FINAL PLAN

CHAPTER 2: POPULATION AND WATER DEMAND PROJECTIONS

Rio Grande Regional Water Plan

BV PROJECT NO. 411250

PREPARED FOR

Rio Grande Regional Water Planning Group

7 OCTOBER 2025

BLACK & VEATCH

Table of Contents

2.0 Population and Water Demand Projections 2-1
2.1 Introduction 2-1
2.2 Population and Municipal Demands 2-2
2.2.1 Population Projections 2-2
2.2.2 Municipal Water Demand Projections 2-8
2.3 Manufacturing Water Demand Projections 2-12
2.4 Steam-Electric Power Generation Water Demand Projections 2-13
2.5 Mining Water Demand Projections 2-15
2.6 Irrigation Water Demand Projections 2-17
2.7 Livestock Water Demand Projections 2-20
2.8 Major Water Providers 2-21

LIST OF TABLES

Table 2-1 Regional Demand Projections by Water Use Category (ac-ft/yr) 2-2
Table 2-2 Population Growth Projections for Region M 2-3
Table 2-3 Projected Population, by Decade 2-5
Table 2-4 GPCD and Projected Municipal WUG Demands by County (ac-ft/yr) 2-9
Table 2-5 Manufacturing Demand Projections by County (ac-ft/yr) 2-12
Table 2-6 Steam-Electric Power Generation Demands by County (ac-ft/yr) 2-15
Table 2-7 Mining Water Demand Projections (ac-ft/yr) 2-16
Table 2-8 Irrigation Demand Projections by County (ac-ft/yr) 2-18
Table 2-9 Projected Distribution of Water Rights and Supplies 2-19
Table 2-10 Livestock Category and Estimated Per Head Daily Water Use 2-20
Table 2-11 Livestock Demand Projections (ac-ft/yr) 2-20
Table 2-12 Region M Major Water Providers 2-21

LIST OF FIGURES

Figure 2-1 Aggregated Demands for Each Water User Group in Region M (ac-ft/yr) 2-1
Figure 2-2 Population Centers for Region M 2-3
Figure 2-3 2030 Population Distribution Among the Eight Counties of Region M (ac-ft/yr) 2-4
Figure 2-4 Distribution of Water Right Types (Maximum Diversion) 2-19
Figure 2-5 Lower Rio Grande Valley Irrigation Districts 2-22

Final Draft

LIST OF APPENDICES

Appendix 2A. Relevant Reports from the 2027 Regional and State Water Planning Database (DB27)

Appendix 2B. Passive Conservation Water Savings by Decade

Appendix 2C. Major Water Providers Population and Water Demand Projections

Final Draft

List of Abbreviations

ac-ft/yr	Acre-Feet per Year
BEG	Bureau of Economic Geology
DB27	2027 Regional and State Water Planning Database
DMI	Domestic/Municipal/Industrial
GPCD	Gallons per Capita per Day
MUD	Municipal Utility District
MWP	Major Water Provider
NASS	National Agricultural Statistical Service
PUD	Public Utility District
RWP	Regional Water Plan
RWPG	Regional Water Planning Group
SUD	Special Utility District
SWP	State Water Plan
TSDC	Texas State Data Center
TWC	Texas Workforce Commission
TWDB	Texas Water Development Board
WAM	Water Availability Model
WCID	Water Control & Improvement District
WID	Water Improvement District
WMS	Water Management Strategy
WSC	Water Supply Corporation
WUG	Water User Group
WWP	Wholesale Water Providers

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2.0 Population and Water Demand Projections

2.1 Introduction

To plan for future growth, current water demands must be quantified, and trends must be identified for change in demand. Region M has experienced changes in both the quantity and type of demands as a result of population growth, changes in irrigated farmland and the type of crops that are grown in any given year, changes in oil and gas mining operations, and other factors.

The Texas Water Development Board (TWDB) collaborated with the Regional Water Planning Groups (RWPGs) to develop the adopted demand projections for the region's water users, shown on Figure 2-1 and in Table 2-1. Population and municipal demands were estimated for utilities and rural areas for municipal water user group (WUG) projections. Other users were aggregated into geographical areas defined by county and river basin boundaries, such as irrigation and steam-electric power generation, to form the demand projections for all other WUGs. TWDB estimated demands using historical data and recent studies for each category to establish the base year. The base year was used with a rate of change to project decadal estimates over the 50-year planning horizon.

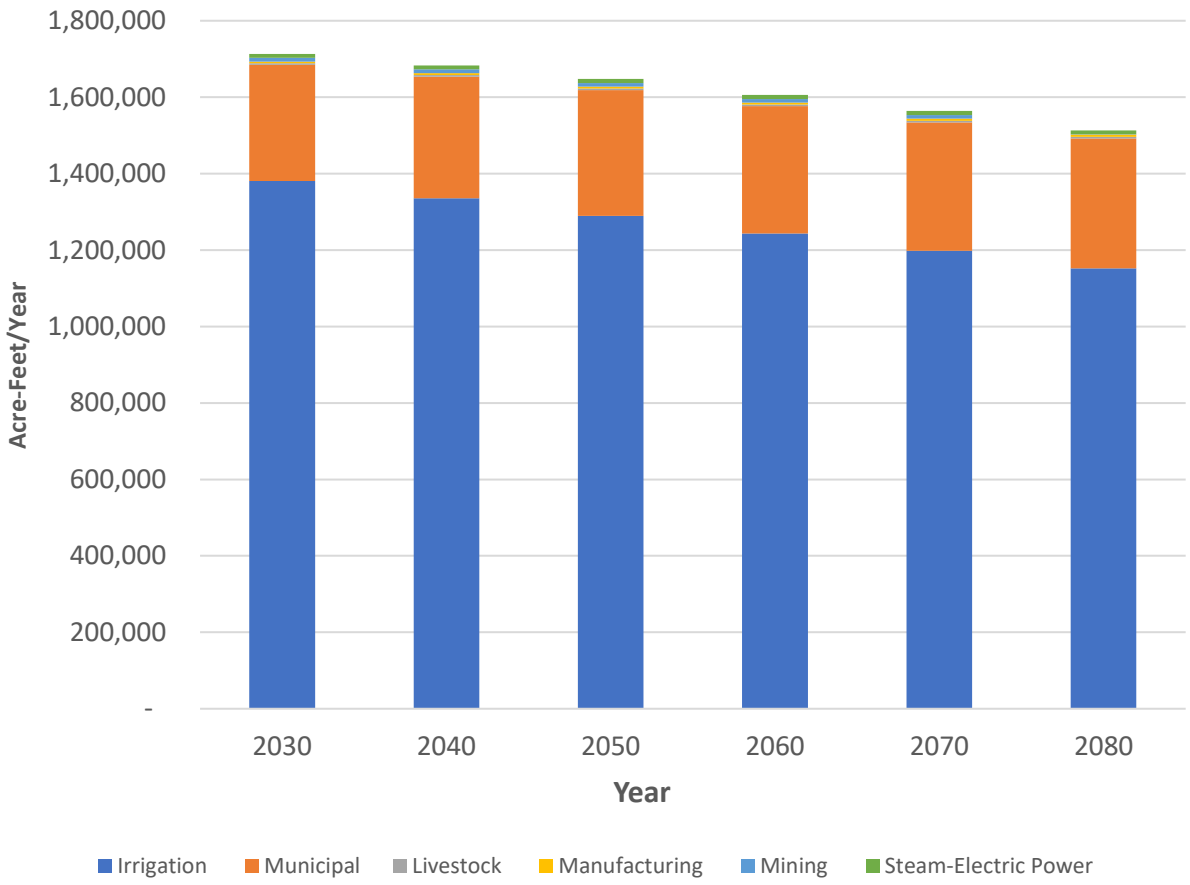

Figure 2-1 Aggregated Demands for Each Water User Group in Region M (ac-ft/yr)

The TWDB draft demand projections were distributed to the RWPGs for review and were revised where necessary based on local information. The Region M Planning Group approved the TWDB estimates for livestock, manufacturing, mining, and steam-electric demands. Revisions were requested and adopted for population, municipal demands, and irrigation demands.

Table 2-1 Regional Demand Projections by Water Use Category (ac-ft/yr)

Water User Group Type	2030	2040	2050	2060	2070	2080
Irrigation	1,381,152	1,335,343	1,289,533	1,243,724	1,197,914	1,152,113
Municipal	303,225	318,603	328,970	332,594	336,302	340,085
Livestock	4,216	4,216	4,216	4,216	4,216	4,216
Manufacturing	4,685	4,859	5,040	5,226	5,419	5,619
Mining	9,484	9,519	9,555	9,589	9,621	634
Steam-Electric	10,621	10,621	10,621	10,621	10,621	10,621
TOTAL	**1,713,383**	**1,683,161**	**1,647,935**	**1,605,970**	**1,564,093**	**1,513,297**

2.2 Population and Municipal Demands

2.2.1 Population Projections

The TWDB generated draft projections for population and municipal demand, which were reviewed by the RWPG and WUGs in the region. Proposed revisions were sent to the TWDB on behalf of the RWPG on August 10, 2023.The TWDB reviewed the request and recommended adoption of the proposed changes on November 1, 2023; the changes were adopted by the Board on November 9, 2023.

Population projections for this cycle were based on the 2020 U.S. Census data. For this reason, the population projections for Region M are generally lower than in previous cycles. Per demographers at the Pew Research Center, the 2020 Census had a nationwide undercount of 5% for Hispanic populations. To address these concerns, the RWPG requested an increase to the county population in Cameron County, Hidalgo County, and Webb County, based on a 5% increase to the Hispanic population percent in each county. These are the three counties where municipal WUGs requested revisions to their population projections.

Figure 2-2 shows the major population centers within the region. Table 2-2 shows the population forecasted by county over the planning horizon.

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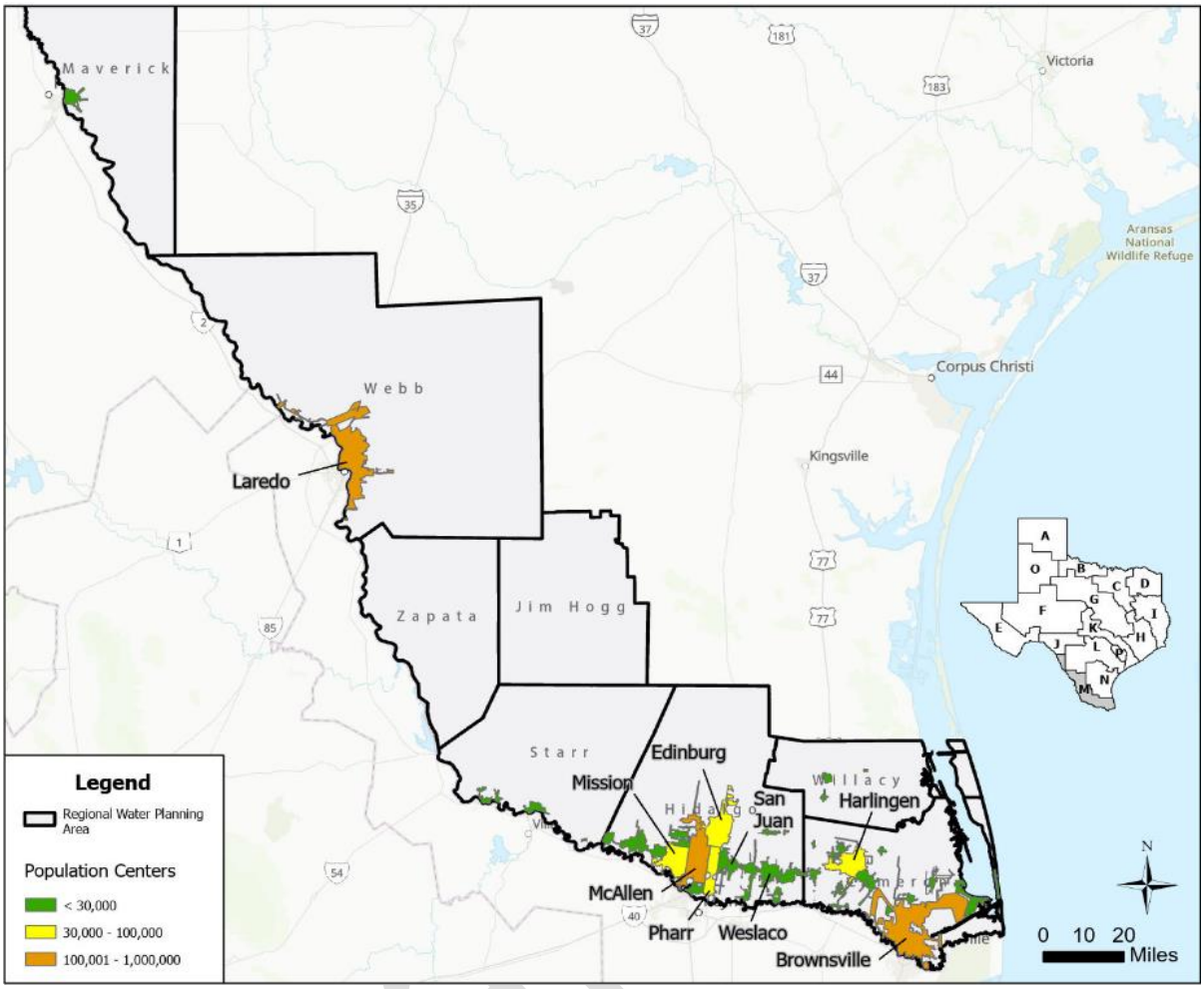

Figure 2-2 Population Centers for Region M

Table 2-2 Population Growth Projections for Region M

County	2030	2040	2050	2060	2070	2080
Cameron	453,325	465,039	469,300	468,071	466,828	465,573
Hidalgo	975,403	1,041,413	1,084,465	1,107,185	1,130,153	1,153,373
Jim Hogg	4,676	4,622	4,508	4,391	4,273	4,154
Maverick	62,424	66,814	70,294	72,996	75,728	78,490
Starr	70,499	75,394	79,002	81,275	83,573	85,896
Webb	292,999	304,635	308,179	305,094	301,977	298,824
Willacy	19,933	19,647	19,083	18,366	17,641	16,908
Zapata	14,075	14,288	14,295	14,158	14,019	13,878
Total	**1,893,334**	**1,991,852**	**2,049,126**	**2,071,536**	**2,094,192**	**2,117,096**

County-level population projections are based on Texas State Data Center (TSDC) Office of the State Demographer county-level population estimates. The base year projections are based on the 2020 census, and projections were developed using demographic trends including birth rates, survival rates, and net migration rates for population cohorts separated by age, gender, and race/ethnicity. TSDC's projections extend to 2050, and the TWDB staff has extended the projection through 2080. Overall, the population for the region increases over the planning horizon, but certain counties do project a decrease in population due to updates to the birth/death and migration rates for each individual county. Refer to Figure 2-3 to see how the Region M population is distributed among the eight counties for 2030.

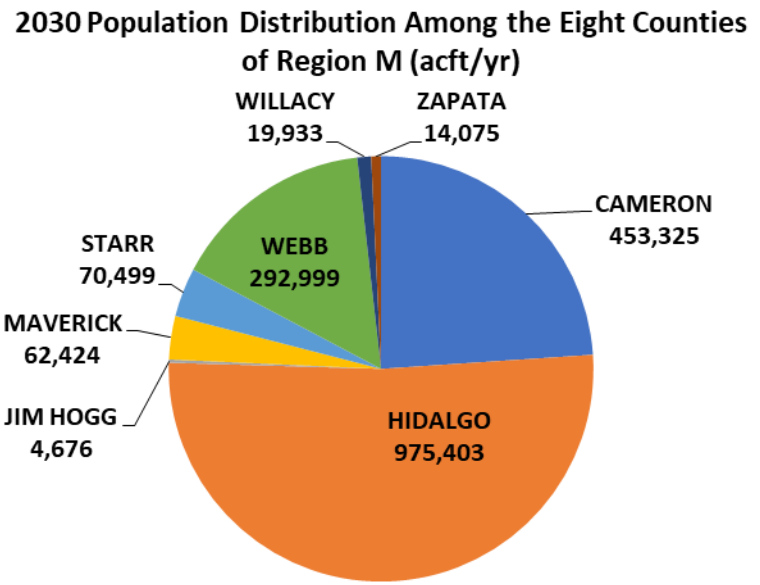

Figure 2-3 2030 Population Distribution Among the Eight Counties of Region M (ac-ft/yr)

The county-level projections were then distributed to a municipal utility level. Municipal WUGs in the 2026 RWPs are defined as follows:

A. Privately-owned utilities that provide an average of more than 100 acre-feet per year (ac-ft/yr) for municipal use for all owned water systems;

B. Water systems serving institutions or facilities owned by the state or federal government that provide more than 100 ac-ft/yr for municipal use;

C. All other retail public utilities not covered in sections (A) and (B) that provide more than 100 ac-ft/yr for municipal use;

D. Collective reporting units, or groups of retail public utilities that have a common association and are requested for inclusion by the RWPG; and

E. Municipal and domestic water use, referred to as "County-Other," not included in paragraphs (A) through (D) of this subsection.

The list of WUGs for the 2026 RWPs was prepared using the rules listed above and TWDB Water Use Survey data for 2015 to 2019.

The population projections (Table 2-3) for each WUG were developed by allocating growth from the county projections to each of the municipal water utilities and rural areas within that county. All county

population not accounted for in a defined municipal WUG (based on items A-D above) is aggregated into a County-Other WUG, which represents unincorporated areas and utilities that do not meet WUG criteria. A combination of factors influences the allocation of growth, including the historical growth of a WUG or historical population and instances where a WUG is expected to have a constant population, such as a prison or military base. Where WUGs are split between counties, they are listed under each county with the portion of their population in that county and indicated by an asterisk. Detailed population projections split between county and river basin are included in the Reports from the 2027 Regional and State Water Planning Database, included in Appendix 2A.

Table 2-3 Projected Population, by Decade

County; City	2030	2040	2050	2060	2070	2080
CAMERON COUNTY						
Brownsville	191,689	196,629	198,396	197,812	197,213	196,600
Combes	3,041	3,120	3,146	3,135	3,124	3,111
County-Other, Cameron	26,712	21,315	15,478	10,491	7,194	4,294
East Rio Hondo Water Supply Corporation (WSC)*	26,908	31,911	37,034	40,909	43,001	45,200
El Jardin WSC	12,677	13,004	13,122	13,085	13,048	13,009
Harlingen	85,744	87,959	88,766	88,532	88,296	88,057
La Feria	6,210	6,369	6,425	6,403	6,379	6,353
Laguna Madre Water District	11,100	11,384	11,484	11,445	11,405	11,362
Los Fresnos	7,486	7,678	7,745	7,717	7,689	7,660
Military Highway WSC*	28,305	29,031	29,285	29,182	29,074	28,963
North Alamo WSC*	4,317	4,428	4,467	4,450	4,434	4,418
Olmito WSC	7,329	7,534	7,643	7,706	7,778	7,864
Palm Valley	1,308	1,341	1,353	1,349	1,342	1,337
Primera	6,782	8,749	10,061	11,067	12,174	12,783
Rio Hondo	1,711	1,755	1,770	1,764	1,758	1,751
San Benito	25,980	26,650	26,890	26,810	26,730	26,646
Santa Rosa	2,947	3,023	3,049	3,039	3,026	3,014
Valley Municipal Utility District (MUD) 2	3,079	3,159	3,186	3,175	3,163	3,151
Cameron County Total	**453,325**	**465,039**	**469,300**	**468,071**	**466,828**	**465,573**

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County; City	2030	2040	2050	2060	2070	2080
HIDALGO COUNTY						
Agua Special Utility District (SUD)*	65,987	70,846	73,984	75,406	76,841	78,289
Alamo	19,549	20,026	20,404	21,105	21,819	22,550
County-Other, Hidalgo	27,570	16,844	4,818	5,523	6,252	6,997
Donna	17,377	18,378	19,045	19,500	19,962	20,430
Edcouch	2,552	2,349	2,246	2,415	2,588	2,765
Edinburg	85,768	93,195	97,911	99,436	100,966	102,501
Elsa	4,659	4,231	4,010	4,334	4,669	5,013
Hidalgo	12,072	12,740	13,187	13,512	13,841	14,175
Hidalgo County MUD No. 1	5,256	5,449	5,590	5,759	5,931	6,107
La Joya	4,764	5,080	5,286	5,399	5,514	5,630
La Villa	2,092	2,491	2,731	2,704	2,676	2,646
McAllen	165,587	184,057	201,554	206,901	212,332	217,849
Mercedes	14,571	14,784	14,985	15,549	16,125	16,714
Military Highway WSC*	15,911	15,602	15,510	16,284	17,077	17,889
Mission	88,336	93,383	96,747	99,076	101,437	103,831
North Alamo WSC*	212,974	235,887	250,160	252,649	255,098	257,509
Pharr	85,215	91,086	94,908	96,862	98,836	100,833
San Juan	23,805	24,380	24,837	25,693	26,565	27,455
Sharyland WSC	88,944	97,326	102,604	103,989	105,371	106,749
Weslaco	32,414	33,279	33,948	35,089	36,253	37,441
Hidalgo County Total	**975,403**	**1,041,413**	**1,084,465**	**1,107,185**	**1,130,153**	**1,153,373**
JIM HOGG COUNTY						
County-Other, Jim Hogg	1,194	1,182	1,155	1,130	1,103	1,075
Jim Hogg County Water Control & Improvement District (WCID) 2	3,482	3,440	3,353	3,261	3,170	3,079
Jim Hogg County Total	**4,676**	**4,622**	**4,508**	**4,391**	**4,273**	**4,154**

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County; City	2030	2040	2050	2060	2070	2080
MAVERICK COUNTY						
County-Other, Maverick	1,328	883	588	404	278	191
Eagle Pass	58,692	62,688	65,889	68,762	71,614	74,461
Maverick County	2,404	3,243	3,817	3,830	3,836	3,838
Maverick County Total	**62,424**	**66,814**	**70,294**	**72,996**	**75,728**	**78,490**
STARR COUNTY						
Agua SUD*	244	242	240	243	245	247
County-Other, Starr	4,359	4,437	4,594	5,045	5,495	5,945
El Sauz WSC	1,708	1,868	1,979	2,022	2,066	2,109
El Tanque WSC	1,385	1,207	1,054	939	836	744
La Grulla	8,309	8,878	9,298	9,569	9,842	10,119
Rio Grande City	17,880	19,073	19,959	20,549	21,147	21,751
Rio WSC	8,102	9,597	10,564	10,561	10,547	10,523
Roma	21,305	22,518	23,450	24,213	24,986	25,771
Union WSC	7,207	7,574	7,864	8,134	8,409	8,687
Starr County Total	**70,499**	**75,394**	**79,002**	**81,275**	**83,573**	**85,896**
WEBB COUNTY						
County-Other, Webb	12,504	8,353	3,925	3,926	3,931	3,938
Laredo	267,373	277,989	281,208	278,353	275,465	272,541
Mirando City WSC	268	279	282	279	275	272
Webb County	12,854	18,014	22,764	22,536	22,306	22,073
Webb County Total	**292,999**	**304,635**	**308,179**	**305,094**	**301,977**	**298,824**
WILLACY COUNTY						
County-Other, Willacy	4,665	4,680	4,326	3,649	2,822	1,813
Lyford	1,992	1,905	1,829	1,766	1,719	1,690
North Alamo WSC*	4,517	4,527	4,553	4,607	4,699	4,841
Port Mansfield Public Utility District (PUD)	358	428	519	660	822	1011
Raymondville	6,991	6,822	6,681	6,580	6,534	6,555

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County; City	2030	2040	2050	2060	2070	2080
Sebastian Mud	1,410	1,285	1,175	1,104	1,045	998
Willacy County Total	**19,933**	**19,647**	**19,083**	**18,366**	**17,641**	**16,908**
ZAPATA COUNTY						
County-Other, Zapata	1,162	1,316	1,424	1,487	1,537	1,581
Falcon Rural WSC	377	305	246	205	172	146
Siesta Shores WCID	1,552	1,576	1,576	1,558	1,542	1,523
Zapata County	10,099	10,249	10,251	10,146	10,038	9,925
Zapata County San Ygnacio and Ramireño	338	286	243	213	187	166
Zapata County WCID-Hwy 16 East	547	556	555	549	543	537
Zapata County Total	**14,075**	**14,288**	**14,295**	**14,158**	**14,019**	**13,878**
Region M Total	**1,893,334**	**1,991,852**	**2,049,126**	**2,071,536**	**2,094,192**	**2,117,096**
*WUGs are in more than one county; population splits are shown.						

2.2.2 Municipal Water Demand Projections

Municipal water demand projections utilize the population projections and a per-person water use volume (gallons per capita per day, GPCD). The base year for the 2026 planning cycle uses the 2021 Plan's baseline dry year (most commonly 2011) GPCD values for water utility and rural areas (county-other) and applies "passive conservation" savings to calculate an updated 2020 baseline GPCD. Passive conservation assumes that a GPCD gradually declines based on natural replacement rates for adoption of water-efficient fixtures and appliances. The 2020 baseline GPCD is then projected out to 2080, continuing to incorporate passive conservation, as appropriate. For each municipal WUG, the projected GPCD is multiplied by the projected population for each future decade to develop municipal water demand projections. When calculating the baseline or projected GPCD values, TWDB staff applied a minimum of 60 GPCD.[1]

The efficiency gains that are applied to GPCD are based on new construction and gradual replacement of fixtures and appliances in existing homes. The fixtures that were included in this estimate are toilets, showerheads, dishwashers, and clothes washers. Total water savings are based on the phased

[1] The 60 GPCD minimum was based on the "Standard New Homes Retrofitted…" estimate of 39 GPCD for indoor use (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 USEPA, 2011) and an estimate that indoor use accounts for 69 percent of total household use (The Grass is Always Greener…Outdoor Residential Water Use in Texas, Sam Marie Hermitte and Robert Mace, TWDB Technical Note 12-01, 2012). The total of 56.5 GPCD is rounded up to account for additional local government and commercial water use.

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implementation of federal efficiency requirements for each of these kinds of fixtures/appliances and assumptions about the rate at which new homes are constructed and old fixtures are replaced.[2] This is considered passive conservation and measures beyond those described above are included in the discussion of advanced water conservation as a water management strategy (WMS) in later chapters. The regional average GPCD for 2030 is 131.3 and in 2080 is 130.7, which is only a 0.5 percent reduction in per-capita daily demand over 50 years. The baseline GPCD and projected municipal water demands for all Region M WUGs are shown in Table 2-4. Appendix 2B provides data on the water savings by decade due to passive conservation for each municipal WUG.

Table 2-4 GPCD and Projected Municipal WUG Demands by County (ac-ft/yr)

County; City	Base Dry-Year GPCD	2030	2040	2050	2060	2070	2080
CAMERON COUNTY							
Brownsville	154	32,212	32,908	33,204	33,106	33,006	32,903
Combes	85	275	280	282	281	280	279
County-Other, Cameron	147	4,244	3,371	2,448	1,659	1,138	679
East Rio Hondo WSC	125	3,636	4,290	4,978	5,499	5,781	6,076
El Jardin WSC	102	1,365	1,391	1,404	1,400	1,396	1,392
Harlingen	159	14,830	15,149	15,288	15,248	15,208	15,166
La Feria	118	787	802	810	807	804	800
Laguna Madre Water District	378	4,638	4,745	4,787	4,771	4,754	4,736
Los Fresnos	60	503	516	521	519	517	515
Military Highway WSC	136	4,180	4,267	4,305	4,290	4,274	4,257
North Alamo WSC	146	687	702	708	705	703	700
Olmito WSC	166	1,326	1,358	1,377	1,389	1,402	1,417
Palm Valley	166	236	241	243	242	241	240
Primera	79	570	730	840	924	1,016	1,067
Rio Hondo	66	118	120	121	121	120	120
San Benito	116	3,249	3,316	3,346	3,336	3,326	3,315
Santa Rosa	79	247	252	254	253	252	251
Valley MUD 2	286	971	994	1,002	999	995	991

[2] For details regarding the way efficiency improvements were calculated, refer to the Regional Water Planning Documentation, Projection Methodology for Draft Population and Municipal Demands, TWDB.

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County; City	Base Dry-Year GPCD	2030	2040	2050	2060	2070	2080
Cameron County Total		**74,074**	**75,432**	**75,918**	**75,549**	**75,213**	**74,904**
HIDALGO COUNTY							
Agua SUD	100	7,100	7,579	7,914	8,066	8,220	8,375
Alamo	125	2,638	2,688	2,739	2,833	2,929	3,027
County-Other, Hidalgo	109	3,220	1,953	559	640	725	811
Donna	117	2,192	2,308	2,391	2,449	2,507	2,565
Edcouch	81	219	200	192	206	221	236
Edinburg	121	11,209	12,114	12,727	12,925	13,124	13,323
Elsa	102	508	459	435	470	507	544
Hidalgo	118	1,534	1,608	1,665	1,706	1,747	1,790
Hidalgo County MUD 1	92	515	529	543	559	576	593
La Joya	116	596	633	658	672	687	701
La Villa	100	225	266	292	289	286	283
McAllen	211	38,276	42,409	46,441	47,673	48,924	50,195
Mercedes	102	1,593	1,605	1,627	1,688	1,751	1,815
Military Highway WSC	136	2,350	2,293	2,280	2,394	2,510	2,630
Mission	187	18,065	19,030	19,716	20,190	20,672	21,159
North Alamo WSC	146	33,888	37,393	39,656	40,051	40,439	40,821
Pharr	100	9,135	9,698	10,105	10,313	10,523	10,736
San Juan	129	3,324	3,388	3,451	3,570	3,691	3,815
Sharyland WSC	160	15,541	16,948	17,867	18,108	18,349	18,589
Weslaco	156	5,500	5,624	5,737	5,930	6,127	6,327
Hidalgo County Total		**157,628**	**168,725**	**176,995**	**180,732**	**184,515**	**188,335**
JIM HOGG COUNTY							
County-Other, Jim Hogg	109	139	137	133	131	127	124

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County; City	Base Dry-Year GPCD	2030	2040	2050	2060	2070	2080
Jim Hogg County WCID 2	126	474	466	454	442	429	417
Jim Hogg County Total		**613**	**603**	**587**	**573**	**556**	**541**
MAVERICK COUNTY							
County-Other, Maverick	120	169	111	74	51	35	24
Eagle Pass	150	9,579	10,192	10,713	11,180	11,644	12,107
Maverick County	128	335	450	529	531	532	532
Maverick County Total		**10,083**	**10,753**	**11,316**	**11,762**	**12,211**	**12,663**
STARR COUNTY							
Agua SUD	100	26	26	26	26	26	26
County-Other, Starr	115	536	543	562	618	673	728
El Sauz WSC	91	167	181	192	196	200	204
El Tanque WSC	134	201	174	152	136	121	108
La Grulla	161	1,460	1,554	1,628	1,675	1,723	1,771
Rio Grande City	214	4,200	4,468	4,676	4,814	4,954	5,096
Rio WSC	93	809	953	1,049	1,049	1,047	1,045
Roma	108	2,475	2,603	2,711	2,799	2,888	2,979
Union WSC	157	1,233	1,291	1,341	1,387	1,434	1,481
Starr County Total		**11,107**	**11,793**	**12,337**	**12,700**	**13,066**	**13,438**
WEBB COUNTY							
County-Other, Webb	105	1,396	922	433	433	434	435
Laredo	144	41,831	43,292	43,794	43,349	42,899	42,444
Mirando City WSC	101	29	30	30	30	30	29
Webb County	107	1,483	2,068	2,613	2,587	2,561	2,534
Webb County Total		**44,739**	**46,312**	**46,870**	**46,399**	**45,924**	**45,442**

Final Draft

County; City	Base Dry-Year GPCD	2030	2040	2050	2060	2070	2080
WILLACY COUNTY							
County-Other, Willacy	112	560	558	515	435	336	216
Lyford	88	186	177	170	164	160	157
North Alamo WSC	146	719	718	722	730	745	767
Port Mansfield PUD	350	138	165	200	254	317	390
Raymondville	106	796	773	757	746	740	743
Sebastian MUD	64	95	86	79	74	70	67
Willacy County Total		**2,494**	**2,477**	**2,443**	**2,403**	**2,368**	**2,340**
ZAPATA COUNTY							
County-Other, Zapata	127	157	177	191	200	206	212
Falcon Rural WSC	169	70	56	45	38	32	27
San Ygnacio MUD	123	207	209	209	206	204	202
Siesta Shores WCID	166	1,829	1,850	1,851	1,832	1,812	1,792
Zapata County	170	63	53	45	39	35	31
Zapata County WCID-Hwy 16 East	266	161	163	163	161	160	158
Zapata County Total		**2,487**	**2,508**	**2,504**	**2,476**	**2,449**	**2,422**

2.3 Manufacturing Water Demand Projections

The primary manufacturing water users in Region M are related to the agriculture industry and the fishing industry, including sugar and vegetable processing. As detailed in Table 2-5, manufacturing projections show an increase from 4,685 ac-ft/yr in decade 2030 to 5,619 ac-ft/yr in decade 2080. The increase in demand occurs primarily in Cameron and Hidalgo counties.

Table 2-5 Manufacturing Demand Projections by County (ac-ft/yr)

County	2030	2040	2050	2060	2070	2080
Cameron	460	477	495	513	532	552
Hidalgo	3,926	4,071	4,222	4,378	4,540	4,708

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County	2030	2040	2050	2060	2070	2080
Jim Hogg	42	44	46	48	50	52
Maverick	98	102	106	110	114	118
Starr	81	84	87	90	93	96
Webb	78	81	84	87	90	93
Willacy	0	0	0	0	0	0
Zapata	0	0	0	0	0	0
Total	**4,685**	**4,859**	**5,040**	**5,226**	**5,419**	**5,619**

Manufacturing water demand projections were developed using 2015 through 2019 data from the TWDB Annual Water Use Survey, historical water use at individual facilities, and Texas Workforce Commission (TWC) employment projections. The baseline manufacturing water demands are based on the highest annual water use, aggregated by county, between 2015 and 2019. The baseline is then projected using a statewide production growth proxy representing consistent incremental change to ensure the accommodation of potential near-term economic and manufacturing sector production growth. Since the first projected decade (2030) of the full planning horizon (2030 – 2080) is more than ten years from the baseline water use data, the statewide annual historical water use rate of change from 2010 - 2019 was chosen as the proxy to adjust the baseline value to the initial year of projections value (2030). This is to account for potential changes in production and water use that may occur between the baseline water use value and the first projected decade. For each planning decade after 2030, a statewide manufacturing growth proxy was applied annually to project increases in manufacturing water demands. For the 2026 Regional Water Plan, the growth proxy was based on the CBP historical number of establishments in the manufacturing sector from 2010-2019. The statewide rate of change was applied to all region-county projections for each decade following 2030.

TWDB staff focuses on facilities that use large volumes of water (more than 10 million gallons), relative to the area of the state and/or are self-supplied by groundwater or surface water. Smaller-use facilities are generally supplied by public utilities as commercial accounts and, thus, are part of the municipal water demands. TWDB staff conducted additional reviews of Texas Commission on Environmental Quality industrial water right usage reports and contacted WWPs and groundwater conservation districts who are not otherwise surveyed to ensure that all large-water use manufacturing facilities are included in the historical estimates.

Because of the increasing reliance on water reuse as a significant source to meet future manufacturing water demands, water reuse volumes have been included in industrial projections. The 2015 through 2019 average volume of reuse water reported statewide by surveyed manufacturing facilities was 32,004 ac-ft/yr, or 3 percent of the total average freshwater manufacturing water use in that same period.

2.4 Steam-Electric Power Generation Water Demand Projections

Steam-electric power water use estimates include volumes reported to the TWDB Annual Water Use Survey by large power generation plants that sell power on the open market but generally do not include cogeneration plants that generate power for manufacturing or mining processes. Steam-electric

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power water use volumes that were reported by surveyed municipal water sellers rather than the power generators are included in these estimates.

Steam-electric power generation water demand is projected to remain below 1 percent the overall non-municipal water demands in Region M throughout the planning horizon. The steam-electric water demands are projected to be a constant 10,621 ac-ft/yr from 2030 to 2080, as shown in Table 2-6 by county for the planning horizon. The demand projections are lower than those in the 2021 Region M Water Plan, mainly due to the cancellation of two planned facilities associated with Coronado Power Ventures (La Paloma Energy Center).

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Table 2-6 Steam-Electric Power Generation Demands by County (ac-ft/yr)

County	2030	2040	2050	2060	2070	2080
Cameron	165	165	165	165	165	165
Hidalgo	10,325	10,325	10,325	10,325	10,325	10,325
Jim Hogg	0	0	0	0	0	0
Maverick	0	0	0	0	0	0
Starr	0	0	0	0	0	0
Webb	131	131	131	131	131	131
Willacy	0	0	0	0	0	0
Zapata	0	0	0	0	0	0
Total	**10,621**	**10,621**	**10,621**	**10,621**	**10,621**	**10,621**

The 2030 water demand projections for each county are based on the highest county-aggregated historical steam-electric power water use in the most recent 5 years (2015 through 2019). The anticipated water use of future facilities and the reported water use of facilities scheduled for retirement, as listed in the state and federal reports, were taken into account in the demand projections. Demand projections were held constant throughout the planning period.

As is the case for the manufacturing demand projections previously described, power generation is expected to rely on water reuse to meet future water demands; estimated water reuse volumes have been included in steam-electric power projection demands. The 2015 through 2019 average volume of reuse water reported statewide by surveyed power facilities was 65,111 ac-ft, or 13 percent of the total average freshwater steam-electric water use. Landfill gas, wood waste biomass, and battery power plants, as well as any power generating facilities using renewable energy sources, are not included in the water demand projections.

2.5 Mining Water Demand Projections

Mining water usage in Region M is dominated by hydraulic fracturing, with some aggregate operations. One of the major hurdles in evaluating mining water usage is the lack of consistent reporting, especially for groundwater usage. In Region M, the use of surface water from the Rio Grande allowed the Region M Planning Group to further inform water demand projections for mining.

Mining water use estimates were based on the 2022 TWDB contracted study, Water Use by the Mining Industry in Texas,[3] with the University of Texas Bureau of Economic Geology (UTBEG). Per TWDB, this study provided a comprehensive and quantitative assessment of mining water use across Texas and identified major mining operations in the state, including oil and gas, aggregates, and coal and lignite. Both historical and current water use were determined, and projections of future water demand were developed for 2030-2080 in each major sub-category within the mining sector, highlighting water use for unconventional oil and gas development. The study also analyzed water use patterns, technological

[3] University of Texas Bureau of Economic Geology. Water Use by the Mining Industry in Texas. August 2022. https://www.twdb.texas.gov/waterplanning/data/projections/MiningStudy/doc/Final%20TWDB%20Mining%20Water%20Use%20Report.PDF

Final Draft

changes, market trends, and water source information. County-level projections were compiled as the sum of individual projections for three sub-sector mining categories: oil and gas, aggregates, and coal. Mining water demand projections are displayed in Table 2-7 by county for the planning horizon.

Table 2-7 Mining Water Demand Projections (ac-ft/yr)

County	2030	2040	2050	2060	2070	2080
Cameron	0	0	0	0	0	0
Hidalgo	234	260	286	312	337	361
Jim Hogg	9	9	9	9	9	9
Maverick	4,898	4,898	4,898	4,898	4,898	2
Starr	193	200	207	213	218	223
Webb	4,142	4,144	4,147	4,149	4,151	31
Willacy	2	2	2	2	2	2
Zapata	6	6	6	6	6	6
Total	**9,484**	**9,519**	**9,555**	**9,589**	**9,621**	**634**

Statewide, a major shift from gas to oil production significantly changed the spatial distribution of production in a relatively short time. Within Region M, accelerated development of the Eagle Ford Shale reflected this trend in Webb and Maverick counties. Adoption of operating practices that allowed for more water recycling and use of brackish water also changed patterns of water consumption and usage at the same time that overall water usage was increasing.

Water usage was estimated for the upstream segment of the oil and gas industry, that is, water used to extract the commodity until it leaves the wellhead. For the aggregate industry, estimates included washing but no further processing, for coal mostly pit dewatering and aquifer depressurization, or mining as defined in the Standard Industrial Classification/North American Industry Classification System codes. Therefore, cement factories, in spite of large quarries, are grouped with manufacturing and not mining.

Reuse or recycling was taken into account in water-use values, as well as opportunity usages such as stormwater collection for aggregate mining. Usage numbers mostly represent consumption. The division of water between surface and groundwater sources is not well documented. Some facilities provided this information directly, but no consistent information is available because of the reporting exemption for the oil and gas industry. Historically (2010-2019), TWDB data estimates approximately 62 percent of water used in mining statewide was groundwater, and regional estimates varied from 24 percent in Zapata County to 94 percent in Jim Hogg County.

The UTBEG report estimated water usage for the oil and gas, coal, and aggregate for a base year (2019) and projected through 2080. Water usage from the different sectors was calculated in different ways, specific to the sector. In general, the data used were collected from reports submitted to the state for permitting (e.g., information about wells submitted to Railroad Commission of Texas), databases including the Information Handling Services (IHS) Enerdeq Database and FracFocus, surveys distributed by TWDB, and communication with operators and industry trade groups.

Final Draft

The UTBEG report stated that for the oil and gas sector water, usage was projected in the 2022 study using a resource-based approach. Estimates of annual hydraulic fracturing water use are based on Total Recoverable Resources (TRR) analyses of oil and gas reservoirs for three of the major plays in Texas. Estimates of quantity of developable resources, quantity of operations needed for extraction, and amount of water used by these operations were developed for each major production region. Concentration of future operations was distributed spatially by characteristics of each major play. Temporal distribution was accomplished by modeling production with a hyperbolic decline curve, once again parameterized by data specific to each play.

No comprehensive data set exists for aggregate mining. Surveys were distributed to operators, but despite collaboration with industry trade groups, response rates were low. Some data from similar historical water-use surveys distributed by TWDB were available. Records of aggregate production coupled with water-use coefficients from previous studies were also utilized in the attempt to quantify aggregate industry water use. The product of aggregate mining is used locally, so population projections were used to predict future production and water use for this sector as well.

2.6 Irrigation Water Demand Projections

Irrigation use within Region M is largely dependent on available supply from the Amistad-Falcon Reservoir system; however, it is important for regional planning that irrigation estimates make a distinction between irrigation water use and irrigation water demand. Since the RWP process permits only a single demand scenario and is intended to represent a drought year, irrigation demand is best developed assuming a dry year in which regional irrigation water needs are met, rather than limiting demand to the availability of surface water supplies.

In most actual drought years, some farmers can respond to anticipated limited water supplies by selecting crops that require less water or no "applied" water (dry land farming); such plants are often lower in value. Similarly, citrus and pecan trees can tolerate minimal water for a limited time period, but their true demand is greater than the minimum water required to survive. To address the long-term needs of the farmers in Region M, demands are based on the "worst-case" scenario, where there is minimal rainfall.

Various methodologies have been proposed for estimating irrigation demand. The 2016 RWP established a base year utilizing TWDB water use estimates, by county, from 2005 through 2009 and aggregating the maximum year for each county to assemble a new representative demand year. The demand was expected to decline over the planning horizon, and the rate of decline was correlated with the increase in demand for municipal water. For 2030 through 2070, the decadal increase in municipal demands was subtracted from the irrigation demand to estimate the impact of urbanization. For the 2021 RWP, the Region M RWPG used a methodology using 2011 as a base year for the irrigation demand projections because of the little rainfall (high demand) and full reservoirs (minimal supply constraints) experienced, for an annual irrigation water use of 1,426,960 ac-ft. Additionally, the Region M RWPG incorporated a rate of change over the planning horizon using the combined influences of sedimentation and the historical rate at which irrigation water rights have been converted to municipal use.

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For the 2026 planning cycle, the Region M RWPG agreed to use the same methodology as in the 2021 Plan. Thus, the 2030-2070 demands were kept identical to the 2021 RWP projections, and then linearly extended to 2080. The projected irrigation demands by county are shown below (Table 2-8).

Table 2-8 Irrigation Demand Projections by County (ac-ft/yr)

County	Historical Use Estimate 2011	Irrigation Projections					
		2030	2040	2050	2060	2070	2080
Cameron	537,217	519,972	502,725	485,479	468,233	450,987	433,744
Hidalgo	688,667	666,560	644,451	622,343	600,236	578,127	556,024
Jim Hogg	360	348	337	325	314	302	290
Maverick	61,706	59,725	57,744	55,763	53,782	51,801	49,820
Starr	23,875	23,109	22,342	21,576	20,809	20,043	19,277
Webb	10,425	10,090	9,756	9,421	9,086	8,752	8,417
Willacy	99,610	96,412	93,215	90,017	86,819	83,621	80,424
Zapata	5,100	4,936	4,773	4,609	4,445	4,281	4,117
Total	**1,426,960**	**1,381,152**	**1,335,343**	**1,289,533**	**1,243,724**	**1,197,914**	**1,152,113**

Supply from the Amistad-Falcon Reservoir system is expected to decrease as a result of sedimentation, which reduces the overall storage capacity. A sediment loading rate was estimated for each reservoir and the reduction in storage is incorporated into the Water Availability Model (WAM). The WAM projections predict a 2030 firm yield of 1,001,776 ac-ft and a 2080 firm yield of 995,863 ac-ft.

As land use changes from agricultural, the water rights are typically converted to municipal use rights. When a Class A or B water right is converted to a domestic/municipal/industrial (DMI), it is reduced to 50 or 40 percent of the maximum diversion, respectively. The distribution of Rio Grande water rights associated with all DMI, Class A, and Class B was evaluated from 2010 through 2017 and used to estimate how water right distribution could be expected to change over the planning horizon (Figure 2-4).

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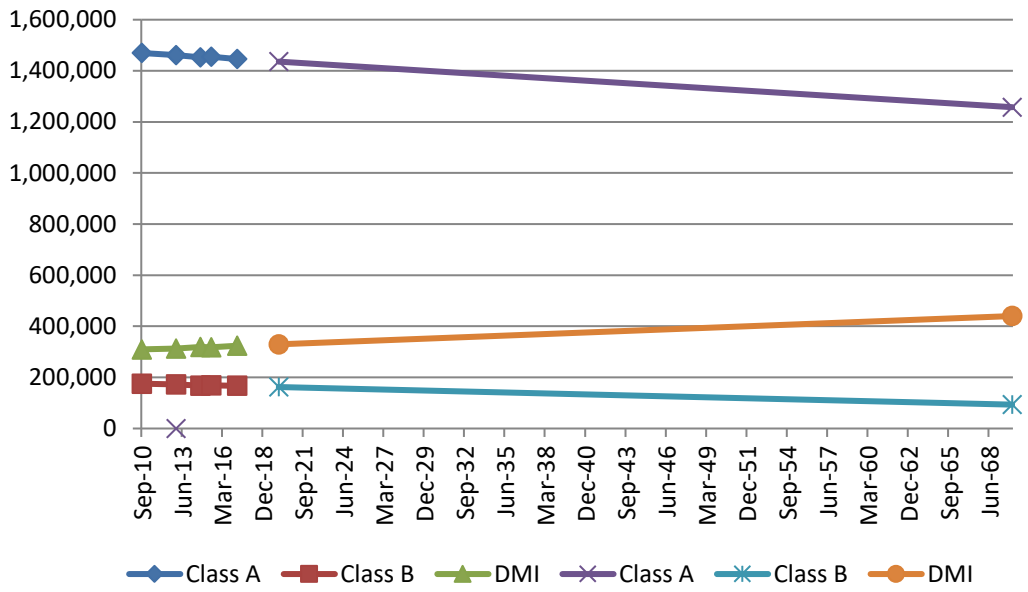

Figure 2-4 Distribution of Water Right Types (Maximum Diversion)

As detailed in Table 2-9, an estimated delivery volume was projected for the planning horizon using the rules for how water is allocated to water right holder accounts according to water right class. A decadal rate of change from the delivery volume was applied to the 2011 supply, which resulted in an overall reduction in demand that follows the reduction in availability and irrigable acreage. These trends were applied to surface water and assumed for groundwater-based demands.

Table 2-9 Projected Distribution of Water Rights and Supplies

Lower Basin Authorized Diversion		Middle Basin Authorized Diversion		Total Authorized Diversion		Firm Yield	
						2030	2080
MUNILWR	253,428	MUNIMID	74,215	MUNI	327,643	327,643	327,643
LOW-A-IRR	1,411,050	MID-A-IRR	156,946	A-IRR	1,567,996	616,056	610,653
LOW-A-MIN	1,077	MID-A-MIN	9,173	A-MIN	10,250	4,027	3,992
LOW-A-MUN	465	MID-A-MUN	2,050	A-MUN	2,515	988	980
LOW-B-IRR	131,682	MID-B-IRR	18,051	B-IRR	149,733	47,063	46,651
LOW-B-MIN	5,020	MID-B-MIN	10,176	B-MIN	15,196	4,776	4,735
LOW-B-MUN	3,823	MID-B-MUN	62	B-MUN	3,885	1,221	1,210

2.7 Livestock Water Demand Projections

Livestock water use estimates are based on historical TWDB annual water use estimates consisting of species-specific water use per head values, multiplied by annual inventory estimates, plus surveyed water use for non-standard livestock production such as fish hatcheries. Table 2-10 displays the livestock category and per head daily water use information.

Table 2-10 Livestock Category and Estimated Per Head Daily Water Use

TWDB Category	Subcategory	Per Head Daily Water Use (gallons)
Cattle	Milk	55
	Fed and Other	15
Chickens	Non-Broilers	0.09
	Broilers	0.09
Turkeys	Turkeys	0.2
Equine	Horses, Ponies, Mules, Donkeys, and Burros	12
Hogs	Hogs	5
Sheep	Sheep	2
Goats	Milk, Meat, Angora	2

Livestock is expected to make up less than 1 percent of the overall non-municipal water demands in Region M throughout the planning horizon. The livestock water demand projections show a constant demand of 4,216 ac-ft/yr for decade 2030 through decade 2080. The regionwide livestock projections are shown in Table 2-11 by county for the planning horizon.

Table 2-11 Livestock Demand Projections (ac-ft/yr)

County	2030	2040	2050	2060	2070	2080
Cameron	287	287	287	287	287	287
Hidalgo	649	649	649	649	649	649
Jim Hogg	420	420	420	420	420	420
Maverick	473	473	473	473	473	473
Starr	945	945	945	945	945	945
Webb	886	886	886	886	886	886
Willacy	197	197	197	197	197	197
Zapata	359	359	359	359	359	359
Region Total	**4,216**	**4,216**	**4,216**	**4,216**	**4,216**	**4,216**

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The 2030 water demand projections for each county were based on the average of the most recent 5 years (2015 through 2019) of water use estimates. The same growth trend from the 2022 SWP was applied to project livestock water demand for 2040 through 2070 and then held constant for 2080. Additionally, the TWDB updated the inventory estimates for broiler chickens for 2015 through 2019, and updated livestock water use estimates for 2015 through 2019 using new per head daily water use for milk cows, chickens, hogs, and goats (Table 2-10); these figures were used in developing the livestock water demand projections.

The rate of change for projections from the 2021 RWP was then applied to the updated base year. During previous RWP cycles, many counties, including all of those within Region M, chose to hold the base constant throughout the planning horizon.

2.8 Major Water Providers

Major Water Provider (MWP) was a new designation in the 2021 planning cycle; an MWP is any WUG or wholesale water provider (WWP) of particular significance to the water supply of a region, as determined by the RWPG. At the February 21, 2024, Region M meeting, the planning group approved the same definition of an MWP as in the 2021 Plan, which is any entity that provides 3,000 ac-ft or more of municipal water per year, and then voted to add Mexico as a new MWP due to the region's unique international water-sharing situation. According to current estimates of 2030 municipal supplies, the entities listed in Table 2-12 have been designated as MWP in the 2026 RWP. Appendix 2C includes the population and demand projections for the MWPs.

While technically not a WUG or WWP, and therefore not allowed to be classified as a MWP per TWDB rules, Mexico is of particular significance to Region M because it provides water to the Amistad-Falcon Reservoir System that it shares with the United States, based on the 1944 Treaty, impacting water levels in the reservoirs and the water users on the United States' side.

Table 2-12 Region M Major Water Providers

Major Water Providers	
Agua Special Utility District (SUD)	Hidalgo County Irrigation District No. 16
Alamo	Hidalgo County Irrigation District No. 2
Bayview Irrigation District No. 11	Hidalgo County Irrigation District No. 6
Brownsville PUB	Hidalgo County Water Improvement District (WID) No. 3*
Brownsville Irrigation District	Laguna Madre Water District
Cameron County Irrigation District No. 2	Laredo
Cameron County Irrigation District No. 3 - La Feria	McAllen
Cameron County Irrigation District No. 6 - Los Fresnos	Military Highway Water Supply Corporation (WSC)
Cameron County Water Improvement District No. 10	Mission
Delta Lake Irrigation District	North Alamo WSC
Donna Irrigation District-Hidalgo County No. 1	Pharr
Eagle Pass	Rio Grande City

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Major Water Providers	
East Rio Hondo WSC	San Benito
Edinburg	San Juan
Harlingen	Sharyland WSC
Harlingen Irrigation District-Cameron County No. 1	Southmost Regional Water Authority
Hidalgo and Cameron Counties Irrigation District No. 9	United Irrigation District
Hidalgo County Irrigation District No. 1	Weslaco

*In January 2025, Hidalgo County Water Improvement District No. 3 and Santa Cruz Water Control and Improvement District No. 15 consolidated into Hidalgo County Consolidated Water Control and Improvement District.

Irrigation districts[4] divert and deliver raw water to irrigated farmland, municipalities, and some industrial and livestock water users. There are 25 irrigation districts in Region M that operate under the Texas Water Code, each of which has its own internal operating policies (Figure 2-5). The physical distribution networks are earthen canals, concrete lined canals, and pipeline. Irrigation districts are discussed in more detail in Chapter 3.

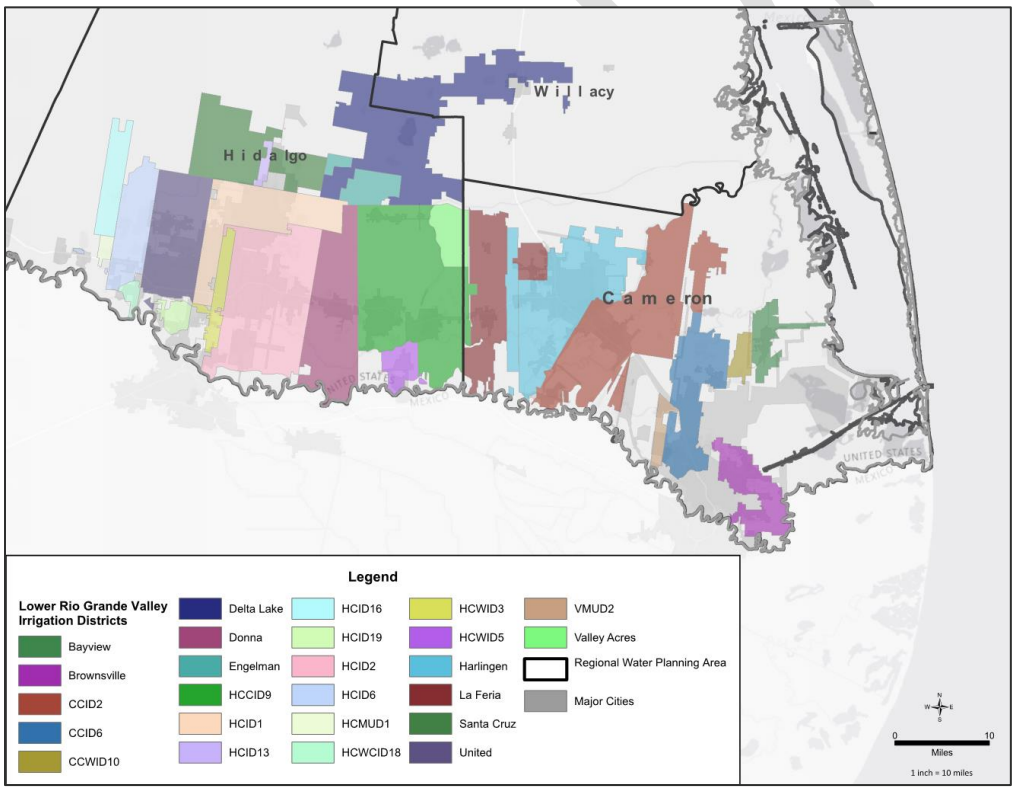

Figure 2-5 Lower Rio Grande Valley Irrigation Districts

[4] For simplicity, the following designations will be referred to collectively as irrigation districts in this plan: irrigation districts, water control and improvement districts, water improvement districts, and other similar designations.

WSCs cover most of the rural area in the Lower Rio Grande Valley and supply many of the populated rural areas in the western counties. The largest are North Alamo WSC, East Rio Hondo WSC, Sharyland WSC, and Military Highway WSC, which all treat and deliver both surface and groundwater to significant unincorporated and rural areas and portions of cities. Additionally, the larger municipal utilities in the region are considered MWPs, which include Alamo, Brownsville PUB, Eagle Pass, Edinburg, Harlingen, Laredo, McAllen, Pharr, Rio Grande City, San Benito, San Juan, and Weslaco.

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Appendix 2A. Relevant Reports from the 2027 Regional and State Water Planning Database (DB27)

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Appendix 2B. Passive Conservation Water Savings by Decade

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Appendix 2C. Major Water Providers Population and Water Demand Projections

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