	
PL4805000	48	453	001913	2033	79	0	134	
PL4805000	48	453	001913	2020	106	0	160	
PL4805000	48	453	001914	3003	660	0	695	
PL4805000	48	453	001915	1013	6	0	26	

2020 Housing Unit Discrepancies by Census Block, Austin

ENTITYID	STATEFP	COUNTYFP	TRACT	BLOCK	CENSUSHU	CENSUSGQ	CQRHU	CQRGQ
PL4805000	48	453	001917	3021	134	0	147	
PL4805000	48	453	001920	2018	9	0	307	
PL4805000	48	453	001920	1000	735	0	974	
PL4805000	48	453	001920	2005	1	0	151	
PL4805000	48	453	001920	2006	377	0	465	
PL4805000	48	453	001922	1003	689	0	769	
PL4805000	48	453	001923	2016	328	0	372	
PL4805000	48	453	002003	2005	302	0	466	
PL4805000	48	453	002006	1001	325	0	389	
PL4805000	48	453	002007	2004	203	0	259	
PL4805000	48	453	002104	1002	74	0	95	
PL4805000	48	453	002105	3003	211	0	234	
PL4805000	48	453	002105	4008	484	0	501	
PL4805000	48	453	002106	1008	87	0	188	
PL4805000	48	453	002110	2009	329	0	383	
PL4805000	48	453	002111	1002	177	0	273	
PL4805000	48	453	002112	2001	348	0	418	
PL4805000	48	453	002113	3017	52	0	86	
PL4805000	48	453	002201	1022	43	0	62	
PL4805000	48	453	002214	2000	325	0	362	
PL4805000	48	453	002220	1019	0	0	284	
PL4805000	48	453	002220	1022	266	0	354	
PL4805000	48	453	002222	1001	18	0	52	
PL4805000	48	453	002222	2004	254	0	282	
PL4805000	48	453	002304	1001	423	0	847	
PL4805000	48	453	002304	1005	252	0	383	
PL4805000	48	453	002304	3004	560	0	642	
PL4805000	48	453	002304	3005	72	0	141	
PL4805000	48	453	002307	2001	892	0	957	
PL4805000	48	453	002307	4002	120	0	166	
PL4805000	48	453	002313	1000	224	0	262	
PL4805000	48	453	002313	1001	160	0	135	
PL4805000	48	453	002313	1005	131	0	1	
PL4805000	48	453	002314	5003	53	0	159	
PL4805000	48	453	002314	3001	281	0	367	
PL4805000	48	453	002314	5012	379	0	453	
PL4805000	48	453	002314	5009	145	0	205	
PL4805000	48	453	002314	1002	127	0	145	
PL4805000	48	453	002316	2000	308	0	527	
PL4805000	48	453	002316	1001	577	0	667	
PL4805000	48	453	002316	1000	399	0	475	
PL4805000	48	453	002320	1008	675	0	799	
PL4805000	48	453	002320	1017	348	0	371	
PL4805000	48	453	002321	2001	34	0	231	
PL4805000	48	453	002321	1013	251	0	311	
PL4805000	48	453	002321	3015	0	0	21	

2020 Housing Unit Discrepancies by Census Block, Austin

ENTITYID	STATEFP	COUNTYFP	TRACT	BLOCK	CENSUSHU	CENSUSGQ	CQRHU	CQRGQ
PL4805000	48	453	002321	3014	15	0	36	
PL4805000	48	453	002321	1014	8	0	1	
PL4805000	48	453	002322	1002	264	0	640	
PL4805000	48	453	002322	2000	280	0	345	
PL4805000	48	453	002323	3001	25	0	200	
PL4805000	48	453	002323	1002	188	0	244	
PL4805000	48	453	002323	3000	194	0	221	
PL4805000	48	453	002323	3005	174	0	198	
PL4805000	48	453	002403	2000	59	0	108	
PL4805000	48	453	002407	1006	220	0	526	
PL4805000	48	453	002407	2000	298	0	477	
PL4805000	48	453	002407	3000	417	0	484	
PL4805000	48	453	002413	2001	210	0	351	
PL4805000	48	453	002419	1008	561	0	756	
PL4805000	48	453	002419	2000	787	0	839	
PL4805000	48	453	002422	2003	390	0	467	
PL4805000	48	453	002422	2005	290	0	342	
PL4805000	48	453	002423	3013	16	0	31	
PL4805000	48	453	002437	1007	273	0	345	
PL4805000	48	453	002437	2003	240	0	290	
PL4805000	48	453	002437	2000	45	0	47	
PL4805000	48	453	002438	3014	447	0	570	
PL4805000	48	453	002440	2001	797	0	1061	
PL4805000	48	453	002440	2016	131	0	209	
PL4805000	48	453	002441	1014	652	0	735	
PL4805000	48	453	002443	1004	296	0	401	
PL4805000	48	453	002443	3004	551	0	617	
PL4805000	48	453	002446	1003	305	0	355	
PL4805000	48	453	002448	3017	159	0	342	
PL4805000	48	453	002448	3018	74	0	144	
PL4805000	48	453	002451	1005	689	0	1023	
PL4805000	48	453	002451	2000	1094	0	1186	
PL4805000	48	453	002500	4000	675	0	875	
PL4805000	48	453	002500	3000	378	0	433	
PL4805000	48	453	002500	3006	376	0	426	
PL4805000	48	491	020311	3008	501	0	604	
PL4805000	48	491	020311	1017	97	0	146	
PL4805000	48	491	020334	1003	849	0	727	
PL4805000	48	491	020356	2016	362	0	414	
PL4805000	48	491	020404	2012	180	0	231	
PL4805000	48	491	020405	4017	436	0	539	
PL4805000	48	491	020405	4002	48	0	84	
PL4805000	48	491	020406	2000	357	0	533	
PL4805000	48	491	020406	1001	486	0	547	
PL4805000	48	491	020406	2005	271	0	330	
PL4805000	48	491	020406	2004	135	0	166	

2020 Housing Unit Discrepancies by Census Block, Austin

ENTITYID	STATEFP	COUNTYFP	TRACT	BLOCK	CENSUSHU	CENSUSGQ	CQRHU	CQRGQ
PL4805000	48	491	020406	2006	223	0	242	
PL4805000	48	491	020408	1007	635	0	908	
PL4805000	48	491	020409	1029	81	0	0	
PL4805000	48	491	020410	4004	562	0	657	
PL4805000	48	491	020410	2007	440	0	490	
PL4805000	48	491	020508	1005	779	0	982	
PL4805000	48	491	020508	1006	854	0	1009	
PL4805000	48	491	020517	1002	0	0	26	
PL4805000	48	453	030000	4004	31	0	367	
PL4805000	48	453	030000	1003	335	0	361	
PL4805000	48	453	030100	2003	233	0	250	
PL4805000	48	453	030200	4000	539	0	590	
PL4805000	48	453	030300	2013	18	0	33	
PL4805000	48	453	030400	3009	127	0	212	
PL4805000	48	453	030500	3006	361	0	597	
PL4805000	48	453	030500	2004	195	0	211	
PL4805000	48	453	030500	3004	48	0	54	
PL4805000	48	453	030600	5009	15	0	80	
PL4805000	48	453	030600	1004	392	0	405	
PL4805000	48	453	030600	1002	146	0	158	
PL4805000	48	453	030700	3000	207	0	260	
PL4805000	48	453	030800	1003	228	0	332	
PL4805000	48	453	030800	3000	345	0	408	
PL4805000	48	453	030800	2014	309	0	361	
PL4805000	48	453	030800	2012	479	0	521	
PL4805000	48	453	031000	3014	476	0	633	
PL4805000	48	453	031300	1003	468	0	549	
PL4805000	48	453	031300	2020	299	0	369	
PL4805000	48	453	031700	3004	265	0	318	
PL4805000	48	453	031700	2007	302	0	333	
PL4805000	48	453	031800	2002	283	0	345	
PL4805000	48	453	031900	2009	514	0	592	
PL4805000	48	453	032000	6010	59	0	579	
PL4805000	48	453	032000	1000	24	0	428	
PL4805000	48	453	032000	3000	319	0	494	
PL4805000	48	453	032000	4009	87	0	145	
PL4805000	48	453	032100	1006	733	0	823	
PL4805000	48	453	032100	3007	576	0	635	
PL4805000	48	453	032100	2031	271	0	329	
PL4805000	48	453	032300	1001	502	0	585	
PL4805000	48	453	032300	1000	366	0	424	
PL4805000	48	453	032300	2006	258	0	294	
PL4805000	48	453	032300	2002	249	0	268	
PL4805000	48	453	032400	1000	406	0	423	
PL4805000	48	453	032500	2000	470	0	528	
PL4805000	48	453	032500	1001	808	0	831	

2020 Housing Unit Discrepancies by Census Block, Austin

ENTITYID	STATEFP	COUNTYFP	TRACT	BLOCK	CENSUSHU	CENSUSGQ	CQRHU	CQRGQ
PL4805000	48	453	032800	1007	435	0	509	
PL4805000	48	453	032800	1008	371	0	212	
PL4805000	48	453	032900	3000	614	0	719	
PL4805000	48	453	032900	1011	330	0	365	
PL4805000	48	453	033000	1015	724	0	884	
PL4805000	48	453	033000	2000	56	0	96	
PL4805000	48	453	033500	2002	708	0	871	
PL4805000	48	453	034100	1009	434	0	665	
PL4805000	48	453	034100	3014	534	0	590	
PL4805000	48	453	034200	1001	193	0	291	
PL4805000	48	453	034400	1001	275	0	332	
PL4805000	48	453	034600	2001	714	0	946	
PL4805000	48	453	034600	2004	345	0	407	
PL4805000	48	453	034600	1003	442	0	72	
PL4805000	48	453	034700	2001	94	0	100	
PL4805000	48	453	034800	1007	456	0	616	
PL4805000	48	453	035800	2057	60	0	120	
PL4805000	48	453	035800	1027	0	0	21	
PL4805000	48	453	037200	2008	95	0	195	
PL4805000	48	453	040000	1003	606	0	685	
PL4805000	48	453	040000	3003	266	0	283	
PL4805000	48	453	040000	4004	239	0	253	
PL4805000	48	453	040200	1009	232	0	277	
PL4805000	48	453	040200	2018	19	0	52	
PL4805000	48	453	040200	1012	179	0	200	
PL4805000	48	453	040300	2003	24	0	64	
PL4805000	48	453	040400	1001	79	0	127	
PL4805000	48	453	040500	2011	260	0	318	
PL4805000	48	453	040600	3005	561	0	624	
PL4805000	48	453	040700	5000	292	0	533	
PL4805000	48	453	040700	4002	558	0	622	
PL4805000	48	453	040700	4006	249	0	290	
PL4805000	48	453	040700	2006	420	0	457	
PL4805000	48	453	040900	4001	186	0	200	
PL4805000	48	453	041000	4002	586	0	660	
PL4805000	48	453	041100	2000	277	0	345	
PL4805000	48	453	041200	2005	63	0	95	
PL4805000	48	453	041200	2014	401	0	424	
PL4805000	48	453	041400	2003	30	0	475	
PL4805000	48	453	041400	2002	423	0	486	
PL4805000	48	453	041500	1003	368	0	411	
PL4805000	48	453	041600	3012	240	0	291	
PL4805000	48	453	041600	4005	192	0	211	
PL4805000	48	453	041600	2005	127	0	138	
PL4805000	48	453	041700	1019	22	0	42	
PL4805000	48	453	042100	4011	55	0	119	

2020 Housing Unit Discrepancies by Census Block, Austin

ENTITYID	STATEFP	COUNTYFP	TRACT	BLOCK	CENSUSHU	CENSUSGQ	CQRHU	CQRGQ
PL4805000	48	453	042200	3001	364	0	392	
PL4805000	48	453	042200	1008	301	0	318	
PL4805000	48	453	042400	1011	26	0	41	
PL4805000	48	453	043100	2000	822	0	892	
PL4805000	48	453	043300	2003	632	0	684	
PL4805000	48	453	043400	1008	170	0	186	
PL4805000	48	453	043400	1009	188	0	201	
PL4805000	48	453	043500	1001	1019	0	1285	
PL4805000	48	453	043500	3039	11	0	274	
PL4805000	48	453	043500	3020	6	0	27	
PL4805000	48	453	043500	3016	10	0	27	
PL4805000	48	453	043600	2016	569	0	634	
PL4805000	48	453	043700	1008	310	0	373	
PL4805000	48	453	043800	1007	257	0	308	
PL4805000	48	453	043900	1009	401	0	444	
PL4805000	48	453	044000	2011	712	0	1142	
PL4805000	48	453	044300	3001	284	0	305	
PL4805000	48	453	044600	2037	0	0	34	
PL4805000	48	453	044600	2040	0	0	24	
PL4805000	48	453	044600	2044	0	0	16	
PL4805000	48	453	045000	1015	299	0	343	
PL4805000	48	453	045100	1022	18	0	514	
PL4805000	48	453	045100	1005	181	0	300	
PL4805000	48	453	045100	2009	24	0	66	
PL4805000	48	453	045300	2002	163	0	223	
PL4805000	48	453	045300	1000	677	0	732	
PL4805000	48	453	045300	2001	233	0	275	
PL4805000	48	453	045300	2008	244	0	261	
PL4805000	48	453	045400	2011	315	0	344	
PL4805000	48	453	045400	1001	290	0	311	
PL4805000	48	453	045400	3000	29	0	48	
PL4805000	48	453	045600	1005	20	0	0	

ATTACHMENT B
BUDA HISTORICAL DATA

Year	Total Produced	Single Family Use	Multi Family Use	Commercial Use	Institutional	Reuse	Total Use	SFH Connect	MFH Connect	Com Connect	SFH Pop est	MFH Pop est	Total Pop est	GPCD (from produced)	GPCD (from use)
2022	618,094,819							3765	981	309	11907	1715	13622	124	0
2021	542,874,014	302,167,000	13,899,000	115,757,000	37,175,000	4,549,335	473,547,335	3,725	981	308	11793	1715	13508	110	96
2020	526,422,049	326,597,000	15,447,000	103,895,000	35,476,000	9,532,480	490,947,480	3655	981	286	11594	1475	13069	110	103
2019	520,434,048	309,861,000	13,422,000	121,151,000	29,518,000	5,962,086	479,914,086	3557	895	369	11386	1400	12786	112	103
2018	457,688,000	269,327,189	11,522,624	112,835,000	35,473,000	5,637,300	434,795,113	3478	847	334	10916	1375	12291	102	97
2017	456,904,300	263,463,207	28,911,793	137,262,000			429,637,000	3437	799	311	10762	1375	12137	103	97
2016	391,873,500	236,107,740	25,041,730	96,589,530			357,739,000	3375	733	298	10468	1375	11843	91	83
2015	386,821,400	229,782,000	19,557,000	117,939,000			367,278,000	3111	733	289	9588	1191	10779	98	93
2014	469,116,200	236,876,000	16,414,000	118,398,000			371,688,000	2952	433	281	9117	999	10116	127	101
2013	412,954,800	235,260,000	12,246,000	114,683,000			362,189,000	2647	433	274	8237	746	8983	126	110
2012	374,293,800	224,272,000	5,323,000	114,479,000			344,074,000	2402	133	251	7428	324	7752	132	122
2011	383,702,600	235,640,065	4,341,000	112,626,000			352,607,065	2244	133	248	6978	264	7242	145	133
2010	346,959,700	189,475,000	888,000	106,532,000			296,895,000	2098	1	236	6535	54	6589	144	123

ATTACHMENT C

CANYON LAKE WATER SERVICE SUPPORTING
DOCUMENTS

Canyon Lake Water Service Company

GROWTH AND DEMAND PROJECTIONS

PREPARED FOR:

Canyon Lake Water Service Company

PREPARED BY:

Freese and Nichols, Inc.
10431 Morado Circle, Suite 300
Austin, Texas 78759
512-617-3100



GROWTH AND WATER DEMAND PROJECTIONS

Prepared for:

Canyon Lake Water Service Company



November 2022

Prepared by:

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CYL22549

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APPENDICES

- Appendix A: TWDB Passive Water Savings Methodology
- Appendix B: GPCD, Population and Water Demand Plots by System
- Appendix C: Near Term Population Projection Methodology Details
- Appendix D: Long Term Population Projection Methodology Details

EXECUTIVE SUMMARY

In June 2022, Canyon Lake Water Service Company (CLWSC) engaged Freese and Nichols, Inc. (FNI) to provide detailed water resources analysis services to provide estimates of projected water demand between 2022 and 2070. The objective of this analysis is to generate data-driven estimates of water usage over a multi-decadal planning horizon so that CLWSC can compare projected demand with its determination of current supply availability. This report outlines the methodology used to develop gallons per capita per day (GPCD) estimates, population projections, and total water demand projections for CLWSC. These results are intended for planning purposes and are subject to change as more detailed information becomes available over time. It is recommended that these results be re-evaluated in five years.

Water demand varies with population and with per-capita water use, or the amount of water used by the average person each day. FNI developed projections of population and GPCD by year for 2022 through 2030 and by decade for 2030-2070 in order to estimate future demand.

To develop GPCD projections, FNI calculated historical per-capita water use based on observed population and water use data. The average of the three highest GPCDs was used to establish the baseline GPCD. To project future GPCDs, FNI applied reductions to the baseline GPCD based on the passive savings calculated for CLWSC in the *2021 South Central Texas Regional Water Plan (SCT RWP)*. These GPCD reductions were applied consistently to all systems within CLWSC. This amounts to a reduction between 2020 and 2030 of approximately 2 GPCD from the initial baseline GPCD, with future decadal reductions tapering off as the savings from replacing pre-1995 appliances wane. Assessing the future savings from CLWSC's water conservation programs was not part of the scope of work for this analysis. The calculated baseline GPCD and projections by decade are included in **Table ES-1**. For more information about how the baseline GPCD was calculated and projections were estimated, see **Section 2.0**.

Table ES-1: Calculated Baseline GPCD and Projected Future GPCD

System	Baseline	2030	2040	2050	2060	2070
Canyon Lake Shores	137	135	135	134	134	134
Triple Peak	129	127	126	126	126	126
North Point	108	106	105	105	105	105
Rust Ranch	73	71	70	70	69	69
Deer Creek	76	74	74	73	73	73
Glenwood	193	191	190	190	190	190
Latigo Ranch	112	110	109	109	109	109
Summit Ridge	202	200	200	199	199	199
Bridlegate	93	91	90	90	90	90

System	Baseline	2030	2040	2050	2060	2070
Kendall West	135	133	133	132	132	132
Texas Country Water	303	302	301	301	300	300
Rockwall Ranch / KT Water	321	319	319	318	318	318

Population projections through the year 2030 were developed by Zonda (formerly Metrostudy) using their proprietary database of housing market activity. Zonda surveyors visually inspect all known residential developments and account for all stages of development activity within each subdivision. The boundaries of the existing water service areas and the Certificate of Convenience and Necessity (CCN) areas, as well as subdivisions discovered in Zonda’s proprietary database, are shown on **Figure ES-1**. In addition to the known subdivisions in the database, future single-family homes and apartments were estimated for each census tract based on recent trends. Subdivisions outside of an existing CCN were generally assigned to the nearest CCN. Future lots and apartments in each census tract were assigned to the CCN and PWS where the largest amount of population growth was expected to occur from subdivisions with known locations in that census tract.

To evaluate the potential impacts of expanding CLWSC’s CCN boundaries, two population projections were developed for Canyon Lake Shores, Kendall West Utility, Triple Peak, and Glenwood. Other systems are assumed to maintain their current boundaries. Therefore, the lower and higher projections are the same. The lower projection scenario only includes population growth within existing CCN boundaries, while the higher scenario includes new developments outside of existing CCNs that might be served by CLWSC. It is assumed that CLWSC would begin serving those new developments starting in 2022. The lower and higher total population projections are shown in **Table ES-2**. Additional details on the near-term population methodology and the detailed projections by system are included in **Section 3.1** and **Appendix C**.

Figure ES-1: PWS and CCN Boundaries, and Known Subdivisions Assigned to Water Systems

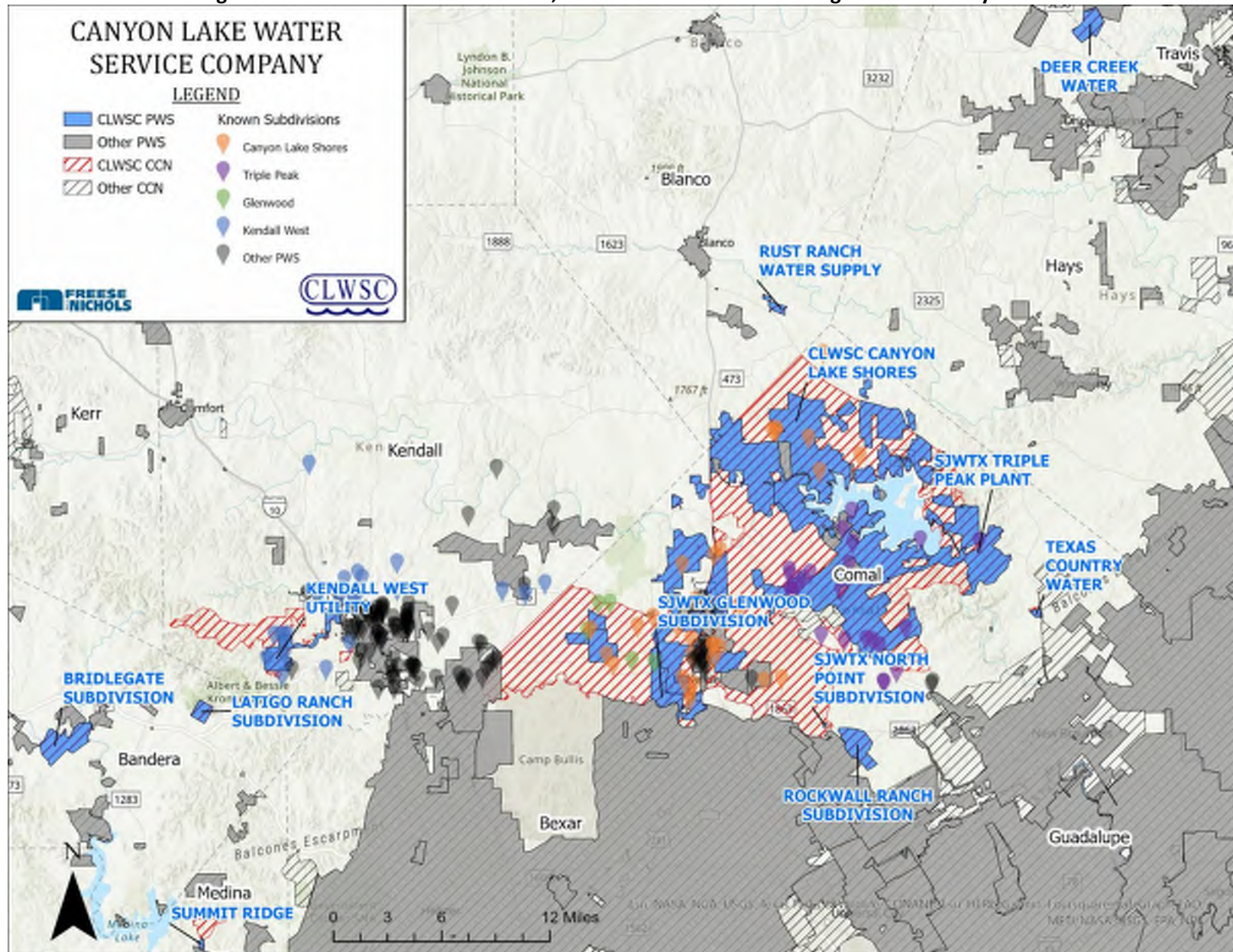


Table ES-2: Near Term Population Projections

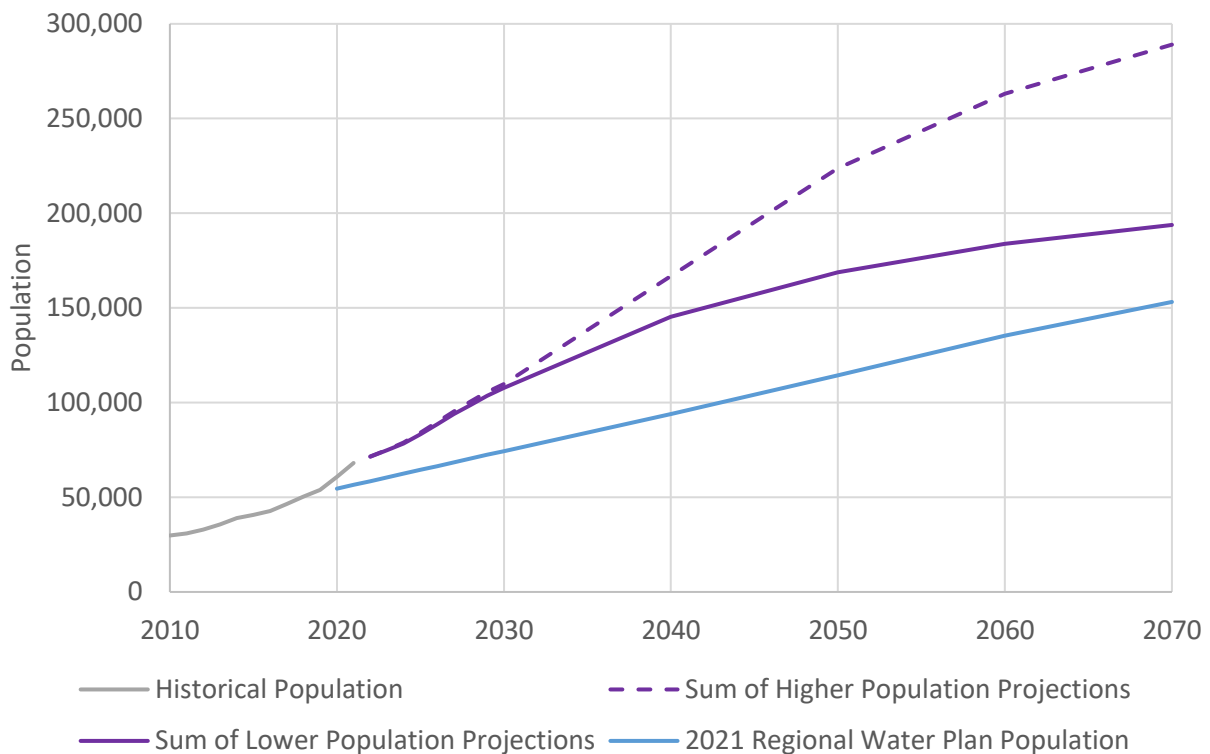
	Total Lower Population Projection (No CCN Expansion)	Total Higher Population Projection (Expansion of CCN)
2022	71,435	71,555
2023	74,802	75,024
2024	78,411	78,922
2025	83,312	84,130
2026	88,565	89,692
2027	93,855	95,295
2028	98,745	100,489
2029	103,623	105,621
2030	107,768	109,903

For the period from 2030-2070, population was projected within each water system by evaluating recent historical population trends and the near-term projections by Zonda, where available. Based on these historical and near-term projection values, a future growth rate was estimated that was similar or slightly lower than the historical values with a declining rate of increase. In addition, a saturation, or buildout, population, was estimated for each water system. In general, the buildout population was calculated by multiplying the relevant CCN area by a population density of 500 to 1,000 persons per square mile. As mentioned earlier, a higher growth scenario was developed for Canyon Lake Shores, Triple Peak, Glenwood, and Kendall West Utility. In the long-term population projection, the assumption was that the CCN for Kendall West Utility will expand by 50 percent from its current size, and that CLWSC will expand in Comal County to serve all areas not currently bounded by an existing CCN. The area of future CCN expansion in Comal County was divided among Canyon Lake Shores, Triple Peak, and Glenwood based on the current relative sizes of the systems' boundaries. Detailed information on the long-term population projection methodology for each system is included in **Section 3.2** and **Appendix D**, and the results for the system as a whole are shown in **Table ES-3**. The combined population projections for all water systems are shown in **Figure ES-2**. The population projections from the 2021 SCT RWP are included in **Figure ES-2** for comparison. This line is the sum of projections for the following "Water User Groups" (WUG): Canyon Lake Water Service, Clear Water Estates, Kendall West Utility, Deer Creek Ranch Water, and KT Water Development. Bridlegate, Latigo Ridge, Summit Ridge, and Texas Country Water are included in the "County-other" category for regional planning and are not included in the figure, but these systems make up less than two percent of the total population of all CLWSC systems.

Table ES-3: Long Term Population Projections

	Total Lower Population Projection (No CCN Expansion)	Total Higher Population Projection (Expansion of CCN)
2030	107,768	109,903
2040	145,257	166,765
2050	168,791	223,799
2060	183,913	263,171
2070	193,813	289,033

Figure ES-2: Historical and Projected Retail Population in CLWSC Water Service Area



The total demand projections are calculated by multiplying projected retail population by the projected GPCD for each system and adding any additional wholesale water demands. The results for the system as a whole are shown in **Table ES-4**, and additional details are included in **Section 4.0**.

Table ES-4: Total Demand Projections

	Total Lower Demand Projection (No CCN Expansion) ac-ft/year	Total Higher Demand Projection (Expansion of CCN) ac-ft/year
2022	11,086	11,103
2023	11,602	11,634
2024	12,163	12,239
2025	12,918	13,039
2026	13,744	13,911
2027	14,567	14,781
2028	15,321	15,579
2029	16,072	16,368
2030	16,708	17,024
2040	22,424	25,863
2050	25,970	34,426
2060	28,249	40,272
2070	29,759	44,111

CLWSC obtains 6,130 ac-ft/year of raw water from Canyon Lake through a contract with the Guadalupe-Blanco River Authority (GBRA). An additional 1,472 ac-ft/year of treated water is available from GBRA through a separate contract. CLWSC operates thirty-eight active wells and five inactive wells in Comal County. Based on the calculated and estimated production capacity of the active wells, 8,944 a-f/year is available from the Edwards/Trinity aquifer. CLWSC is currently in the process of acquiring a well field from KT Water Resources Ltd., which could yield 10,000 to 21,000 ac-ft/year. Additional details regarding existing supplies can be found in **Section 5.0**.

The combined retail and wholesale water demand, as well as total firm supply as identified by CLWSC staff, is presented in **Figure ES-3**. **Based on the growth and demand projections developed within this report, the total water demand is expected to exceed supply around the year 2040 for the higher demand scenario and 2044 for the lower demand scenario. This would change if the KT Water Resources Ltd. wellfield is not acquired or does not yield a firm supply similar to what is shown in this report.**

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1.0 INTRODUCTION

Canyon Lake Water Service Company (CLWSC) is an investor-owned utility providing water service in seven south central Texas counties. CLWSC currently has the exclusive right and requirement to serve approximately 260 square miles in Comal and Kendall Counties, which is the primary study area of this report. Within those two counties, CLWSC owns and operates seven individual systems: Canyon Lake Shores, Triple Peak, North Point Subdivision, Glenwood, Kendall West Utility, Texas Country Water, and Rockwall Ranch/KT Water. CLWSC also owns five water systems outside of Kendall and Comal counties: Rust Ranch, Deer Creek, Latigo Ranch, Summit Ridge, and Bridlegate. CLWSC operates but does not own Miralomas MUD, and this water system is excluded from FNI's analysis.

CLWSC obtains raw water from Canyon Lake via a contract with the Guadalupe-Blanco River Authority (GBRA). CLWSC also utilizes groundwater produced from the Edwards/Trinity Aquifer. CLWSC owns and operates three water treatment plants that treat water diverted from Canyon Lake: Canyon Lake Shores, Triple Peak, and Sybil Lightfoot. Some additional treated water originating from the Western Canyon project is purchased from GBRA. In addition to customers within CLWSC's retail water service area, CLWSC provides water wholesale to Windmill Ranch and City of Blanco. The City of Blanco has its own contract for up to 600 acre-feet per year (ac-ft/year) from GBRA.

In June 2022, CLWSC engaged Freese and Nichols, Inc. (FNI) to provide detailed water resources analysis services culminating in estimates of projected water demand between 2022 and 2070. The objective of this analysis is to generate data-driven estimates of water usage over a multi-decadal planning horizon so that CLWSC can compare projected demand with its determination of current supply availability. This report outlines the methodology used to develop gallons per capita per day (GPCD) estimates, population projections, and total water demand projections for CLWSC. These results are intended for planning purposes and are subject to change as more detailed information becomes available over time. It is recommended that these results be re-evaluated in five years.

1.1 LIST OF ABBREVIATIONS

Table 1-1 summarizes a list of abbreviations used in this report.

Table 1-1: Abbreviations

Abbreviation	Definition
ac-ft/year	Acre-Feet per Year (1 acre-foot per year = 325,851 gallons per year)
CCN	Certificate of Convenience and Necessity

CLWSC	Canyon Lake Water Service Company
GBRA	Guadalupe-Blanco River Authority
GPCD	Gallons per Capita per Day
MGD	Million Gallons per Day
PUC	Public Utility Commission
PWS	Public Water System
SCT RWP	South Central Texas Regional Water Plan (Region L Plan)
TWDB	Texas Water Development Board
WUG	Water User Group

2.0 GALLONS PER CAPITA PER DAY (GPCD) ESTIMATES

Historical demand data for CLWSC was obtained through CLWSC's records, Texas Water Development Board (TWDB) Water Use Surveys, and other sources.

2.1 KEY ASSUMPTIONS

In order to calculate consistent, defensible GPCD projections across years and between systems, the following assumptions were made:

- GPCD is calculated for each individual system within CLWSC's service area, as the systems are configured as of September 2022.
- This report uses a combined average GPCD rather than individual rates for different customer types, and it is assumed that the ratio of residential volumetric usage to commercial and other non-residential uses (such as construction water use and nonrevenue water) does not change in the future. Should this ratio change in the future, GPCDs could be different from these projections.
- Historic populations were calculated using past connection counts as reported in TWDB Water Use Surveys or in CLWSC records, as available. For all historical data, population was estimated by multiplying connection counts by 2.75. This value is supported by a review of 2010 and 2020 census data, which shows around 2.6 to 2.8 persons per household in the census tracts overlapping the CLWSC service area. CLWSC's people per connection policy has changed in the past, and some systems recently acquired by CLWSC appear to have used different techniques to estimate population. This analysis uses a constant factor of 2.75 people per connection to maintain consistency.
- Connection counts were not available for Latigo Ranch prior to 2020, which was recently acquired by CLWSC. Population was estimated by interpolating between the earliest available water use survey population of 60 in 2017 to the value of 120 reported by CLWSC in 2021. The water use surveys in 2018-2020 show a decline in population, and it was assumed that this was in error.
- The Summit North system merged with Canyon Lake Shores in 2020, and Clear Water Estates merged with Triple Peak. For each of these cases, historical population and water use data was combined to match the current system configuration.

- As requested by CLWSC, Miralomas MUD was excluded from this analysis, since it is an isolated system that is operated but not owned by CLWSC.
- CLWSC supplies water to two wholesale customers from the Canyon Lake Shores treatment plant: Windmill Ranch and the City of Blanco. This wholesale water use was not included in the GPCD calculation for Canyon Lake Shores, and separate projections were developed for wholesale water use. These wholesale water use estimates were added to the retail demand projections, as described in **Section 4.2**.

2.2 BASELINE GPCD METHODOLOGY

Per-capita water use depends on two variables: total water usage and population served. Total water usage was sourced from historic TWDB Water Use Surveys for each CLWSC system and CLWSC intake and billing records, as available. Served population was calculated by multiplying the historic connection counts found within the TWDB Water Use Surveys and CLWSC records by 2.75 people per connection. Applying Equation (1) yielded GPCD estimates for each year that historic data were available.

$$\text{GPCD} = (\text{Total Annual Water Usage in Gallons} / \text{Population}) / 365 \text{ Days} \quad (1)$$

Per-capita water use varies over time, and it tends to be higher in years with drier weather because of higher water demand for landscape irrigation. When estimating future conditions, one could use the highest historical GPCD, but this approach may be overly conservative. Averaging all years would result in a lower projection, but this would minimize the most critical years for water supply planning. After initial coordination with CLWSC, the average of the three highest GPCDs was used to establish each system's baseline GPCD in order to represent demand conditions that might occur during a dry year, which is when supplies are most likely to be constrained.

In the event that a water system's data did not include the year 2011, the average of the three highest GPCDs was increased by 10 percent to establish the baseline GPCD. While 2022 has rivalled 2011 for number of hot and dry days, as well as water usage, the timeline of this analysis requires findings prior to the end of 2022. Therefore, 2011 is still considered the benchmark for a conservative estimate for high water usage, and the average GPCD including 2011 was approximately 10 percent higher than the average of the three next highest GPCDs for systems where 2011 data was available. These corrections were applied to North Point, Latigo Ranch, Summit Ridge, Bridlegate, Kendall West Utility, and Texas Country Water.

2.3 GPCD PROJECTION METHODOLOGY

Assessing the future savings from CLWSC's water conservation programs was not part of the scope of work for this analysis. Therefore, the only reductions applied to the baseline GPCD were based on the passive savings applied to CLWSC in the *2021 SCT RWP* (which was the same methodology used in the *2016 SCT RWP*). These GPCD reductions were applied consistently to all systems within CLWSC by subtracting the savings that occur after 2020 from the calculated baseline GPCD for each system. This amounts to a reduction between 2020 and 2030 of approximately 2 GPCD from the initial baseline GPCD, with future decadal reductions tapering off as the savings from replacing pre-1995 appliances wane. For more detailed information about the methodology used for estimating passive savings, please see **Appendix A** of this report.

2.4 GPCD FINDINGS

As described in **Section 2.2**, a baseline GPCD value was calculated based on historical water use and population. A summary of historical water use is included in **Table 2-1**, and historical population is shown in **Table 2-2**. The historical GPCD values calculated using these values are included in **Table 2-3**. The calculated baseline GPCD and projections by decade are included in **Table 2-4**. Figures showing the historical and projected GPCD are included in **Appendix B**.

Table 2-1: Historical Total Retail Water Use (acre-ft)

System	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Canyon Lake Shores	1,447	1,920	1,709	1,594	1,688	2,222	2,237	2,510	2,627	3,026	3,731	3,753
Triple Peak	2,048	2,471	2,125	1,841	2,256	1,819	1,851	2,303	2,344	2,638	2,996	3,039
North Point	-	-	7	7	7	7	7	8	7	8	9	10
Rust Ranch	26	29	26	29	29	30	31	33	35	34	37	36
Deer Creek	71	93	95	116	134	141	149	181	186	183	207	203
Glenwood	39	50	41	45	47	47	50	67	85	110	152	210
Latigo Ranch	-	-	-	-	-	-	-	6	7	10	13	14
Summit Ridge	-	-	-	-	-	-	-	-	-	14	20	20
Bridlegate	-	-	-	-	-	-	-	38	43	42	55	52
Kendall West	274	274 ^a	274 ^a	234	237	249	268	294	321	351	367	427
Texas Country Water	-	-	-	-	-	-	79	95	62	72	81	75
Rockwall Ranch / KT Water	186	319	306	323	339	317	357	406	429	431	555	- ^b
Total	4,090	5,156	4,582	4,189	4,736	4,832	5,029	5,941	6,145	6,919	8,225	7,840^c

^a Duplicative reporting entry.

^b Neither Water Use Survey nor CLWSC intake data available.

^c Does not include any usage data from Rockwall Ranch.

Table 2-2: Historical Total Population Served

System	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Canyon Lake Shores	10,178	10,852	12,117	13,525	15,590	16,360	17,251	18,846	20,859	22,426	26,318	33,817
Triple Peak	15,040	15,271	15,659	16,693	17,493	18,101	18,744	19,993	21,304	22,842	25,493	29,752
North Point	-	-	77	74	74	74	74	77	80	80	80	88
Rust Ranch	347	344	349	347	396	404	415	451	470	476	495	536
Deer Creek	1,067	1,191	1,290	1,403	1,774	1,823	1,977	2,115	2,230	2,335	2,384	2,448
Glenwood	209	209	223	223	253	278	289	325	542	693	850	1,474
Latigo Ranch ^a	-	-	-	-	-	-	-	60	75	90	105	120
Summit Ridge	-	-	-	-	-	-	-	-	-	68	69	168
Bridlegate	-	-	-	-	-	-	-	462	644	470	534	578
Kendall West	2,283	2,490 ^b	2,490 ^b	2,335	2,360	2,395	2,404	2,439	2,508	2,582	2,750	2,967
Texas Country Water	-	-	-	-	-	-	270	275	283	283	283	294
Rockwall Ranch / KT Water	696	839	910	1,029	1,114	1,221	1,320	1,375	1,414	1,477	1,532	- ^c
Total	29,818	30,987	32,907	35,626	39,053	40,656	42,743	46,417	50,408	53,822	60,891	66,469^d

^a Population reported in TWDB Water Use Surveys appear incorrect, so the 2017 figure represents what was reported in that year's Water Use Survey, and subsequent years are an interpolation between that figure and what CLWSC reported as population in 2021.

^b Duplicative reporting entry.

^c Data not available.

^d Does not include data for Rockwall Ranch.

Table 2-3: Calculated Historical GPCD

System	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Canyon Lake Shores	127	158	126	105	97	121	116	119	112	120	127	103
Triple Peak	122	144	121	98	115	90	88	103	98	103	105	91
North Point	-	-	77	86	81	90	89	88	77	92	106	97
Rust Ranch	67	76	67	75	65	66	67	65	66	64	67	59
Deer Creek	59	70	65	74	67	69	67	76	75	70	78	74
Glenwood	168	214	163	181	167	152	155	184	139	142	160	127
Latigo Ranch	-	-	-	-	-	-	-	90	85	97	106	102
Summit Ridge	-	-	-	-	-	-	-	-	-	185	261	106
Bridlegate	-	-	-	-	-	-	-	90	85	97	106	102

System	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Kendall West	107	107 ^a	107 ^a	89	90	93	100	108	114	121	119	129
Texas Country Water	-	-	-	-	-	-	263	309	196	226	256	229
Rockwall Ranch / KT Water	238	340	301	280	271	232	241	264	271	261	324	- ^b

^a Duplicative reporting entry

^b Data not available

Table 2-4: Calculated Baseline GPCD and Projected Future GPCD

System	Baseline	2030	2040	2050	2060	2070
Canyon Lake Shores	137	135	135	134	134	134
Triple Peak	129	127	126	126	126	126
North Point ^a	108	106	105	105	105	105
Rust Ranch	73	71	70	70	69	69
Deer Creek	76	74	74	73	73	73
Glenwood	193	191	190	190	190	190
Latigo Ranch ^a	112	110	109	109	109	109
Summit Ridge ^a	202	200	200	199	199	199
Bridlegate ^a	93	91	90	90	90	90
Kendall West ^a	135	133	133	132	132	132
Texas Country Water ^a	303	302	301	301	300	300
Rockwall Ranch / KT Water	321	319	319	318	318	318

^a Additional 10 percent increase due to missing 2011 data.

3.0 POPULATION PROJECTIONS

Population projections for the study area were estimated for use in the development of municipal water demand projections. The boundaries of the existing water service areas and the Certificate of Convenience and Necessity (CCN) areas are shown on **Figure 3-1**. This map also shows the subdivisions with a known location in the Zonda database, color coded by the water system by which we assume they will be served for the purposes of the near-term projections.

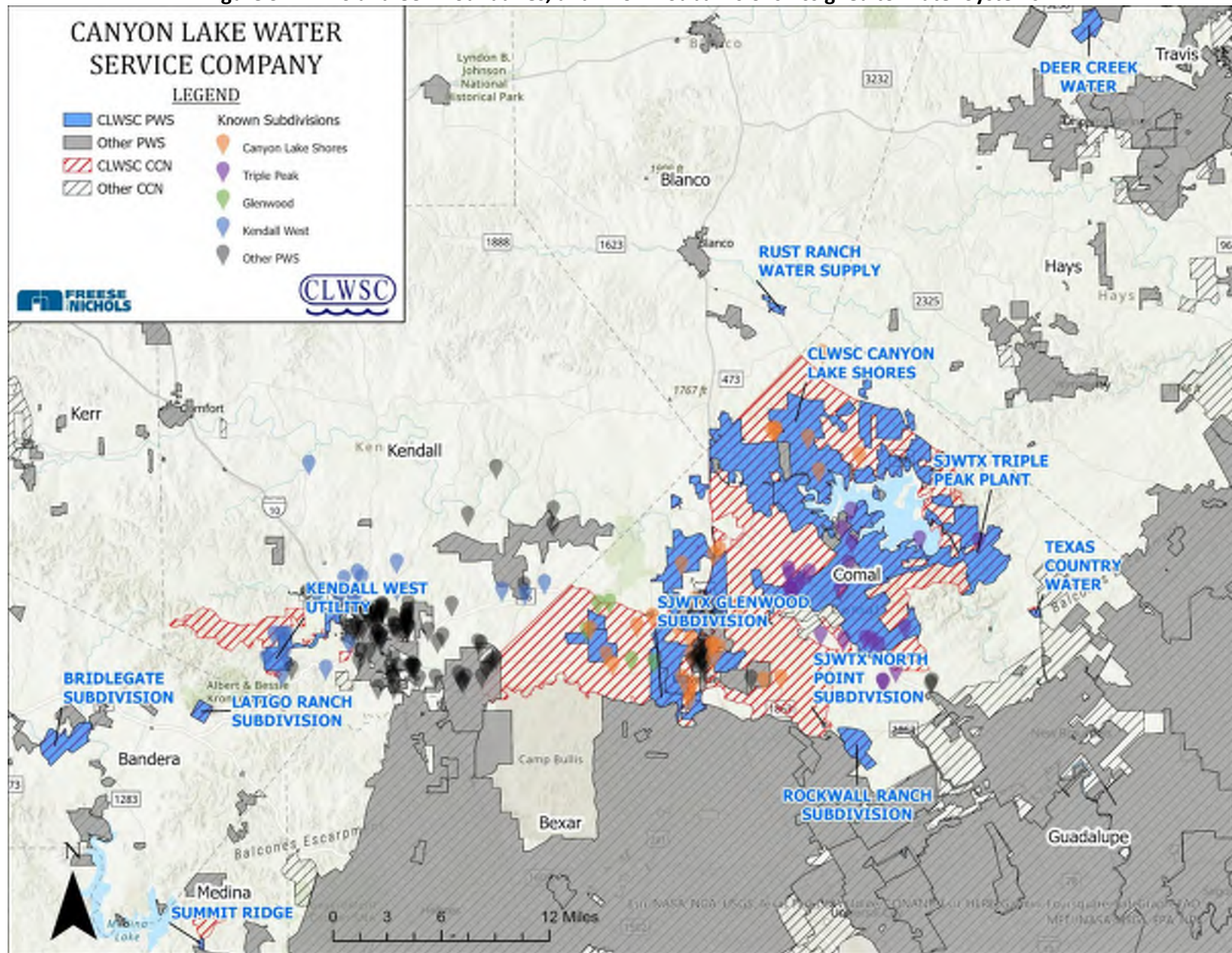
3.1 NEAR TERM POPULATION PROJECTIONS (2022-2030)

Population projections through the year 2030 were developed by Zonda (formerly Metrostudy) using their proprietary database of housing market activity. The database is focused on residential development in the San Antonio MSA, with quarterly surveys conducted by staff to track future platted lots, lots under active development, vacant developed lots, homes under construction, finished vacant homes, and occupied homes. Zonda surveyors visually inspect all known residential developments and account for all stages of development activity within each subdivision. This data allows Zonda to forecast housing unit and population growth for various geographies based on detailed supply and demand trends. In addition to the survey data, external sources of information for projections include the US Census Bureau, ESRI (third party demographic data), ALN Apartment Data, Inc. (third party apartment data), and RealPage (third party apartment data). The following outline describes the methodology for housing unit and population projections in the study area.

1. Baseline Housing Unit and Population Counts

Utilizing data from the 2020 Census (collected in April 2020), occupied housing unit and population counts were determined for each of the 26 Census Tracts that make up the assessment area. Note that the boundaries of some Census Tracts extended beyond the boundaries of the assessment area, likely leading to modestly higher occupied housing unit and population counts.

Figure 3-1: PWS and CCN Boundaries, and Known Subdivisions Assigned to Water Systems



2. Historic Population to Household Ratios

Utilizing Census Bureau data (provided by ESRI), the overall average household size (2020 population / 2020 occupied housing units) and the average new household size (2020 population – 2010 population / 2020 occupied housing units – 2010 occupied housing units) were calculated for individual Census Tracts in Comal and Kendall counties. The average overall/new household formation rates (Census Tract and County) was utilized to convert projected housing unit growth to projected population growth in the assessment area. Based upon Census data for the San Antonio MSA, an average household size of 1.80 residents was assumed for apartment units (regardless of location). The average persons per household ratio for all new subdivisions assumed to be served by CLWSC in the higher scenario was 2.62.

3. Projecting For Sale Housing Unit Growth

In order to project for sale housing unit growth in the assessment area, the following steps were taken using Zonda's proprietary housing survey data:

- a. Aggregated total future new home supply in the assessed area.
- b. Utilized five-year trends to project additional new lots/homes that could be added to the assessment area between now and 2030.
- c. Assessed new home closing trends at the subdivision level to project the pace at which new homes will close over the forecast period.
- d. Projected annual housing unit growth through 2030 for active and future subdivisions in the assessment area.

4. Projecting Apartment Unit Growth

In order to project apartment unit growth in the assessment area, the following steps were taken using data from third party sources such as ALN Apartment Data, Inc. and RealPage:

- a. Identified recently completed (since 2020), under construction, and planned apartment communities to determine the extent and location of apartment development activity within the assessment area.
- b. Utilized five-year trends to project additional apartment units that could be added to the assessment area between now and 2030.

- c. Projected annual apartment unit growth through 2030 for active and future apartment communities in the assessment area.

5. Projecting Population Growth

Once the for-sale and apartment housing unit projections were completed, the annual new housing unit projections were converted into annual population growth projections by applying the household formation rates detailed in Step 2.

In addition to the known subdivisions in the database, future single-family homes and apartments were estimated for each census tract based on recent trends.

Subdivisions with a known location in the database were assigned to a water system based on the Public Water System (PWS) and Certificate of Convenience and Necessity (CCN) boundary shapefiles available from the Texas Water Development Board (TWDB) and Public Utility Commission (PUC), respectively. We assumed that subdivisions outside of a PWS but inside a CCN would be served by the nearest PWS associated with that CCN. Subdivisions outside of an existing CCN were generally assigned to the nearest CCN. Future lots and apartments in each census tract were assigned to the CCN and PWS where the largest amount of population growth was expected to occur from subdivisions with known locations in that census tract.

To evaluate the potential impacts of expanding CLWSC's CCN boundaries, two population projections were developed for Canyon Lake Shores, Kendall West Utility, Triple Peak, and Glenwood. Other systems are assumed to maintain their current boundaries, so the lower and higher projections are the same. The lower projection scenario only includes subdivisions that are within existing CCN boundaries, while the higher scenario includes new developments outside of existing CCNs that might be served by CLWSC. It is assumed that CLWSC would begin serving those new developments starting in 2022. The lower and higher population projections are shown in **Table 3-1** and **Table 3-2**. Additional details on the near term population methodology are included in **Appendix C**.

Table 3-1: Near Term Lower Population Projections (No CCN Expansion)

System	2022	2023	2024	2025	2026	2027	2028	2029	2030
Canyon Lake Shores	29,541	31,019	32,688	35,426	38,294	41,300	43,996	46,891	49,490
Triple Peak	31,051	32,358	33,480	34,749	35,922	37,080	38,237	39,221	39,879
North Point ^a	88	88	88	88	88	88	88	88	88
Rust Ranch ^a	536	536	536	536	536	536	536	536	536
Deer Creek ^a	2,457	2,466	2,476	2,485	2,495	2,504	2,513	2,523	2,532

System	2022	2023	2024	2025	2026	2027	2028	2029	2030
Glenwood	1,677	1,896	2,230	2,561	3,199	3,734	4,166	4,597	4,951
Latigo Ranch ^a	138	156	174	192	211	229	247	265	283
Summit Ridge ^a	193	218	244	269	294	320	345	370	396
Bridlegate ^a	631	684	738	791	845	898	952	1,005	1,058
Kendall West	3,139	3,346	3,675	4,080	4,500	4,934	5,383	5,795	6,172
Texas Country Water ^a	294	294	294	294	294	294	294	294	294
Rockwall Ranch / KT Water ^a	1,689	1,739	1,789	1,839	1,889	1,938	1,988	2,038	2,088
Total	71,435	74,802	78,411	83,312	88,565	93,855	98,745	103,623	107,768

^a These near-term population projections were developed using the methods described in Section 3.2 for 2030 with linear interpolation from 2021-2030

Table 3-2: Near Term Higher Population Projections (Expansion of CCN)

System	2022	2023	2024	2025	2026	2027	2028	2029	2030
Canyon Lake Shores	29,541	31,019	32,863	35,775	38,817	41,997	44,867	47,936	50,642
Triple Peak	31,172	32,565	33,757	35,116	36,380	37,632	38,887	39,936	40,610
North Point ^a	88	88	88	88	88	88	88	88	88
Rust Ranch ^a	536	536	536	536	536	536	536	536	536
Deer Creek ^a	2,457	2,466	2,476	2,485	2,495	2,504	2,513	2,523	2,532
Glenwood	1,677	1,896	2,230	2,561	3,199	3,734	4,166	4,597	4,951
Latigo Ranch ^a	138	156	174	192	211	229	247	265	283
Summit Ridge ^a	193	218	244	269	294	320	345	370	396
Bridlegate ^a	631	684	738	791	845	898	952	1,005	1,058
Kendall West	3,139	3,362	3,733	4,182	4,646	5,124	5,606	6,032	6,424
Texas Country Water ^a	294	294	294	294	294	294	294	294	294
Rockwall Ranch / KT Water ^a	1,689	1,739	1,789	1,839	1,889	1,938	1,988	2,038	2,088
Total	71,555	75,024	78,922	84,130	89,692	95,295	100,489	105,621	109,903

^a These near-term population projections were developed using the methods described in Section 3.2 for 2030 with linear interpolation from 2021-2030

3.2 LONG TERM POPULATION PROJECTIONS (2030-2070)

Population was projected within each water system for the period from 2030-2070 by evaluating recent historical population trends and the near-term projections by Zonda, where available. The population growth rate, k , was calculated using Equation (2).

$$P_t = P_0 e^{kt} \quad (2)$$

Here, the initial population is denoted P_0 , the population after t years is P_t , and e is the exponential constant. The annual growth rate, k , was calculated for the period from 2010-2021 (as available) as well as for 2010-2030 and 2020-2030 for the water systems with population projections from Zonda. Based on

these values, a future growth rate was estimated that was similar or slightly lower than the historical values. The growth rate was applied using Equation (3) to model growth with a declining rate of increase. This equation requires a saturation, or buildout, population, which was estimated for each water system. In Equation (3), P_0 is the initial population, P_t is the population after t years, and S is the buildout population.

$$P_t = P_0 + (S - P_0)(1 - e^{-k(t-t_0)}) \quad (3)$$

In general, the buildout population was calculated by multiplying the relevant CCN area by a population density of 800 or 1,000 persons/square mile. Since the Canyon Lake Shores, Triple Peak, and Glenwood systems share a CCN area, the CCN area was divided among the systems based on the current ratio of existing PWS boundary areas. As mentioned in **Section 3.1**, a higher growth scenario was developed for Canyon Lake Shores, Triple Peak, Glenwood, and Kendall West Utility. In the long-term population projection, the assumption was that the CCN for Kendall West Utility will expand by 50 percent from its current size, and that CLWSC will expand in Comal County to serve all areas not currently bounded by an existing CCN, with the area of Canyon Lake excluded. Similar to the existing CCN, the area of future CCN expansion was divided among Canyon Lake Shores, Triple Peak, and Glenwood based on the current relative sizes of the PWS boundaries. Detailed information on the long-term population projection methodology for each system is included in **Appendix D**, and the results are shown in **Table 3-3** and **Table 3-4**. The combined population projections for all water systems are shown in **Figure 3-2**. The population projections from the *2021 SCT RWP* are included in **Figure 3-2** for comparison. This line is the sum of projections for the following WUGs: Canyon Lake Water Service, Clear Water Estates, Kendall West Utility, Deer Creek Ranch Water, and KT Water Development. It does not include the remaining four customers that were grouped in County-other for the *2021 SCT RWP*, but these account for less than 2 percent of the total projected population. Figures showing population projections for individual water systems are included in **Appendix B**.

Table 3-3: Long Term Lower Population Projections (No Expansion)

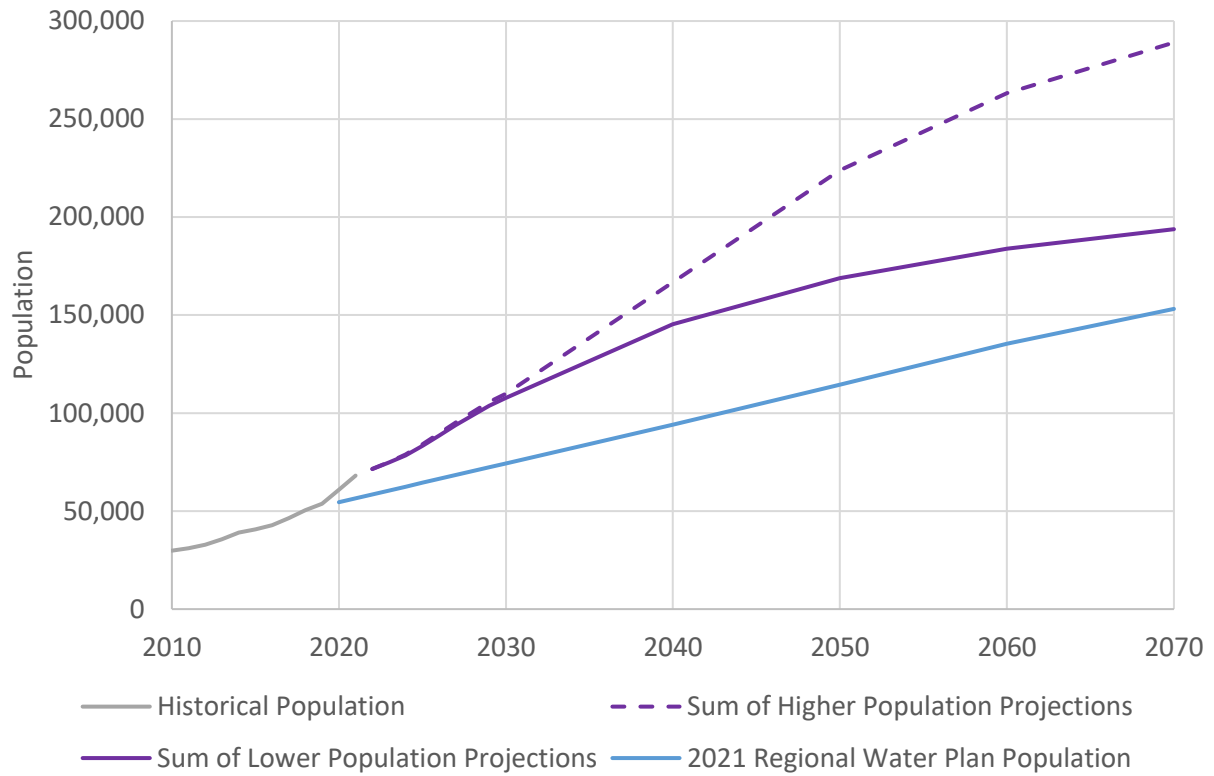
System	2030	2040	2050	2060	2070
Canyon Lake Shores	49,490	70,309	82,936	90,594	95,239
Triple Peak	39,879	51,439	60,002	66,347	71,046
North Point	88	88	88	88	88
Rust Ranch	536	536	536	536	536
Deer Creek	2,532	2,602	2,653	2,690	2,717
Glenwood	4,951	7,232	8,072	8,380	8,494
Latigo Ranch	283	382	419	432	437

System	2030	2040	2050	2060	2070
Summit Ridge	396	563	624	647	655
Bridlegate	1,058	1,361	1,528	1,619	1,669
Kendall West	6,172	8,105	9,166	9,748	10,067
Texas Country Water	294	294	294	294	294
Rockwall Ranch / KT Water	2,088	2,346	2,474	2,537	2,569
Total	107,768	145,257	168,791	183,913	193,813

Table 3-4: Long Term Higher Population Projections (Expansion of CCN)

System	2030	2040	2050	2060	2070
Canyon Lake Shores	50,642	82,490	115,821	136,037	148,299
Triple Peak	40,610	54,576	73,346	90,207	102,698
North Point	88	88	88	88	88
Rust Ranch	536	536	536	536	536
Deer Creek	2,532	2,602	2,653	2,690	2,717
Glenwood	4,951	10,924	13,121	13,930	14,227
Latigo Ranch	283	382	419	432	437
Summit Ridge	396	563	624	647	655
Bridlegate	1,058	1,361	1,528	1,619	1,669
Kendall West	6,424	10,602	12,895	14,153	14,844
Texas Country Water	294	294	294	294	294
Rockwall Ranch / KT Water	2,088	2,346	2,474	2,537	2,569
Total	109,903	166,765	223,799	263,171	289,033

Figure 3-2: Historical and Projected Retail Population in CLWSC Water Service Area



4.0 PROJECTED WATER DEMAND

4.1 RETAIL WATER DEMAND

CLWSC's retail demands include municipal demands for residential, commercial, and institutional customers, as well as some bulk haulers. Since the ratio of water customer types is expected to remain similar over time, a combined GPCD was utilized that is based on total water use and total population, as described in **Section 2.1**. Retail water demands were calculated for each water system using Equation (4).

$$\text{Water Use (ac-ft/year)} = (\text{Population} * 365 \text{ Days} * \text{GPCD}) / 325,851 \text{ gal/ac-ft} \quad (4)$$

4.2 WHOLESALE WATER DEMAND

CLWSC provides wholesale water to two customers. Since this water is delivered from the Canyon Lake Shores WTP, the wholesale amounts described below were added to the total demand for the Canyon Lake Shores system.

4.2.1 Windmill Ranch Subdivision/Kestral Airpark

CLWSC is contracted to supply up to 50 kgal/day to Windmill Ranch, and it is assumed this amount remains constant through the planning horizon. After converting this amount to ac-ft/year, it is then adjusted based on the average water loss percentage for Canyon Lake Shores of 22.3 percent for a total annual raw water demand of 72.1 ac-ft/year.

4.2.2 City of Blanco

The City of Blanco has a contract with GBRA for up to 600 ac-ft/year of treated water from CLWSC, but there are transmission capacity limitations. At the request of CLWSC, a demand of 57 ac-ft/year was assumed based on recent usage. After adjusting for losses, this equates to a raw water demand of 73.3 ac-ft/year.

4.3 TOTAL WATER DEMAND

The combined retail and wholesale water demand by system is presented in **Table 4-1** and **Table 4-2**. Figures showing demand projections for individual water systems are included in **Appendix B**.

Table 4-1: Lower Total Demand Projections (ac-ft/year)

System	2022	2023	2024	2025	2026	2027	2028	2029	2030	2040	2050	2060	2070
Canyon Lake Shores	4,678	4,905	5,161	5,578	6,015	6,471	6,879	7,315	7,706	10,878	12,821	14,028	14,790
Triple Peak	4,476	4,657	4,811	4,986	5,146	5,304	5,462	5,594	5,679	7,286	8,476	9,360	10,018
North Point	11	11	11	11	11	10	10	10	10	10	10	10	10
Rust Ranch	43	43	43	43	43	43	43	43	42	42	42	42	42
Deer Creek	208	209	209	209	210	210	210	210	210	214	217	220	222
Glenwood	362	409	480	551	687	801	893	984	1,059	1,542	1,718	1,782	1,805
Latigo Ranch	17	19	22	24	26	28	30	33	35	47	51	53	53
Summit Ridge	44	49	55	61	66	72	78	83	89	126	139	144	146
Bridlegate	65	71	76	81	87	92	97	102	108	137	154	163	167
Kendall West	475	505	554	614	677	741	807	868	923	1,206	1,360	1,445	1,491
Texas Country Water	100	100	100	100	100	100	100	99	99	99	99	99	99
Rockwall Ranch / KT Water	607	625	642	660	677	695	712	730	747	837	882	904	915
Total	11,086	11,602	12,163	12,918	13,744	14,567	15,321	16,072	16,708	22,424	25,970	28,249	29,759

Table 4-2: Higher Total Demand Projections (ac-ft/year)

System	2022	2023	2024	2025	2026	2027	2028	2029	2030	2040	2050	2060	2070
Canyon Lake Shores	4,678	4,905	5,187	5,632	6,094	6,577	7,011	7,474	7,881	12,714	17,765	20,851	22,752
Triple Peak	4,493	4,687	4,851	5,039	5,212	5,383	5,554	5,696	5,783	7,730	10,361	12,727	14,481
North Point	11	11	11	11	11	10	10	10	10	10	10	10	10
Rust Ranch	43	43	43	43	43	43	43	43	42	42	42	42	42
Deer Creek	208	209	209	209	210	210	210	210	210	214	217	220	222
Glenwood	362	409	480	551	687	801	893	984	1,059	2,329	2,792	2,962	3,024
Latigo Ranch	17	19	22	24	26	28	30	33	35	47	51	53	53
Summit Ridge	44	49	55	61	66	72	78	83	89	126	139	144	146
Bridlegate	65	71	76	81	87	92	97	102	108	137	154	163	167
Kendall West	475	508	563	630	699	769	841	903	961	1,577	1,913	2,098	2,199
Texas Country Water	100	100	100	100	100	100	100	99	99	99	99	99	99
Rockwall Ranch / KT Water	607	625	642	660	677	695	712	730	747	837	882	904	915
Total	11,103	11,634	12,239	13,039	13,911	14,781	15,579	16,368	17,024	25,863	34,426	40,272	44,111

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6.0 NEXT STEPS

The scope of work for this report calls for the development of growth and water demand projections. As a value-added service, this report additionally combines its demand projections with the current supply availability assumptions provided by CLWSC staff. Merging those two sources of data identifies a need for additional water by the year 2040 for the higher demand scenario and 2044 for the lower demand scenario, with significant needs arising in 2050 and beyond. This would change if the KT Water Resources Ltd. wellfield is not acquired or does not yield a firm supply similar to what is shown in this report. CLWSC should consider a detailed evaluation of the reliability of its current supplies, to better understand the timing of its future water needs.

Securing additional water supplies can take a decade or more of planning and design before the supply comes online. CLWSC should begin securing its immediate water needs, as well as begin evaluating water supply alternatives for the intermediate and long-term planning horizons. For a utility as geographically fragmented as CLWSC, this analysis of future water supply alternatives should be tailored and not a one-size-fits-all approach. Water conservation should be evaluated as part of that process. An Integrated Long Range Water Supply Plan is an effective way to communicate to both utility leadership and customers the vision of the utility.

In an ever-changing landscape, it is important to revisit water planning assumptions regularly, especially for an expanding utility in a growing region. Future water supply alternatives which seem unaffordable or not easily implementable today could be more appealing in the future. Macroeconomic factors could change the growth trajectory if labor market and/or materials commodities within the housing development industry become increasingly unstable.

APPENDIX A

TWDB Passive Water Savings Methodology

Projection Methodology – Draft Population and Municipal Water Demands

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2 Population

The population projection methodology takes place in two steps: first, projections at the county level and then projections at the city/utility level.

2.1.1 County Population Projections

Draft county population projections are based on Texas State Data Center (TSDC)/ Office of the State Demographer county-level population projections. Such projections are based on recent and projected demographic trends, including the birth rates, survival rates, and net migration rates of population groups defined by age, gender and race/ethnicity.

The TSDC develops county-level population projections from 2011 to 2050 under three migration scenarios:

- 1) no net migration (natural growth only),
- 2) net migration rates of 2000-2010 (“full-migration scenario”), and
- 3) 2000-2010 migration rates halved (“half-migration scenario”).

The State Data Center strongly recommends use of the half-migration scenario for long-term-planning. For each county, the draft projection is based on the half-migration scenario as the default, but alternatives (full-migration scenario or a composite of the scenarios) were chosen in select instances where a different scenario was more reflective of anticipated growth patterns.

While the TSDC’s projections extend to 2050, the 2017 State Water Plan will require projections to 2070. TWDB staff has extended the projections to 2060 and 2070 by using the trend of average annual growth rates of the 2011-2050 TSDC projections. In 60 counties, the TSDC-projected population show a decline sometime between 2011 and 2050. For these counties, staff held the county population at its highest point prior to the decline for the following reasons:

- 1) Small Impact - the difference between holding the populations of these 60 counties constant or projecting continued decline in 2050 is 21,987, or 0.05 percent of the state-wide population of over 41 million. The largest county-specific difference between constant population and declining population is 2,030, the smallest is 17, and the average county difference is 366;
- 2) Constant System Requirements - projected population decline is often a decline in the number of people per household rather than a reduction in the number of connections that a water system must serve. The water systems must continue to have the capability to serve the customer connections regardless of population.

2.1.2 Water User Group Population Projections

The regional and state water plans require population projections for individual Municipal Water User Groups.

Water User Group Criteria

Municipal water user groups in the regional planning process include:

- Cities with a 2010 population greater than 500;
- Select Census Designated Places, such as military bases and in counties with no incorporated cities;

- Utilities (areas outside the places listed above) providing more than 280 acre-feet of municipal water per year;
- Collections of utilities with a common water supplier or water supplies (Collective Reporting Units); and
- Remaining rural, unincorporated population summarized as “County-Other”

The criterion for including only cities with populations greater than 500 has been used throughout the regional planning process, beginning with the 2001 regional water plans and the 2002 state water plan. Smaller cities are included in the aggregated “County-Other” water use, but are not separately delineated because many such small cities may not have a public water system or may not be the owner of the system. Regional planning groups do have the option of combining smaller water systems/cities into a collective water user group when the systems share a similar source or provider and are anticipated to coordinate in meeting their future water needs. In addition, regions may request the inclusion of cities or systems below the threshold criteria as distinct water user groups. This can be accommodated in the online planning database.

2.1.2.1 Overlapping Boundaries

The previous section noted various criteria for water user groups. In some cases, the boundaries of qualifying water user groups may overlap. Examples and the method of population and water use allocation include:

- **City utility serving beyond city limits** - The service area boundary of a city-owned water utility may extend beyond the city boundaries; in such cases, the population and associated water use outside of the city limits are allocated not to the city but to the County-Other water user group.
- **Non-city utility serving city residents** – A non-city water utility may provide water directly to residents of a city that qualifies as a water user group; in such cases, the population and associated water use in the shared area are attributed to the city rather than the non-city utility in the regional water plan. Additional information regarding these shared populations and demands can be provided to the RWPGs and their technical consultants.

2.1.3 Projection Methodology

Projections for these individual water user groups are developed by allocating growth from the county projections down to the cities, utilities, and rural areas. The methods of allocating future populations from the county to the sub-county areas include:

- 1) Share of Growth - applying the water use group’s historical (2000-2010) share of the county’s growth to future growth;
- 2) Share of Population - applying the water user group’s historical (2000-2010) share of the county population to projected county population; and
- 3) Constant Population - applied to military bases, and other water user groups that had population decline between 2000 and 2010 in a county with overall population growth.

The sum of all water user group populations within a county is reconciled to the total county projection prior to the finalization of draft projections.

3 Municipal Water Demands:

Draft municipal water demand projections utilize the population projections and a per-person water use volume for each city, water utility and rural area (County-Other). The draft projections will include 2011 per-person water use values (Gallons Per Capita Daily or GPCD) as the initial 'dry-year' water use estimate. Staff then applies future anticipated reductions in water use due to natural replacement rates for adoption of water-efficient fixtures and appliances required by law.

For each municipal water user group, the 2011 GPCD, minus the incremental anticipated savings for each future decade due to water-efficient fixtures/appliances, is multiplied by the projected population to develop the municipal water demand projections.

3.1.1 2011 Gallons Per Capita Daily (GPCD)

The 2011 GPCD for each water user group is calculated by:

- Calculating the net water use of each water system surveyed annually by the TWDB (total intake volume minus sales to large industrial facilities and to other public water suppliers),
- Allocating all or portions of the system net use and applicable estimates of non-system municipal water use (private groundwater) to the planning water user groups (city boundaries or water utility service areas), and
- Dividing the total water use allocated to a water user group by 365 and by the 2011 population estimate.

For city water user groups, the 2011 population estimates from the U.S. Census Bureau were used. Historically, the July 1st population estimates from the Texas State Data Center (TSDC) have been used in GPCD calculation, however because the TSDC had not released their 2011 population estimates by January 2013, staff used the available Census Bureau estimates. For non-city utility water user groups (Districts, Water Supply Corporations, and Investor Owned Utilities), the population reported in the annual water use survey was utilized, with an alternative calculation based on the reported number of connections if necessary.

3.1.2 Minimum GPCD Values

When calculating the base (2011) or projected GPCD values, TWDB staff applied a minimum of 60 GPCD. The minimum value of 60 GPCD is based upon several recent studies: *Analysis of Water Use in New Single-Family Homes*¹ and an internal TWDB report, *The Grass Is Always Greener...Outdoor Residential Water Use In Texas*, analyzing the percentage of Texas residential water used outside of the home.² The single-family home study studied the average per-person water use for:

- 1) Pre-1995 Homes (62.18 GPCD),
- 2) Standard New Homes built after 2001 (44.15 GPCD),
- 3) Standard new homes retrofitted with high-water-efficient fixtures and appliances (39.0 GPCD), and
- 4) New WaterSense Homes built with the best available technology for water conservation (35.6 GPCD).

¹ *Analysis of Water Use in New Single Family Homes*, Prepared by William B. DeOreo of Aquacraft Water Engineering & Management for The Salt Lake City Corporation and the U.S. Environmental Protection Agency, 2011

² *The Grass Is Always Greener...Outdoor Residential Water Use In Texas*, Sam Marie Hermitte and Robert Mace, Technical Note 12-01, 2012

With the assumed replacement of fixtures and appliances over the next 50 years, the indoor per-person water use of the Standard New Home Retrofitted (39.0 GPCD) can be expected under existing standards. However, this is only indoor use and the single-family home study found that there was no statistical difference in outdoor water use between types of housing.

The TWDB study of outdoor water use in Texas estimated that on average 31 percent of total residential water use is outdoor water use. Utilizing this average outdoor water use percentage (31 percent) and the indoor water use (69 percent) of 39 GPCD for retrofitted new homes produces a total residential GPCD of 56.5 GPCD. While some municipal water user groups may remain primarily residential, any water use by the local government or commercial water users will contribute some to the water user groups average GPCD. For this reason, staff rounded the minimum GPCD to 60.

3.1.3 Water Efficiency Savings

Federal standards on plumbing fixtures, dish washers, and clothes washers sold in the U.S. have recently been upgraded with potential savings due to installation of more water efficient units comprising a small, although significant, portion of total water use. Table 1 summarizes the expected savings from adoption of the standards, which apply by Federal Law to the fixtures and appliances sold in the U.S. for each of the effective date years shown. Years shown in Table 1 for each type of fixture/washer are the legislated beginning of sales of those items, with the associated water savings levels mandated by law.

Details concerning each of the pertinent pieces of legislation may be found at the websites noted in Table 2.

Anticipated savings due to water-efficient fixtures/appliances include:

- 1) Toilets and Showerheads – savings of 16 GPCD;
- 2) High-Efficiency Toilets – savings of 1.63 GPCD;
- 3) Dishwashers – savings of 1.61 to 1.90 GPCD; and
- 4) Clothes Washers – 6.45 GPCD

Table 1. Summary of Water Efficiency Savings and Implementation Years

	1995	2007	2010	2013	2015	2018
<i>Item</i>						
Plumbing Fixtures, 1991 (toilets, showerheads)	<i>Combined savings: 16 GPCD</i>					
High-Efficiency Toilet, 2009			<i>Savings: 0.32 gal/flush or 1.63 GPCD</i>			
Dishwashers			<i>Standard: 6.5 gal/cycle Savings*: 7.5 gal/cycle or 1.83 GPCD</i>	<i>Standard: 5 gal/cycle Savings: 9 gal/cycle or 1.93 GPCD</i>		
Front Load Clothes Washers		<i>Standard: 9.5 gal/cycle Savings: 17.5 gal/cycle or 5.23 GPCD</i>			<i>Standard: 4.7 gal/cycle Savings: 22.3 gal/cycle or 6.67 GPCD</i>	
Top Load Clothes Washers		<i>Standard: 9.5 gal/cycle Savings: 17.5 gal/cycle or 5.23 GPCD</i>			<i>Standard: 8.4 gal/cycle Savings: 18.6 gal/cycle or 5.56 GPCD</i>	<i>Standard: 6.5 gal/cycle Savings: 20.5 gal/cycle or 6.13 GPCD</i>

*Savings for dishwashers and clothes washers are calculated versus historical average usage noted below:
Dishwashers: 14 gal/cycle, Clothes Washers: 27 gal/cycle (minor use of front load clothes washer previous to 2007). GPCD savings based on assumed 2.75 people per household, 215 dishwasher loads/yr, and 300 clothes washer loads/yr.

Table 2. Background Information on Federal Standards on Water/Energy Efficiency

Item	Effective Year	Website
Plumbing Fixtures	1995	http://www.gao.gov/new.items/rc00232.pdf
High-Efficiency Toilets	2010-2014	www.capitol.state.tx.us (search House Bill 2667, 81 st Legislature (Regular) 2009)
Dishwashers	2010	http://www1.eere.energy.gov/buildings/appliance_standards/residential/pdfs/74fr16040.pdf
Dishwashers	2013	http://www1.eere.energy.gov/buildings/appliance_standards/residential/dishwashers.html (see section on Energy Conservation Standards)
Clothes Washers	2007	http://www1.eere.energy.gov/buildings/appliance_standards/residential/pdfs/rcw_dfr_tsd_ch3.pdf (see section 3.7.2)
Clothes Washers	2015, 2018	http://www1.eere.energy.gov/buildings/appliance_standards/residential/clothes_washers.html (see section on Energy Conservation Standards)

3.1.4 Plumbing Fixtures Efficiency Savings, 1991 (“Plumbing Code Savings”)

The suggested water savings that accompanied the water demand projections represent an estimation of the amount of water (average per-person) that will be saved by the conversion to more water-efficient fixtures as described in the State Water-Efficient Plumbing Act passed in 1991. Those housing units built before the law came into effect will, over time, replace their old fixtures with the new water-efficient fixtures. TWDB is providing a suggested schedule at which the fixture replacements will take place, and the effect that the replacement will have on the city or utility’s average Gallons Per Capita Daily (GPCD).

3.1.4.1 Water Savings

From the a recent study of water conservation, it is estimated that the average savings of replacing higher water-use fixtures with more efficient fixtures mandated by state and federal laws would be 16 gallons per person, per day (10.5 gallons for toilets and 5.5 gallons for showerheads).

3.1.4.2 Replacement Schedule

The TWDB compiles population data rather than housing data, so in calculating the number of houses and the less-efficient fixtures, the Board staff used population as a proxy for the number of houses at the time the law took effect and the projection of future houses. The July 1995 population estimate is used as a benchmark to determine the potential average per-capita water savings of a city or utility. The 1995 population (as a proxy for housing and fixtures) is assumed to have less-efficient fixtures, which can be replaced, lowering their GPCD and the city’s or utility’s average GPCD. Any population growth after 1995 is expected to inhabit new housing that was built with the more efficient water fixtures. No additional water savings can be expected on the basis of fixture replacement for the post-1995 population. Fixture standards have not changes since the initial law was implemented.

The July 1995 population estimate was chosen as a starting point for adoption of the more efficient fixtures for several reasons. First, in both the state and federal laws affecting plumbing codes, retailers were allowed to continue selling the less-efficient fixtures that they had in stock. Second, in any areas, whether a city or a subdivision served by a utility, there are vacant housing units which will eventually be

occupied. Although there was no population in the house, there were less-efficient fixtures that will be used, and replaced, by residents eventually. Third, because we are using a proxy for the number of fixtures and the proxy (population estimate) can have varying degrees of accuracy, the July 1995 estimate was felt to be a good, conservative number.

The annual rate of fixture replacement was estimated to be 2 percent of the 1995 population, implying a 50 year adoption period for the 1995 population of housing. By the year 2045, 100 percent of the 1995 population would have the new water-efficient plumbing fixtures.

STEPS IN CALCULATING THE WATER SAVINGS DUE TO FIXTURE REPLACEMENT

- A) Establish the Base ‘Dry-Year’ and Associated GPCD. Due to the extreme drought experience in 2011, it was decided that the year 2011 GPCD would act as the default ‘dry-year’ water use figure for all municipal water user groups. However, the base year for the population projections was 2010, so the dry-year GPCD (2011) will be applied to the 2010 base year. All potential water saving calculations are therefore subtracted from this reference GPCD (year 2011, assigned as the year 2010 value) to calculate the expected GPCD for each water user group over time as adoption of the various water saving technologies (fixtures, clothes and dish washers) proceed.
- B) Calculate the estimated savings due to replacement between 1995 and 2010. Some fixture replacement took place between the passage of the law and the year 2010. The savings that result decrease the potential water savings available after the year 2010. Using the estimate that 2% of the 1995 population will replace the fixtures each year, 30% of the 1995 replaced their fixtures by the year 2010.

$$EQ. 1: PCS_{2010} = ((POP_{1995} * 30\%) + G_{1995-10}) / POP_{2010} * 16 \text{ GPCD}$$

Calculates the percentage of the 2010 population that has water-efficient fixtures.

The per-person amount saved per replaced toilet and showerhead.

GPCD2010	Per-person, per-day water use in 2010 (GPCD)
G1995-10	Population growth between 1995 and 2010
PCS2010	The city/utility’s average GPCD savings due to plumbing code changes (fixture replacement) between 1995 and 2010.
PCS2020	The city/utility’s average GPCD savings due to plumbing code changes (fixture replacement) between 2010 and 2020
POP1995	July 1995 population estimate
POP2010	Census 2010 population (cities) or Year 2010 population estimate (utilities)

Note: The per-person savings for each toilet and showerhead replaced is 16 gallons, however this change in GPCD applies for the portion of the 1995 population that replaced fixtures up to the point in time under consideration plus the new housing units in the water use group service area. The average GPCD savings for the entire city or utility will be considerably less than the maximum possible 16 GPCD due to non-replacement of plumbing fixtures by the majority of 1995 housing units. As noted in the calculation

above (EQ 1.), the estimated water savings are a combination of the accrued savings due to 30 percent of the 1995 level housing units, plus all of the growth from 1995 to the year 2010.

C) Calculate the remaining savings that will become available in each decade.

EQ. 2: PCS2020 =

$$\left[((POP1995 * 50\%) + (POP2020 - P1995)) / POP2020 \right] * 16 \text{ GPCD} \text{ minus } PCS2010$$

Calculates the percentage of the 2010 population that has water-efficient fixtures (30% of the 1995 pop plus the growth between 2010 and 1995, divided by the 2010 total population).

These water-use savings took place before the water-use base year (2000) and cannot be subtracted from the base

Similar water savings calculations (a point estimate for the year 2020 (EQ 2)) combine water savings from 50 percent of the 1995 housing population plus all of the population growth since 1995. Water savings estimated to be in place by 2010 (PCS2010), already implicit in the year 2010 estimated GPCD, are then subtracted from the potential savings to avoid double counting the potential savings.

Estimated GPCD for the year 2020 is then the baseline Dry Year GPCD (**GPCD2010**) less the water savings accumulated up to that point in time.

EQ 3: 2020 Per-Person Water Use (GPCD) =

2010 Per-Person Water Use (GPCD2000) MINUS Fixture Efficiency Savings (PCS2020)

Note: A formula similar to EQ. 3 would apply for each decade through 2070. By 2060 and 2070 all of the fixture replacements would have taken place and no additional water savings (and GPCD reductions) will occur.

3.1.5 High-Efficiency Toilet Savings, 2009

House Bill 2667 of the 81st Texas Legislature (2009) mandated that all toilets installed in residential and commercial buildings, with limited exemptions be High-Efficiency Toilet, using no more than 1.28 gallons per flush. The act also addressed water efficiency standards for showerheads, urinals, and faucet flow.

3.1.5.1 Water Savings

The 2009 law required that by January 2014, all toilets use no more than 1.28 gallons per flush. This is a 20% savings from the 1.6 gallons per flush standard set in the 1991 Texas law. Based upon an average frequency of per-person toilet use in households of 5.1 and a per-use savings of 0.32 gallons per use the estimated saving of adopting high-efficiency toilets is 1.63 GPCD. The act also required changes to standards for showerheads, from 2.75 gallons per minute to 2.5 gallons per minute, and standards for urinals and faucets, however at the regional water planning level such savings become too detailed and cumbersome to incorporate.

3.1.5.2 Replacement Schedule

To provide toilet manufacturers time to shift production to high-efficiency toilets, the 2009 law allowed a phasing in period by the percent of models offered for sale meeting the 1.28 gallons per flush standard:

- January 1, 2010 – 50% of the models offered for sale
- January 1, 2011 – 67% of the models offered for sale
- January 1, 2012 – 75% of the models offered for sale
- January 1, 2013 – 85% of the models offered for sale
- January 1, 2014 – 100% of the models offered for sale

Similar to the replacement of water-efficient fixtures required by the 1991 law, the replacement of pre-high-efficiency toilet was assumed to be 2 percent per year, with adjustments for the 2010-2014 time period as the high-efficiency toilets are being phased in.

3.1.6 Dishwasher Savings Efficiency Savings

3.1.6.1 Water Savings

The baseline water use per load of dishwashers prior to mandatory efficiency standards was 14 gallons per load. Beginning in 2010, dishwashers were required to use no more than 6.5 gallons per cycle. By 2013 the maximum water use is set at 5 gallons per cycle for all dishwashers produced or sold in the country. Thus, the savings per load for the 2010 machine standards is 7.5 gallons per load (14 gallons – 6.5 gallons) and 9 gallons for the 2013 standards (14 gallons – 5 gallons).

The water efficiency saving for the 2010 – 2020 period is a weighted average of the 2010 and 2013 standards (3 years at 7.5 gal/load plus 7 years at 9 gal/load): 8.55 gallons per load. Water savings after 2020 is the full implementation of the 2013 standards of 5 gallons per load, or a savings of 9 gallons per load.

Table 3. Use and installation assumptions

Metric	Value	Source
People/ household	2.75	Texas State Data Center
Loads/household/yr	215	DOE/EPA estimate
Percentage of new construction installing a new Dishwasher	96.7%	DOE documentation on year 2012 dishwasher standards

Per-person, per day water use saving of the installation of new dishwashers:

Water Savings (2010 to 2020)

$$\begin{aligned} &= (8.55 \text{ gal/load} * 215 \text{ loads/yr}) / (365 \text{ days/year} * 2.75 \text{ people per household}) \\ &= 1.83 \text{ GPCD max savings for each new dishwasher installed.} \end{aligned}$$

Water Savings (2020 to 2070)

$$\begin{aligned} &= (9 \text{ gal/load} * 215 \text{ loads/yr}) / (365 \text{ days/yr} * 2.75 \text{ people/household}) \\ &= 1.93 \text{ GPCD max savings for each new dishwasher installed} \end{aligned}$$

3.1.6.2 Replacement Schedule and Baseline Adoption Values

A ten year useful life was assumed for dishwashers, with the baseline for dishwashers statewide estimated at 78 percent of existing households for 2010. The latter value is based on metropolitan statistics from the American Housing Survey (<http://www.census.gov/housing/ahs/data/metro.html>). Therefore, 78 percent of the 2010 population for each water use group was assumed to be the starting point for new, more water efficient dishwasher installation. The ten year useful life implied that ten percent of the 2010 population would install the more water efficient dishwashers each year. It is assumed that all pre-2010 dishwashers have the 14 gal/load water use level, so all benefits of the new standard(s) accrue beginning in 2010, and the updated WUG-specific GPCD values do not have to be adjusted for previous new technology adoption.

3.1.7 Clothes Washer Efficiency Savings

3.1.7.1 Water Savings

The first nationwide standards for residential clothes washers took effect in 2007, requiring both top and front-loading machines to use a maximum of 9.5 gallons per load, compared to a possible use of 27 gallons in pre-efficiency-standard machines. Future efficiency standards will require a maximum usage of 8.4 gallons per load in top-loading machines and 4.7 gallons in front-loading machines in the year 2015. In 2018, the maximum usage for top-loading machines will be reduced further to 6.5 gallons.

Table 4. Parameters for Clothes Washer Savings Calculations

Metric	Value	Source
People Per Household	2.75	Texas State Data Center, 2010 Census
Loads/household/yr	300	DOE/EPA estimate
Proportion of TX households with clothes washers in 2010	75%	American Housing Survey, Metro Stats for 4 major cities in Tx
Percentage of new construction installing a new Clothes Washer	91%	DOE documentation on year 2012 Clothes washer standards
Proportion Top-Loads vs Front-Loads	40% vs 60%	DOE documentation on year 2012 Clothes washer standards
Lifespan of Clothes Washing Machines	Top Load – 14 years, Front Load – 11 years, “Composite” – 12 years	www.bankrate.com/brm/news/pf/20050810c1.asp

Potential Max savings for

- Both Top Loading and Front Loading Machines (27 gallon -9.5 gallon) = 17.5 gallon for year 2007 standard
- Top Loading Machines (27 gallon -8.4 gallon) = 18.6 gallon /cycle for year 2015 standard
- Top Loading Machines (27 gallon -6.5 gallon) = 20.5 gallon /cycle for year 2018 standard
- Front Loading Machines (27 gallon -4.7 gallon) = 22.3 gallon /cycle for year 2015 standard

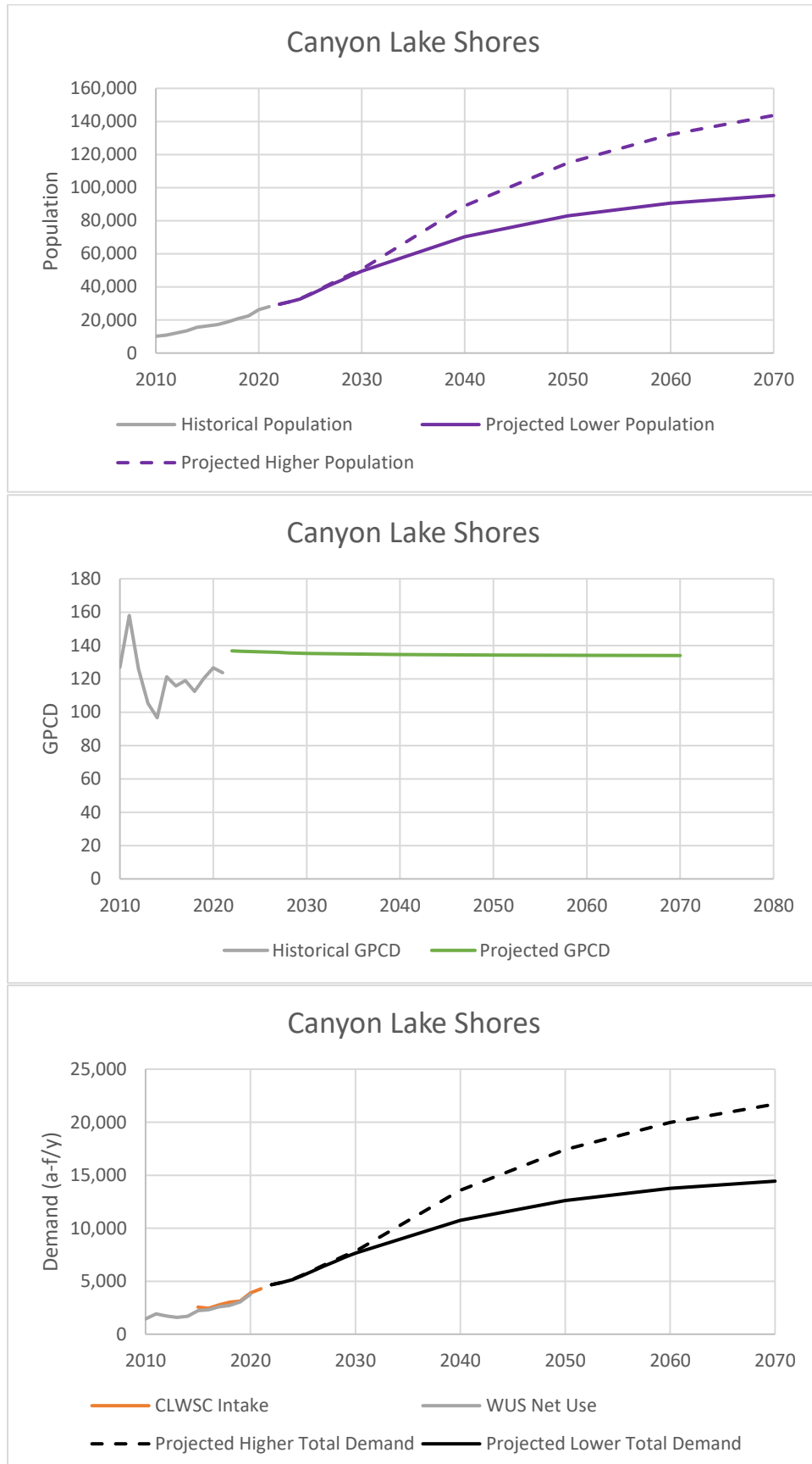
3.1.7.2 Replacement Schedule

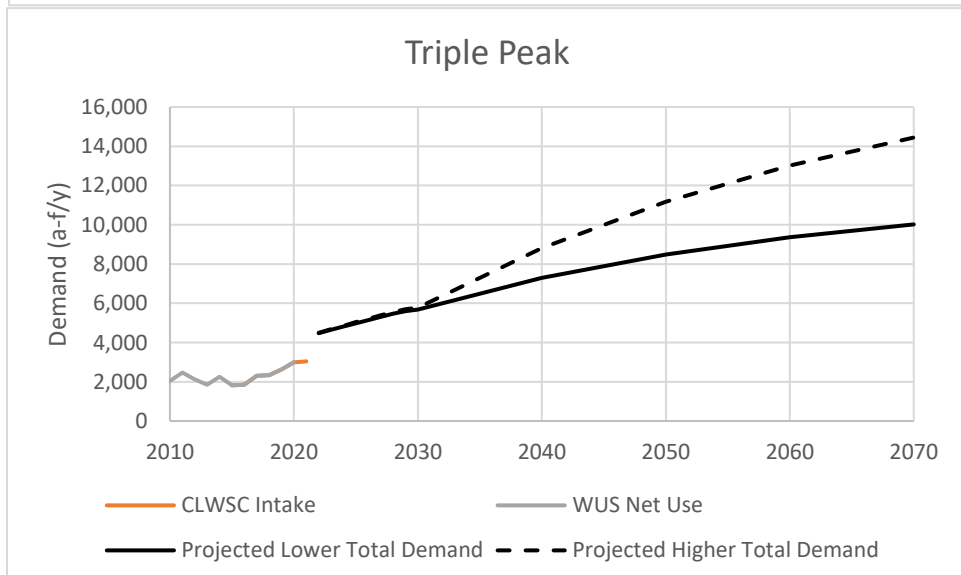
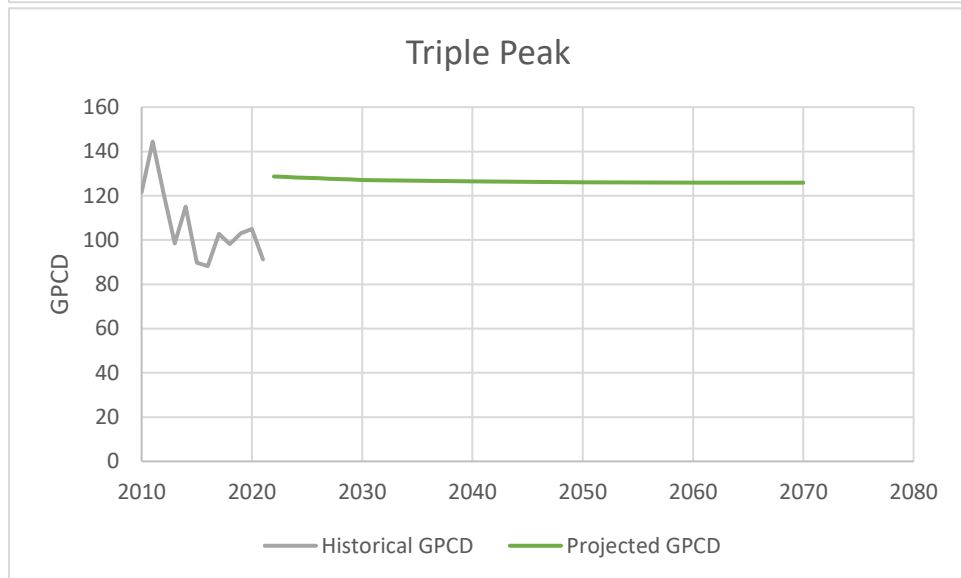
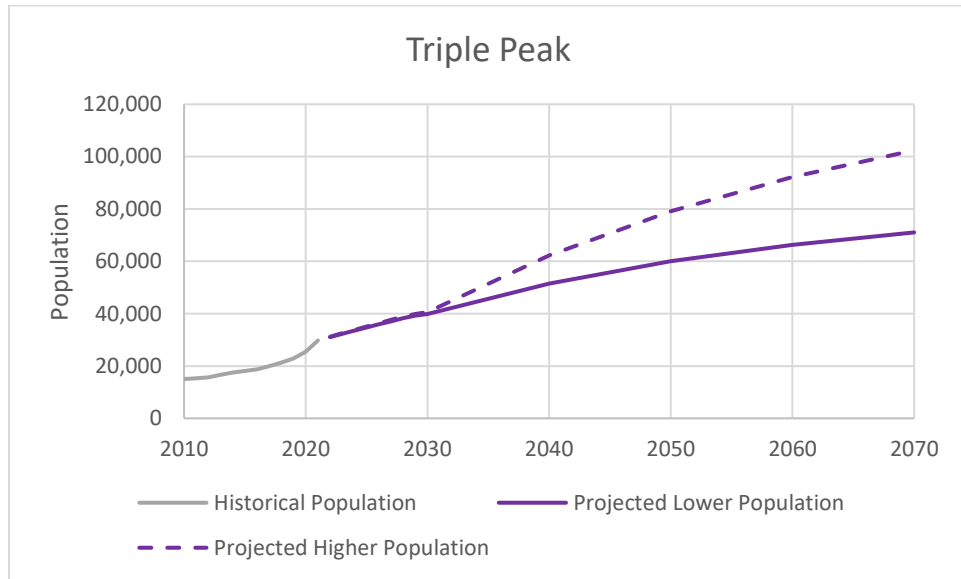
A twelve year replacement schedule is assumed for the clothes washers. New clothes washer purchases/replacements assume that forty percent of the replacements are top-loading machines and 60

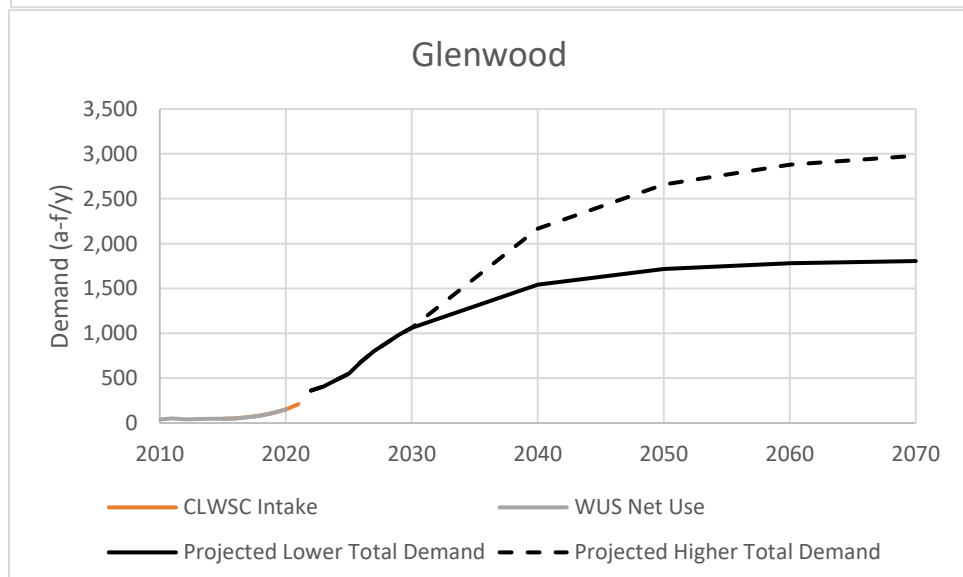
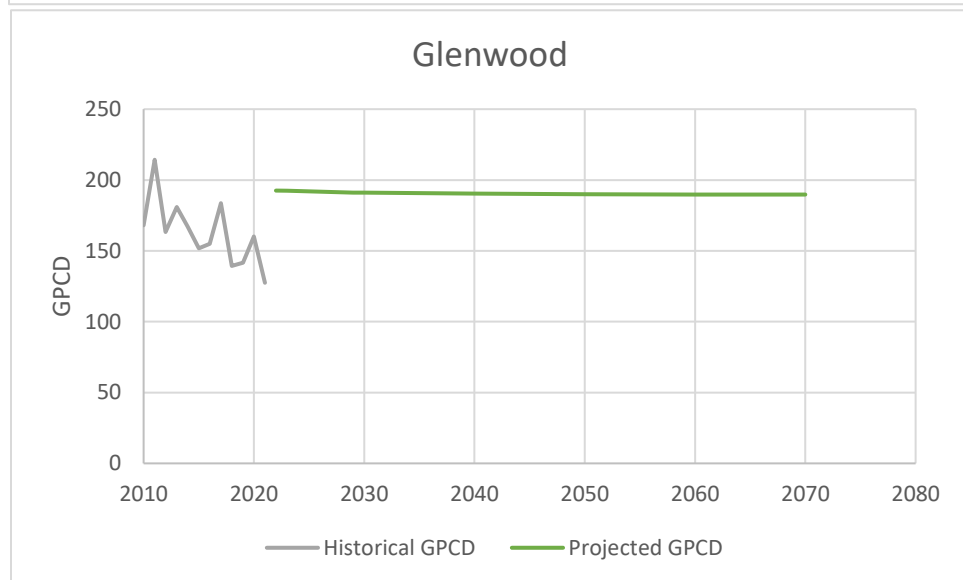
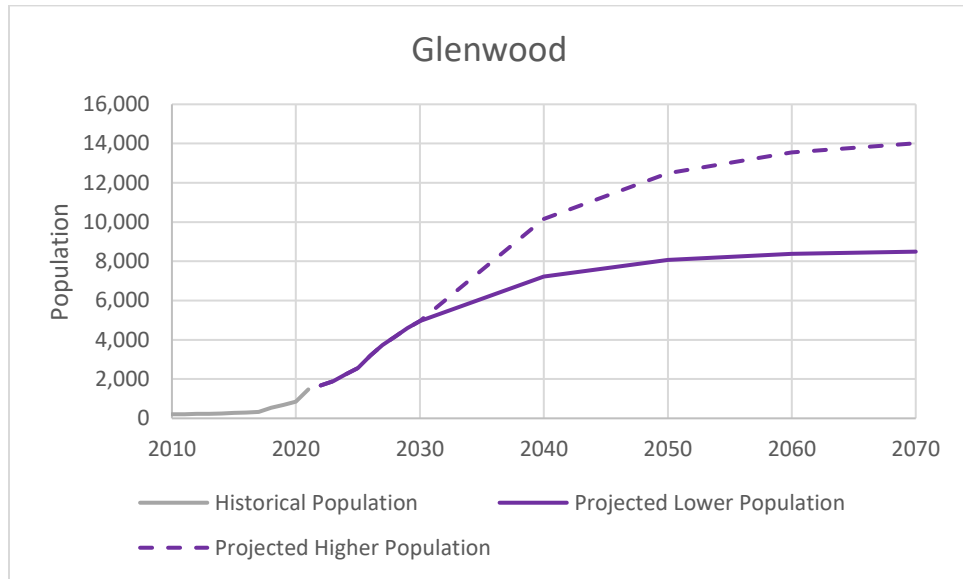
percent are frontloading. A composite machine (i.e., part top-loader and part front-loader) is assumed to ease the water savings calculation process, and a weighted average savings calculation, based upon the respective potential savings of the two types of machines, is performed. The American Housing Survey of 2010 for four major cities in Texas estimated that 75 percent of households have clothes washers. This percentage was applied as a statewide average. In addition, 2012 U.S. Department of Energy studies estimate that 96.7 percent of new residential construction will have clothes washers. These two parameters are used to determine the number of clothes washers eligible for replacement, or will be installed in new constructions as the estimates of potential GPCD savings are calculated for each decade.

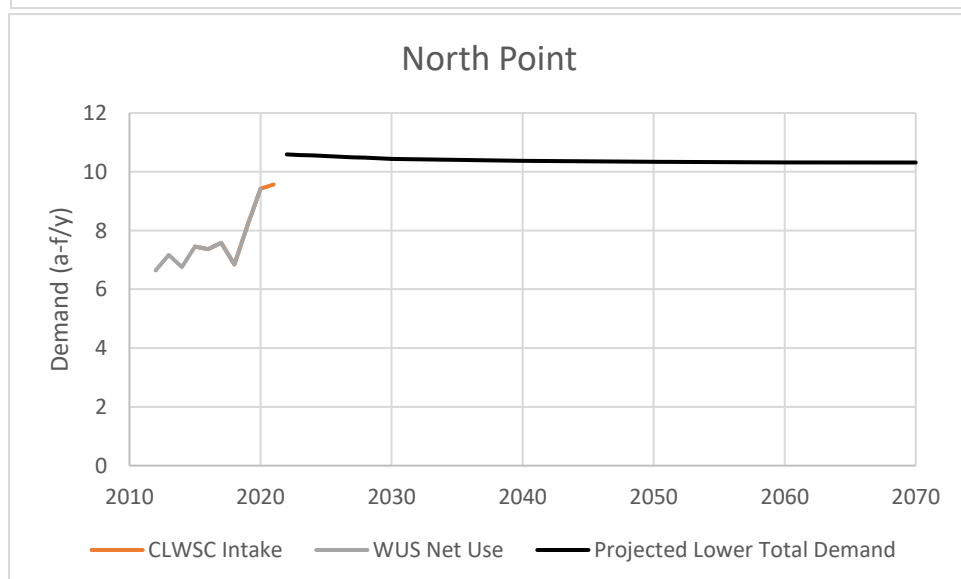
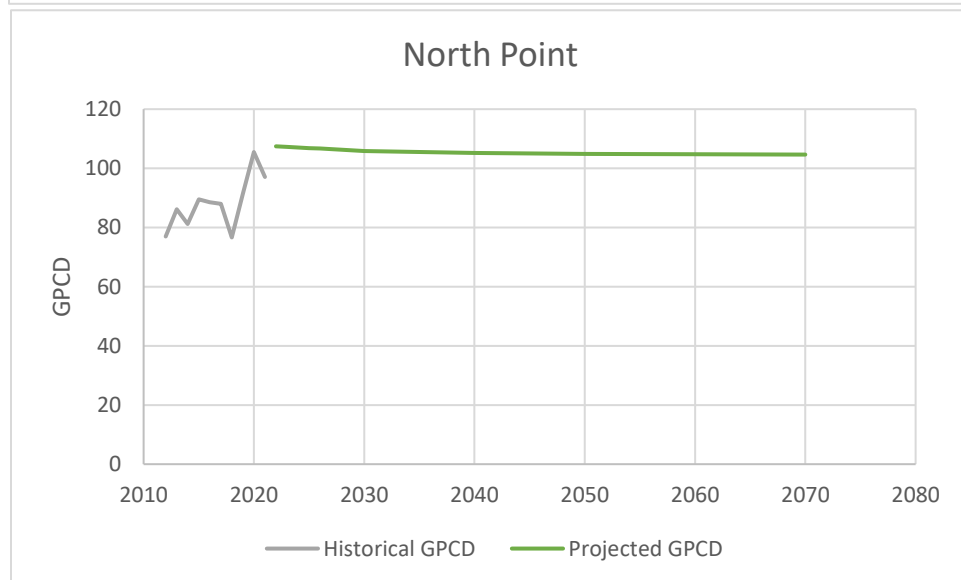
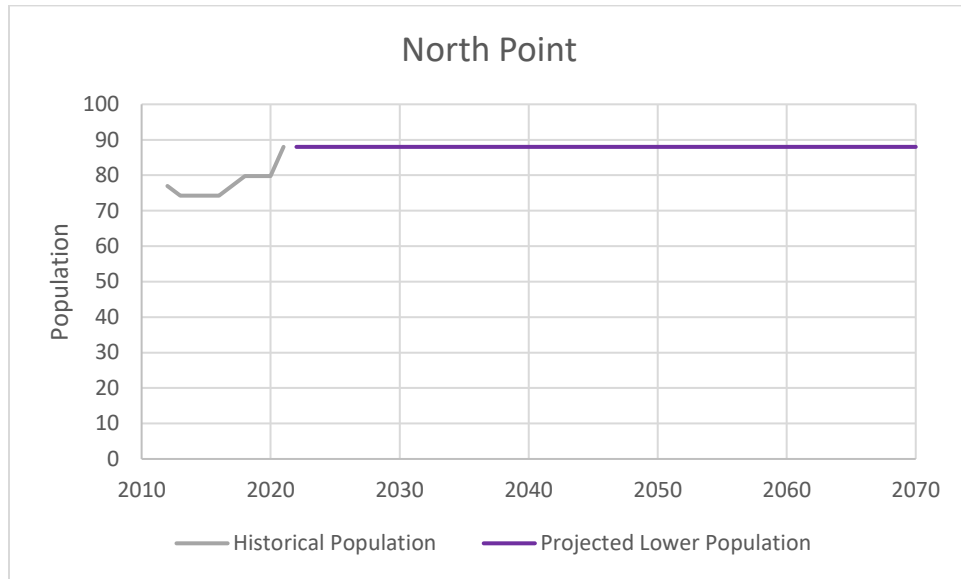
APPENDIX B

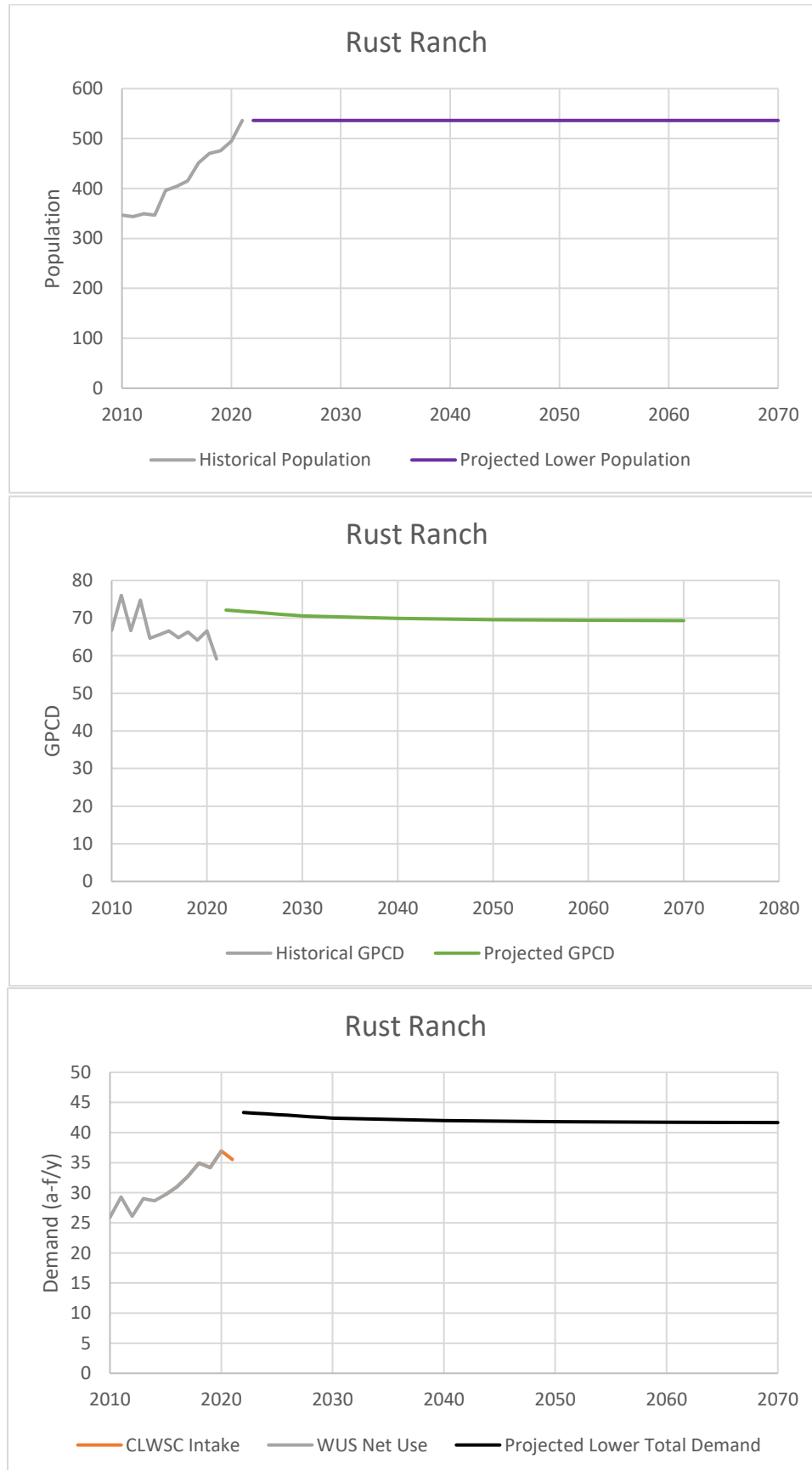
GPCD, Population, and Water Demand Plots by System

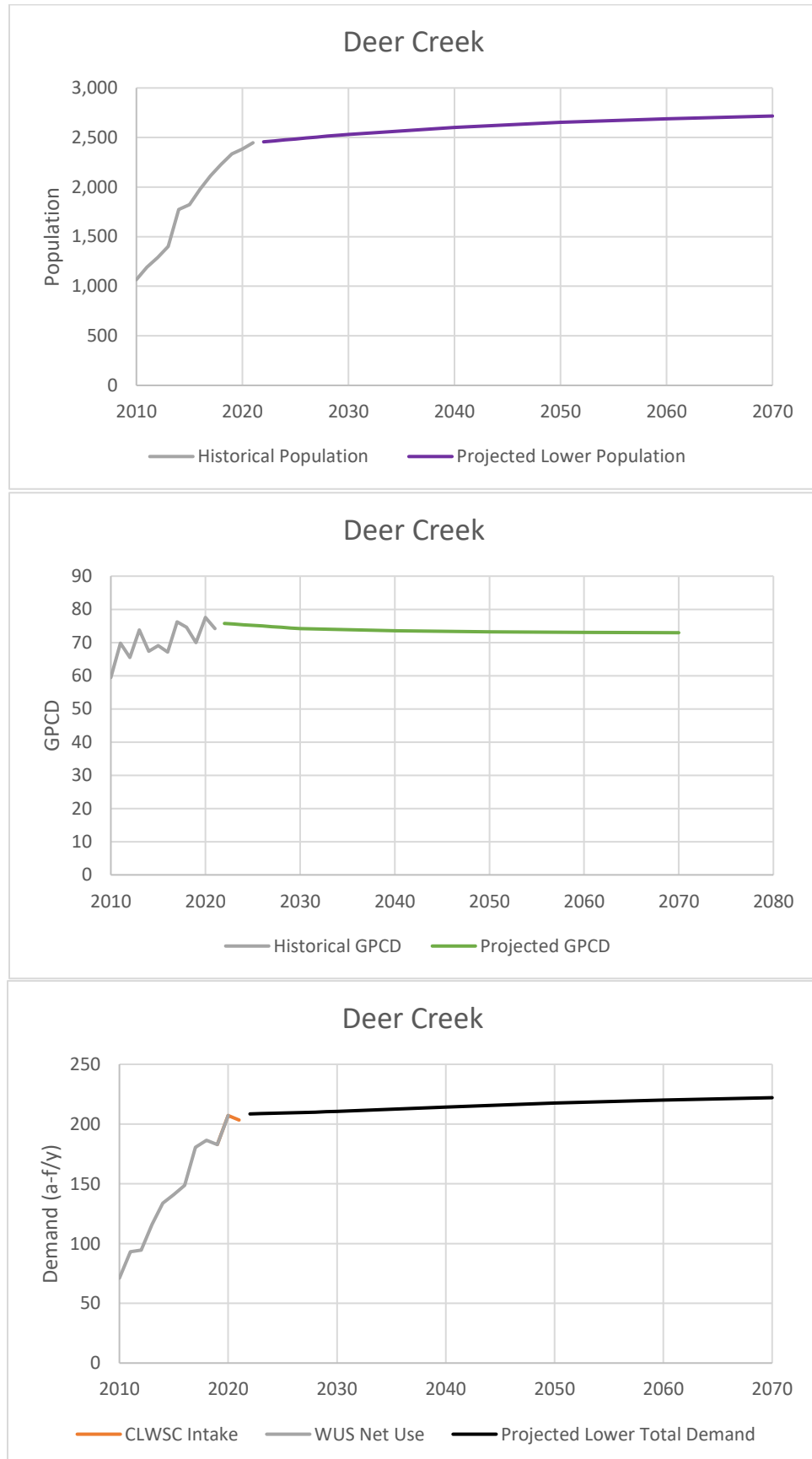


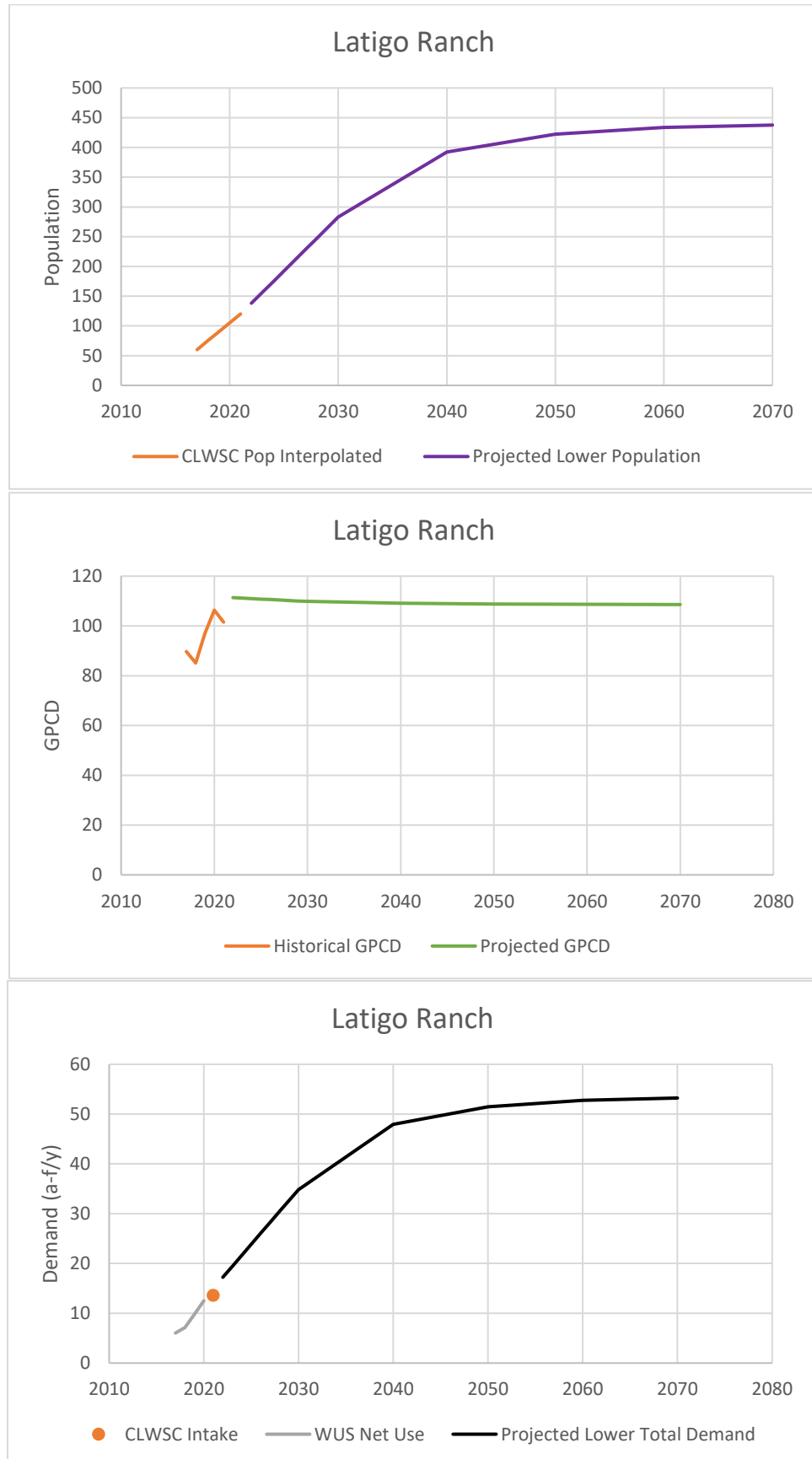


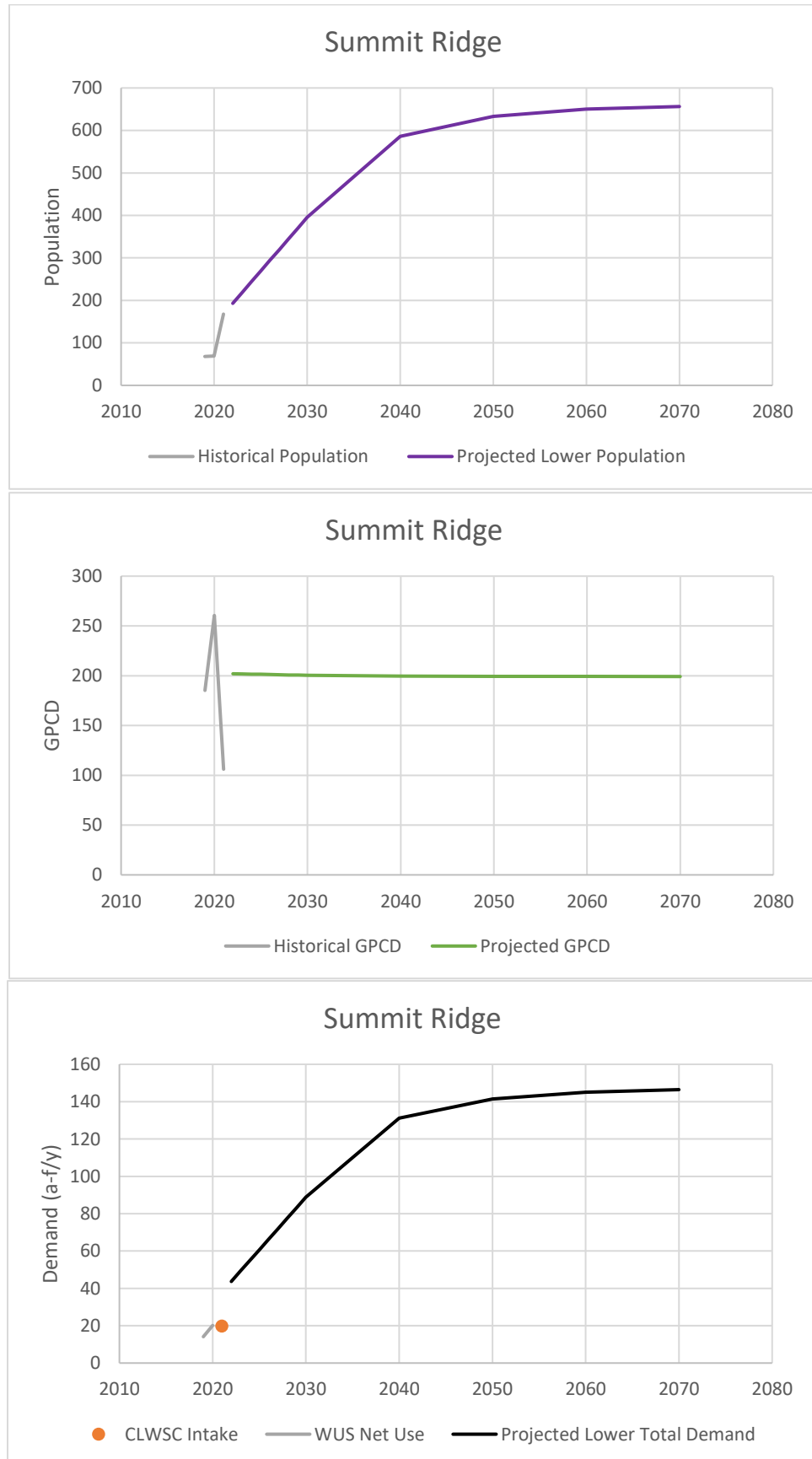




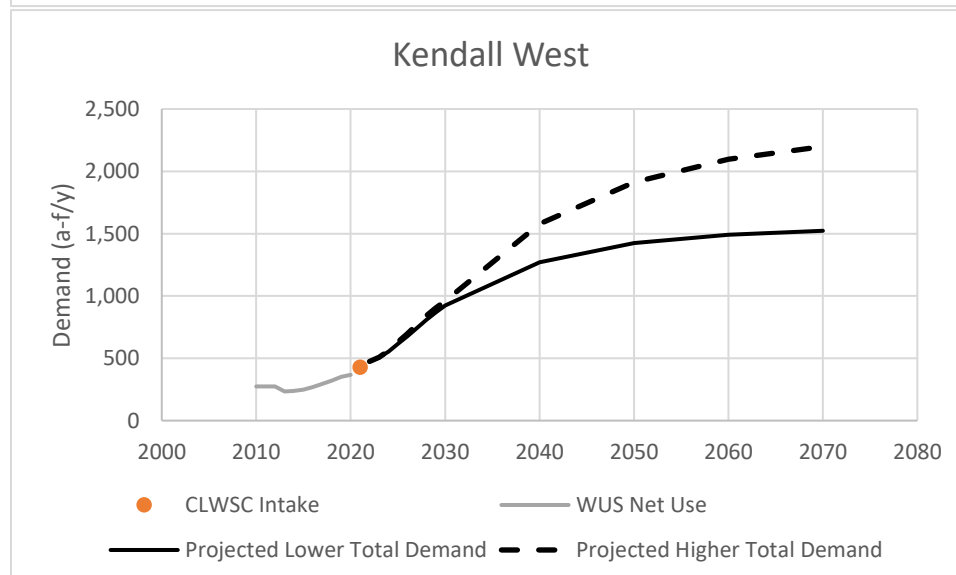
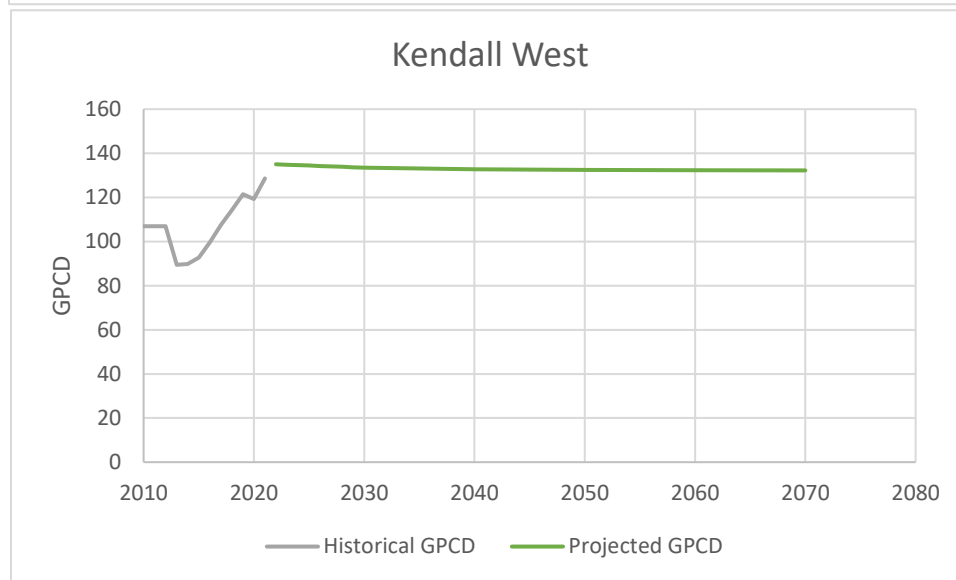
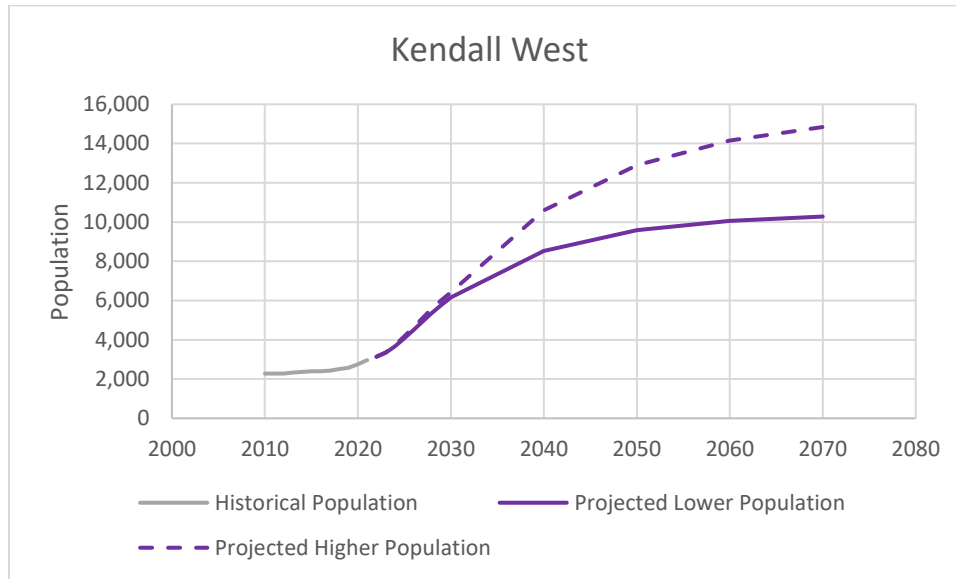


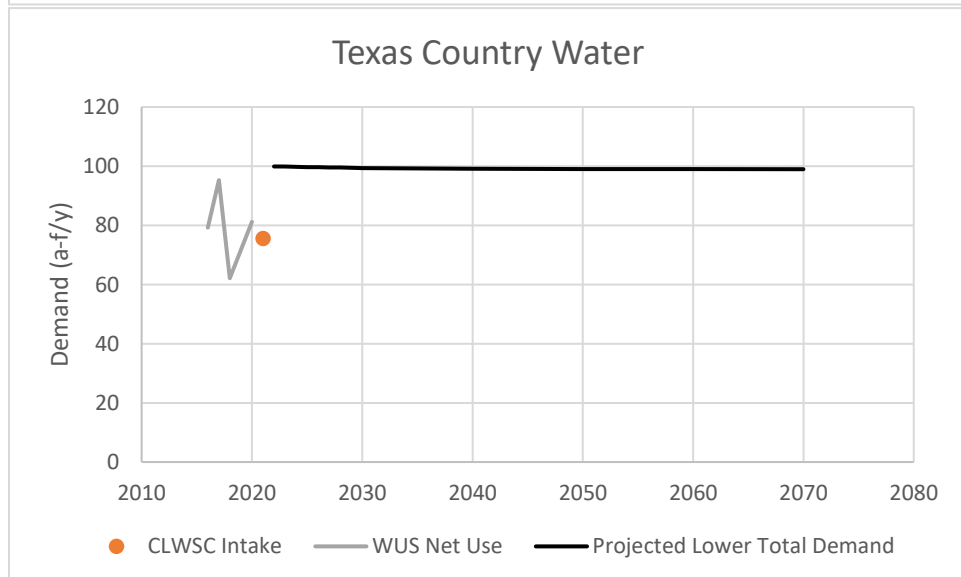
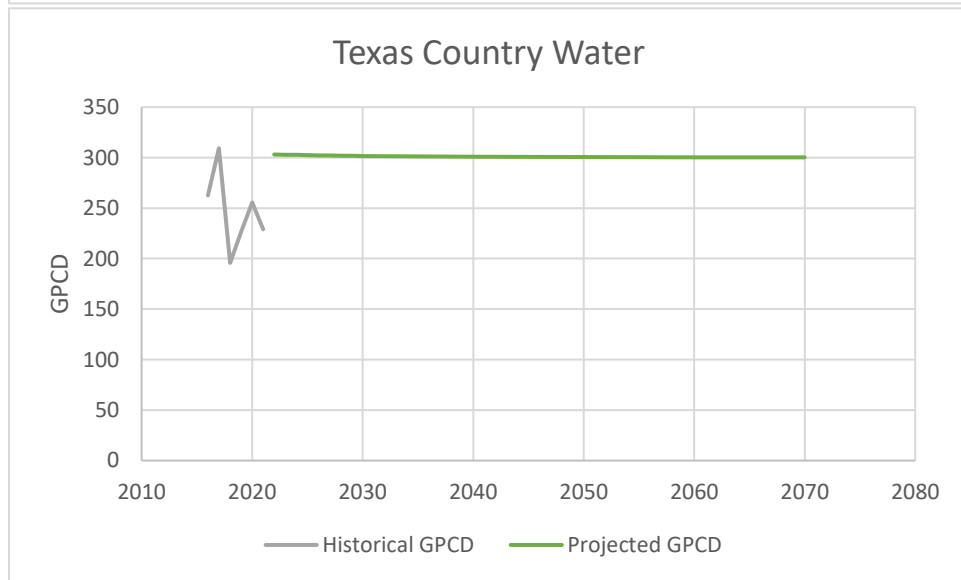
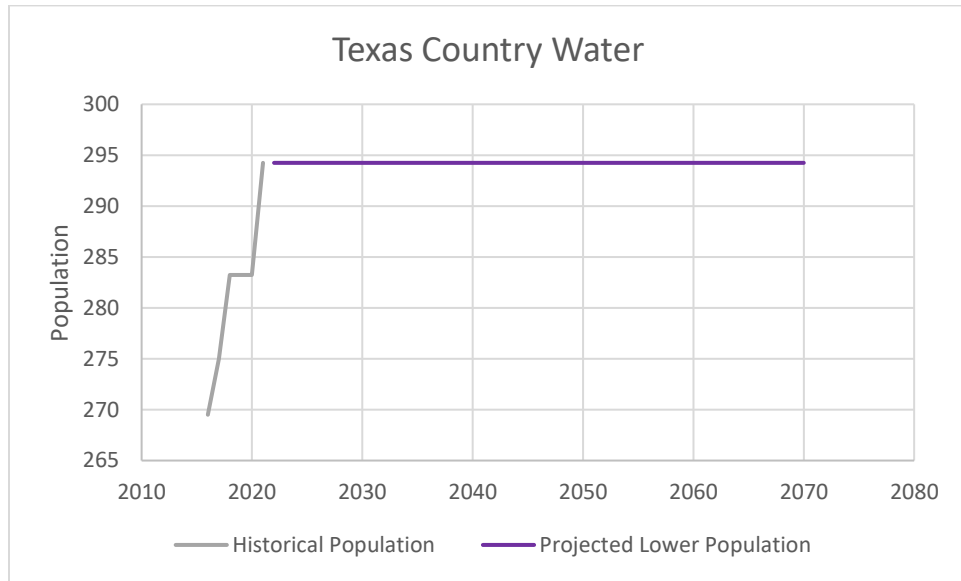


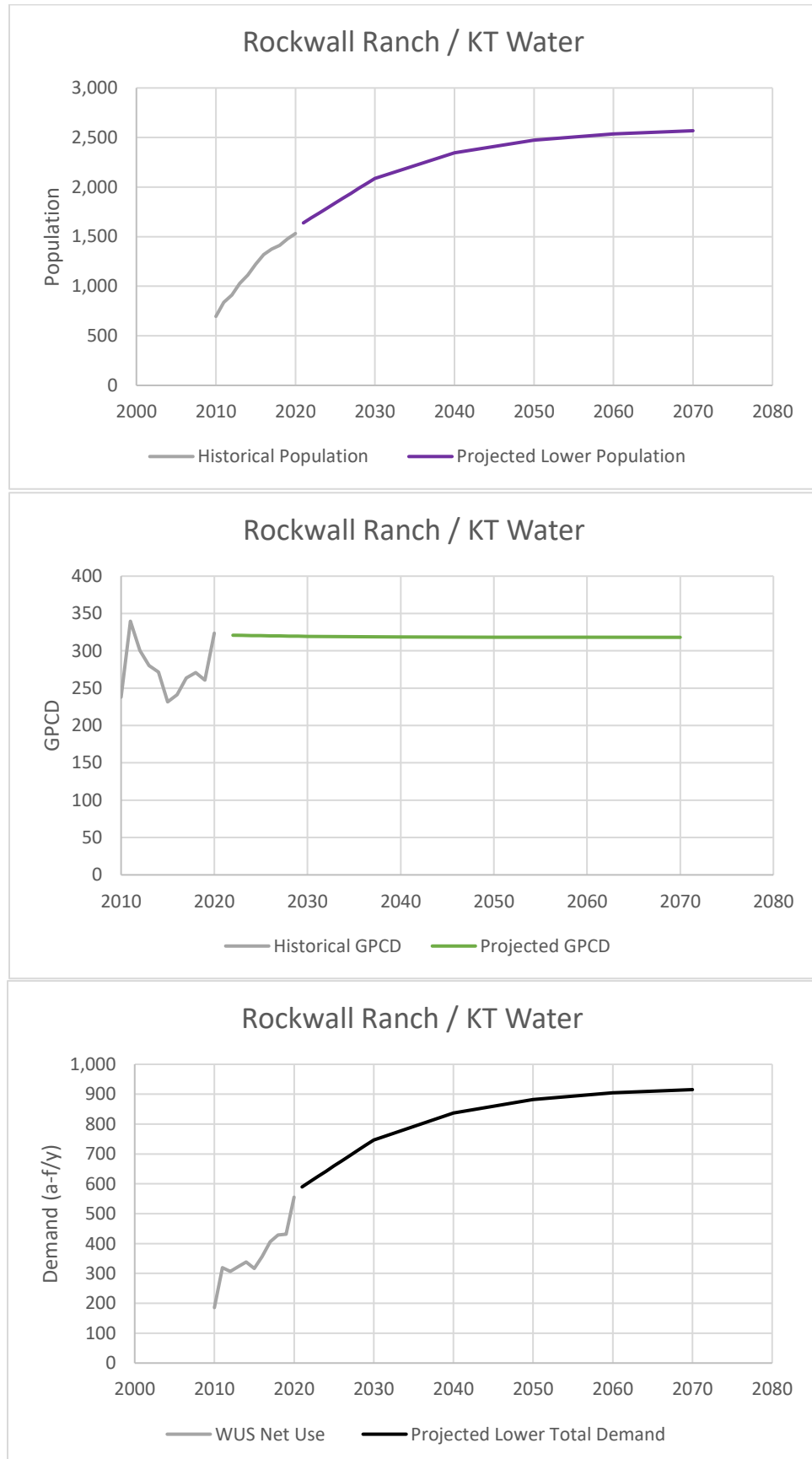












APPENDIX C

Near Term Population Projection Methodology Details

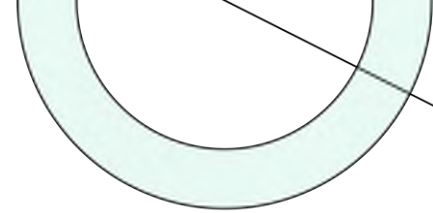


Canyon Lake Water Service Company Growth Projections

Freese & Nichols, Inc.

Housing Unit & Population Projections

September 2022



Background/Objectives, Key Contacts & Limiting Conditions

BACKGROUND & OBJECTIVES

As we understand it, Client is assisting the Canyon Lake Water Service Company with retail area growth water demand projections. As part of that process, Client is seeking housing unit and population forecast growth figures through 2030 for select areas in Comal and Kendall Counties. As detailed in this methodology overview, our forecast figures will be based upon several sources, including Zonda’s proprietary quarterly housing survey, Census Bureau data, and third-party data demographic and housing market data sources.

Note: This report was completed following the global COVID-19 pandemic, during an aggressive Fed tightening schedule. The recommendations contained herein reflect the most recent data available but are subject to change as the market evolves.

LIMITING CONDITIONS

Client is responsible for representations about the development plans, marketing expectations and for disclosure of any significant information that might affect the ultimate realization of the projected results. There will usually be differences between projected and actual results because events and circumstances frequently do not occur as expected, and the difference may be material. We have no responsibility to update our report for events and circumstances occurring after the date of our report. Payment of any and all of our fees and expenses is not in any way contingent upon any factor other than our providing services related to this report.

KEY CONTACTS

The following key team members participated on this analysis:

Tim Sullivan, Senior Managing Principal, oversees our Advisory practice. With over 38 years of experience, Mr. Sullivan is an expert in residential and mixed-use feasibility studies, strategic planning and product development, and regularly conducts market analyses around the United States and internationally.

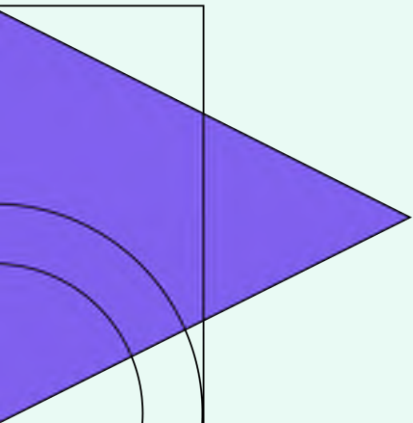
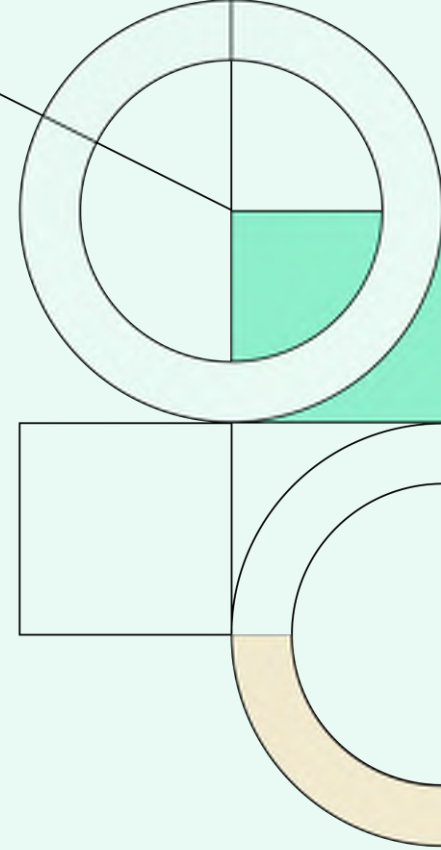
Bryan Glasshagel, Senior Vice President, managed the engagement on a day-to-day basis. Mr. Glasshagel has over 21 years of experience in the real estate and banking industries. He regularly directs the analysis of residential and mixed-use communities in Houston and around Texas.

Kara Weinstein, Manager, Advisory. Kara Weinstein has worked in the Austin, Texas real estate industry for over 15 years, serving in real estate law and development administration for production builders and developers, as a realtor, and as Community Director for Whisper Valley, a net-zero energy master planned community in Austin, Texas.

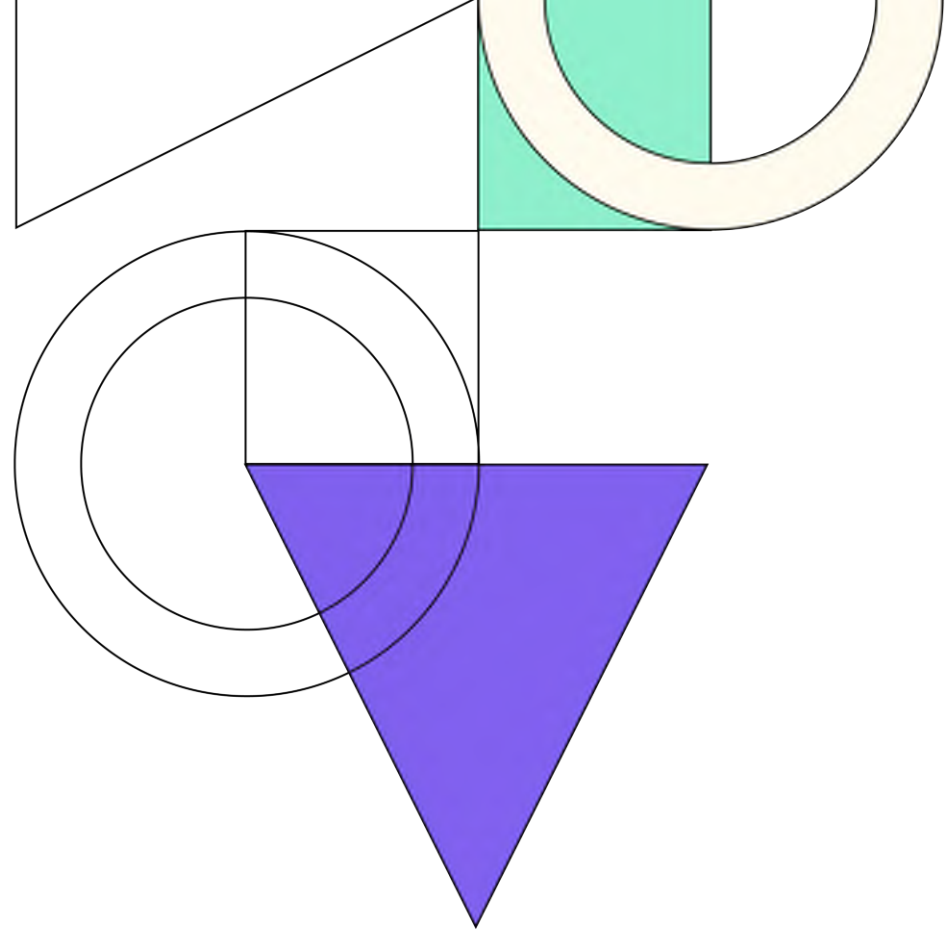
Additional support was provided as needed.

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Company Background



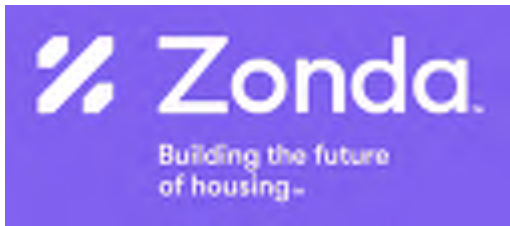
Zonda Overview

Company Background

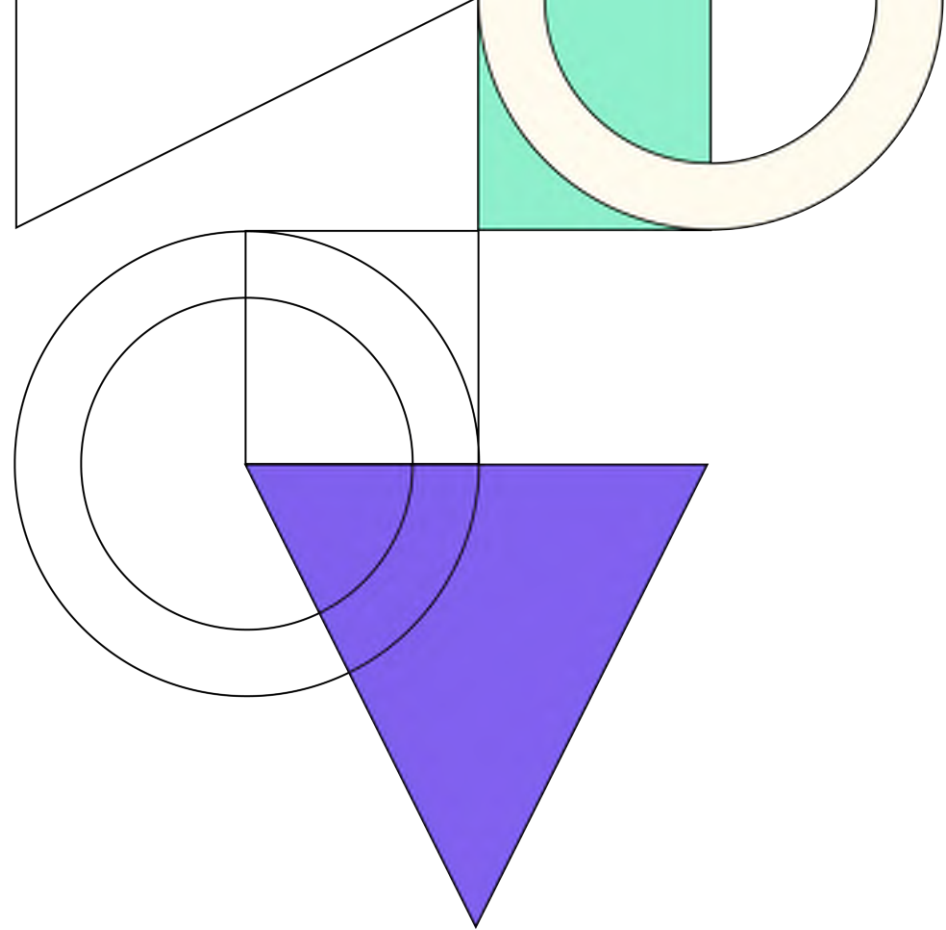
Zonda is the leading national housing data intelligence firm in the United States. We work with audiences across the housing industry to streamline access to critical information and drive new opportunities. We exist to inform, advise, and connect the next generation of housing industry experts, leveraging the information, insights, and people that move the industry forward.

Local and national teams with deep industry knowledge. Our national data and advisory team includes 50 technologists, 60 advisors, and 500 researchers. Our team is focused on delivering the housing industry's most comprehensive platforms covering over 275 housing and economic metrics. Our advisory team is a trusted advisor to clients, providing market feasibility and customized strategic research for a variety of land uses.

Acquired with Meyers Research to form Zonda in 2018, Metrostudy was founded in Houston and has been a leading provider of housing market data in Texas for over 45 years. While Metrostudy expanded to cover most of the nation's major metropolitan areas with its proprietary quarterly housing survey, the company's roots are in Texas markets. Zonda is the leading provider of housing market data in the San Antonio MSA and is recognized for its consulting expertise on development, marketing, and economic issues. Zonda provides feasibility studies and strategic consulting services on residential and commercial real estate projects across the market. Clients include builders, developers, lenders, equity partners, municipalities, and other entities.

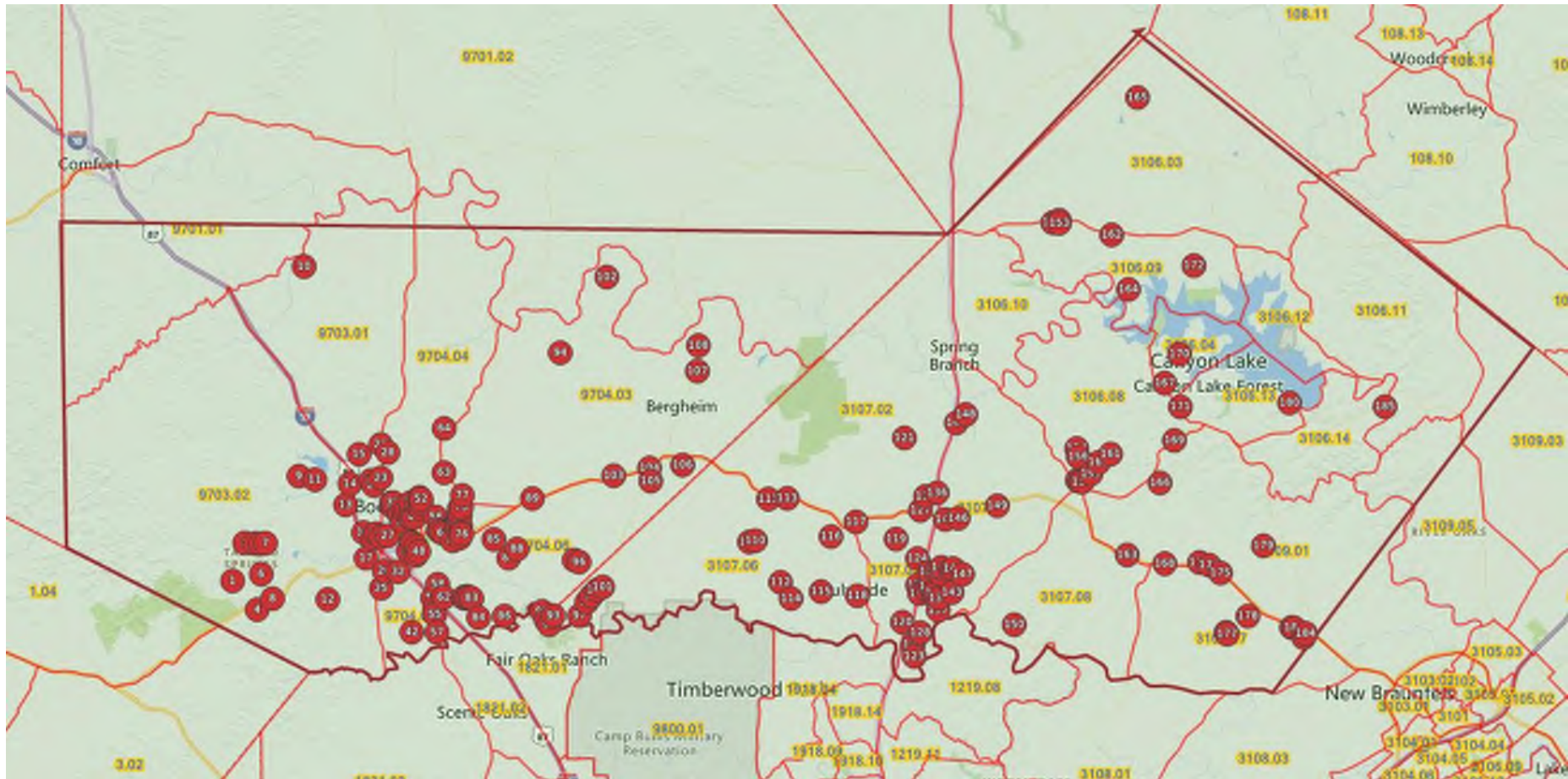


Assessment Area Overview



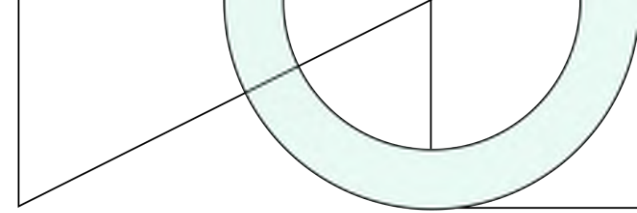
Assessment Area Overview

The assessment area includes locations north of Cibolo Creek in both Comal and Kendall counties. Zonda tracks 185 built-out, active, and future for sale residential subdivisions in the assessment area shown below. These subdivisions are spread across 20 Census Tracts (overall assessment area includes portions of 26 Census Tracts – not all Census Tracts have subdivisions tracked by Zonda).



Residential Project Summary – Water CCN & Public Water System

Assessment Area Overview



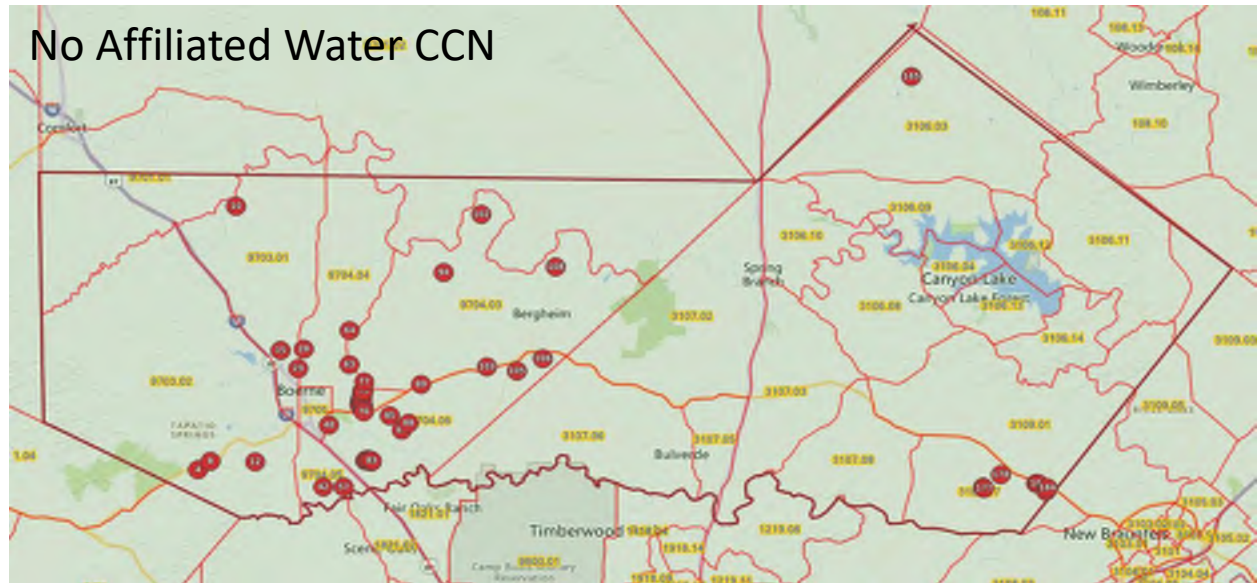
In terms of total future supply in the Zonda database, 63% is located within the SJWTX water CCN. In addition to subdivisions included in our database, Zonda projected an additional 6,325 lots and apartments could be added to the SJWTX water utility. While included in our growth projections, these additional lots and apartment units are not included in the table below.

Water CCN / Public Water System	Subdivisions	New Home Starts	New Home Closings	Total Lots & Homes	Occupied Homes	Model Homes	Finished Vacant Homes	Homes Under Construction	Vacant Developed Lots	Future Lots	Total Future Supply*
AQUA TEXAS INC	2	0	0	194	194	0	0	0	0	0	0
KENDALL POINTE	1	0	0	108	108	0	0	0	0	0	0
STONEGATE WATER SYSTEM	1	0	0	86	86	0	0	0	0	0	0
CITY OF BOERNE	63	336	333	10,871	3,981	11	19	189	473	6,198	6,890
CITY OF BOERNE	63	336	333	10,871	3,981	11	19	189	473	6,198	6,890
CITY OF FAIR OAKS RANCH	11	45	60	2,009	962	1	0	31	9	1,006	1,047
FAIR OAKS RANCH UTILITIES	11	45	60	2,009	962	1	0	31	9	1,006	1,047
DILLON WATER RESOURCES	1	0	0	34	34	0	0	0	0	0	0
BERRY OAKS WATER COMPANY	1	0	0	34	34	0	0	0	0	0	0
GUADALUPE BLANCO RIVER AUTHORITY	16	161	106	4,567	2,131	2	4	114	262	2,054	2,436
GBRA CORDILLERA RANCH	5	57	28	3,082	1,447	1	0	56	211	1,367	1,635
GBRA JOHNSON RANCH SUBDIVISION	11	104	78	1,485	684	1	4	58	51	687	801
MONARCH UTILITIES I LP	3	13	12	624	576	0	0	7	28	13	48
RIM ROCK RANCH	1	9	8	384	359	0	0	4	11	10	25
WINDMILL RANCH SUBDIVISION	2	4	4	240	217	0	0	3	17	3	23
NEW BRAUNFELS UTILITIES	2	0	0	382	382	0	0	0	0	0	0
NEW BRAUNFELS UTILITIES	2	0	0	382	382	0	0	0	0	0	0
SAN ANTONIO WATER SYSTEM	1	0	0	256	0	0	0	0	0	256	256
SAN ANTONIO WATER SYSTEM	1	0	0	256	0	0	0	0	0	256	256
SJWTX INC	86	1,942	1,406	27,115	9,540	44	52	1,375	1,467	14,637	17,575
CLWSC CANYON LAKE SHORES	30	920	690	13,506	4,275	16	22	653	614	7,926	9,231
GBRA LOMAS WATER CO COMAL TRACE	1	2	4	267	260	0	0	2	5	0	7
KENDALL WEST UTILITY	25	81	57	2,521	1,290	4	3	64	158	1,002	1,231
MIRALOMAS MUD	1	19	21	1,153	82	0	1	16	77	977	1,071
SJWTX GLENWOOD SUBDIVISION	5	147	82	2,892	386	5	4	107	203	2,187	2,506
SJWTX TRIPLE PEAK PLANT	24	773	552	6,776	3,247	19	22	533	410	2,545	3,529
Totals:	185	2,497	1,917	46,052	17,800	58	75	1,716	2,239	24,164	28,252

Residential Project Summary – No Affiliated Water CCN

Assessment Area Overview

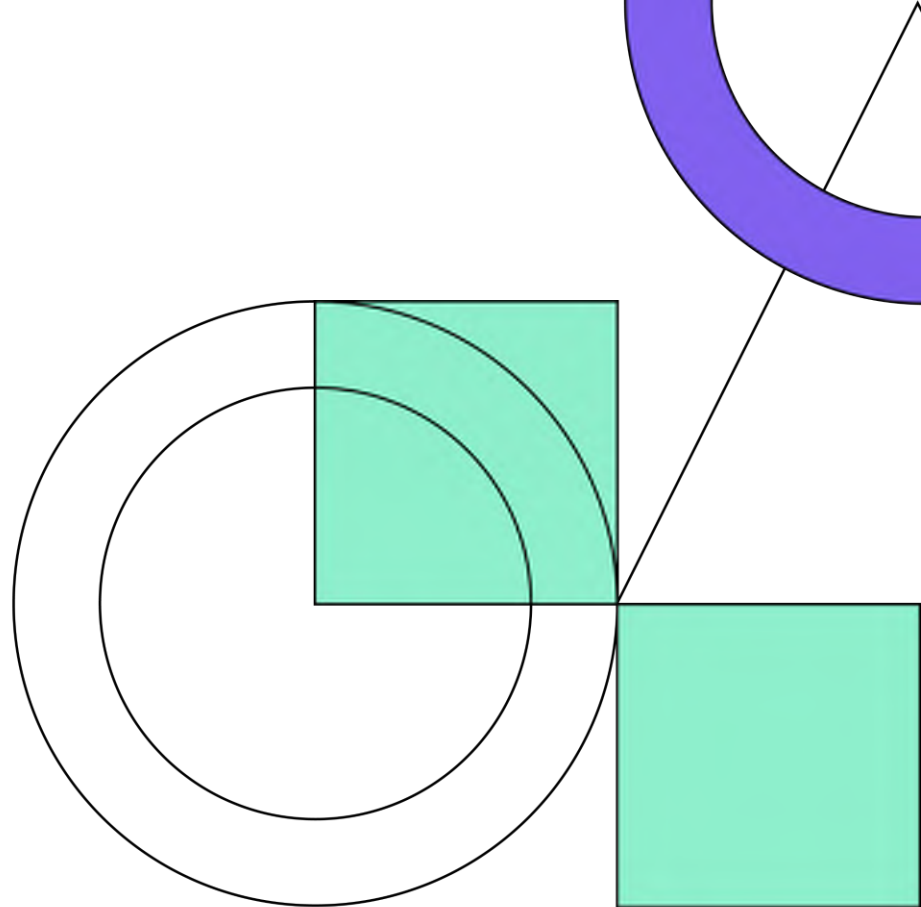
Of the 185 subdivisions in the Zonda database, 47 were not within existing CCNs. These subdivisions in the Zonda database account for 26% of total future supply (7,430 lots/homes). In addition to subdivisions included in our database, Zonda projected an additional 6,325 lots/homes could be added to various CCNs in the area assessed for this engagement. While included in our growth projections, these additional lots and apartment units are not included in the table on the previous slide or below. For purposes of this analysis, we assigned these subdivisions and future lot/homes to the geographically closest CCN (subdivisions) or dominant CCN (future lots/homes) in the immediate area.



27% of total future supply not within an existing CCN was reassigned to the SJWTX water CCN.

CN / Public Water System	Subdivisions	New Home Starts	New Home Closings	Total Lots & Homes	Occupied Homes	Model Homes	Finished Vacant Homes	Homes Under Construction	Vacant Developed Lots	Future Lots	Total Future Supply*
CITY OF BOERNE	24	208	166	6,112	749	4	10	116	308	4,925	5,363
CITY OF BOERNE	24	208	166	6,112	749	4	10	116	308	4,925	5,363
GUADALUPE BLANCO RIVER AUTHORITY	3	3	3	780	627	0	0	3	16	134	153
GBRA CORDILLERA RANCH	3	3	3	780	627	0	0	3	16	134	153
NEW BRAUNFELS UTILITIES	2	0	0	382	382	0	0	0	0	0	0
NEW BRAUNFELS UTILITIES	2	0	0	382	382	0	0	0	0	0	0
SJWTX INC	18	88	83	2,985	1,071	2	3	71	113	1,725	1,914
CLWSC CANYON LAKE SHORES	3	0	0	492	0	0	0	0	0	492	492
KENDALL WEST UTILITY	11	5	6	632	487	0	0	8	12	125	145
MIRALOMAS MUD	1	19	21	1,153	82	0	1	16	77	977	1,071
SJWTX TRIPLE PEAK PLANT	3	64	56	708	502	2	2	47	24	131	206
Totals:	47	299	252	10,259	2,829	6	13	190	437	6,784	7,430

Projections Summary

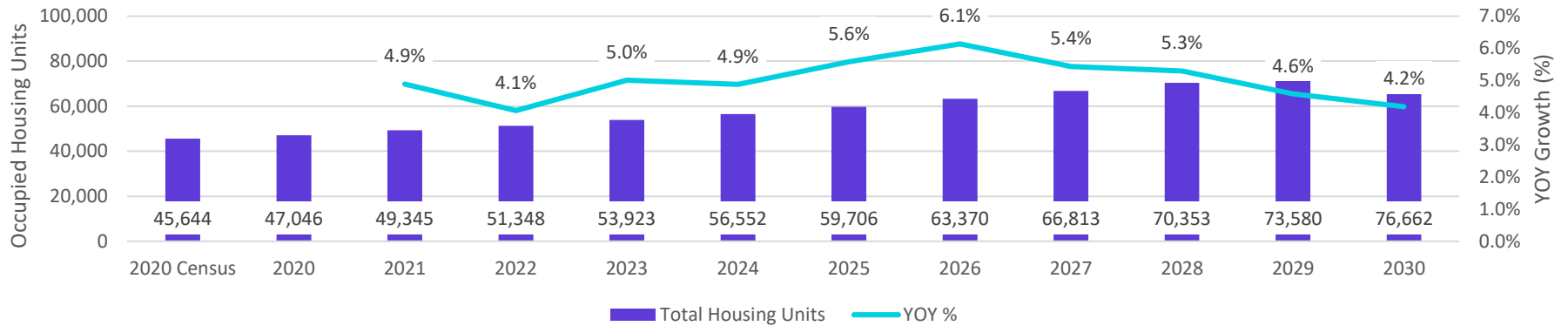


Projected Annual Total Housing Units and Population

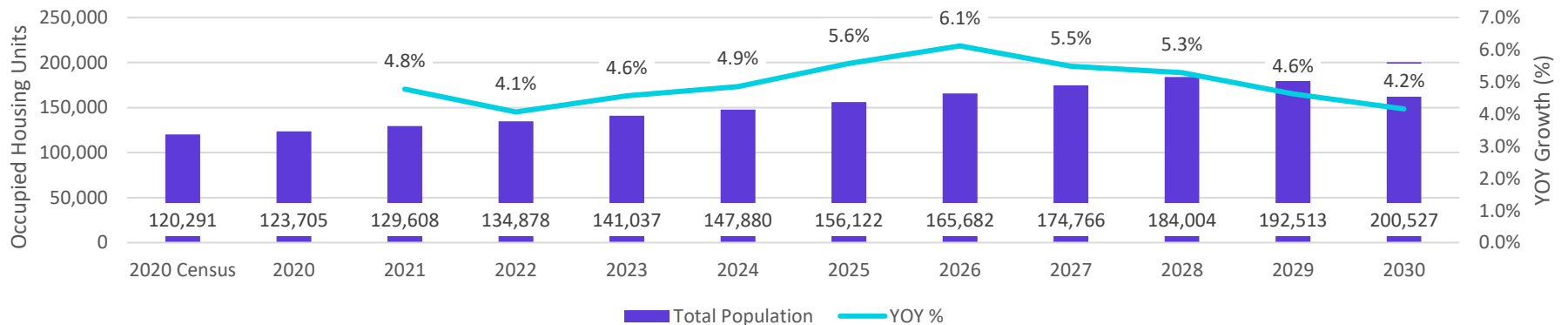
Projections Summary

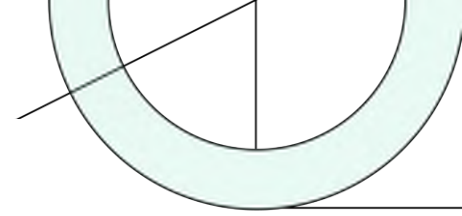
Based upon data from the 2020 Census, the Census Tracts in the assessment area had a total population of 120,291 residents in 45,644 occupied housing units. Our analysis indicates that the population in the assessment area could increase to 156,122 residents by 2025 (59,706 occupied housing units) and to 200,527 residents by 2030 (76,662 occupied housing units). Given that some Census Tracts extend beyond the borders of the assessment area, these figures are likely modestly higher than true counts in the assessment area.

Total Occupied Housing Units



Total Population



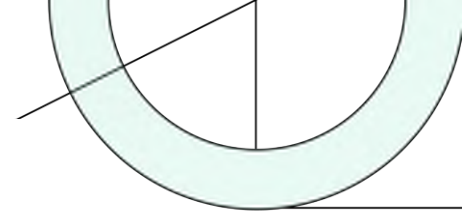


Annual New Housing Unit Projections – Water CCN & Public Water System

Projections Summary

In terms of new housing unit projections, 63% are located within the SJWTX water CCN. This equates to 17,928 new housing units in the SJWTX CCN. These projections include 1,079 new housing units within existing subdivisions that are not within existing CCNs (see methodology on page 9).

N / PUBLIC WATER SYSTEM	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
AQUA TEXAS INC	0	0	0	0	0	0	0	0	0	0	0
KENDALL POINTE	0	0	0	0	0	0	0	0	0	0	0
STONEGATE WATER SYSTEM	0	0	0	0	0	0	0	0	0	0	0
CITY OF BOERNE	413	472	355	900	702	697	1,079	814	1,110	825	1,081
CITY OF BOERNE	413	472	355	900	702	697	1,079	814	1,110	825	1,081
CITY OF FAIR OAKS RANCH	13	59	45	14	43	43	105	105	105	79	70
FAIR OAKS RANCH UTILITIES	13	59	45	14	43	43	105	105	105	79	70
DILLON WATER RESOURCES	0	0	0	0	0	0	0	0	0	0	0
BERRY OAKS WATER COMPANY	0	0	0	0	0	0	0	0	0	0	0
GUADALUPE BLANCO RIVER AUTHORITY	72	94	126	99	155	146	134	115	116	116	116
GBRA CORDILLERA RANCH	30	29	30	28	28	46	48	51	53	53	53
GBRA JOHNSON RANCH SUBDIVISION	42	65	96	71	127	100	86	64	63	63	63
MONARCH UTILITIES I LP	2	5	14	20	12	8	1	0	0	0	0
RIM ROCK RANCH	0	3	10	8	8	4	0	0	0	0	0
WINDMILL RANCH SUBDIVISION	2	2	4	12	4	4	1	0	0	0	0
NEW BRAUNFELS UTILITIES	0	0	0	0	0	0	0	0	0	0	0
NEW BRAUNFELS UTILITIES	0	0	0	0	0	0	0	0	0	0	0
SAN ANTONIO WATER SYSTEM	0	0	0	0	47	47	47	47	47	21	0
SAN ANTONIO WATER SYSTEM	0	0	0	0	47	47	47	47	47	21	0
SJWTX INC	688	1,455	1,249	1,327	1,456	2,000	2,084	2,149	1,948	1,971	1,601
CLWSC CANYON LAKE SHORES	368	805	567	610	712	1,167	1,168	1,270	1,106	1,229	1,043
GBRA LOMAS WATER CO COMAL TRACE	1	4	0	4	3	0	0	0	0	0	0
KENDALL WEST UTILITY	22	59	60	85	145	175	181	186	188	167	153
MIRALOMAS MUD	22	26	12	21	21	21	21	21	21	21	21
SJWTX GLENWOOD SUBDIVISION	20	84	76	82	125	124	238	200	161	161	132
SJWTX TRIPLE PEAK PLANT	255	477	534	525	450	512	477	472	472	393	252
Totals:	1,188	2,085	1,789	2,360	2,415	2,940	3,450	3,229	3,326	3,012	2,868



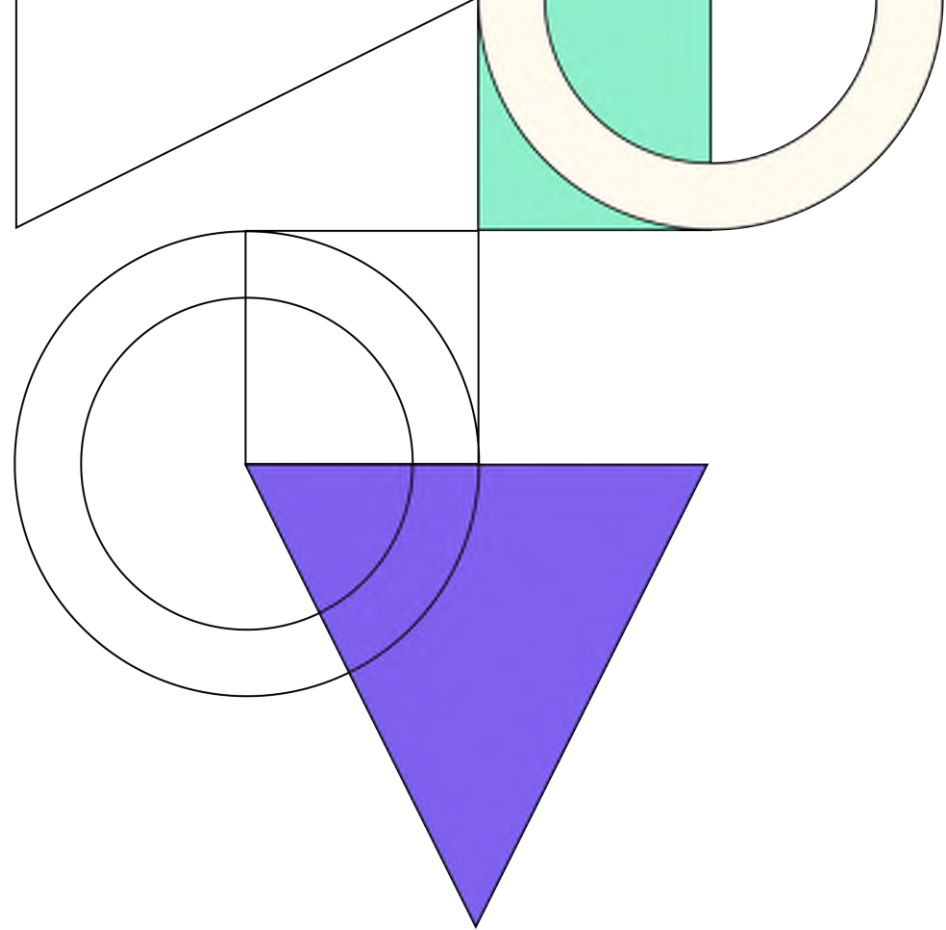
Annual New Housing Unit Projections – Water CCN & Public Water System

Projections Summary

In terms of population growth, 62% is located within the SJWTX water CCN. This equates to 46,539 new residents in the SJWTX CCN. These projections include 2,801 new residents within existing subdivisions that are not within existing CCNs (See methodology on page 9).

R CCN / PUBLIC WATER SYSTEM	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
AQUA TEXAS INC	0	0	0	0	0	0	0	0	0	0	0
KENDALL POINTE	0	0	0	0	0	0	0	0	0	0	0
STONEGATE WATER SYSTEM	0	0	0	0	0	0	0	0	0	0	0
CITY OF BOERNE	943	1,208	1,040	2,011	1,929	2,060	2,894	2,434	2,993	2,468	2,908
CITY OF BOERNE	943	1,208	1,040	2,011	1,929	2,060	2,894	2,434	2,993	2,468	2,908
CITY OF FAIR OAKS RANCH	35	159	121	39	116	116	293	293	293	224	200
FAIR OAKS RANCH UTILITIES	35	159	121	39	116	116	293	293	293	224	200
DILLON WATER RESOURCES	0	0	0	0	0	0	0	0	0	0	0
BERRY OAKS WATER COMPANY	0	0	0	0	0	0	0	0	0	0	0
GUADALUPE BLANCO RIVER AUTHORITY	194	253	339	266	417	392	361	308	313	313	313
GBRA CORDILLERA RANCH	81	79	81	76	76	123	130	137	144	144	144
GBRA JOHNSON RANCH SUBDIVISION	113	174	258	191	341	268	231	172	169	169	169
MONARCH UTILITIES I LP	5	12	34	51	29	20	3	0	0	0	0
RIM ROCK RANCH	0	7	23	18	18	9	0	0	0	0	0
WINDMILL RANCH SUBDIVISION	5	5	11	32	11	11	3	0	0	0	0
NEW BRAUNFELS UTILITIES	0	0	0	0	0	0	0	0	0	0	0
NEW BRAUNFELS UTILITIES	0	0	0	0	0	0	0	0	0	0	0
SAN ANTONIO WATER SYSTEM	0	0	0	0	134	134	134	134	134	60	0
SAN ANTONIO WATER SYSTEM	0	0	0	0	134	134	134	134	134	60	0
SJWTX INC	1,821	3,856	3,322	3,376	3,803	5,104	5,459	5,500	5,090	5,030	4,178
CLWSC CANYON LAKE SHORES	970	2,125	1,497	1,477	1,844	2,912	3,042	3,180	2,870	3,069	2,706
GBRA LOMAS WATER CO COMAL TRACE	3	11	0	11	8	0	0	0	0	0	0
KENDALL WEST UTILITY	60	163	171	223	372	449	464	478	482	427	392
MIRALOMAS MUD	55	66	30	53	53	53	53	53	53	53	53
SJWTX GLENWOOD SUBDIVISION	53	224	203	219	334	331	637	536	431	431	354
SJWTX TRIPLE PEAK PLANT	680	1,267	1,420	1,393	1,192	1,359	1,264	1,252	1,254	1,050	673
Totals:	2,999	5,488	4,855	5,743	6,429	7,826	9,144	8,669	8,823	8,094	7,598

Methodology



Forecast Methodology Overview

Methodology

In order to create new housing unit and population growth forecasts through 2030, we utilized our proprietary database of for sale housing activity. Zonda's proprietary database is centered on a quarterly survey of all new for sale residential development in the San Antonio MSA. Zonda surveyors visually inspect all known residential developments and account for all stages of development activity within each subdivision:

- ☐ Future platted lots
- ☐ Lots under active development
- ☐ Vacant developed lots
- ☐ Homes under construction
- ☐ Finished vacant homes
- ☐ Occupied homes



Based on the above, residential development activity is tracked for each community from conceptual stage through build-out. With over 25 years of historical data, Zonda's proprietary survey data creates a unique ability for our firm to monitor the supply and demand trends behind new household formations across the market. This extensive survey data and our in-depth knowledge of the local housing market allows us to accurately forecast housing unit and population growth figures for various geographies within the San Antonio MSA.

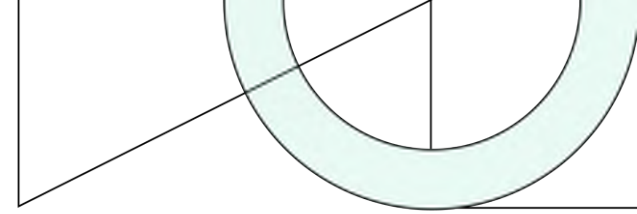
In addition to our proprietary housing survey data, select secondary data sources were also utilized in our housing unit and population growth forecasts. As part our forecast process, we also utilized secondary sources of information to supplement our proprietary housing survey data:

- ☐ Census Bureau
- ☐ ESRI (third party demographic data provider)
- ☐ ALN Apartment Data, Inc. (third party apartment data provider)
- ☐ RealPage (third part apartment data provider)

Our analysis focused on housing unit and population forecasts for select areas in Comal and Kendall counties. The result of the analysis is new housing unit and population growth projections through 2030 for the defined assessment area (Census Tract, water utility, and public water system levels).

Detailed Forecast Process

Methodology



Our housing unit and population forecasts are derived from a multi-step process. The following outline details the steps and methodology that Zonda undertook as it relates to generating new housing unit and population growth projections for the assessed area:

Step #1 – Baseline Housing Unit and Population Counts

Utilizing data from the 2020 Census (collected in April 2020), we determined the occupied housing unit and population counts for each of the 26 Census Tracts that make up the assessment area. Note that the boundaries of some Census Tracts extended beyond the boundaries of the assessment area, likely leading to modestly higher occupied housing unit and population counts.

Step #2 – Historic Population to Household Ratios

Utilizing Census Bureau data (provided by ESRI), we determined both the overall average household size (2020 population / 2020 occupied housing units) and the average new household size (2020 population – 2010 population / 2020 occupied housing units – 2010 occupied housing units) for individual Census Tracts and Comal and Kendall counties.

The average overall/new household formation rates (Census Tract and County) was utilized to convert projected housing unit growth to projected population growth in the assessment area for this engagement. Based upon Census data for the San Antonio MSA, an average household size of 1.80 residents was assumed for apartment units (regardless of location).

Step #3 – Projecting For Sale Housing Unit Growth

In order to project for sale housing unit growth in the assessment area, we completed the following steps using our proprietary housing survey data:

1. Aggregated total future new home supply in the assessed area.
2. Utilized five years trends to project additional new lots/homes that could be added to the assessment area between now and 2030.
3. Assessed new home closing trends at the subdivision level to project the pace at which new homes will close over the forecast period.
4. Projected annual housing unit growth through 2030 for active and future subdivisions in the assessment area.

Detailed Forecast Process (Continued)

Methodology

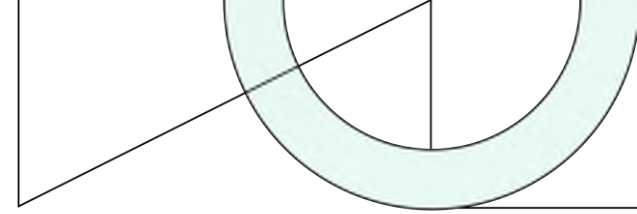
Step #4 – Projecting Apartment Unit Growth

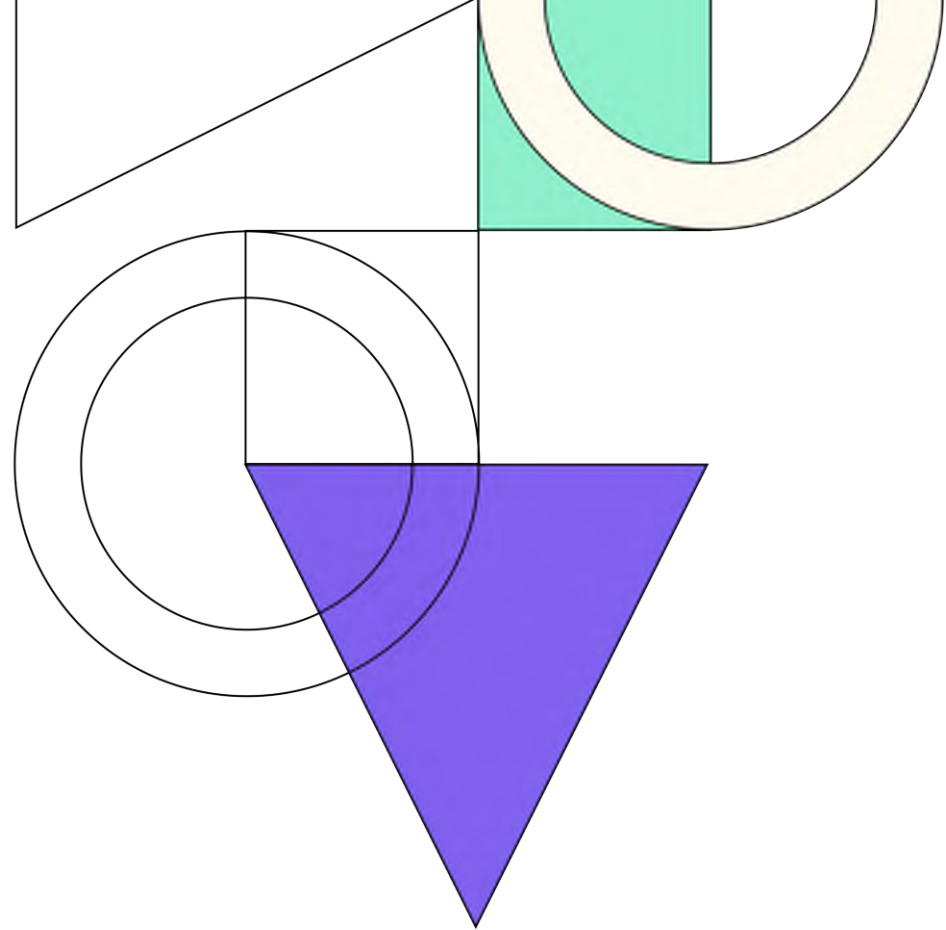
In order to project apartment unit growth in the assessment area, we completed the following steps using data from third party sources such as ALN Apartment Data, Inc. and RealPage:

1. Identified recently completed (since 2020), under construction, and planned apartment communities to determine the extent and location of apartment development activity within the assessment area.
2. Utilized five year trends to project additional apartment units that could be added to the assessment area between now and 2030.
3. Projected annual apartment unit growth through 2030 for active and future apartment communities in the assessment area.

Step #5 – Projecting Population Growth

Once the for sale and apartment housing unit projections were completed, the annual new housing unit projections were converted into annual population growth projections by applying the household formation rates detailed in Step 2.





Subdivision Forecast Example

Copper Canyon Subdivision

Subdivision Forecast Example

Copper Canyon is a subdivision in Bulverde (Comal County) that will include roughly 1,147 homes at build-out. The following select steps illustrate how subdivisions will generally be assessed as part of the forecast process:

Step #2 – Historic Population to Household Ratios

The following is the household formation ratio for Census Tract 3107.03 and Comal County:

Persons Per Household				
County (New)	County (Overall)	Census Tract (New)	Census Tract (Overall)	Average
2.54	2.59	2.80	2.80	2.68

Step #3 – Projecting For Sale Housing Unit Growth

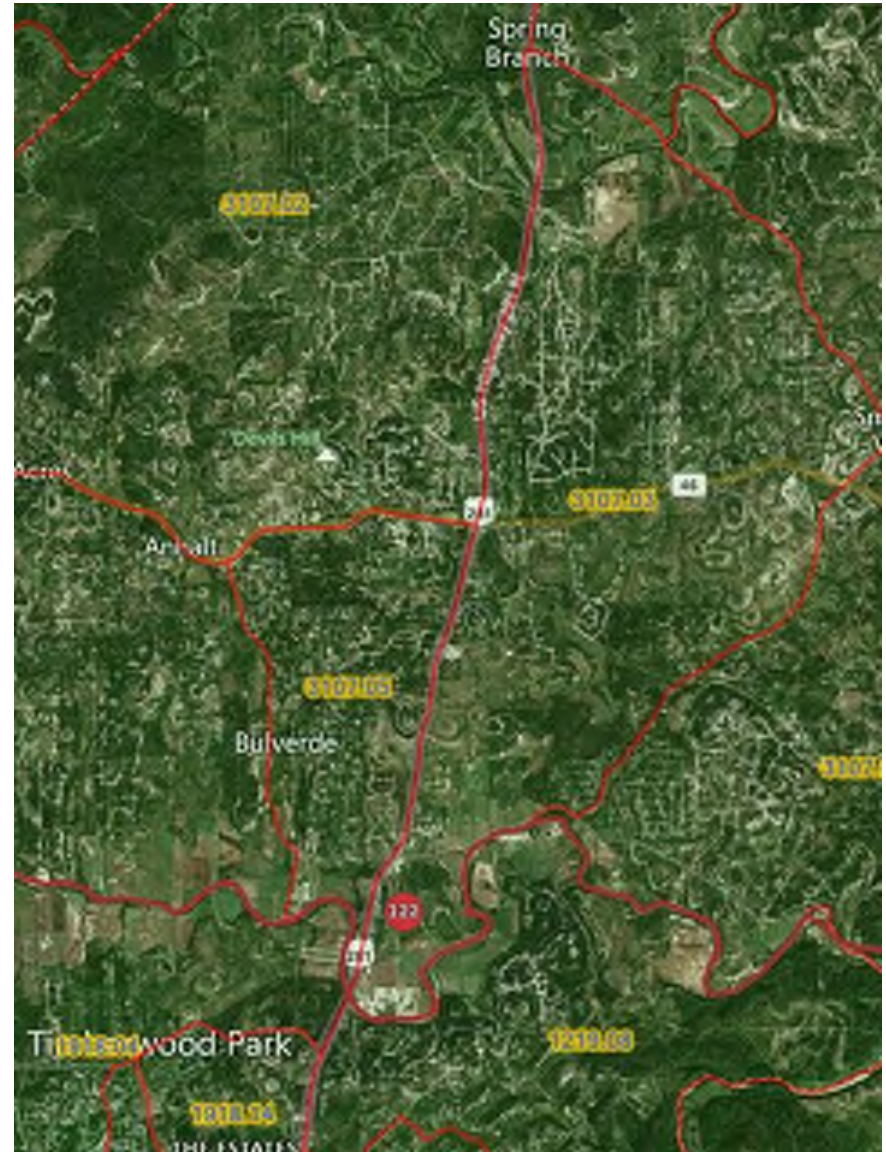
The following summarizes the forecast approach for projected household growth for Copper Canyon:

- ❑ Total of 135 new home closings between 3Q21 and 2Q22
- ❑ Total future supply of 660 lots/homes as of 2Q22

With 660 lots/homes remaining and an annual closing pace of 135 homes per year, Copper Canyon will continue to add new housing units through 2027.

Step #5 – Projecting Overall Population Growth

Based upon an average of 2.68 people per household, future closing activity at Copper Canyon could generate 1,769 new residents across the remaining 660 lots/homes (build-out occurs in 2027).





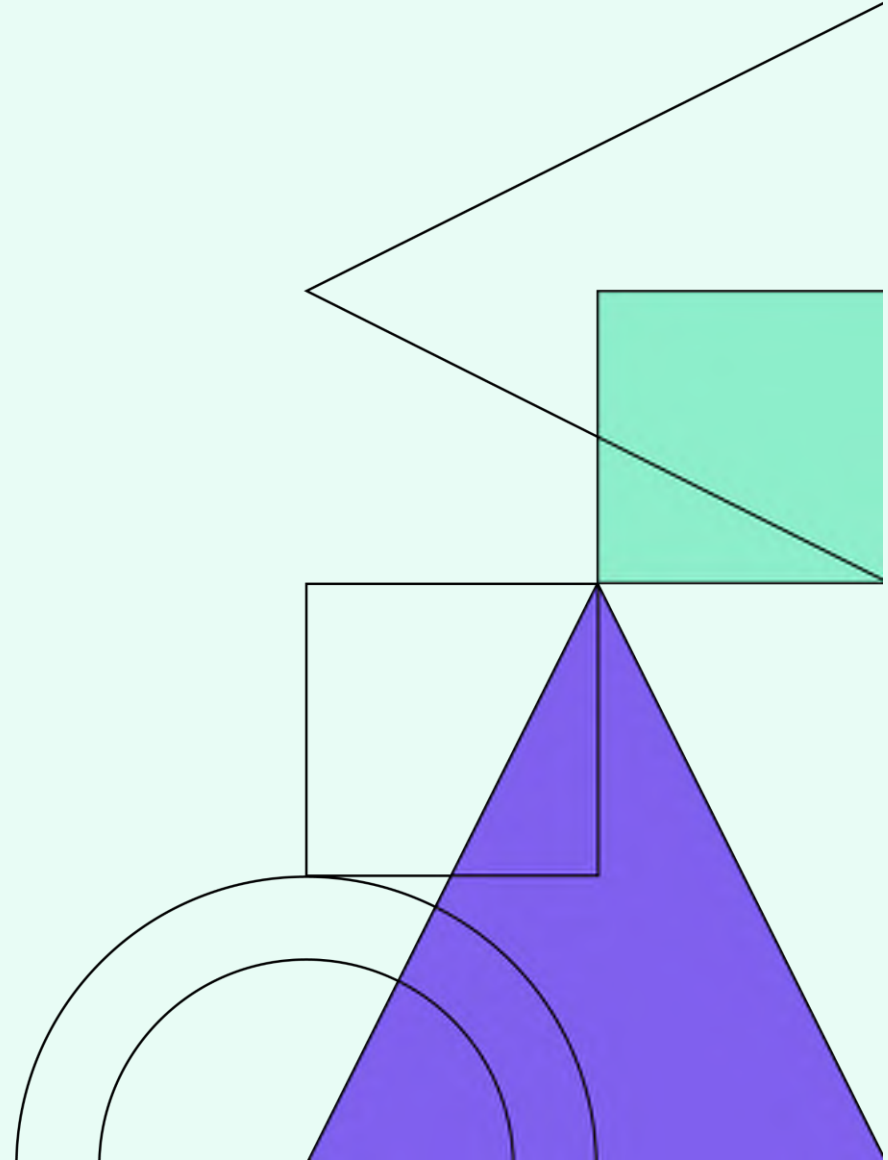
Thank you!

Zonda

3200 Bristol Street, Suite 640

Costa Mesa, CA 92626

(877) 966-3210



APPENDIX D

Long Term Population Projection Methodology Details

Appendix D - Long-Term Population Projection Methodology

System	Lower Population Projection Assumptions	Higher Population Projection Assumptions
Canyon Lake Shores (CLS)	The CLS PWS boundary is about 52.4% of the total PWS area for CLS, TP, and GW. Assumed that CLS will expand to 52.4% of the combined CCN in Comal County (244.3 sq. mi.) or 128 sq. mi. with a population density of 800 people/sq. mi. for a buildout population of 102,400. The growth rate from 2010-2020 is around 9%, and the growth rate from 2021-2030 is around 6% based on Zonda projections. Assumed a future growth rate of 5% per year.	Assumed that SJWTX CCN in Comal County will expand to fill remaining areas in the county not currently bounded by an existing CCN for a total area of 399 sq. mi., with 52.4% or 209 sq. mi. being CLS. With a density of 800 people/sq. mi., estimated the buildout population as 167,200. Assumed a growth rate of 4% per year.
Triple Peak (TP)	The TP PWS boundary is about 43.2% of the total PWS area for CLS, TP, and GW. Assumed that TP will expand to 43.2% of the combined CCN in Comal County or 105.6 sq. mi. with a population density of 800 people/sq. mi. for a buildout population of 84,480. The population growth rate from 2010 to 2020 was around 6% per year, and the growth rate from 2021-2030 based on Zonda projections was around 3%. Assumed a future growth rate of 3% per year.	Assumed that SJWTX CCN in Comal County will expand to fill remaining areas in the county not currently bounded by an existing CCN for a total area of 399 sq. mi., with 43.2% or 173 sq. mi. being TP. With a density of 800 people/sq. mi., estimated the buildout population as 138,400. Assumed a growth rate of 2.5% per year.
North Point (NP)	CLWSC indicated that North Point is built out, so the population was assumed to remain constant at the 2021 value of 96.	Same as lower scenario
Rust Ranch (RR)	Assumed that RR is build out, and population remains constant at 2021 value of 585	Same as lower scenario
Deer Creek (DC)	Assumed a buildout population of 2,790 based on a density of 1,500 people/sq. mi. and a service area of 1.86 sq. mi. This service area boundary does not appear to cover the entire neighborhood, so the area might actually be larger.	Same as lower scenario
Glenwood (GW)	The GW PWS boundary is about 4.4% of the total PWS area for CLS, TP, and GW. Assumed that GW will expand to 5% of the combined CCN in Comal County or 10.7 sq. mi. with a population density of 800 people/sq. mi. for a buildout population of 8,560. The population growth rate from 2010 to 2020 was around 16% per year, and the growth rate from 2021-2030 based on Zonda projections was around 13%. Assumed a future growth rate of 10% per year.	Assumed that SJWTX CCN in Comal County will expand to fill remaining areas in the county not currently bounded by an existing CCN for a total area of 399 sq. mi., with 4.4% or 18 sq. mi. being GW. With a density of 800 people/sq. mi., estimated the buildout population as 14,400. Assumed a growth rate of 8% per year.

System	Lower Population Projection Assumptions	Higher Population Projection Assumptions
Latigo Ranch (LR)	Assumed a buildout population of 440 based on a density of 500 people/sq. mi. and a CCN area of 88 sq. mi. This service area boundary is a large square and might include area that will not be developed as part of the subdivision. Assumed a growth rate of 10% per year. The growth rate from 2017-2021 was 17%, but this is based on a population of 60 in the 2017 water use survey, which might not be reliable.	Same as lower scenario
Summit Ridge (SR)	Assumed a buildout population of 660 based on a density of 500 people/sq. mi. and a CCN area of 1.32 sq. mi. Assumed a growth rate of 10%. The historical growth rate from 2019-2021 was 13.5%.	Same as lower scenario
Bridlegate (BG)	Assumed a buildout population of 1,730 based on a density of 500 people/sq. mi. and a CCN area of 3.46 sq. mi. Assumed a growth rate of 6%. The historical growth rate from 2017-2021 was 5.6%.	Same as lower scenario
Kendall West (KWU)	Assumed a buildout population of 10,456 based on a density of 800 people/sq. mi. and a CCN area of 13.1 sq. mi. Assumed a growth rate of 8%. The historical growth rate from 2010-2020 was around 3%, and the growth rate from 2021-2030 based on Zonda projections was around 8%.	Assumed the KWU CCN expands by 50% to 19.6 sq. mi, resulting in a buildout population of 15,684 based on a density of 800 people/sq. mi. Assumed a growth rate of 6% per year.
Texas Country Water (TCW)	Assumed that TCW is build out and population remains constant at 2021 value of 321	Same as lower scenario
Rockwall Ranch / KT Water (KTW)	Assumed a buildout population of 2,600 based on a density of 1,000 people/sq. mi. and a CCN area of 2.6 sq. mi. Assumed a growth rate of 7%. The historical growth rate from 2010-2020 was 8%.	Same as lower scenario

ATTACHMENT D
COTTONWOOD CREEK MUD 1 AERIAL

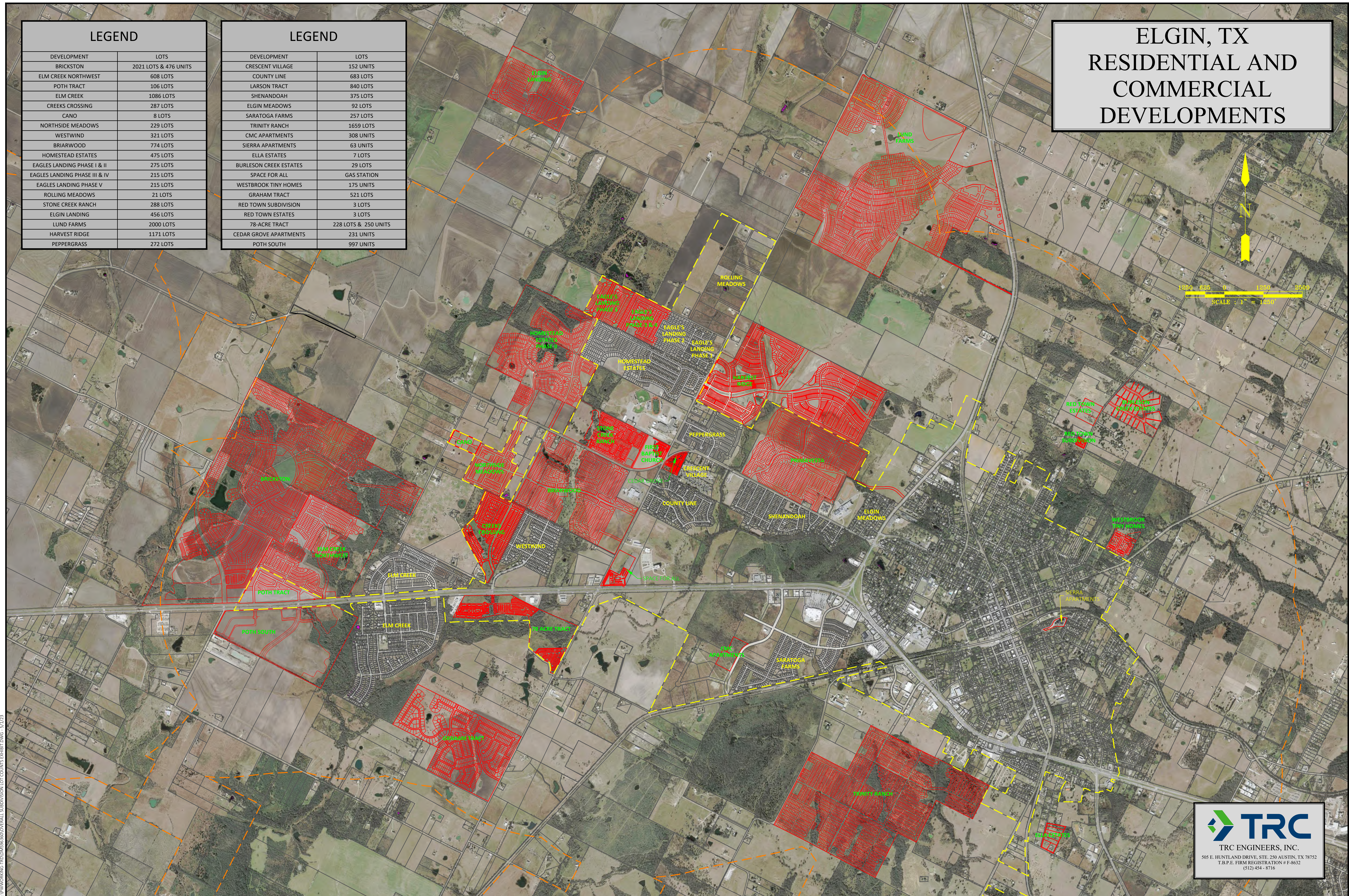


ATTACHMENT E
ELGIN FUTURE DEVELOPMENT

ELGIN, TX
RESIDENTIAL AND
COMMERCIAL
DEVELOPMENTS

LEGEND	
DEVELOPMENT	LOTS
BRICKSTON	2021 LOTS & 476 UNITS
ELM CREEK NORTHWEST	608 LOTS
POTH TRACT	106 LOTS
ELM CREEK	1086 LOTS
CREEKS CROSSING	287 LOTS
CANO	8 LOTS
NORTHSIDE MEADOWS	229 LOTS
WESTWIND	321 LOTS
BRIARWOOD	774 LOTS
HOMESTEAD ESTATES	475 LOTS
EAGLES LANDING PHASE I & II	275 LOTS
EAGLES LANDING PHASE III & IV	215 LOTS
EAGLES LANDING PHASE V	215 LOTS
ROLLING MEADOWS	21 LOTS
STONE CREEK RANCH	288 LOTS
ELGIN LANDING	456 LOTS
LUND FARMS	2000 LOTS
HARVEST RIDGE	1171 LOTS
PEPPERGRASS	272 LOTS

LEGEND	
DEVELOPMENT	LOTS
CRESCENT VILLAGE	152 UNITS
COUNTY LINE	683 LOTS
LARSON TRACT	840 LOTS
SHENANDOAH	375 LOTS
ELGIN MEADOWS	92 LOTS
SARATOGA FARMS	257 LOTS
TRINITY RANCH	1659 LOTS
CMC APARTMENTS	308 UNITS
SIERRA APARTMENTS	63 UNITS
ELLA ESTATES	7 LOTS
BURLESON CREEK ESTATES	29 LOTS
SPACE FOR ALL	GAS STATION
WESTBROOK TINY HOMES	175 UNITS
GRAHAM TRACT	521 LOTS
RED TOWN SUBDIVISION	3 LOTS
RED TOWN ESTATES	3 LOTS
78-ACRE TRACT	228 LOTS & 250 UNITS
CEDAR GROVE APARTMENTS	231 UNITS
POTH SOUTH	997 UNITS



ATTACHMENT F

GOLDTHWAITE WATER USE SURVEYS

TEXAS WATER DEVELOPMENT BOARD
WATER USE SURVEY

WATER USE IN CALENDAR YEAR: 2010

SYSTEM NAME:

CITY OF GOLDTHWAITE

OPERATOR NAME:

MULTIPLE SURVEY ORG:

MAILING ADDRESS 1:

PO BOX 450

MAILING ADDRESS 2:

CITY/STATE/ZIP:

GOLDTHWAITETX76844-

PWS NAME:

CITY OF GOLDTHWAITE

SURVEY NUMBER:

0330600

PRIMARY USED COUNTY:

MILLS

PRIMARY USED RIVER BASIN:

COLORADO

ORGANIZATION MAIN PHONE:

- -

MAIN EMAIL:

WEB:

PWS CODE:

1670001

INTAKE:

Water Type		County	Basin	Reservoir / River	Water Right #	% Consumed	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
SURFACE WATER SELF SUPPLIED		MILLS	COLORADO	COLORADO RUN OF RIVER		100.00	E	N	0.00	96,585,500	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
6,105,000	0	0	13,744,500	15,369,750	17,267,250	16,013,250	1,848,000	13,975,500	9,003,500	0	3,258,750

CONNECTIONS & USAGE:

	CONNECTIONS	VOLUME (GALLONS)
TOTAL METERED RETAIL:	940	0
Residential - Single Family	850	82,148,175
Residential - Multi Family	85	8,214,825
Institutional	0	0
Commercial	0	0
Industrial	0	0
Agriculture	0	0
Reuse	0	0
TOTAL UNMETERED:	2	900,000

WATER SYSTEM INFORMATION:

Estimated full-time residential population served directly by this system	1,802
---	-------

TEXAS WATER DEVELOPMENT BOARD
WATER USE SURVEY

WATER USE IN CALENDAR YEAR: 2021

SYSTEM NAME:

CITY OF GOLDTHWAITE

OPERATOR NAME:

MULTIPLE SURVEY ORG:

MAILING ADDRESS 1:

PO BOX 450

MAILING ADDRESS 2:

CITY/STATE/ZIP:

GOLDTHWAITETX76844-

PWS NAME:

CITY OF GOLDTHWAITE

SURVEY NUMBER:

0330600

PRIMARY USED COUNTY:

MILLS

PRIMARY USED RIVER BASIN:

COLORADO

ORGANIZATION MAIN PHONE:

325-648-3186

MAIN EMAIL:

WEB:

PWS CODE:

1670001

INTAKE:

Water Type		County	Basin	Aquifer	Well Name (if applicable)		Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
GROUND WATER SELF SUPPLIED		MILLS	COLORADO	TRINITY AQUIFER	Highway Well		M	N	0.00	11,712,400	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1,464,050	1,464,050	1,464,050	1,464,050	1,464,050	1,464,050	1,464,050	1,464,050	0	0	0	0
Water Type		County	Basin	Reservoir / River	Water Right #	% Consumed	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
SURFACE WATER SELF SUPPLIED		MILLS	COLORADO	COLORADO RUN OF RIVER		100.00	E	N	0.00	220,047,000	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
22,518,000	22,518,000	22,518,000	25,314,000	19,524,000	21,150,000	20,754,000	22,117,500	22,117,500	12,042,000	0	9,474,000
Water Type		County	Basin	Seller Name and/or Seller System		River / Reservoir	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
SURFACE WATER PURCHASED				CITY OF SAN SABA			M	N	0.00	18,975,741	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1,026,956	0	0	0	1,689,778	1,763,283	2,398,947	3,284,317	3,284,317	1,896,517	3,351,743	279,883

SALES:

BUYER	SALE TYPE (MUNICIPAL or INDUSTRIAL)	COUNTY NAME	BASIN NAME	WATER TYPE	AQUIFER NAME (if GW)	SURFACE WATER Name (if SW)	RAW or TREATED	TOTAL VOLUME (GALLONS)
GOLDTHWAITE PLANT	I			SURFACE WATER			Treated	0

COUNTY CONNECTIONS:

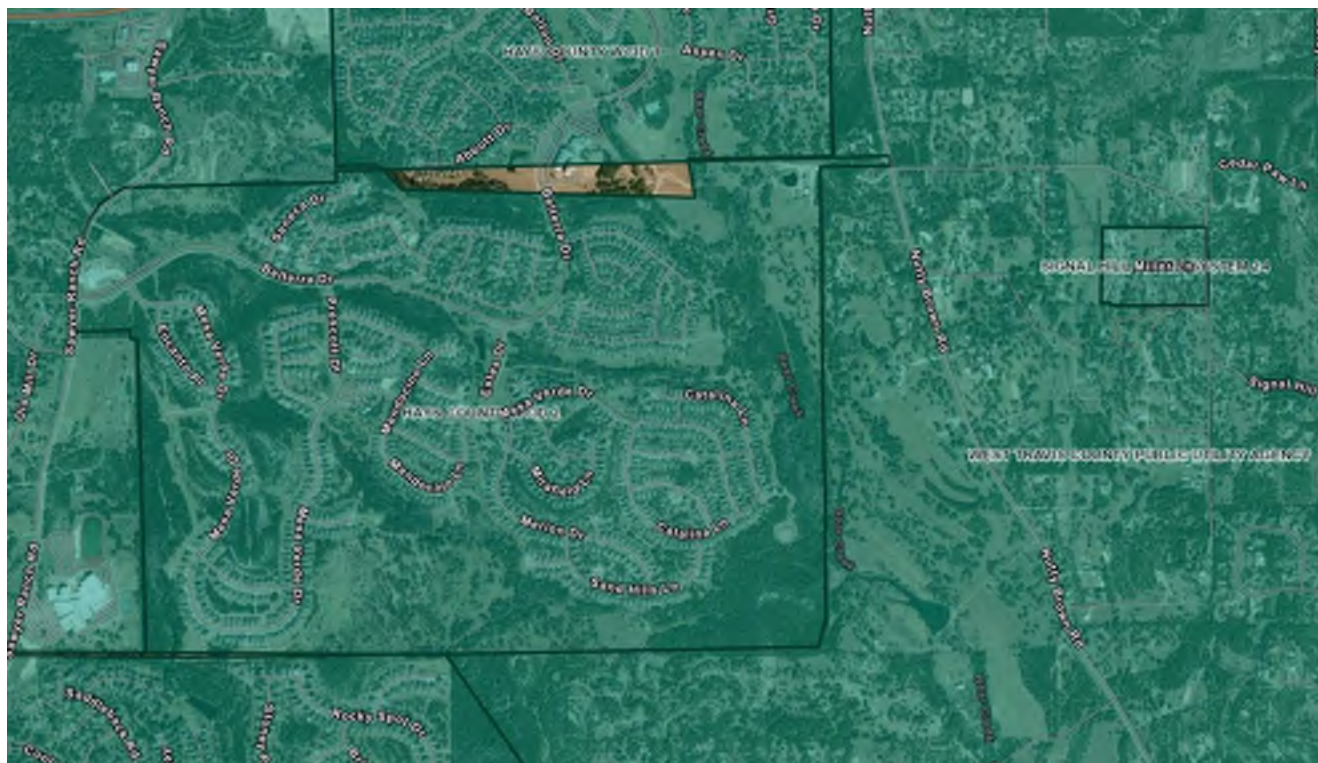
COUNTY NAME	TOTAL CONNECTIONS
MILLS	1,164

CONNECTIONS & USAGE:	CONNECTIONS	VOLUME (GALLONS)
TOTAL METERED RETAIL:	1,165	95,284,697
Residential - Single Family	859	53,620,195
Residential - Multi Family	143	2,738,100
Institutional	49	11,580,700
Commercial	113	24,556,702
Industrial	0	0
Agriculture	0	0
Reuse	1	2,789,000
TOTAL UNMETERED:	0	0

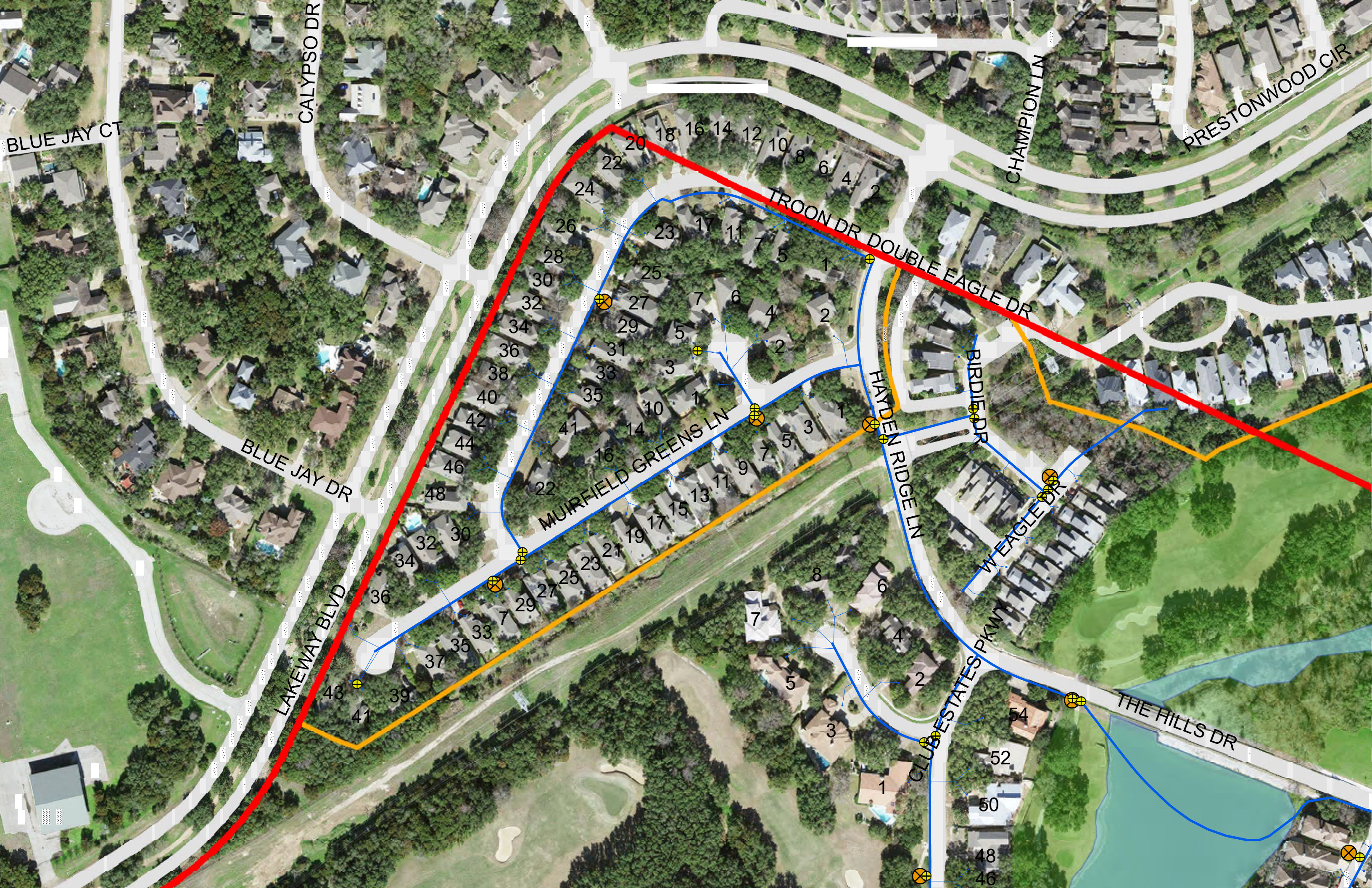
WATER SYSTEM INFORMATION:

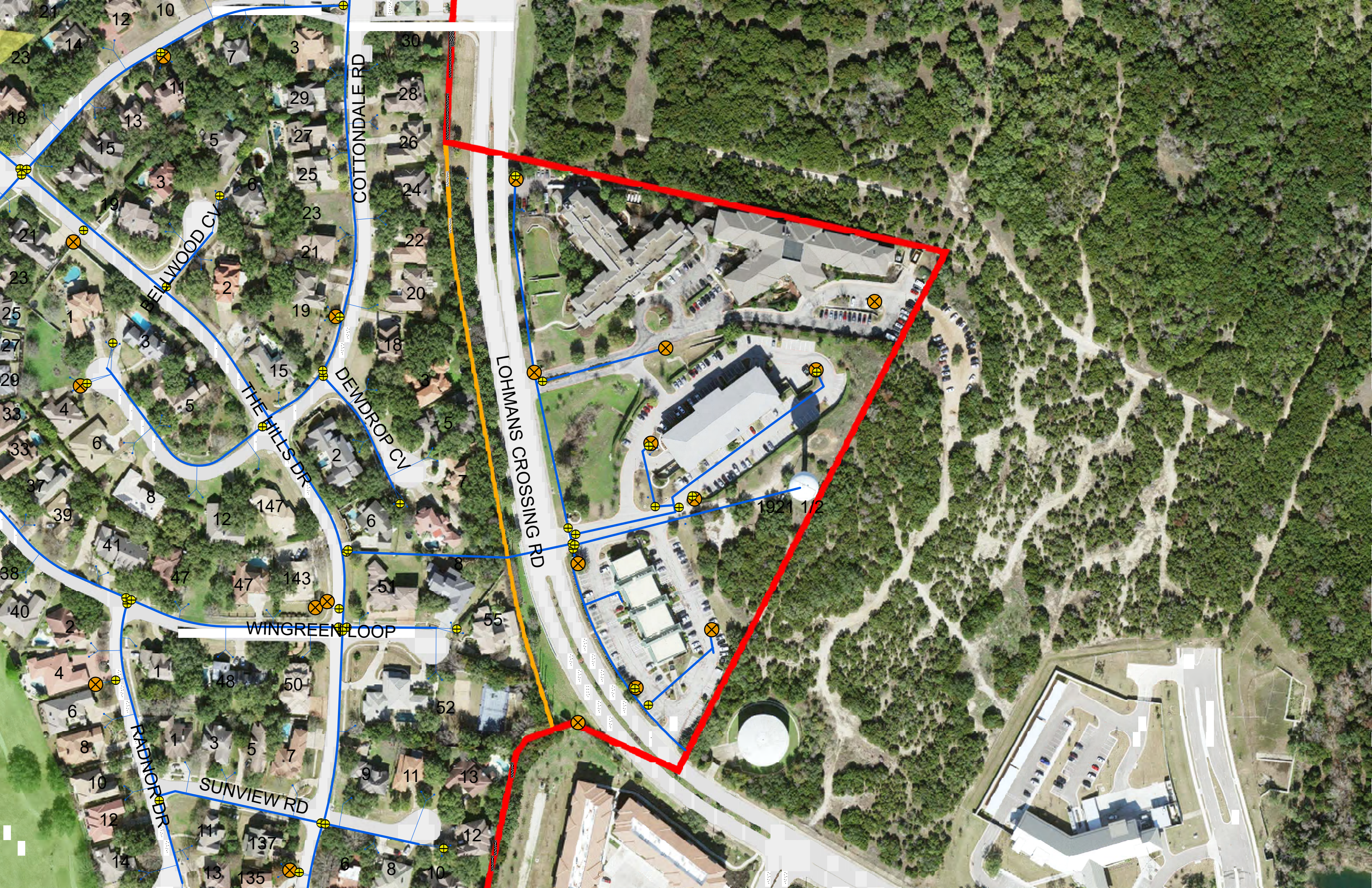
Estimated full-time residential population served directly by this system	1,738
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ATTACHMENT G
HAYS COUNTY WCID 2 AERIAL



ATTACHMENT H
HURST CREEK MUD SERVICE AREA
BOUNDARY





ATTACHMENT I

JOHNSON CITY WATER USE SURVEYS

TEXAS WATER DEVELOPMENT BOARD
WATER USE SURVEY

WATER USE IN CALENDAR YEAR: 2010

SYSTEM NAME:

CITY OF JOHNSON CITY

OPERATOR NAME:

MULTIPLE SURVEY ORG:

MAILING ADDRESS 1:

PO BOX 369

MAILING ADDRESS 2:

CITY/STATE/ZIP:

JOHNSON CITYTX78636-

PWS NAME:

CITY OF JOHNSON CITY

SURVEY NUMBER:

0439200

PRIMARY USED COUNTY:

BLANCO

PRIMARY USED RIVER BASIN:

COLORADO

ORGANIZATION MAIN PHONE:

- -

MAIN EMAIL:

WEB:

PWS CODE:

160001

INTAKE:

Water Type		County	Basin	Aquifer	Well Name (if applicable)		Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
GROUND WATER SELF SUPPLIED		BLANCO	COLORADO	TRINITY AQUIFER	5		M	N	0.00	80,146,798	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
5,403,880	6,000,200	4,221,900	5,635,294	5,594,760	9,049,950	7,500,980	10,932,900	8,047,324	6,152,580	6,037,920	5,569,110

CONNECTIONS & USAGE:

	CONNECTIONS	VOLUME (GALLONS)
TOTAL METERED RETAIL:	831	0
Residential - Single Family	626	60,333,380
Residential - Multi Family	0	0
Institutional	0	0
Commercial	162	20,797,081
Industrial	0	0
Agriculture	0	0
Reuse	0	0
TOTAL UNMETERED:	2	10,000

WATER SYSTEM INFORMATION:

Estimated full-time residential population served directly by this system	1,600
---	-------

TEXAS WATER DEVELOPMENT BOARD
WATER USE SURVEY

WATER USE IN CALENDAR YEAR: 2020

SYSTEM NAME:

CITY OF JOHNSON CITY

OPERATOR NAME:

MULTIPLE SURVEY ORG:

MAILING ADDRESS 1:

PO BOX 369

MAILING ADDRESS 2:

CITY/STATE/ZIP:

JOHNSON CITYTX78636-

PWS NAME:

CITY OF JOHNSON CITY

SURVEY NUMBER:

0439200

PRIMARY USED COUNTY:

BLANCO

PRIMARY USED RIVER BASIN:

COLORADO

ORGANIZATION MAIN PHONE:

- -

MAIN EMAIL:

WEB:

PWS CODE:

160001

INTAKE:

Water Type		County	Basin	Aquifer	Well Name (if applicable)		Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
GROUND WATER SELF SUPPLIED		BLANCO	COLORADO	TRINITY AQUIFER	5		M	N	0.00	54,000,000	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	5,000,000	6,000,000	6,000,000	4,000,000	5,000,000	4,000,000	4,000,000

COUNTY CONNECTIONS:

COUNTY NAME	TOTAL CONNECTIONS
BLANCO	883

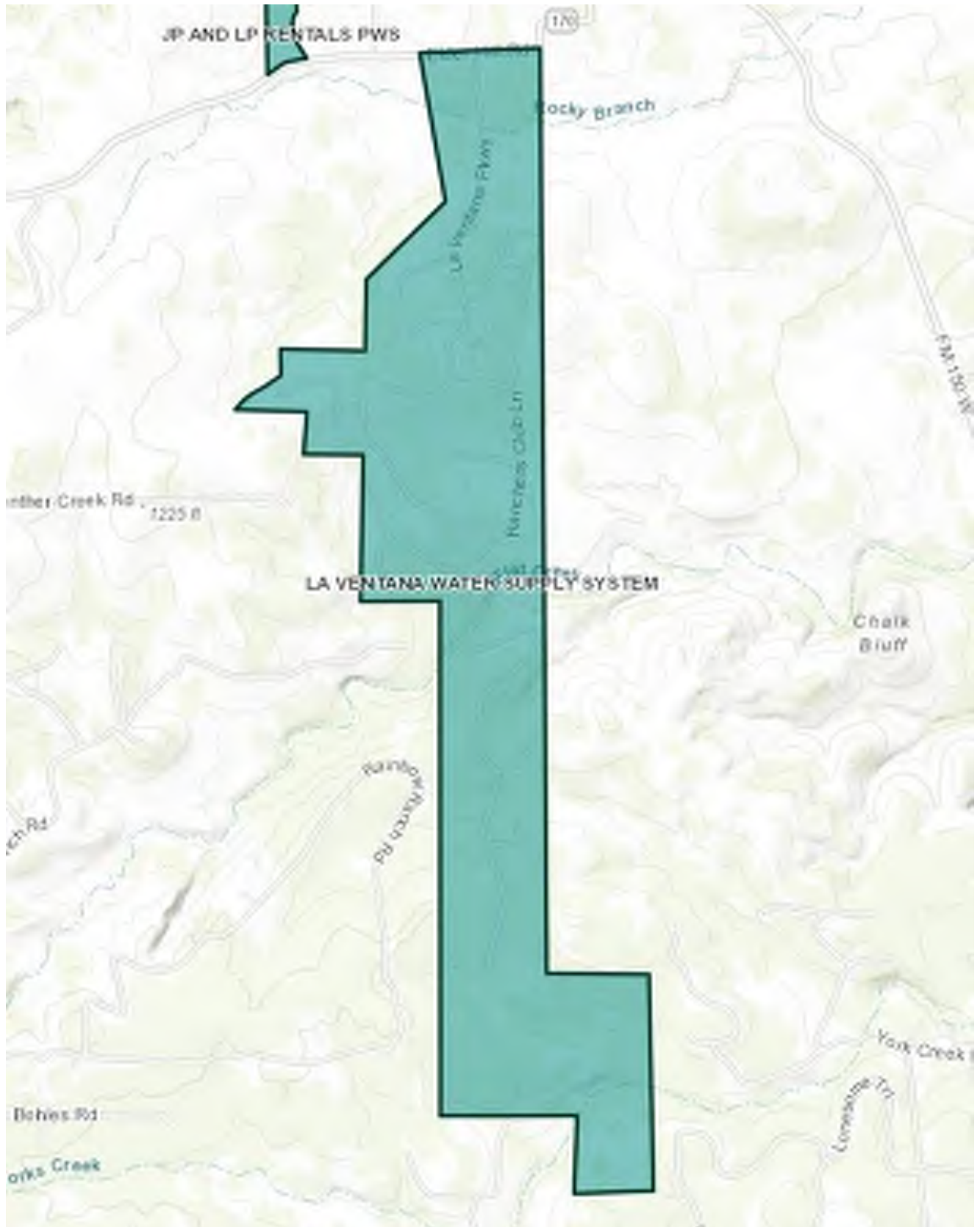
CONNECTIONS & USAGE:

	CONNECTIONS	VOLUME (GALLONS)
TOTAL METERED RETAIL:	883	51,194,000
Residential - Single Family	615	26,863,000
Residential - Multi Family	81	3,551,000
Institutional	0	0
Commercial	187	20,780,000
Industrial	0	0
Agriculture	0	0
Reuse	0	0
TOTAL UNMETERED:	1	115,000

WATER SYSTEM INFORMATION:

Estimated full-time residential population served directly by this system	2,091
---	-------

ATTACHMENT J
LA VENTANA WSC AERIAL



ATTACHMENT K
LAGO VISTA WATER USE SURVEYS

TEXAS WATER DEVELOPMENT BOARD
WATER USE SURVEY

WATER USE IN CALENDAR YEAR: 2020

SYSTEM NAME:

CITY OF LAGO VISTA

OPERATOR NAME:

MULTIPLE SURVEY ORG:

MAILING ADDRESS 1:

PO BOX 4727

MAILING ADDRESS 2:

CITY/STATE/ZIP:

LAGO VISTA

TX

78645-0001

PWS NAME:

CITY OF LAGO VISTA

SURVEY NUMBER:

0871728

PRIMARY USED COUNTY:

TRAVIS

PRIMARY USED RIVER BASIN:

COLORADO

ORGANIZATION MAIN PHONE:

512-267-1155

MAIN EMAIL:

WEB:

www.lagovistatexas.org

PWS CODE:

2270092

INTAKE:

Water Type		County	Basin	Reservoir / River	Water Right #	% Consumed	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
SURFACE WATER SELF SUPPLIED		TRAVIS	COLORADO	TRAVIS LAKE/RESERVOIR		100.00	M	N	0.00	484,762,000	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
32,851,000	30,024,000	29,655,000	31,130,000	40,766,000	47,666,000	58,464,000	58,622,000	40,813,000	45,455,000	37,388,000	31,928,000

CONNECTIONS & USAGE:

	CONNECTIONS	VOLUME (GALLONS)
TOTAL METERED RETAIL:	4,526	483,062,000
Residential - Single Family	4,241	478,900,000
Residential - Multi Family	0	0
Institutional	0	0
Commercial	285	4,162,000
Industrial	0	0
Agriculture	0	0
Reuse	0	0
TOTAL UNMETERED:	0	1,700,000

WATER SYSTEM INFORMATION:

Estimated full-time residential population served directly by this system	14,153
---	--------

ATTACHMENT L
LAKEWAY MUD SUPPORTING
DOCUMENTATION

LAKEWAY MUNICIPAL UTILITY DISTRICT

1097 LOHMANS CROSSING • LAKEWAY, TX 78734-4459

MAIN OFFICE: (512) 261-6222 x110 • CUSTOMERSERVICE@LAKEWAYMUD.ORG

AFTER HOURS EMERGENCY: (512) 314-7590 • FAX (512) 261-6681



May 15, 2023

Mr. Adam Conner
Freese and Nichols
10431 Morado Cir #300
Austin, TX 78759

Transmitted via email: adam.conner@freese.com

**RE: Region K Population & Demand Estimates
Lakeway MUD - Request for Revision**

Mr. Conner,

After review of Lakeway MUD's (LMUD's) Region K 2030 through 2080 population and demand projections, it was found that the estimates are in need of slight revision.

The current Region K population and demand estimates were determined to be 16-21% low initially in 2030, compared to recent actual population and use, and a slightly higher ultimately in 2080 due to lack of consideration for area buildout. The projected distribution is consequently different and requested revisions are provided in more detail, below.

Population Estimates

The current 2022 LMUD population already exceeds the estimates that Region K has for 2030. With additional consideration of the anticipated full buildout of the area by the year 2044, the revised population estimates are noted in the table below.

Year	P2030	P2040	P2050	P2060	P2070	P2080
Population	11,678	12,047	12,194	12,194	12,194	12,194

The above estimates assume 2.46 persons per household, per the 2017-2021 US Census.

Demand Estimates

The estimated value of 226 Base GPCD in the draft Region K estimates is low. Upon evaluation of recent 2022 potable water usage, the actual average gallons per capita day (gpcd) was 235 gpcd. The Lakeway area has a notable transient population of lake-area vacation and rental properties that impacts this resulting value.

While demand during 2022 is not as extreme as the 2011 drought of record demand, the value is recent and representative enough of high demand conditions to be adequate for planning purposes. The 235 gpcd baseline value from 2022 was used to develop the revised demand estimates, as noted in the table below.

Year	D2030	D2040	D2050	D2060	D2070	D2080
Demand (acre-ft)	3,069	3,166	3,205	3,205	3,205	3,205

Should you have any questions, please contact me at (512) 261-6222, extension 140.

Respectfully,



Earl Foster, General Manager

Cc: Mr. Neil Deeds, INTERA, via email at ndeeds@intera.com

LAKEWAY MUNICIPAL UTILITY DISTRICT

1097 LOHMANS CROSSING • LAKEWAY, TX 78734-4459

MAIN OFFICE: (512) 261-6222 x110 • CUSTOMERSERVICE@LAKEWAYMUD.ORG

AFTER HOURS EMERGENCY: (512) 314-7590 • FAX (512) 261-6681



May 25, 2023

Mr. Adam Conner
Freese and Nichols
10431 Morado Cir #300
Austin, TX 78759

Transmitted via email: adam.conner@freese.com

**RE: Region K Population & Demand Estimates
Lakeway MUD – Supplement to 5/15/23 Request for Revision**

Mr. Conner,

This letter is to supplement the prior LMUD revision request and is in response to our subsequent discussions with regards to accurate account of raw water use, as well as development of baseline gallons per capita day (GPCD) data. As LMUD is responsible for ensuring that adequate future supplies are available to meet community needs through retail and contractual wholesale requirements, the revisions provided in the May 15, 2023 letter reflected all related water usage. This supplement, however, provides additional information that separates out the LMUD-only retail information, as well as addresses LMUD's proposed baseline GPCD further.

It is important to highlight that removal of the delivered wholesale component results in inaccurately higher values in LMUD's baseline GPCD, for the following reasons:

- As the wholesale provided by LMUD traverses within and to the far extents of LMUD's distribution system prior to delivery, the system water losses associated with the wholesale delivery portion remain within LMUD's baseline GPCD.
- As the most recent 2-year wholesale deliveries have averaged roughly 10% of LMUD distributed flows and system water loss has been on the order of 15%, this inaccuracy is notable.

This inaccuracy should be addressed in the plan chapter for population and demand.

A further adjustment to Lakeway MUD's (LMUD's) Region K 2030 through 2080 population and demand projections has been provided to remove the wholesale component. Even with LMUD-only retail considered, the current Region K population and demand estimates were determined to be 9-16% low initially in 2030, compared to recent actual population and use, and slightly higher ultimately in 2080 due to lack of consideration for area buildout. The projected distribution is consequently different and requested revisions are provided in more detail, as follows.

Population Estimates

The current 2022 LMUD-only retail population already exceeds the estimates that Region K has for 2030. With additional consideration of the anticipated full buildout of the area by the year 2044, the revised population estimates are noted in the table as follows.

Year	P2030	P2040	P2050	P2060	P2070	P2080
Population	10,726	11,095	11,242	11,242	11,242	11,242

The above estimates assume 2.46 persons per household, per the 2017-2021 US Census.

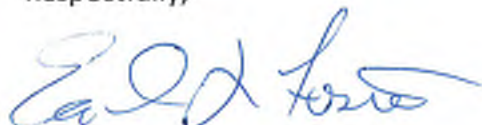
Demand Estimates

It should be noted that the estimated value of 226 Base GPCD in the current draft Region K estimates is low.

You indicated that TWDB requires use of 2011 data for baseline development which would result in a value of 263 GPCD. LMUD had some data reporting issues during the 2011 timeframe, but with applied data corrections, a revised baseline value of 253 GPCD was derived and is recommended for use in the plan.

Should you have any questions, please contact me at (512) 261-6222, extension 140.

Respectfully,



Earl Foster, General Manager

Cc: Mr. Neil Deeds, INTERA, via email at ndeeds@intera.com

ATTACHMENT M

LEANDER SUPPORTING DOCUMENTATION

CITY OF LEANDER - MODIFIED POPULATION AND WATER DEMAND PROJECTIONS

Population/Connections/LUEs						Internal Leander Demand			Total Leander Demand with Wholesale			
End of Year		No. of Domestic Units	Population	No. of Water Connections	Connection Growth Rate	No. of LUEs	Average Day Internal Leander Demand (MGD)	Max Day Internal Leander Demand (MGD)	Average Flow per Person per Day (gpcd)	Total Wholesale Contracts - Max Day Demand (MGD)	Average Day Demand with Wholesale (MGD)	Max Day Demand with Wholesale (MGD)
2015	Historical/Actual	12,922	43,418	13,092		15,449	4.75	11.90	109.46	0.00	4.75	11.90
2016		14,729	49,489	14,703	12.3%	17,350	5.50	11.50	111.19	0.00	5.50	11.50
2017		16,420	55,171	16,463	12.0%	19,426	6.16	10.90	111.57	0.00	6.16	10.90
2018		18,120	60,883	18,063	9.7%	21,314	6.89	12.42	113.13	0.32	7.05	12.74
2019		19,999	67,197	19,887	10.1%	23,467	7.87	14.94	117.07	0.35	8.16	15.29
2020		22,760	76,474	22,971	15.5%	27,106	9.77	17.63	127.74	0.52	9.49	16.79
2021		25,857	86,880	26,026	13.3%	30,711	8.34	14.44	96.00	0.64	8.66	14.74
2022		28,242	94,328	28,548	9.7%	33,687	10.00	17.77	106.01	3.43	17.77	20.46
2023	Projected	31,066	101,897	31,403	10.0%	37,055	12.56	23.55	123.27	4.00	14.69	27.55
2024		34,173	112,087	34,543	10.0%	40,761	13.82	25.91	123.27	4.00	15.95	29.91
2025		37,590	123,296	37,997	10.0%	44,837	15.20	28.50	123.27	4.00	17.33	32.50
2026		40,409	132,543	40,847	7.5%	48,200	16.34	30.64	123.27	4.00	18.47	34.64
2027		43,440	142,483	43,911	7.5%	51,815	17.56	32.93	123.27	4.00	19.70	36.93
2028		46,698	153,170	47,204	7.5%	55,701	18.88	35.40	123.27	4.00	21.01	39.40
2029		49,033	160,828	49,564	5.0%	58,486	19.83	37.17	123.27	1.00	20.36	38.17
2030		51,485	168,870	52,042	5.0%	61,410	20.82	39.03	123.27	1.00	21.35	40.03
2031		54,059	177,313	54,645	5.0%	64,481	21.86	40.98	123.27	1.00	22.39	41.98
2032		55,681	182,632	56,284	3.0%	66,415	22.51	42.21	123.27	1.00	23.05	43.21
2033		57,351	188,111	57,972	3.0%	68,407	23.19	43.48	123.27	1.00	23.72	44.48
2034		59,072	193,755	59,712	3.0%	70,460	23.88	44.78	123.27	1.00	24.42	45.78
2035		60,253	197,630	60,906	2.0%	71,869	24.36	45.68	123.27	1.00	24.90	46.68
2036		61,458	201,582	62,124	2.0%	73,306	24.85	46.59	123.27	1.00	25.38	47.59
2037		62,687	205,614	63,366	2.0%	74,772	25.35	47.52	123.27	1.00	25.88	48.52
2038		63,941	209,726	64,634	2.0%	76,268	25.85	48.48	123.27	1.00	26.39	49.48
2039		64,580	211,824	65,280	1.0%	77,031	26.11	48.96	123.27	1.00	26.65	49.96
2040		65,226	213,942	65,933	1.0%	77,801	26.37	49.45	123.27	1.00	26.91	50.45
2041		65,552	215,012	66,263	0.5%	78,190	26.51	49.70	123.27	1.00	27.04	50.70
2042		65,880	216,087	66,594	0.5%	78,581	26.64	49.95	123.27	1.00	27.17	50.95

1. Population = 3.28 people/Domestic Unit for 2023 and beyond, 3.34 for 2022, and 3.36 before 2022
2. No. of LUEs = 1.18 x No. of Water Connections (based on 2020 review of actual connections/meters)
3. Assume Average Day Demand = 400 gpd/Connection (~340 gpd/LUE)
4. Max Day Demand = 750 gpd/Connection (~635 gpd/LUE)
5. For population and water projections, utilizing a modified growth rate that is more aggressive than Comp Plan
6. Projections are based on demands with no watering restrictions, impacts of new irrigation and tiered rate ordinances are not factored in currently, pending data
7. Assume buildout of City is 225,000 population

ATTACHMENT N

MARBLE FALLS DRAFT IMPACT FEE ANALYSES

Project: City of Marble Falls Impact Fee Study
Location: City Council Chambers
Date: September 8, 2022
Title: Impact Fee Advisory Committee – Meeting 2 Data Packet

Start Time: 6:00 pm
End Time:

A. Development Map & Summary

- Attachment A1 – Development Map
- Attachment A2 – Development Projections Summary

B. Population Projections

- Attachment B – Population Growth Scenarios Chart

C. Future Land Use Map & Summary

- Attachment C1 – Future Land Use Map
- Attachment C2 – Future Land Use Area Summary

D. Water Service Area Map

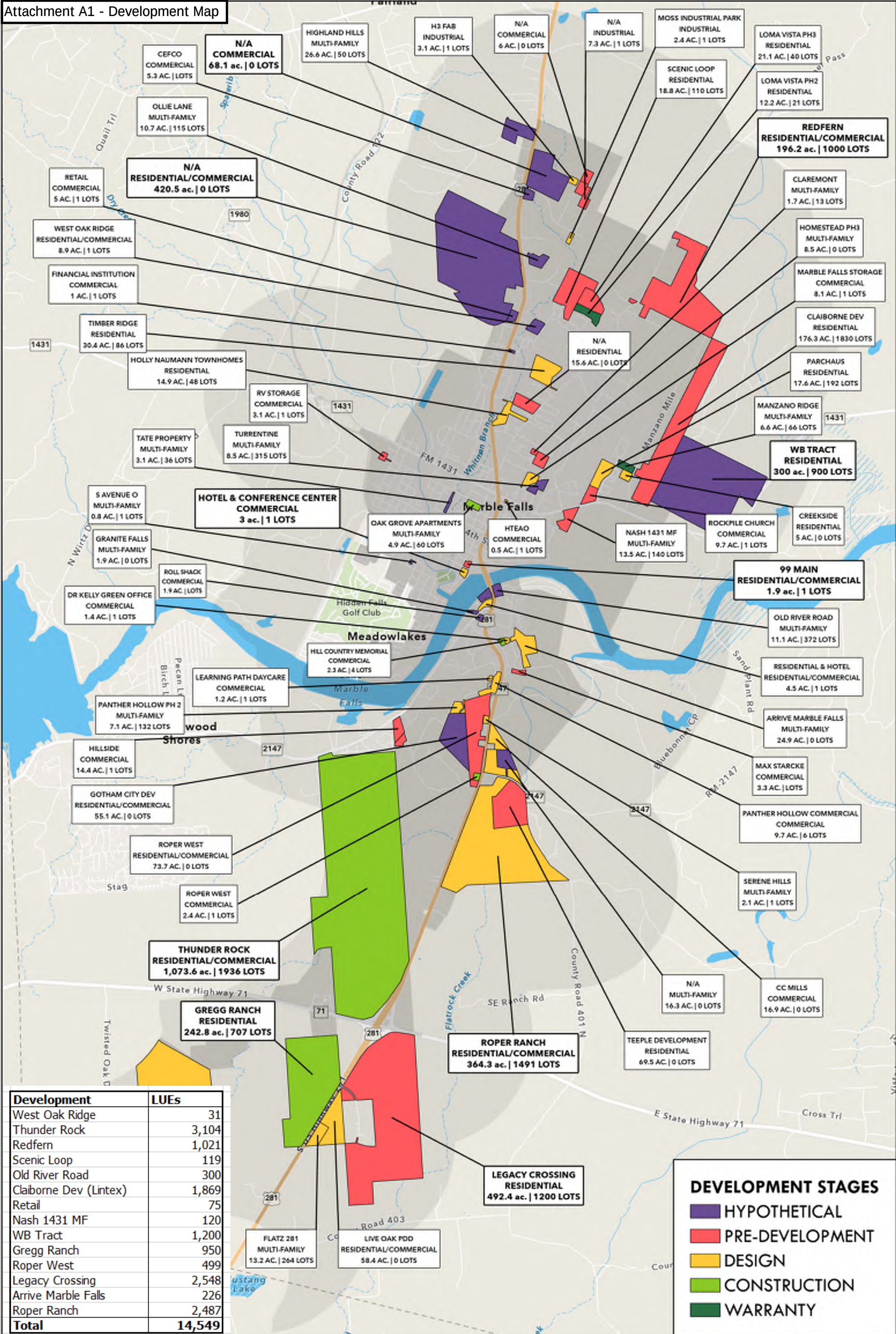
- Attachment D – Water Service Area Map

E. Wastewater Service Area Map

- Attachment E – Wastewater Service Area Map

F. Future Water/Sewer Connections

- Attachment F Water Connections Summary

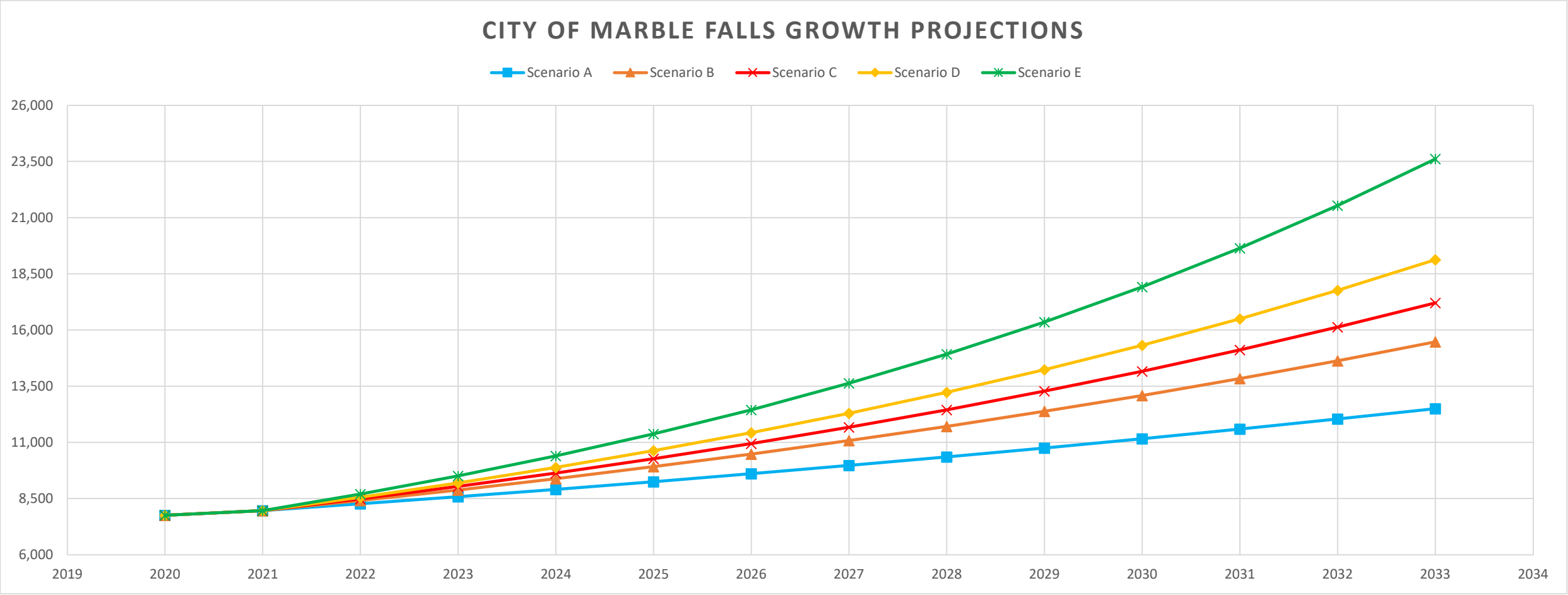


Development Summary - Northside

Type of Development	Name	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SF and/or Master Planned	Claiborne (Lintex) Development	0	50	50	50	50	50	50	50	50	50	50
	Redfern	0	0	100	0	150	0	100	0	150	0	100
	WB Tract	0	0	0	140	240	140	140	140	140	140	140
	Ronhaar/Shiflett Tract	0	0	0	100	0	100	50	50	50	50	50
	NE corner Resource/281	0	0	0	50	25	25	25	25	0	0	0
Multifamily	Parchaus MF	0	200	0	0	0	0	0	0	0	0	0
	Timber Ridge SF	0	0	85	0	0	0	0	0	0	0	0
	Ollie Ln MF	0	0	150	0	0	0	0	0	0	0	0
	Serene Falls	0	0	80	0	0	0	0	0	0	0	0
	99 Main	0	0	0	100	0	0	0	0	0	0	0
	Homestead Phase 3 MF	0	0	0	50	0	0	0	0	0	0	0
	Nash MF	0	0	0	150	0	0	0	0	0	0	0
	12th Street MF	0	0	300	0	0	0	0	0	0	0	0
	Public Housing Development (PFC)	0	0	288	0	0	0	0	0	0	0	0
Major Commercial / Misc.	Conference Center	0	0	150	0	0	0	0	0	0	0	0
	River Road waterfront (with MF)	0	0	150	50	0	0	0	0	0	0	0
	Miscellaneous In-fill Development	20	100	50	50	50	50	50	50	50	50	50
Annual Total LUEs		20	350	1,403	740	515	365	415	315	440	290	390
Cumulative Total LUEs		20	370	1,773	2,513	3,028	3,393	3,808	4,123	4,563	4,853	5,243
Cumulative Total Population		48	892	4,273	6,056	7,297	8,177	9,177	9,936	10,997	11,696	12,636

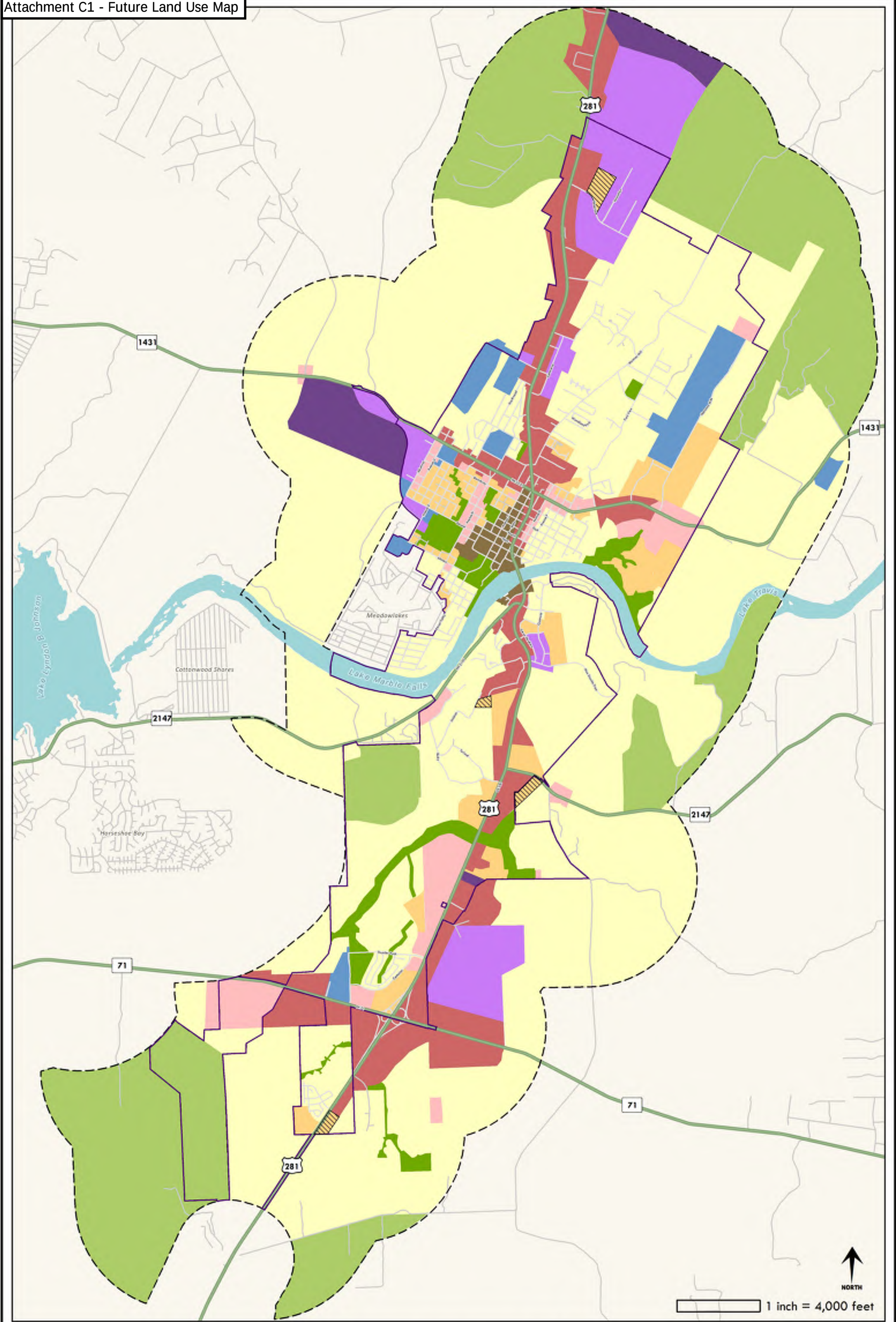
Development Summary - Southside

Type of Development	Name	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
SF and/or Master Planned	Gregg Ranch	155	0	121	0	102	0	46		151	0	141
	Thunder Rock	0	872	0	500	0	467	0	293	0	295	0
	Roper Ranch	0	0	200	200	200	200	200	200	200	200	200
	Legacy Crossing	0	200	200	200	200	200	200	200	200	200	150
	West Roper	0	0	250	46	43	78	68	15	0	0	0
Multifamily	Triangle MF	0	50	0	200	0	0	0	0	0	0	0
	Arrive MF	0	0	216	0	0	0	0	0	0	0	0
	Panther Hollow Ph 2. MF	0	0	200	200	0	0	0	0	0	0	0
Major Commercial / Misc.	Panther Hollow Commercial	0	10	30	10	0	0	0	0	0	0	0
	Miscellaneous In-fill Development	20	20	20	20	20	20	20	20	20	20	20
Annual Total LUEs		175	1,152	1,237	1,376	565	965	534	728	571	715	511
Cumulative Total LUEs		175	1,327	2,564	3,940	4,505	5,470	6,004	6,732	7,303	8,018	8,529
Cumulative Total Population		422	3,198	6,179	9,495	10,857	13,183	14,470	16,224	17,600	19,323	20,555



	Annual Growth Rate (%)	Location	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Scenario A	4%	City Limits	7,044	7,227	7,516	7,817	8,129	8,455	8,793	9,144	9,510	9,891	10,286	10,698	11,126	11,571
	2%	ETJ	715	735	750	765	780	796	811	828	844	861	878	896	914	932
		TOTAL	7,759	7,962	8,266	8,581	8,909	9,250	9,604	9,972	10,355	10,752	11,165	11,594	12,040	12,503
Scenario B	6%	City Limits	7,044	7,227	7,661	8,120	8,607	9,124	9,671	10,252	10,867	11,519	12,210	12,942	13,719	14,542
	2%	ETJ	715	735	750	765	780	796	811	828	844	861	878	896	914	932
		TOTAL	7,759	7,962	8,410	8,885	9,387	9,920	10,483	11,079	11,711	12,380	13,088	13,838	14,633	15,474
Scenario C	7%	City Limits	7,044	7,227	7,733	8,274	8,853	9,473	10,136	10,846	11,605	12,417	13,287	14,217	15,212	16,277
	2%	ETJ	715	735	750	765	780	796	811	828	844	861	878	896	914	932
		TOTAL	7,759	7,962	8,483	9,039	9,633	10,269	10,948	11,674	12,449	13,279	14,165	15,113	16,126	17,209
Scenario D	8%	City Limits	7,044	7,227	7,805	8,430	9,104	9,832	10,619	11,468	12,386	13,377	14,447	15,603	16,851	18,199
	2%	ETJ	715	735	750	765	780	796	811	828	844	861	878	896	914	932
		TOTAL	7,759	7,962	8,555	9,194	9,884	10,628	11,430	12,296	13,230	14,238	15,325	16,499	17,765	19,131
Scenario E	10%	City Limits	7,044	7,227	7,950	8,745	9,619	10,581	11,639	12,803	14,083	15,492	17,041	18,745	20,619	22,681
	2%	ETJ	715	735	750	765	780	796	811	828	844	861	878	896	914	932
		TOTAL	7,759	7,962	8,699	9,509	10,399	11,377	12,451	13,631	14,928	16,353	17,919	19,641	21,533	23,614

1. 2020 & 2021 City Population is based on U.S. Census Data Estimates
2. TWDB Est. ~4% Annual Growth



This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of boundary properties.

Adopted: July 2018
Updated: September 2022



Land Use Assumptions

Impact Fee Update

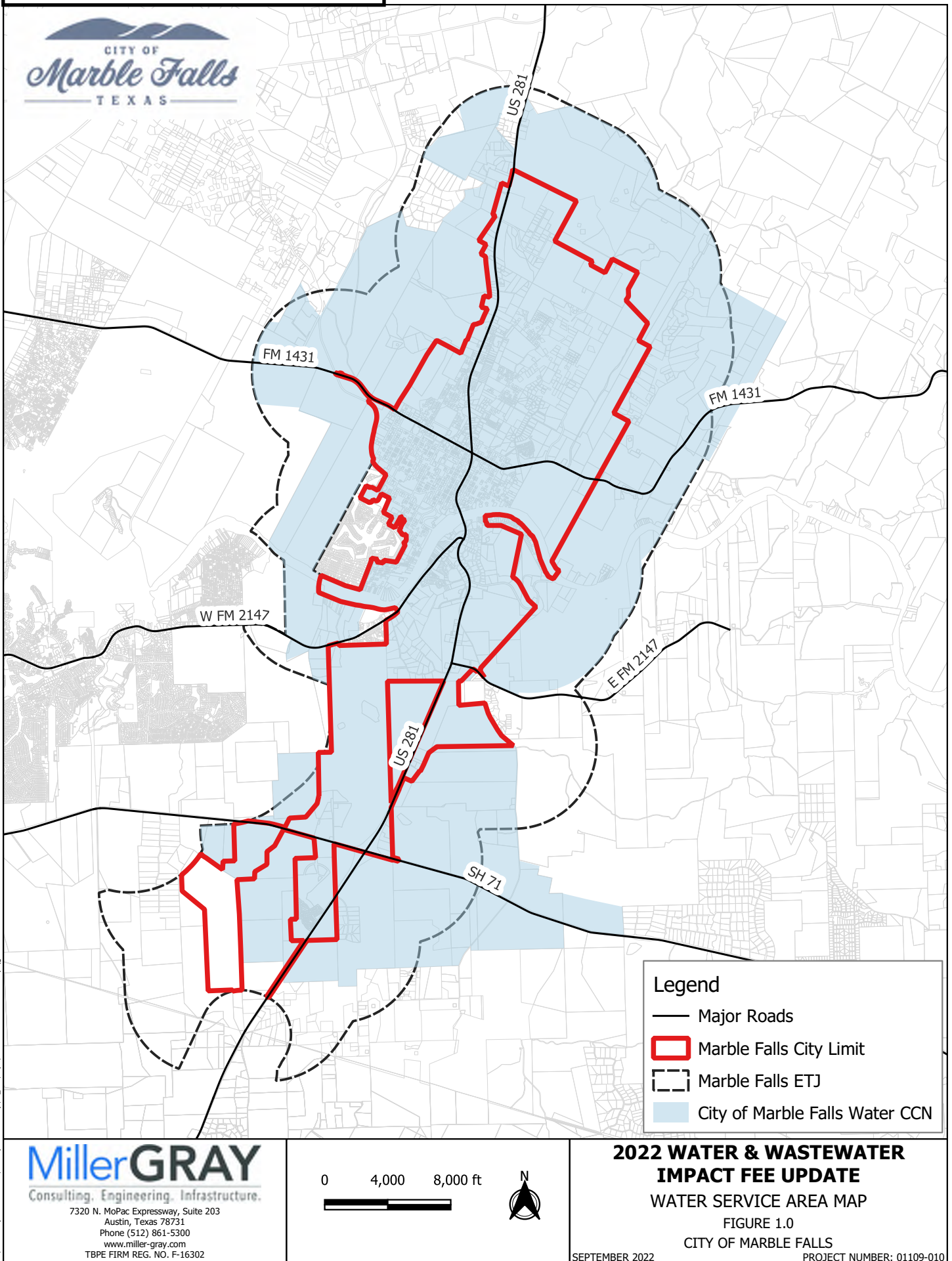
- | | | | |
|--------------------------|--------------------------|---------------|------------------------|
| Parks & Open Space | Transitional Residential | Business Park | Public & Institutional |
| Ranch Rural & Estate | Neighborhood Commercial | Industrial | Multi Family |
| Neighborhood Residential | Corridor Commercial | Downtown | |

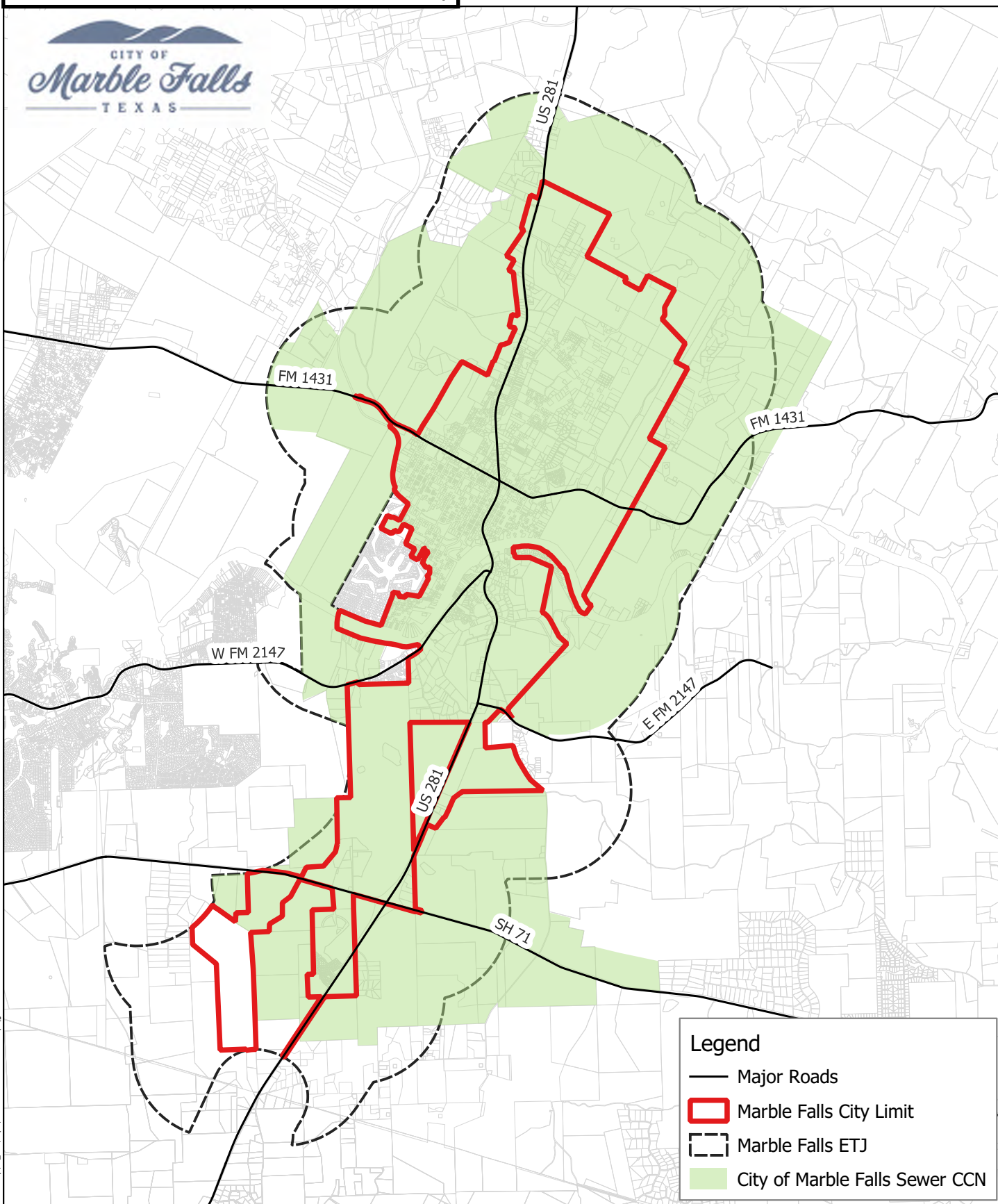
Attachment C2 - Future Land Use Area Summary

Project: Impact Fee Study
Job No.: 01109-010
Date: 9/1/2022
By: SCS/MG
Title: Future Land Use

Future Land Use Summary Table

Future Land Use Classification	Total Area (Acres)	Percent (%)
Business Park	1,352	4.8%
Corridor Commercial	2,129	7.6%
Downtown	163	0.6%
Industrial	514	1.8%
Lake Marble Falls	523	1.9%
Neighborhood Commercial	750	2.7%
Neighborhood Residential	14,778	52.5%
Parks & Open Space	571	2.0%
Public & Institutional	536	1.9%
Ranch Rural & Estate	5,850	20.8%
Transitional Residential	1,001	3.6%





MillerGRAY
Consulting. Engineering. Infrastructure.

7320 N. MoPac Expressway, Suite 203
Austin, Texas 78731
Phone (512) 861-5300
www.miller-gray.com
TBPE FIRM REG. NO. F-16302

0 4,000 8,000 ft



**2022 WATER & WASTEWATER
IMPACT FEE UPDATE**
WASTEWATER SERVICE AREA MAP

FIGURE 1.0
CITY OF MARBLE FALLS

SEPTEMBER 2022

PROJECT NUMBER: 01109-010

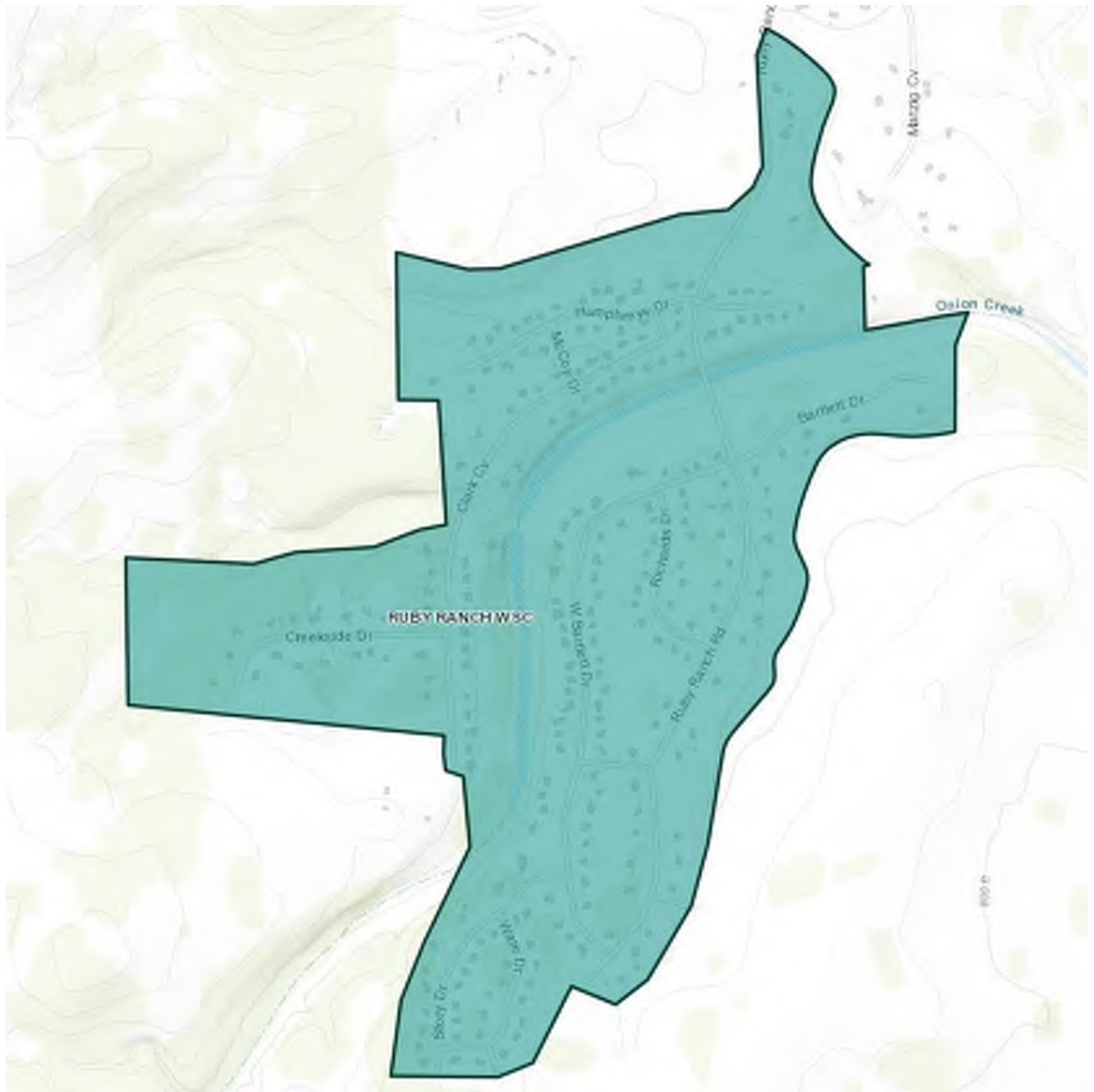
Attachment F - Water Connections Summary

	CURRENT				Annual Growth Rate (4%)			Annual Growth Rate (6%)			Annual Growth Rate (8%)			Annual Growth Rate (10%)			Annual Growth Rate (12%)		
Water Meter Size	Living Unit Equivalents (LUEs per Meter) (a)	Number of Meters in 2022 (b)	Number of LUEs in 2022	Equivalent Population	Number of Meters in 2032	Number of LUEs in 2032	Equivalent Population	Number of Meters in 2032	Number of LUEs in 2032	Equivalent Population	Number of Meters in 2032	Number of LUEs in 2032	Equivalent Population	Number of Meters in 2032	Number of LUEs in 2032	Equivalent Population	Number of Meters in 2032	Number of LUEs in 2032	Equivalent Population
WATER																			
3/4"	1.00	2,920	2,920	7,037	4,322	4,322	10,417	5,229	5,229	12,603	6,304	6,304	15,193	7,574	7,574	18,253	9,069	9,069	21,856
1"	1.67	415	693	1,670	614	1,026	2,472	743	1,241	2,991	896	1,496	3,606	1,076	1,798	4,332	1,289	2,153	5,188
1.5"	3.33	30	100	241	44	148	356	54	179	431	65	216	520	78	259	624	93	310	748
2"	5.33	156	831	2,004	231	1,231	2,966	279	1,489	3,589	337	1,795	4,326	405	2,157	5,198	485	2,582	6,224
3"	10.00	11	110	265	16	163	392	20	197	475	24	237	572	29	285	688	34	342	823
4"	16.67	8	133	321	12	197	476	14	239	576	17	288	694	21	346	834	25	414	998
6"	33.33	7	233	562	10	345	832	13	418	1,007	15	504	1,214	18	605	1,458	22	725	1,746
Total Water		3,547	5,021	12,101	5,250	7,432	17,912	6,352	8,992	21,671	7,658	10,840	26,125	9,200	13,023	31,386	11,016	15,595	37,583

(a) Derived from AWWA C700-C703 standards for continuous rated flow performance scaled to 3/4" meter.

(b) Source: City of Marble Falls, meter count as of July 2022

ATTACHMENT O
RUBY RANCH WSC AERIAL



ATTACHMENT P
SAN SABA WATER USE SURVEYS

TEXAS WATER DEVELOPMENT BOARD
WATER USE SURVEY

WATER USE IN CALENDAR YEAR: 2020

SYSTEM NAME:

CITY OF SAN SABA

OPERATOR NAME:

MULTIPLE SURVEY ORG:

MAILING ADDRESS 1:

303 S. CLEAR

MAILING ADDRESS 2:

CITY/STATE/ZIP:

SAN SABA

TX

76877-

PWS NAME:

CITY OF SAN SABA

SURVEY NUMBER:

0770600

PRIMARY USED COUNTY:

SAN SABA

PRIMARY USED RIVER BASIN:

COLORADO

ORGANIZATION MAIN PHONE:

325-372-8905

MAIN EMAIL:

sswd@centex.net

WEB:

Jesse Hunt

PWS CODE:

2060001

INTAKE:

Water Type		County	Basin	Aquifer	Well Name (if applicable)		Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
GROUND WATER SELF SUPPLIED		SAN SABA	COLORADO	OTHER AQUIFER	3 - BY WAREHOUSE		M	N	0.00	82,662,000	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
7,450,000	3,414,000	3,715,000	5,496,000	7,586,000	9,752,000	16,195,000	16,628,000	3,318,000	4,375,000	3,434,000	1,299,000
Water Type		County	Basin	Aquifer	Well Name (if applicable)		Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
GROUND WATER SELF SUPPLIED		SAN SABA	COLORADO	OTHER AQUIFER	4		M	N	0.00	179,424,000	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
12,272,000	9,969,000	12,420,000	12,561,000	16,396,000	17,120,000	17,180,000	19,135,000	14,547,000	18,015,000	15,125,000	14,684,000
Water Type		County	Basin	Reservoir / River	Water Right #	% Consumed	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
SURFACE WATER SELF SUPPLIED		SAN SABA	COLORADO	COLORADO RUN OF RIVER	01906-0-	100.00	E	N	0.00	35,121,600	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
2,325,000	900,000	2,565,000	3,471,600	4,290,000	4,890,000	5,430,000	4,650,000	4,050,000	1,425,000	675,000	450,000
Water Type		County	Basin	Reservoir / River	Water Right #	% Consumed	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
SURFACE WATER SELF SUPPLIED		SAN SABA	COLORADO	COLORADO RUN OF RIVER	01903-0-	100.00	E	N	0.00	58,714,000	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
986,000	2,220,000	10,272,000	1,050,000	7,305,000	6,945,000	0	5,565,000	16,092,000	3,929,000	0	4,350,000

SALES:

BUYER	SALE TYPE (MUNICIPAL or INDUSTRIAL)	COUNTY NAME	BASIN NAME	WATER TYPE	AQUIFER NAME (if GW)	SURFACE WATER Name (if SW)	RAW or TREATED	TOTAL VOLUME (GALLONS)
CITY OF GOLDTHWAITE	M			SURFACE WATER			Raw	21,604,000
NORTH SAN SABA WSC	M			GROUND WATER			Treated	46,323,400

COUNTY CONNECTIONS:

COUNTY NAME	TOTAL CONNECTIONS
MILLS	1
SAN SABA	1,372

CONNECTIONS & USAGE:

	CONNECTIONS	VOLUME (GALLONS)
TOTAL METERED RETAIL:	1,362	216,993,278
Residential - Single Family	1,078	105,729,752
Residential - Multi Family	0	0
Institutional	0	0
Commercial	283	105,930,626
Industrial	1	5,332,900
Agriculture	0	0
Reuse	0	0
TOTAL UNMETERED:	10	3,592,450

WATER SYSTEM INFORMATION:

Estimated full-time residential population served directly by this system	3,128
---	-------

TEXAS WATER DEVELOPMENT BOARD
WATER USE SURVEY

WATER USE IN CALENDAR YEAR: 2021

SYSTEM NAME:

CITY OF SAN SABA

OPERATOR NAME:

MULTIPLE SURVEY ORG:

MAILING ADDRESS 1:

303 S. CLEAR

MAILING ADDRESS 2:

CITY/STATE/ZIP:

SAN SABA

TX

76877-

PWS NAME:

CITY OF SAN SABA

SURVEY NUMBER:

0770600

PRIMARY USED COUNTY:

SAN SABA

PRIMARY USED RIVER BASIN:

COLORADO

ORGANIZATION MAIN PHONE:

325-372-8905

MAIN EMAIL:

sswd@centex.net

WEB:

Jesse Hunt

PWS CODE:

2060001

INTAKE:

Water Type		County	Basin	Aquifer	Well Name (if applicable)		Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
GROUND WATER SELF SUPPLIED		SAN SABA	COLORADO	OTHER AQUIFER	3 - BY WAREHOUSE		M	N	0.00	60,270,000	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1,250,000	3,970,000	7,830,000	5,370,000	2,320,000	6,670,000	6,130,000	9,260,000	6,650,000	2,790,000	3,250,000	4,780,000
Water Type		County	Basin	Aquifer	Well Name (if applicable)		Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
GROUND WATER SELF SUPPLIED		SAN SABA	COLORADO	OTHER AQUIFER	4		M	N	0.00	204,290,000	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
16,820,000	15,120,000	15,220,000	13,680,000	16,970,000	18,000,000	20,880,000	20,490,000	19,590,000	17,350,000	16,580,000	13,590,000
Water Type		County	Basin	Reservoir / River	Water Right #	% Consumed	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
SURFACE WATER SELF SUPPLIED		SAN SABA	COLORADO	COLORADO RUN OF RIVER	01906-0-	100.00	E	N	0.00	31,410,000	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
2,880,000	1,950,000	2,445,000	0	0	2,520,000	3,015,000	3,645,000	3,750,000	4,560,000	2,265,000	4,380,000
Water Type		County	Basin	Reservoir / River	Water Right #	% Consumed	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
SURFACE WATER SELF SUPPLIED		SAN SABA	COLORADO	COLORADO RUN OF RIVER	01903-0-	100.00	E	N	0.00	54,228,061	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
18,642,000	0	6,225,000	5,100,000	2,115,000	3,453,061	0	0	5,263,000	8,453,000	3,177,000	1,800,000

SALES:

BUYER	SALE TYPE (MUNICIPAL or INDUSTRIAL)	COUNTY NAME	BASIN NAME	WATER TYPE	AQUIFER NAME (if GW)	SURFACE WATER Name (if SW)	RAW or TREATED	TOTAL VOLUME (GALLONS)
CITY OF GOLDTHWAITE	M			SURFACE WATER			Raw	23,550,000
NORTH SAN SABA WSC	M			GROUND WATER			Treated	40,790,000

COUNTY CONNECTIONS:

COUNTY NAME	TOTAL CONNECTIONS
MILLS	1
SAN SABA	1,370

CONNECTIONS & USAGE:

	CONNECTIONS	VOLUME (GALLONS)
TOTAL METERED RETAIL:	1,361	207,123,800
Residential - Single Family	1,072	83,960,017
Residential - Multi Family	0	0
Institutional	0	0
Commercial	282	108,957,677
Industrial	1	11,258,000
Agriculture	6	2,948,106
Reuse	0	0
TOTAL UNMETERED:	0	0

WATER SYSTEM INFORMATION:

Estimated full-time residential population served directly by this system	3,128
---	-------

ATTACHMENT Q
SCHULENBURG SUPPORTING
DOCUMENTATION

SCHULENBURG, TEXAS

Market Guide

City Contact Information

Tami Walker
City Administrator/City Secretary
City of Schulenburg

t.walker@schulenburgtx.org

(979) 743-4126 (office)
(979) 743-4398 (fax)

Peer Analysis

The Peer Analysis, built by Retail Strategies along with our analytics partner (Tetrad), identifies analogue retail nodes within a similar demographic and retail makeup. The Peer Analysis is derived from a 5 or 10 minute drive time from major comparable retail corridors throughout the country. The variables used are population, income, daytime population, market supply and gross leasable area. The following are retail areas that most resemble this core city:

Peer Trade Areas

Breckenridge, TX	3215 W Walker St
Eastland, TX	1371 E Main St
Yoakum, TX	304 W Grand Ave
Caldwell, TX	403 W Highway 21
Bowie, TX	1500 Highway 59 N
Fairfield, TX	300 W Commerce St

Demographics

(10-Minute Drive Time)



Average Age
42.4



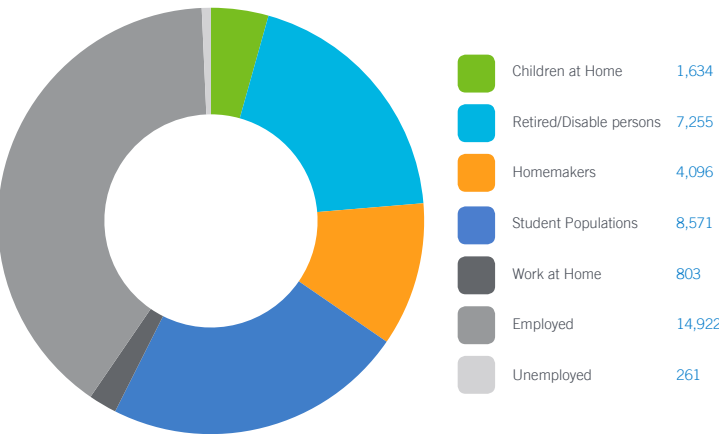
Median Household Income
\$45,537



Growth Rate
2.64%

Daytime Population 37,542

(Custom Trade Area)



GAP Analysis \$64,978,861

(Custom Trade Area)

The Gap Analysis is a summary of the primary spending Gaps segmented by retail category. It measures actual consumer expenditures within the City's trade area and compares it to the potential retail revenue generated by retailers in the same area. The difference between the two numbers reflects leakages, or the degree to which consumers travel outside the community for certain retail goods and services. The Gap analysis is a useful tool to gauge retail supply and demand within the community.



Other General Merchandise Stores	\$31,882,427
Clothing Store	\$12,790,639
Electronics & Appliance Stores	\$7,793,556
Furniture and Home Furnishings Stores	\$6,721,082
Shoe Stores	\$3,659,808
Beer, Wine & Liquor Stores	\$2,131,349

Focus Categories

The top categories for focused growth in the municipality are pulled from a combination of leakage reports, peer analysis, retail trends and real estate intuition. Although these are the top categories, our efforts are inclusive beyond the defined list.

Let us know how we can help you find a site!



Clothing & Accessories



Home Furnishings



Building Equipment



General Merchandise



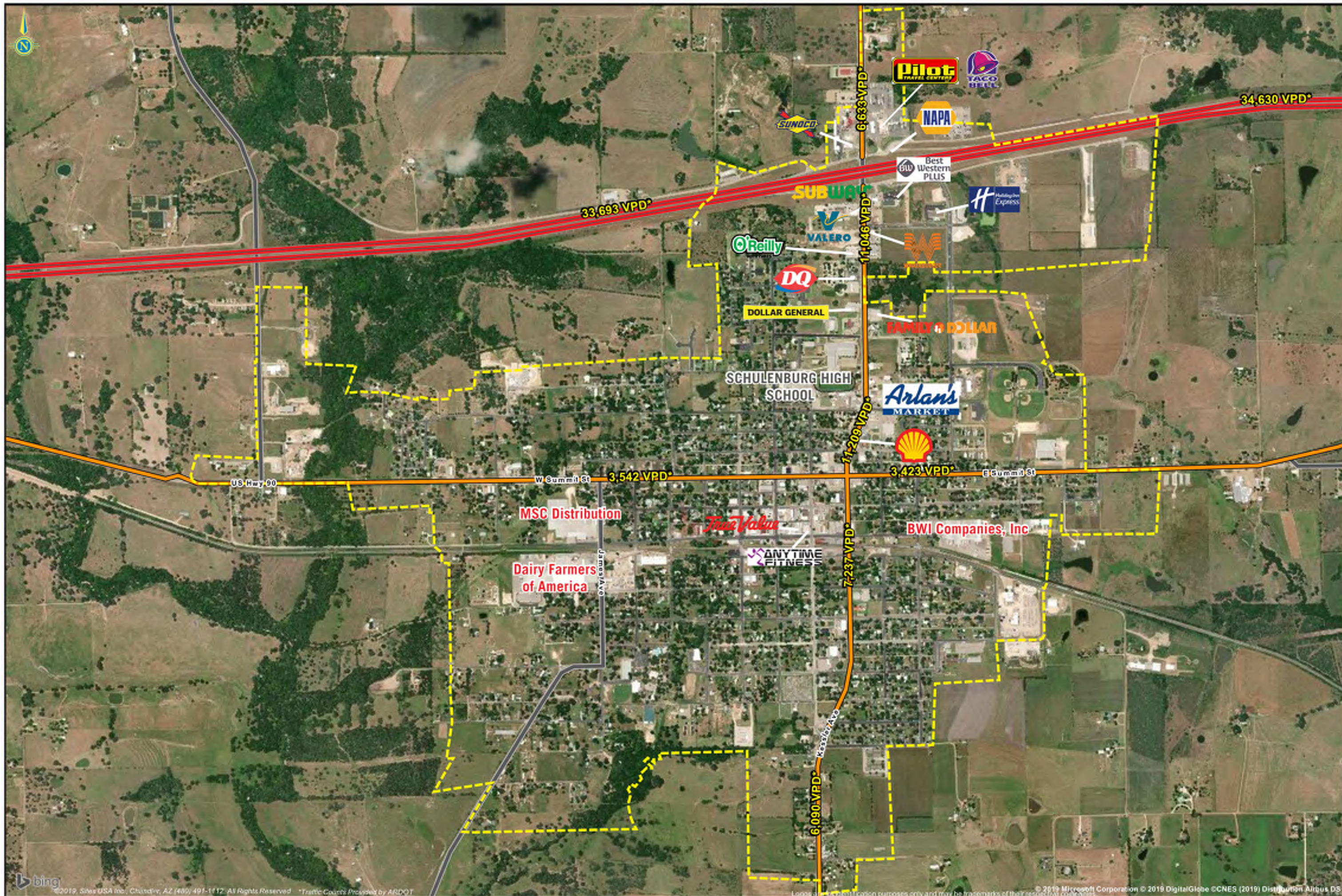
DEMOGRAPHIC PROFILE	3 Mile Radius	5 Mile Radius	10 Mile Radius
2018 Estimated Population	3,646	4,441	10,143
Daytime Population	4,655	5,089	9,865
Median HH Income	\$41,488	\$43,546	\$50,263
Number of Households	1,427	1,763	4,133

	5 Minute DT	10 Minute DT	15 Minute DT
2018 Estimated Population	3,339	6,172	11,130
Daytime Population	4,494	8,063	11,674
Median HH Income	\$41,183	\$45,537	\$48,297
Number of Households	1,298	2,451	4,460

*Source: STI PopStats



Follow us!



ATTACHMENT R
TRAVIS COUNTY MUD 18 AERIAL



ATTACHMENT S

TRAVIS COUNTY WCID 18 SUPPORTING
DOCUMENTATION



GENERAL MANAGER'S REPORT

TRAVIS COUNTY WATER CONTROL &
IMPROVEMENT DISTRICT # 18
Board of Directors Meeting



June 12, 2023

Travis County W.C.I.D. #18
June 12, 2023

- 1) The water loss for the time period from March 7 to April 6 is a loss of 9.74%. We have a loss of 12.93% for the year.
- 2) The pump #6 blockage still exists. The line will be in the lake needs to be cleaned. This may be part of the problem. The lower lake line that we thought was feeding these pumps was found to be incorrect. This means we need to clean the higher line in lake. We are scheduling this shortly. Pump #6 will need to be pulled simultaneously to make sure everything is clean upon completion of the project.
- 3) The new chemical room install has some action this month. Everything has been moved to the room. We are waiting on new meter specifications from Pall to complete this job. The system is in operation but just needs to have the metering of chemicals added. The current measurements are being done manually.
- 4) The west clarifier recirculation drive is being pumped down so repairs can be made. The trash pumps that pull the sludge out of the clarifier are not doing a good enough job. We are going to fill the clarifier with water and blast the sludge with air and waste it out.
- 5) We have removed the media from one of the underdrains at the conventional plant. This project is basically on hold now until the fall.
- 6) Water restrictions continue to call for mandatory two times a week watering. This has not changed since last month. The current lake levels are at 1,040,882 acre feet.
- 7) The radio communication between the Woodlake and Village West stations continues to have sporadic problems. We had one drop out this last month. We have altered the settings on the delays for the alarm. This has eliminated some of the alarms that are not needed. We still have allowed us time should we get an alarm to respond.
- 8) The Village water tank has been taken down and is waiting to be replaced at this time. Tank construction has begun. The old tank has been removed. Valves have been repaired now. We are just waiting on the new tank to come in.
- 9) The LAS building will begin in its construction soon. I am told that we are still waiting on permits.
- 10) A tree has fallen in the backyard of the office. I am trying to get either Austin Energy or just find a tree service to remove it. This is difficult due to the existing electrical lines by it. I will update at the meeting.

Travis County Water Control & Improvement District #18

Operations Report

For the Month of April 2023

GENERAL INFORMATION

Occupied Single Family Connections	1841	x 3 =	<u>5523</u>	Estimated Population
Vacant Single Family Connections	<u>42</u>			
Builder	<u>12</u>			
Vacant Builder	<u>1</u>			
Commercial Connections	<u>10</u>			
Vacant Commercial Connections	<u>2</u>			
Church	<u>4</u>			
District Meters	<u>2</u>			
Vacant District Meters	<u>0</u>			
Fire Hydrant	<u>0</u>			
Vacant Fire Hydrant	<u>0</u>			
Irrigation	<u>5</u>			
Vacant Irrigation	<u>1</u>			
 TOTAL CONNECTIONS	 <u>1920</u>			

BACTERIOLOGICAL ANALYSES

7 Water samples taken on 04/19/23 All bacterial samples were satisfactory

WATER ACCOUNTING

Pumped Through Finished WTP Meter					
from	<u>03/07/23</u>	to	<u>04/06/23</u>	<u>19,072,000</u>	Gallons
System Flushing					
from	<u>03/07/23</u>	to	<u>04/06/23</u>	<u>0</u>	Gallons
Total Gallons Billed					
from	<u>03/07/23</u>	to	<u>04/06/23</u>	<u>17,215,000</u>	Gallons
Total Adjustments To Billing					
from	<u>03/07/23</u>	to	<u>04/06/23</u>	<u>0</u>	Gallons
Gallons gain/loss				<u>(1,857,000)</u>	Gallons
Percentage gain/loss				-9.74%	

ATTACHMENT T

WELLS BRANCH MUD SUPPORTING
DOCUMENTATION

TEXAS WATER DEVELOPMENT BOARD
WATER USE SURVEY

WATER USE IN CALENDAR YEAR: 2021

SYSTEM NAME:

WELLS BRANCH MUD

OPERATOR NAME:

CROSSROADS UTILITY SERVICES

MULTIPLE SURVEY ORG:

MAILING ADDRESS 1:

2601 FOREST CREEK DR

MAILING ADDRESS 2:

CITY/STATE/ZIP:

ROUND ROCKTX78665-

PWS NAME:

WELLS BRANCH MUD 1

SURVEY NUMBER:

0607440

PRIMARY USED COUNTY:

TRAVIS

PRIMARY USED RIVER BASIN:

COLORADO

ORGANIZATION MAIN PHONE:

512-246-1400

MAIN EMAIL:

randerson@crossroadsus.com

WEB:

crossroadsus.com

PWS CODE:

2270227

INTAKE:

Water Type		County	Basin	Seller Name and/or Seller System		River / Reservoir	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
SURFACE WATER PURCHASED		TRAVIS	COLORADO	CITY OF AUSTIN	GENERAL DISTRIBUTION SYSTEM	AUSTIN LAKE/RESERVOIR	M	N	100.00	453,843,800	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
29,811,400	34,114,000	34,173,000	34,523,500	37,242,000	43,335,000	38,284,000	44,251,000	50,311,000	38,267,000	36,552,900	32,979,000

SALES:

BUYER	SALE TYPE (MUNICIPAL or INDUSTRIAL)	COUNTY NAME	BASIN NAME	WATER TYPE	AQUIFER NAME (if GW)	SURFACE WATER Name (if SW)	RAW or TREATED	TOTAL VOLUME (GALLONS)
GUNZE ELECTRONICS USA CORP	I			SURFACE WATER			Treated	145,000
DXC TECHNOLOGY SERVICES	I			SURFACE WATER			Treated	2,336,000
SWVP TANDEM BLVD LLC	I			SURFACE WATER			Treated	304,000

CONNECTIONS & USAGE:

	CONNECTIONS	VOLUME (GALLONS)
TOTAL METERED RETAIL:	7,471	435,963,000
Residential - Single Family	2,921	169,542,000
Residential - Multi Family	4,435	196,841,000
Institutional	38	20,713,000
Commercial	74	46,082,000
Industrial	3	2,785,000
Agriculture	0	0
Reuse	0	0
TOTAL UNMETERED:	0	0

WATER SYSTEM INFORMATION:

Estimated full-time residential population served directly by this system	19,377
---	--------

Units	NAME	SERVICE ADDRESS	April	March	February	January
284	RIDGECREST APARTMENTS	3101 WELLS BRANCH PKWY	1093	941	941	897
152	AUSTIN AFFORDABLE HOUSING CORP	2323 WELLS BRANCH PKWY	496	416	416	555
44	LAKES AT RENAISSANCE PARK APT	LAKE METER 831240 2IN	118	84	84	89
44	LAKES AT RENAISSANCE PARK APT	LAKE METER Bldgs G & H	224	148	148	144
44	LAKES AT RENAISSANCE PARK APT	LAKE METER 831594 2IN	111	96	96	104
44	LAKES AT RENAISSANCE PARK PAT	LAKE 2IN METER 831587	90	68	68	65
44	LAKES AT RENAISSANCE PARK APT	LAKE 2IN METER 831647	156	62	62	61
44	LAKES AT RENAISSANCE PARK APT	LAKE 2IN METER 831586	232	141	141	115
212	ARBORS OF WBCH C/O	1831 WELLS BRANCH PKWY	935	583	583	587
372	CHAPARRAL CREEK ASSOCIATES	14100 THERMAL DR	1467	1134	1134	1202
504	CAF CITYMARK MORGAN OWNER LLC	1801 WELLS BRANCH PKWY	2355	2400	2400	2518
308	PRESERVE AT WELLS BRANCH	1773 WELLS BRANCH PKWY	1245	1012	1012	1086
276	WYNDHAVEN WELLS BRANCH LLC	1720 WELLS BRANCH PKWY	671	959	959	1745
216	WELLS BRANCH SENIORS LTD	14320 TANDEM BLVD DOM	483	464	464	445
167	HFT HOLDING -WELLS BRANCH LLC	14300 TANDEM LN	339	248	248	264
576	BECKS AT WELLS BRANCH LP	2801 WELLS BRANCH PKWY	2210	1681	1681	1835
38	TAP PARK AT WELLS LLC	1915 WELLS BRANCH PKWY	53	43	43	86
38	TAP PARK AT WELLS LLC	1915 WELLS BRANCH PKWY	187	114	114	126
38	TAP PARK AT WELLS LLC	1915 WELLS BRANCH PKWY	258	438	438	16
38	TAP PARK AT WELLS LLC	1915 WELLS BRANCH PKWY	221	177	177	189
38	TAP PARK AT WELLS LLC	1915 WELLS BRANCH PKWY	147	110	110	214
38	TAP PARK AT WELLS LLC	1915 WELLS BRANCH PKWY	210	145	145	158
38	TAP PARK AT WELLS LLC	1915 WELLS BRANCH PKWY	130	142	142	133
336	MID AMERICA APARTMENTS, LP	1630 WELLS BRANCH PKWY	1989	1561	1561	1628
348	AURA 33 HUNDRED APARTMENTS	3300 WELLS BRANCH PKWY	660	626	765	908
154	AFFINITY AT WELLS BRANCH, LLC	14508 OWEN TECH BLVD-APT BLDG	615	611	517	556
87	TX OWEN TECH 2018 LTD	14011 OWEN TECH BLVD-DOM	72	124	337	350
87	TX OWEN TECH 2018 LTD	14011 OWEN TECH-DOM 2	118	111	149	169

4,609



Murfee Engineering Company

May 17th, 2023

Shirley Ross
District Manager
3000 Shoreline Drive
Austin, TX 78728

Re: Wells Branch MUD – Lower Colorado River Water Planning Group (Region K) Current and Proposed Multifamily Units

Ms. Ross:

Murfee Engineering Company (MEC) was approached by District staff to investigate current and projected multifamily development growth for the purposes of water usage demand planning. The following multifamily development unit counts have been collected from design engineers, design plans, and a City of Austin Service Extension Request as displayed in Table 1 below:

Table 1: Current and Proposed Multifamily Development

Development	Development Stage	Units	LUEs	Source
Lots 1A & 2 Austin Continuum Mixed Use Development	Proposed	350	329	SER
Lot 3 - Austin Continuum Multifamily	Proposed	345	215	Engineer
Alamo Wells (Ph O Sec 2) Multifamily	Proposed	317	222	Plans
2800 WB Pkwy Multifamily	Proposed	227	159	Engineer
Generational Housing Multifamily	Developed	174	122	LUE Table/Plans

If you have any questions, please do not hesitate to contact me.

Sincerely,

Evan Parker, E.I.T.

cc: Jason Baze, P.E. – MEC
MEC File No. 91070.506

ATTACHMENT U

HURST CREEK MUD 2022 WATER USE SURVEY

TEXAS WATER DEVELOPMENT BOARD
WATER USE SURVEY

WATER USE IN CALENDAR YEAR: 2022

SYSTEM NAME:

OPERATOR NAME:

MULTIPLE SURVEY ORG:

MAILING ADDRESS 1:

MAILING ADDRESS 2:

CITY/STATE/ZIP:

PWS NAME:

HURST CREEK MUD

102 TROPHY DR

AUSTINTX78738-

HURST CREEK MUD

SURVEY NUMBER:

PRIMARY USED COUNTY:

PRIMARY USED RIVER BASIN:

ORGANIZATION MAIN PHONE:

MAIN EMAIL:

WEB:

PWS CODE:

0410850

TRAVIS

COLORADO

512-261-6281

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2270172

INTAKE:

Water Type		County	Basin	Reservoir / River	Water Right #	% Consumed	Metered or Estimated	Brackish / Saline (Y or N)	% Treated Prior to Intake	Total Volume (gallons)	
SURFACE WATER SELF SUPPLIED		TRAVIS	COLORADO	TRAVIS LAKE/RESERVOIR		100.00	M	N	0.00	349,408,000	
JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
17,734,000	14,382,000	21,856,000	28,708,000	32,821,000	37,209,000	43,861,000	41,632,000	38,469,000	34,732,000	20,705,000	17,299,000
Water Type		County	Basin		Metered or Estimated		% Reuse for Industrial	% Reuse for Landscape	% Reuse for Agriculture	% Reuse for Other	Total Volume (gallons)
REUSE SELF SUPPLIED DIRECT NON-POTABLE		TRAVIS	COLORADO		M		0.00	100.00	0.00	0.00	72,082,000

COUNTY CONNECTIONS:

COUNTY NAME	TOTAL CONNECTIONS
TRAVIS	1,207

CONNECTIONS & USAGE:

	CONNECTIONS	VOLUME (GALLONS)
TOTAL METERED RETAIL:	1,204	301,581,000
Residential - Single Family	1,177	277,590,000
Residential - Multi Family	0	0
Institutional	13	12,710,000
Commercial	14	11,281,000
Industrial	0	0
Agriculture	0	0
Reuse	0	0
TOTAL UNMETERED:	0	38,776,000

WATER SYSTEM INFORMATION:

Estimated full-time residential population served directly by this system	2,550
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