

**Water Resources Planning Department**

**Projection Analysis Work Sheets  
for  
Willows District**

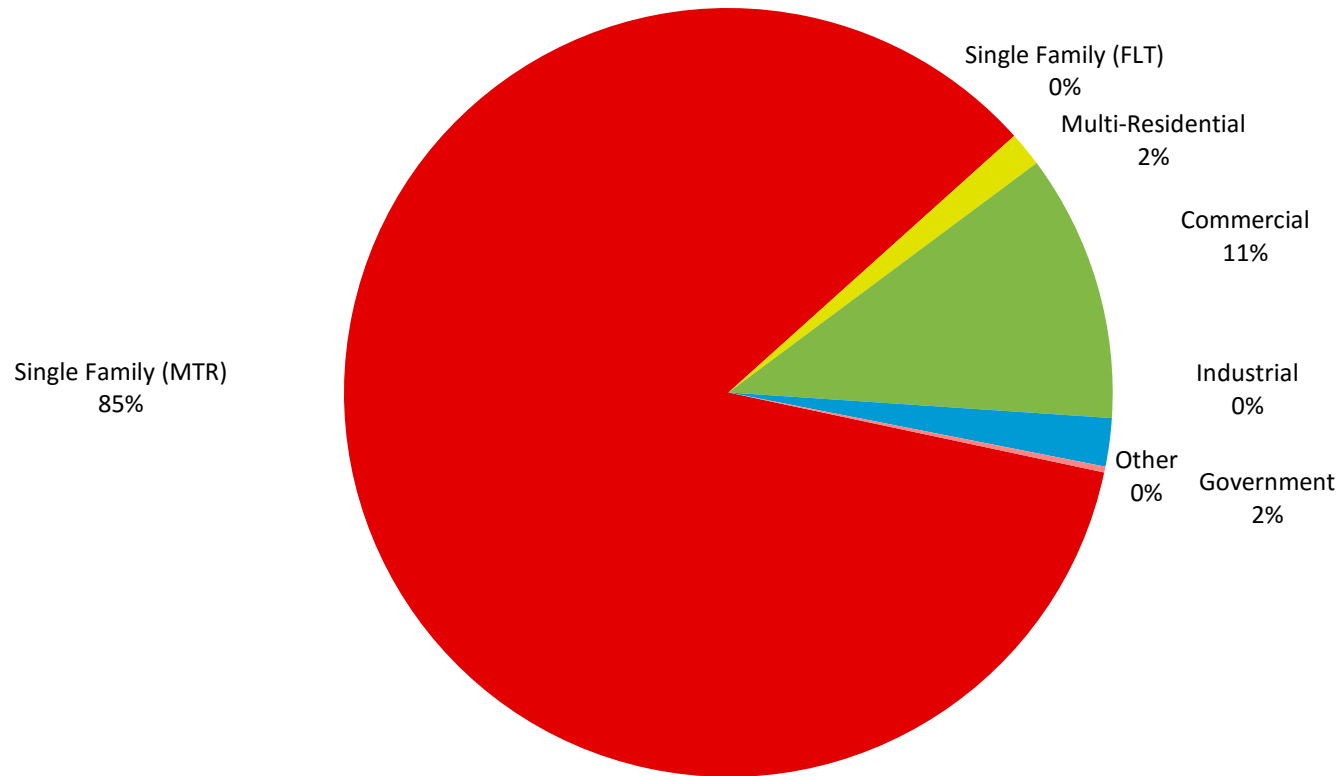
**2015**



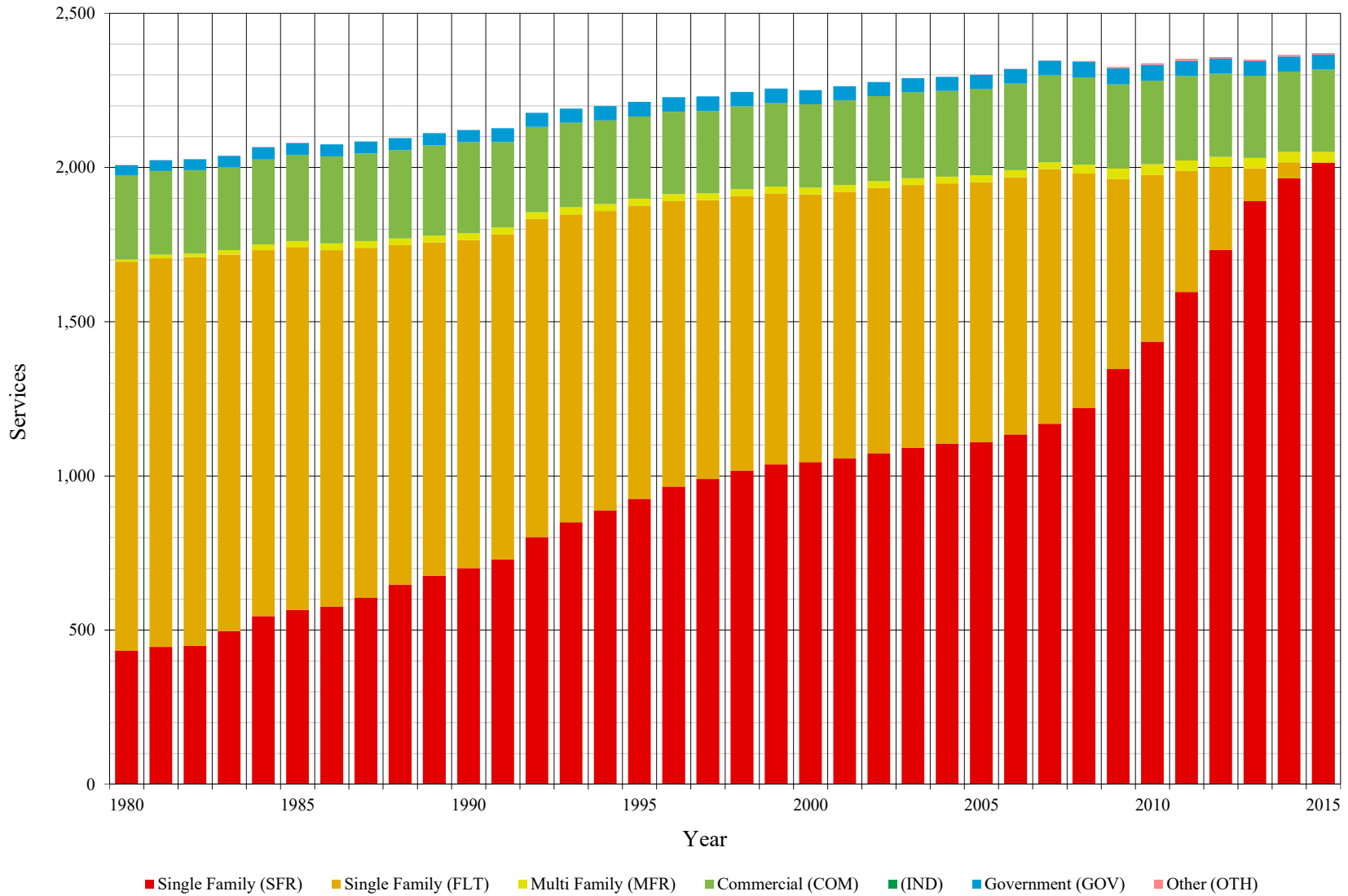
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## Distribution of Services (2015)



# Historical Services



**California Water Service Company - Willows Districts**  
**Water Supply and Demand Analysis and Projections**  
**Average Annual Services**

Year	Single Family (SFR)	Single Family (FLT)	Single Family (Total)	Multi Family (MFR)	Commercial (COM)	Industrial (IND)	Government (GOV)	Other (OTH)	Total	Annual Change
1980	432	1,262	1,695	6	273	0	34	0	2,008	
1981	445	1,260	1,705	12	272	0	35	0	2,024	16
1982	449	1,260	1,709	12	271	0	35	0	2,027	3
1983	497	1,220	1,718	14	270	0	37	0	2,038	11
1984	545	1,187	1,732	19	275	0	40	0	2,065	27
1985	566	1,176	1,742	20	279	0	39	0	2,080	14
1986	576	1,155	1,732	22	283	0	39	0	2,075	-5
1987	604	1,135	1,739	22	284	0	39	0	2,084	9
1988	647	1,101	1,747	22	287	0	39	0	2,095	11
1989	676	1,081	1,757	22	293	0	39	0	2,111	16
1990	700	1,065	1,765	22	295	0	39	0	2,122	11
1991	729	1,055	1,783	22	277	0	44	0	2,127	5
1992	801	1,032	1,833	22	277	0	46	0	2,177	50
1993	850	998	1,848	23	274	0	46	0	2,191	14
1994	889	970	1,858	23	272	0	46	0	2,199	8
1995	925	951	1,876	23	266	0	47	0	2,212	14
1996	965	925	1,891	23	267	0	47	0	2,227	15
1997	989	904	1,894	22	267	0	47	0	2,230	2
1998	1,017	890	1,907	22	269	0	47	0	2,245	15
1999	1,037	879	1,916	22	271	0	47	0	2,256	11
2000	1,045	868	1,913	22	270	0	46	0	2,250	-6
2001	1,057	864	1,921	22	275	0	45	0	2,263	13
2002	1,073	860	1,933	22	275	0	46	0	2,277	13
2003	1,090	852	1,943	22	279	0	46	0	2,290	13
2004	1,104	844	1,948	22	278	0	46	0	2,294	4
2005	1,110	843	1,952	22	281	0	45	1	2,301	7
2006	1,134	835	1,969	22	281	0	47	1	2,320	19
2007	1,169	825	1,994	22	283	0	47	1	2,347	26
2008	1,219	761	1,981	28	283	0	50	2	2,345	-2
2009	1,347	615	1,962	34	273	0	53	4	2,325	-19
2010	1,435	541	1,976	34	270	0	52	5	2,337	12
2011	1,597	392	1,988	34	273	0	50	6	2,352	15
2012	1,733	267	2,000	34	270	0	49	5	2,358	6
2013	1,890	107	1,997	34	265	0	49	4	2,350	-8
2014	1,965	51	2,016	34	260	0	49	5	2,364	15
2015	2,016	0	2,016	35	267	0	48	6	2,371	7
5 Yr Avg.	1,840	163	2,004	34	267	0	49	5	2,359	8
10 Yr Avg.	1,550	439	1,990	31	273	0	49	4	2,347	7
10 Yr Avg.	1,396	577	1,973	28	274	0	48	3	2,326	7
20 Yr Avg.	1,300	656	1,956	27	273	0	48	2	2,305	8

Note: Reclassification occurred between categories from 2007 to 2009

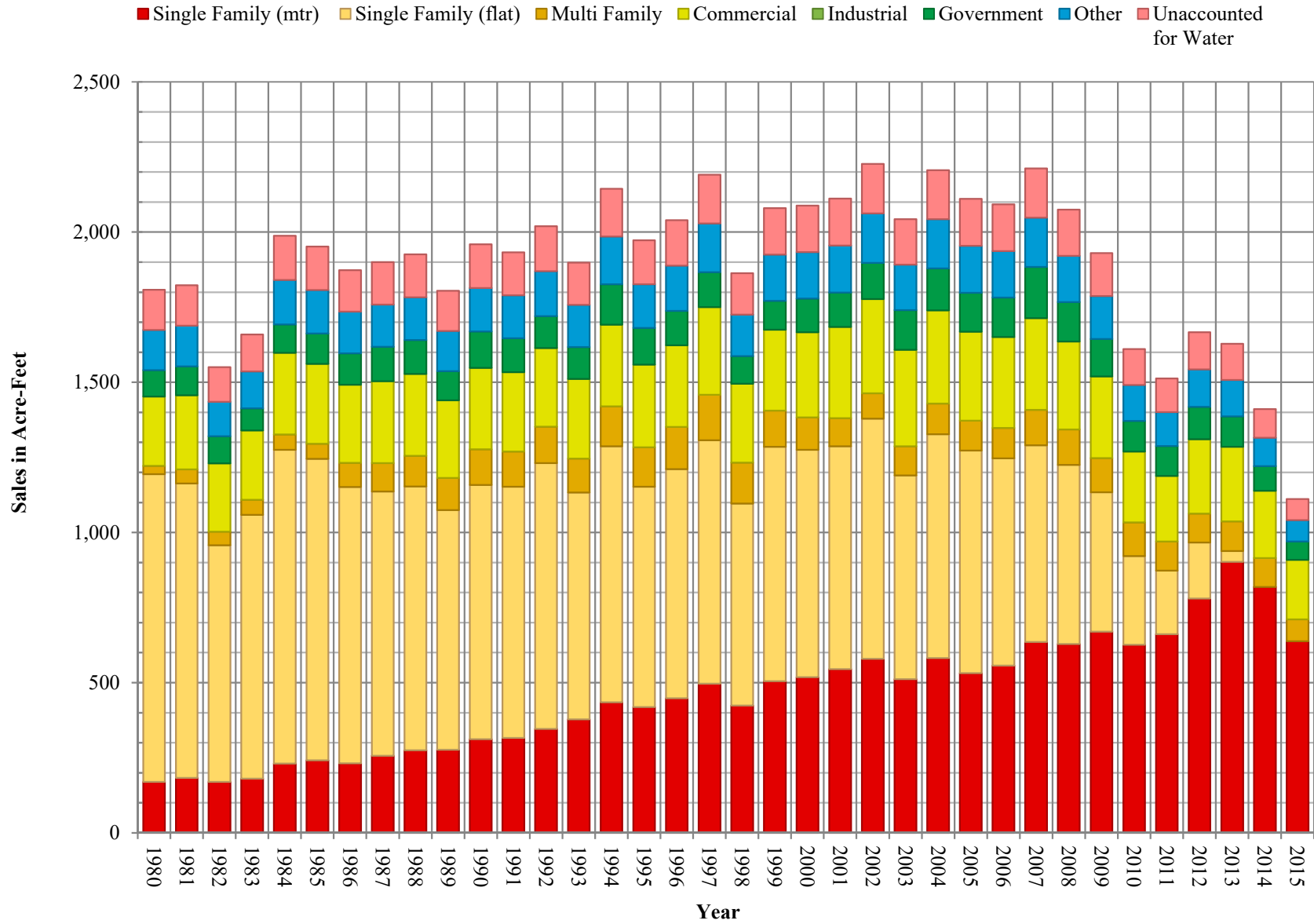
**California Water Service Company - Willows Districts**  
**Water Supply and Demand Analysis and Projections**  
**Service Growth Percentage**

Year	Single Family (SFR)	Single Family (FLT)	Single Family (Total)	Multi Family (MFR)	Commercial (COM)	Industrial (IND)	Government (GOV)	Other (OTH)	Total
1981	2.91%	-0.15%	0.63%	85.33%	-0.31%		1.96%	-50.00%	0.78%
1982	0.84%	-0.03%	0.20%	3.60%	-0.40%		1.68%	0.00%	0.16%
1983	10.79%	-3.15%	0.51%	14.58%	-0.25%		4.02%	-50.00%	0.55%
1984	9.65%	-2.77%	0.83%	36.36%	1.91%		7.73%	100.00%	1.34%
1985	3.73%	-0.87%	0.58%	5.78%	1.24%		-0.63%	50.00%	0.69%
1986	1.87%	-1.77%	-0.59%	9.66%	1.50%		-0.64%	-100.00%	-0.22%
1987	4.85%	-1.75%	0.44%	1.15%	0.32%		0.00%		0.43%
1988	7.11%	-3.05%	0.47%	0.00%	1.12%		0.00%		0.55%
1989	4.53%	-1.78%	0.56%	0.00%	2.01%		0.00%		0.74%
1990	3.54%	-1.50%	0.44%	0.00%	1.00%		0.85%		0.52%
1991	4.07%	-0.93%	1.05%	0.00%	-6.12%		12.29%		0.25%
1992	9.92%	-2.17%	2.77%	-0.76%	-0.21%		3.02%		2.35%
1993	6.07%	-3.26%	0.81%	6.87%	-1.02%		0.55%		0.64%
1994	4.60%	-2.87%	0.56%	-1.43%	-0.88%		0.55%		0.36%
1995	4.12%	-1.89%	0.98%	0.00%	-2.09%		2.17%		0.62%
1996	4.34%	-2.72%	0.76%	0.00%	0.34%		0.00%		0.69%
1997	2.49%	-2.29%	0.15%	-3.62%	0.16%		0.00%		0.11%
1998	2.80%	-1.57%	0.71%	-0.75%	0.62%		0.00%		0.67%
1999	1.99%	-1.24%	0.49%	-1.14%	0.68%		0.00%		0.48%
2000	0.71%	-1.25%	-0.19%	1.15%	-0.28%		-2.84%		-0.24%
2001	1.20%	-0.52%	0.42%	-0.38%	2.01%		-0.91%		0.58%
2002	1.52%	-0.39%	0.66%	0.38%	-0.03%		1.47%		0.59%
2003	1.59%	-0.92%	0.47%	-0.38%	1.45%		0.00%		0.57%
2004	1.29%	-1.01%	0.28%	0.38%	-0.45%		-0.91%		0.17%
2005	0.46%	-0.11%	0.21%	0.00%	0.96%		-0.73%		0.31%
2006	2.20%	-0.95%	0.84%	0.00%	0.21%		4.06%	87.50%	0.84%
2007	3.08%	-1.14%	1.29%	0.00%	0.47%		0.71%	-60.00%	1.13%
2008	4.32%	-7.77%	-0.68%	29.17%	0.27%		6.34%	350.00%	-0.07%
2009	10.44%	-19.16%	-0.94%	19.06%	-3.65%		4.47%	81.48%	-0.83%
2010	6.57%	-12.05%	0.73%	0.25%	-0.95%		-1.43%	18.37%	0.51%
2011	11.25%	-27.58%	0.62%	0.25%	1.08%		-3.86%	32.76%	0.63%
2012	8.53%	-31.83%	0.57%	0.00%	-1.25%		-1.67%	-22.08%	0.24%
2013	9.10%	-60.04%	-0.13%	0.00%	-1.67%		0.00%	-18.33%	-0.34%
2014	3.96%	-52.02%	0.97%	0.00%	-2.04%		-0.34%	22.45%	0.62%
2015	2.57%	-100.00%	-0.03%	2.21%	2.50%		-1.71%	16.67%	0.28%
5 Yr. Avg.	7.08%	-54.29%	0.40%	0.49%	-0.28%		-1.52%	6.29%	0.29%
10 Yr. Avg.	6.20%	-31.25%	0.32%	0.34%	-0.15%		0.66%	50.88%	0.30%
15 Yr. Avg.	4.54%	-21.03%	0.35%	0.21%	0.18%		0.37%	50.88%	0.35%
20 Yr. Avg.	4.02%	-16.23%	0.36%	-0.09%	0.21%		0.13%	50.88%	0.35%

Note: Values in red excluded due to reclassification.

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# Historical Sales



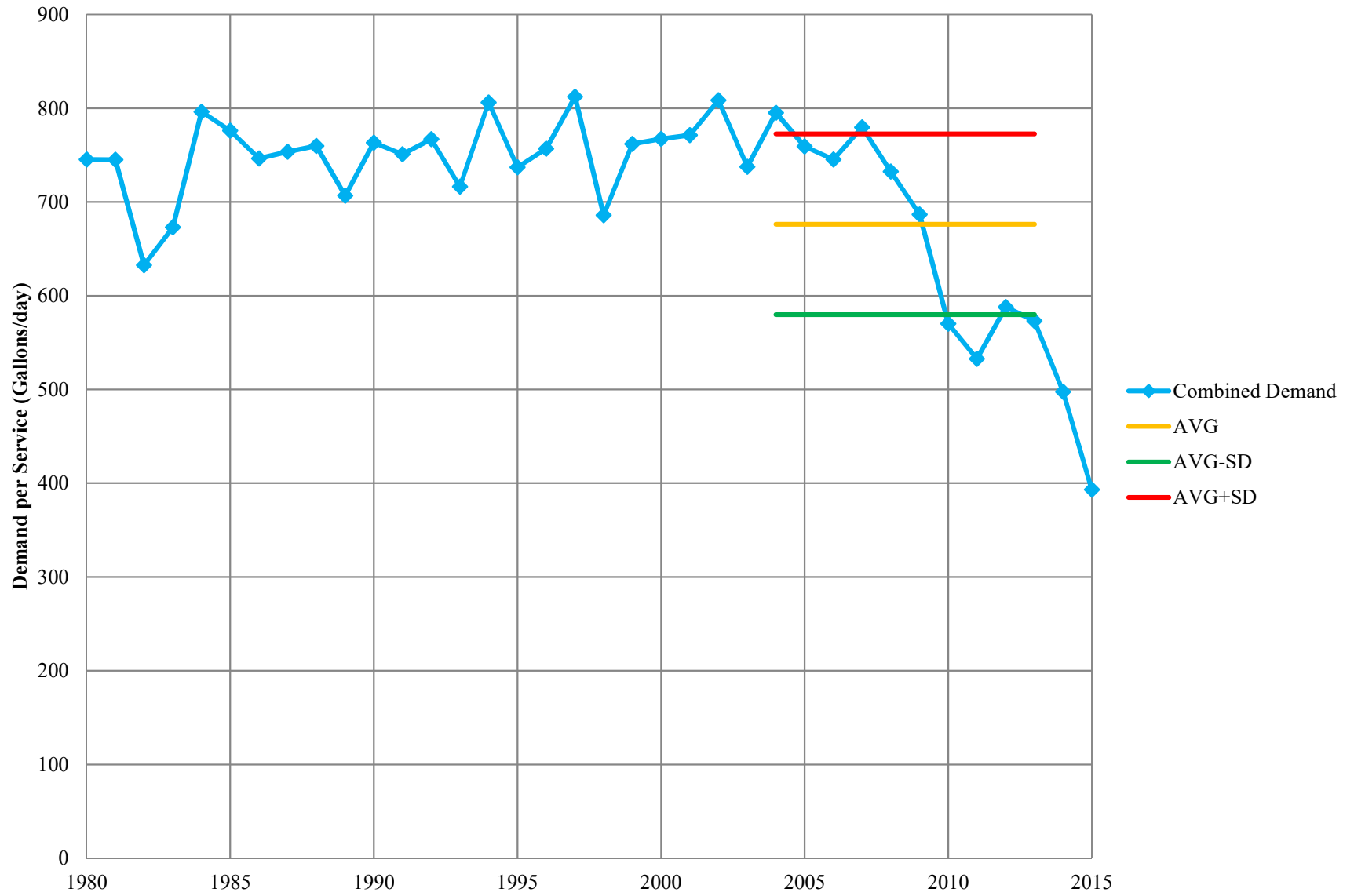


**California Water Service Company - Willows Districts**  
**Water Supply and Demand Analysis and Projections**  
**Sales (AF)**

Worksheet 3

Year	Single Family			Multi Family (MFR)	Commercial (COM)	Industrial (IND)	Government (GOV)	Other (OTH)	Unaccounted for Water (UAFW)	Total Sales (AF)	Total Demand (AF)	Total Demand (MGal)
	(SFR)	(FLT)	(Total)									
1980	169	1,025	1,194	27	231	0	87	2	134	1,542	1,676	546
1981	183	980	1,163	47	247	0	96	1	135	1,554	1,689	550
1982	169	788	958	45	227	0	91	1	115	1,321	1,436	468
1983	181	878	1,058	50	231	0	74	0	123	1,414	1,537	501
1984	231	1,044	1,275	52	272	0	95	2	147	1,695	1,842	600
1985	241	1,004	1,245	51	265	0	101	1	145	1,663	1,808	589
1986	231	921	1,152	80	260	0	105	0	139	1,596	1,735	565
1987	257	880	1,136	95	272	0	115	0	141	1,618	1,759	573
1988	275	878	1,154	102	273	0	112	0	143	1,641	1,783	581
1989	277	798	1,075	107	259	0	97	0	134	1,537	1,671	545
1990	312	846	1,158	118	271	0	121	0	145	1,669	1,814	591
1991	316	837	1,152	117	264	0	113	0	143	1,646	1,790	583
1992	346	885	1,231	122	262	0	107	0	150	1,721	1,870	609
1993	378	756	1,133	113	265	0	106	0	141	1,617	1,758	573
1994	435	852	1,287	133	272	0	135	0	159	1,826	1,985	647
1995	419	733	1,152	131	276	0	121	0	146	1,681	1,827	595
1996	448	763	1,211	141	272	0	115	0	151	1,738	1,889	615
1997	497	810	1,307	151	292	0	117	0	162	1,867	2,029	661
1998	424	673	1,097	136	263	0	92	0	138	1,587	1,725	562
1999	505	780	1,285	121	269	0	97	0	154	1,771	1,925	627
2000	518	757	1,275	108	283	0	113	0	155	1,779	1,934	630
2001	546	741	1,287	94	304	0	115	0	156	1,799	1,956	637
2002	580	799	1,379	84	314	0	120	0	165	1,897	2,062	672
2003	512	678	1,190	97	321	0	132	0	151	1,740	1,892	616
2004	582	745	1,327	102	310	0	140	0	163	1,879	2,043	666
2005	532	741	1,273	99	296	0	129	2	157	1,800	1,957	638
2006	557	690	1,247	101	303	0	131	1	155	1,782	1,937	631
2007	635	655	1,290	118	305	0	171	1	164	1,885	2,049	668
2008	629	597	1,225	118	292	0	131	3	154	1,770	1,924	627
2009	670	465	1,134	114	271	0	125	2	143	1,646	1,789	583
2010	627	295	922	112	236	0	102	2	119	1,373	1,493	486
2011	661	212	873	97	218	0	100	3	112	1,291	1,404	457
2012	780	187	967	96	248	0	108	10	124	1,428	1,553	506
2013	902	36	938	99	248	0	102	1	121	1,388	1,509	492
2014	818	0	818	97	224	0	82	3	95	1,223	1,318	430
2015	638	0	638	73	198	0.0	61	3	71	973	1,044	340

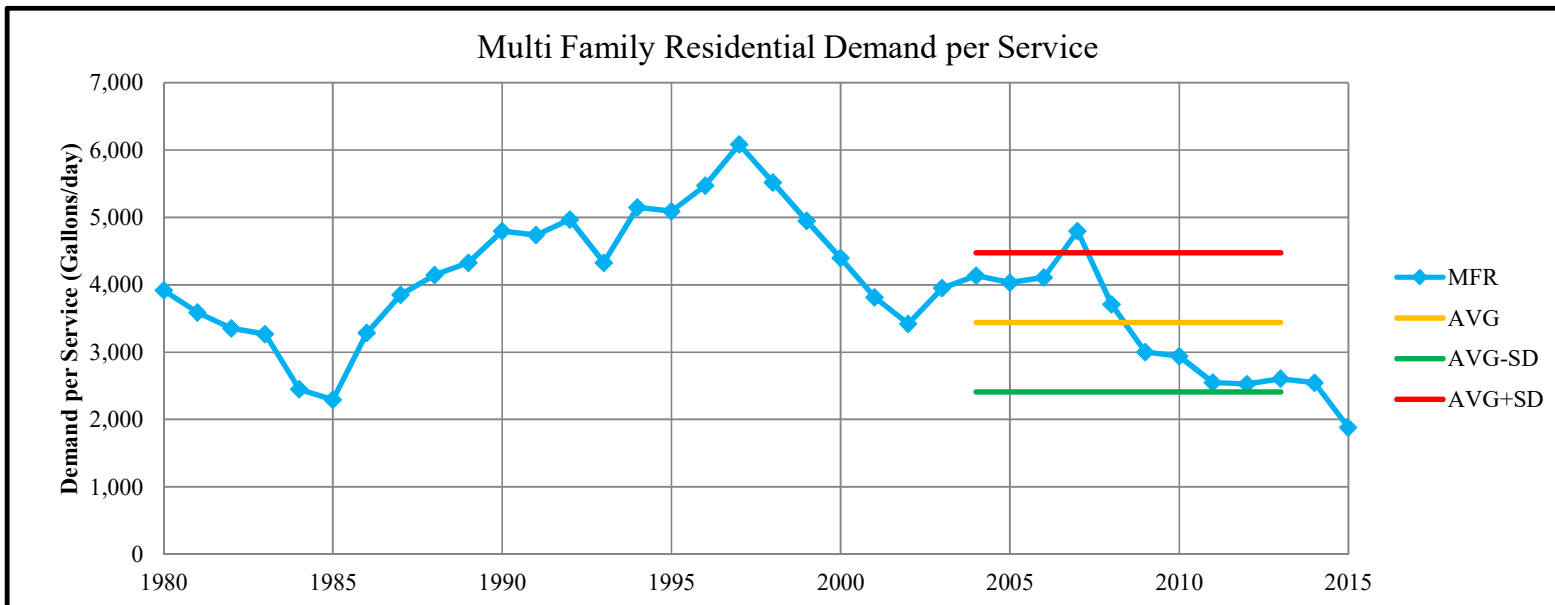
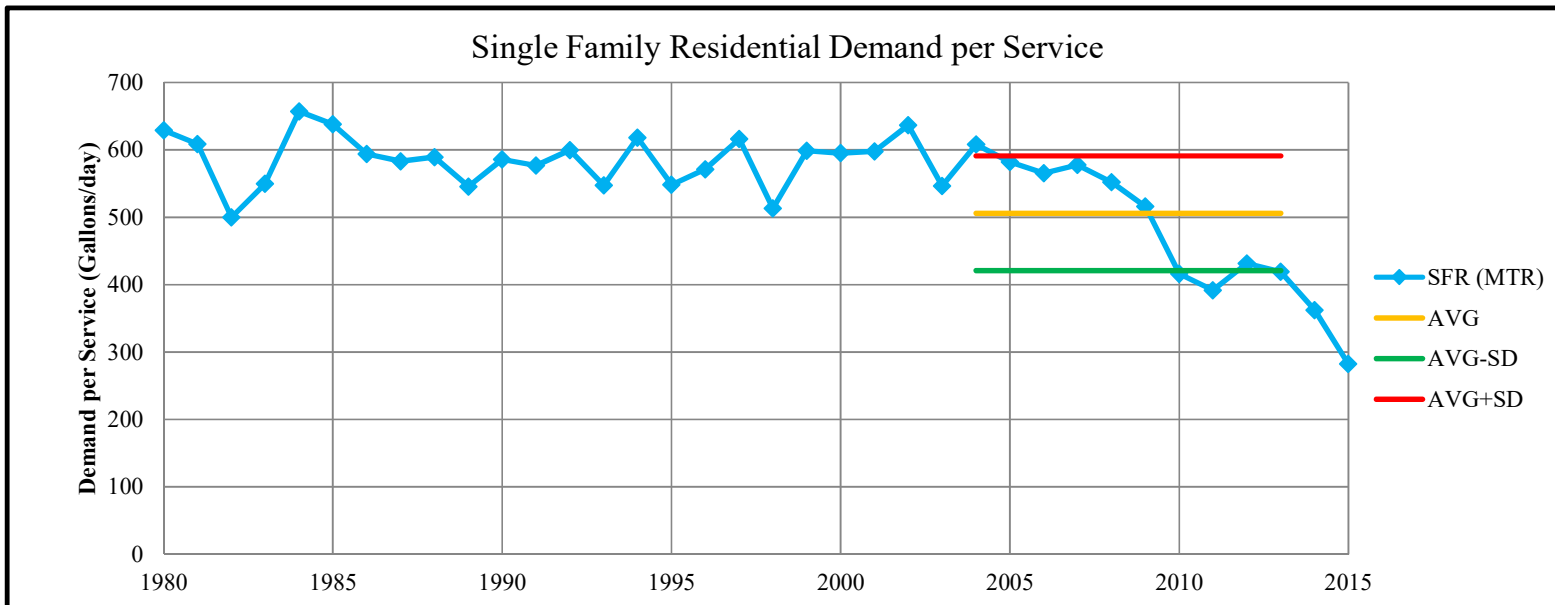
### Combined Demand per Service

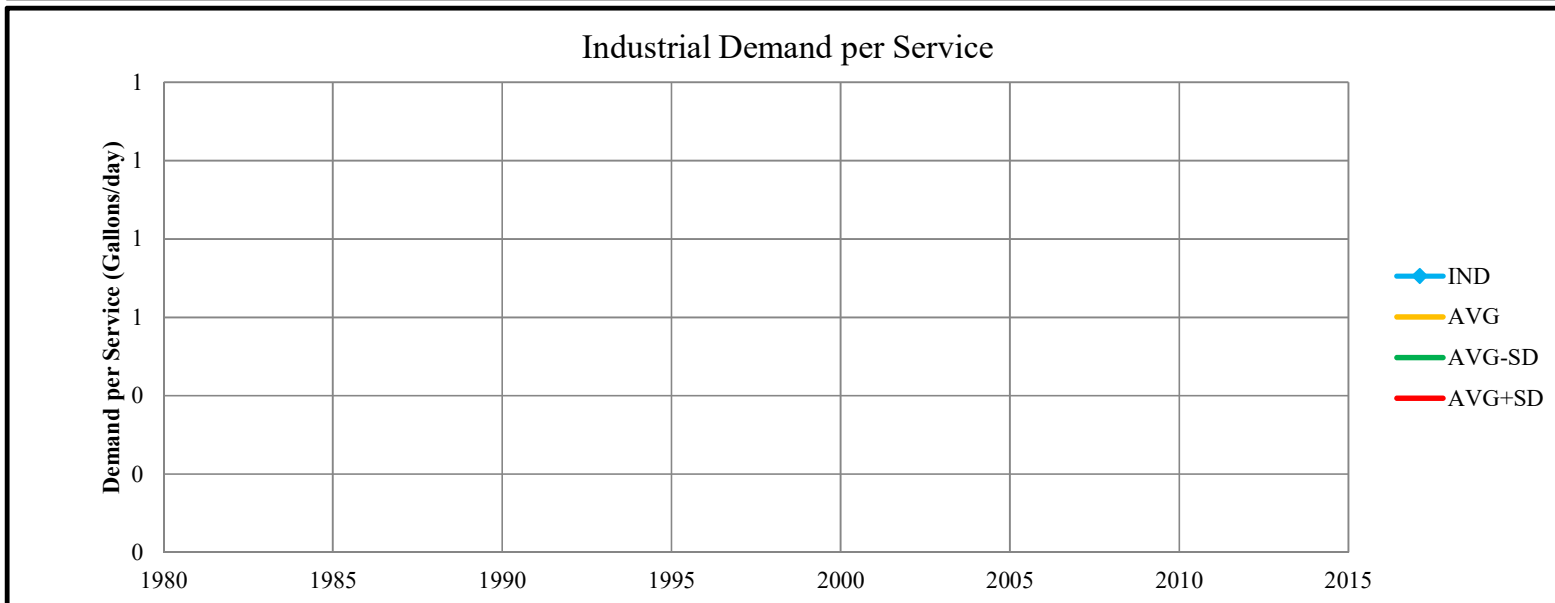
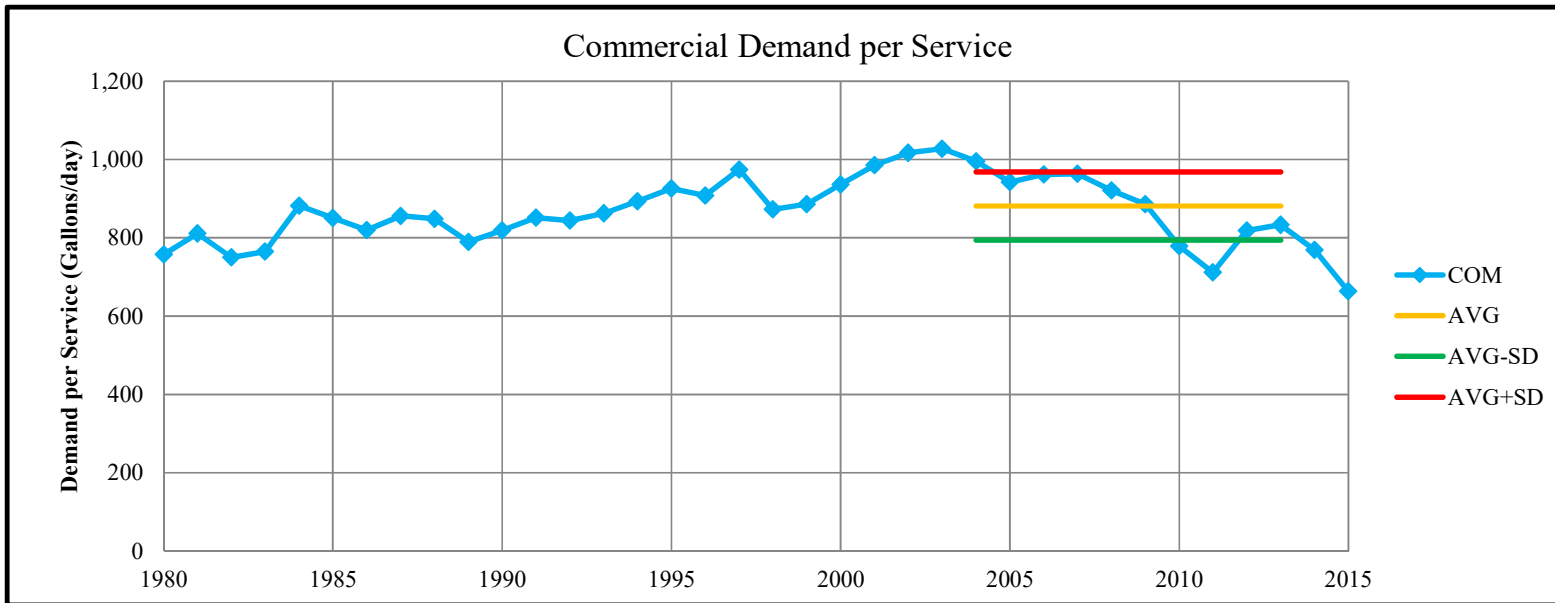


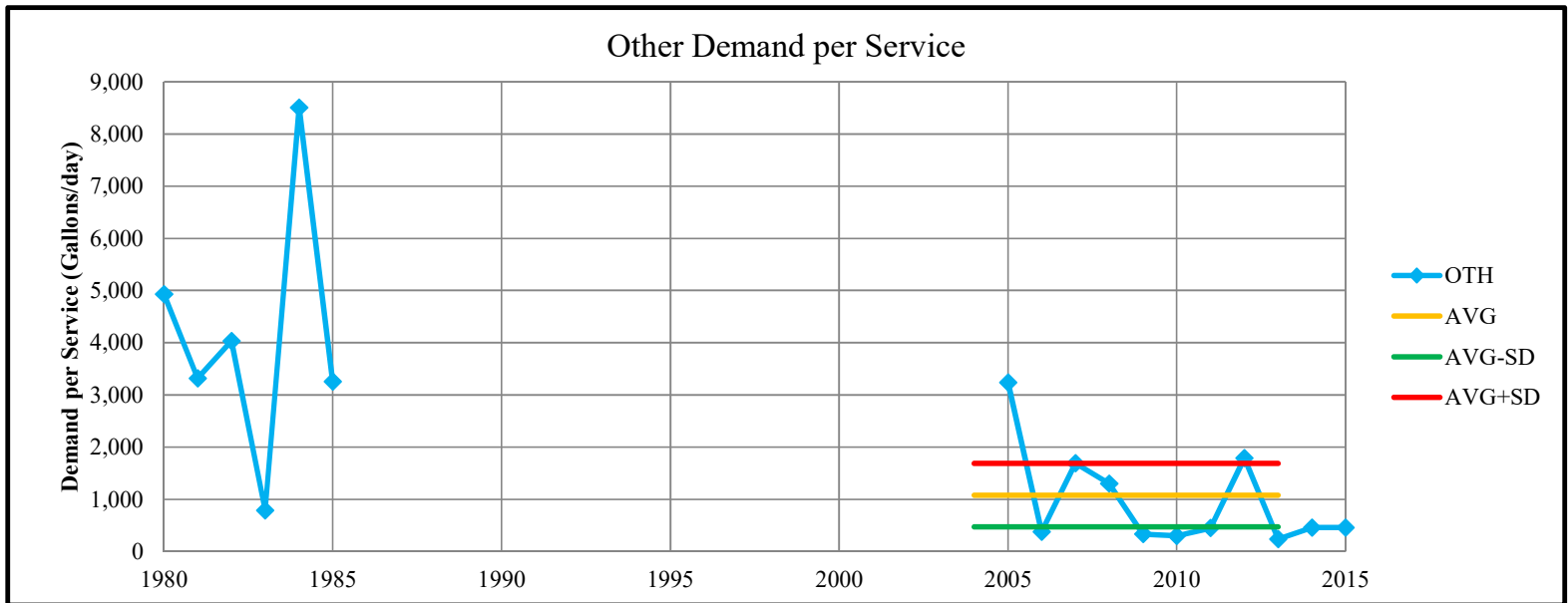
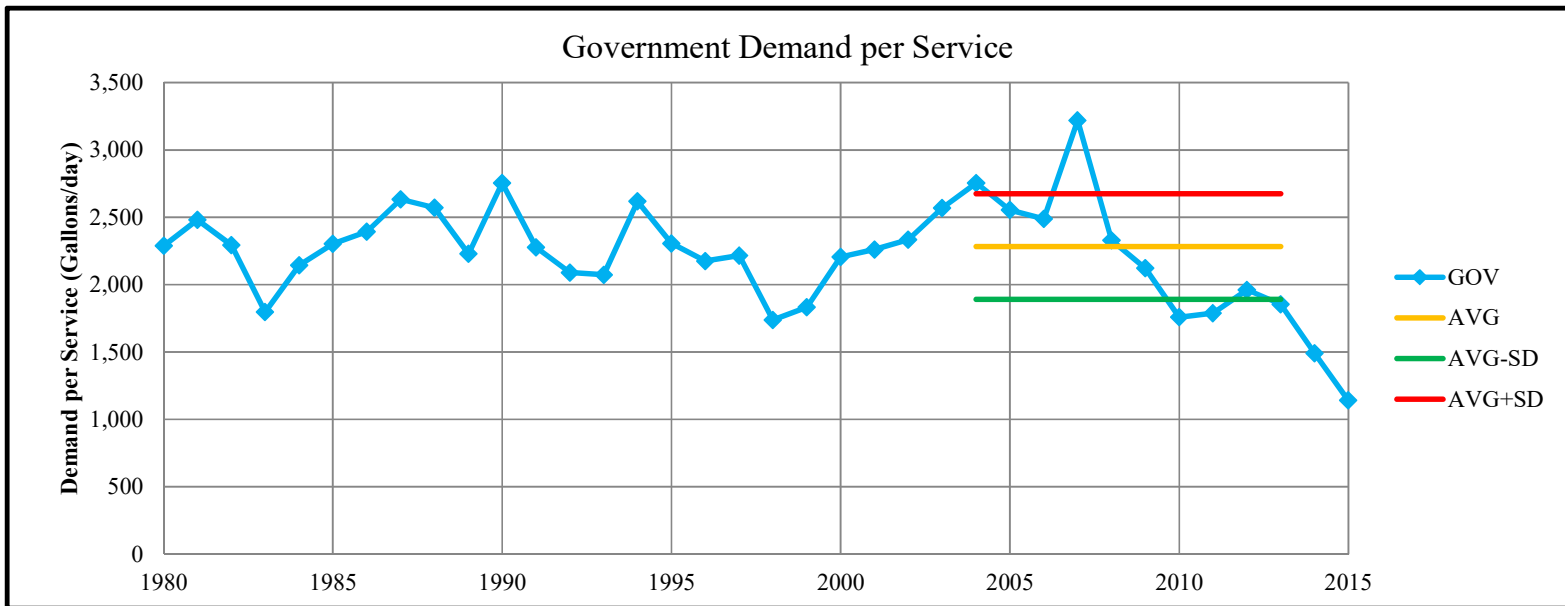
**California Water Service Company - Willows Districts**  
**Water Supply and Demand Analysis and Projections**  
**Demand per Service (Gallons per Day)**

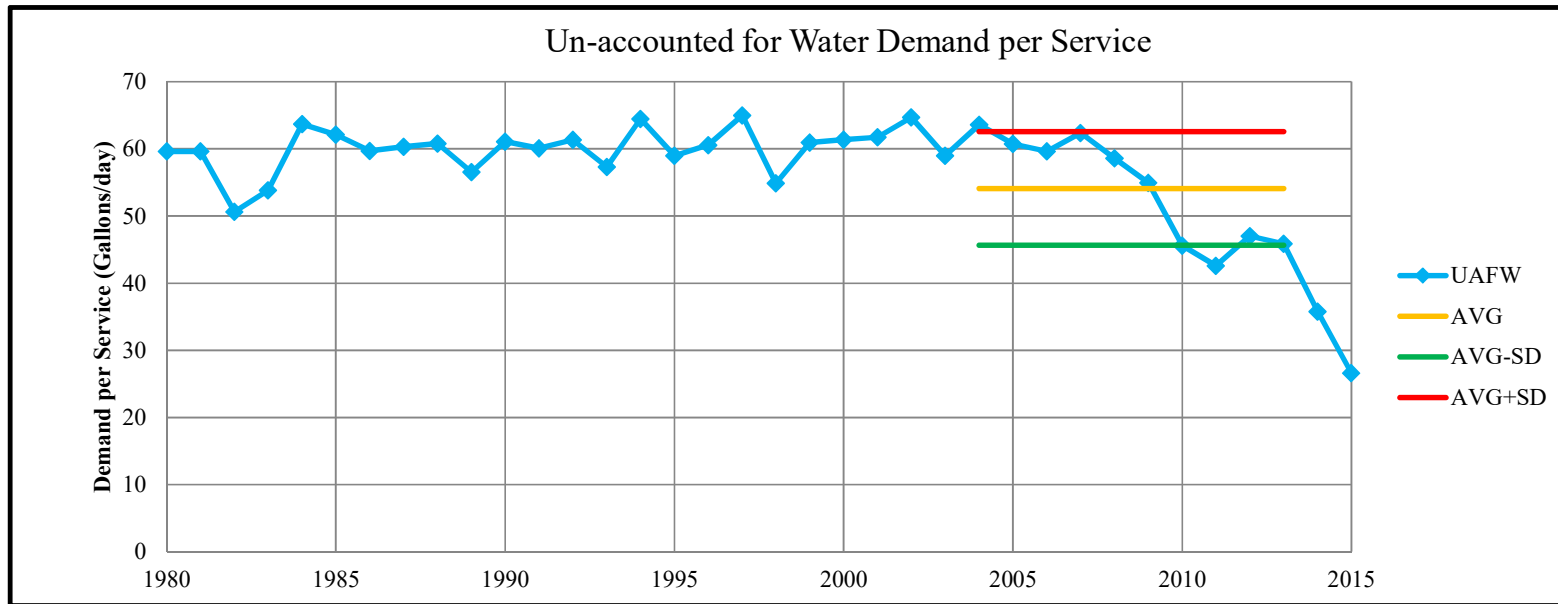
Year	SFR (MTR)	SFR (FLT)	SFR (TOT)	MFR	COM	IND	GOV	OTH	UAFW	Combined Demand/Serv
1980	350	725	629	3,919	757		2,290	4,931	60	745
1981	367	694	609	3,586	811		2,481	3,320	60	745
1982	337	558	500	3,352	750		2,294	4,033	51	633
1983	325	642	550	3,267	765		1,798	787	54	673
1984	378	786	657	2,452	882		2,145	8,509	64	796
1985	381	762	638	2,292	851		2,304	3,255	62	776
1986	358	711	594	3,286	820		2,393		60	746
1987	380	692	583	3,853	856		2,634		60	754
1988	380	713	589	4,145	849		2,572		61	760
1989	366	659	546	4,328	790		2,230		57	707
1990	398	710	586	4,798	819		2,755		61	763
1991	387	708	577	4,736	851		2,277		60	751
1992	386	765	600	4,969	844		2,092		61	767
1993	397	676	548	4,327	863		2,073		57	716
1994	437	785	618	5,148	894		2,618		64	806
1995	404	688	548	5,091	926		2,306		59	737
1996	414	736	572	5,474	909		2,176		61	757
1997	448	800	616	6,084	974		2,218		65	812
1998	372	675	513	5,519	873		1,739		55	686
1999	435	793	599	4,947	886		1,835		61	762
2000	443	778	595	4,394	936		2,205		61	767
2001	461	766	598	3,816	986		2,262		62	771
2002	482	830	637	3,421	1,017		2,335		65	809
2003	419	710	547	3,953	1,027		2,569		59	738
2004	470	789	608	4,135	996		2,755		64	795
2005	428	785	582	4,032	942		2,554	3,234	61	759
2006	439	737	565	4,110	962		2,487	375	60	746
2007	485	709	578	4,799	963		3,220	1,693	62	780
2008	460	700	552	3,707	921		2,330	1,299	59	733
2009	444	674	516	3,003	886		2,122	330	55	687
2010	390	487	416	2,939	779		1,759	297	46	570
2011	370	483	392	2,548	712		1,789	447	43	533
2012	402	625	432	2,527	819		1,963	1,791	47	588
2013	426	303	419	2,605	833		1,855	239	46	573
2014	372	0	362	2,544	769		1,492	456	36	498
2015	282		282	1,881	663		1,141	459	27	393
AVG (2004-2013)	431		506	3,440	881		2,284	1,078	54	676
SD	46		85	1,033	87		392	607	8	96

Note: Average based on 2004-2013 due to 2014 and 2015 are drought years.









**California Water Service Company - Willows Districts**  
**Water Supply and Demand Analysis and Projections**  
**Percentage Change in Annual Demand**

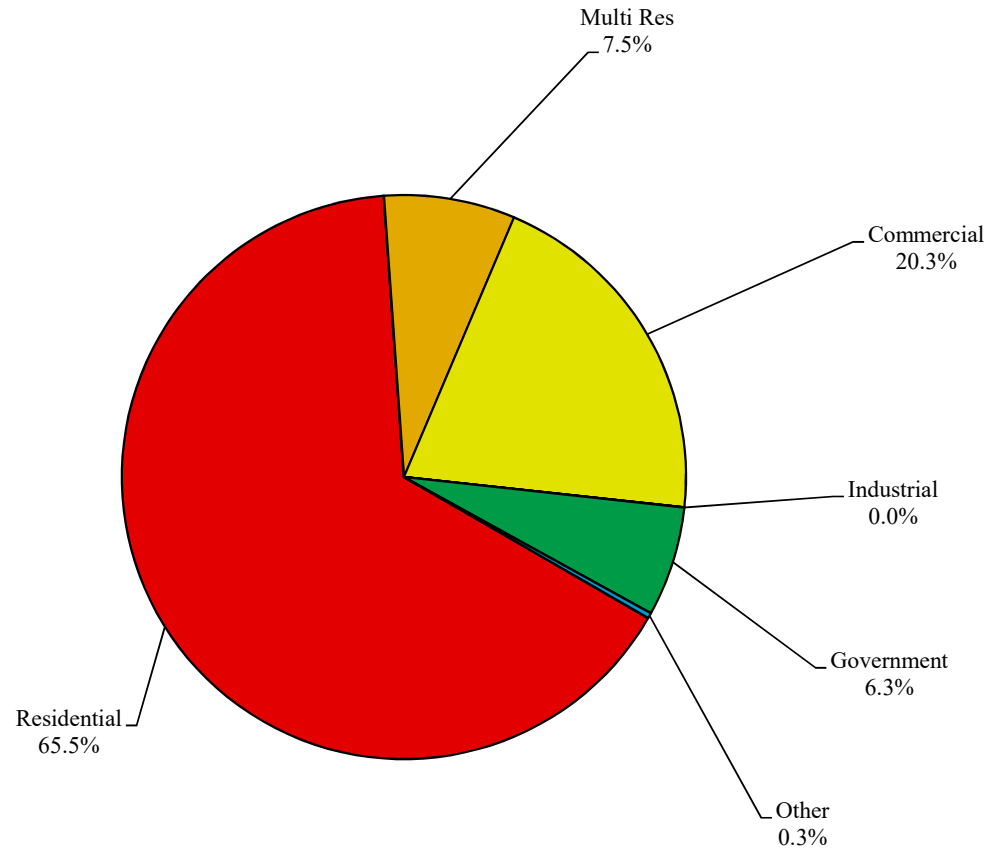
Worksheet 5

Year	Residential	Multi Res	Commercial	Industrial	Government	Other	Unaccounted	Total
1981	8.02%	69.58%	6.75%		10.45%	-66.33%	0.76%	0.76%
1982	-7.47%	-3.16%	-7.86%		-6.00%	21.48%	-14.96%	-14.96%
1983	6.77%	11.67%	1.65%		-18.44%	-90.24%	6.99%	6.99%
1984	27.55%	2.37%	17.51%		28.48%	2062.50%	19.86%	19.86%
1985	4.69%	-1.16%	-2.31%		6.76%	-42.63%	-1.84%	-1.84%
1986	-4.18%	57.26%	-2.16%		3.20%	-100.00%	-4.04%	-4.04%
1987	11.02%	18.59%	4.78%		10.04%		1.40%	1.40%
1988	7.17%	7.58%	0.20%		-2.34%		1.37%	1.37%
1989	0.70%	4.43%	-5.07%		-13.30%		-6.29%	-6.29%
1990	12.60%	10.84%	4.76%		24.58%		8.56%	8.56%
1991	1.20%	-1.28%	-2.43%		-7.17%		-1.36%	-1.36%
1992	9.66%	4.12%	-1.08%		-5.39%		4.51%	4.51%
1993	9.10%	-6.93%	1.16%		-0.33%		-6.00%	-6.00%
1994	15.09%	17.28%	2.67%		26.96%		12.93%	12.93%
1995	-3.65%	-1.10%	1.48%		-9.99%		-7.98%	-7.98%
1996	6.91%	7.51%	-1.55%		-5.66%		3.40%	3.40%
1997	10.95%	7.13%	7.41%		1.93%		7.43%	7.43%
1998	-14.75%	-9.97%	-9.88%		-21.60%		-14.99%	-14.99%
1999	19.21%	-11.39%	2.26%		5.52%		11.62%	11.62%
2000	2.61%	-10.15%	5.30%		16.79%		0.44%	0.44%
2001	5.27%	-13.49%	7.43%		1.64%		1.12%	1.12%
2002	6.30%	-10.00%	3.12%		4.73%		5.46%	5.46%
2003	-11.69%	15.10%	2.52%		10.01%		-8.28%	-8.28%
2004	13.59%	5.00%	-3.55%		6.30%		8.00%	8.00%
2005	-8.61%	-2.48%	-4.47%		-7.98%		-4.23%	-4.23%
2006	4.78%	1.94%	2.36%		1.33%	-78.23%	-0.98%	-0.98%
2007	14.05%	16.75%	0.60%		30.37%	80.35%	5.77%	5.77%
2008	-1.04%	-0.22%	-4.17%		-23.06%	245.28%	-6.11%	-6.11%
2009	6.51%	-3.56%	-7.23%		-4.84%	-53.93%	-7.03%	-7.03%
2010	-6.42%	-1.89%	-12.98%		-18.27%	6.54%	-16.56%	-16.56%
2011	5.51%	-13.09%	-7.56%		-2.22%	99.86%	-5.96%	-5.96%
2012	17.96%	-0.82%	13.50%		7.88%	212.29%	10.62%	10.62%
2013	15.64%	3.10%	0.06%		-5.53%	-89.11%	-2.84%	-2.84%
2014	-9.26%	-2.36%	-9.53%		-19.82%	133.61%	-21.52%	-11.85%
2015	-22.08%	-24.43%	-11.67%		-24.87%	17.54%	-25.41%	-20.46%



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## Percent of Total Sales by Type of Use (2015)

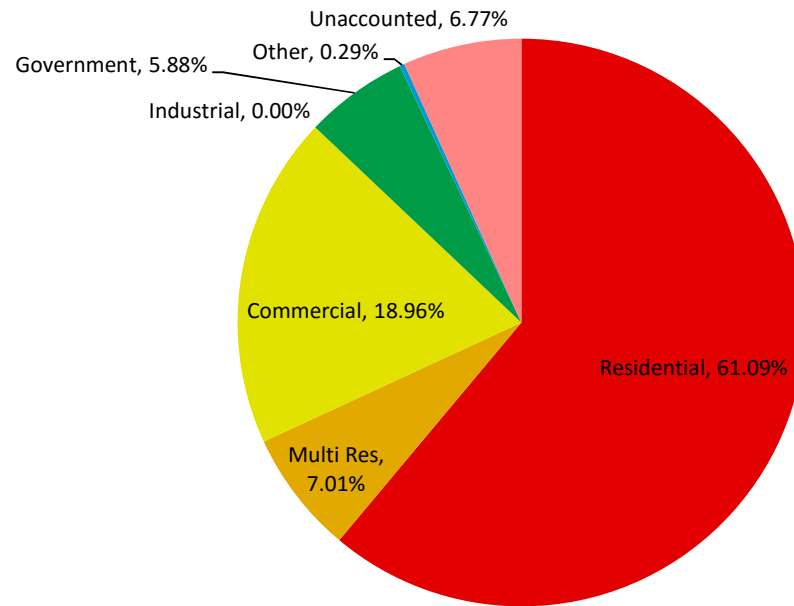


**California Water Service Company - Willows Districts**  
**Water Supply and Demand Analysis and Projections**  
**Percentage of Total Sales**

Worksheet 6

Year	Residential	Multi Res	Commercial	Industrial	Government	Other	Percent Total
1980	77.45%	1.78%	14.99%	0.00%	5.66%	0.12%	100.00%
1981	74.88%	2.99%	15.89%	0.00%	6.20%	0.04%	100.00%
1982	72.47%	3.41%	17.21%	0.00%	6.85%	0.06%	100.00%
1983	74.86%	3.56%	16.35%	0.00%	5.22%	0.01%	100.00%
1984	75.24%	3.04%	16.03%	0.00%	5.60%	0.09%	100.00%
1985	74.84%	3.06%	15.95%	0.00%	6.09%	0.05%	100.00%
1986	72.17%	5.02%	16.27%	0.00%	6.55%	0.00%	100.00%
1987	70.21%	5.87%	16.81%	0.00%	7.11%	0.00%	100.00%
1988	70.31%	6.23%	16.61%	0.00%	6.85%	0.00%	100.00%
1989	69.90%	6.94%	16.83%	0.00%	6.34%	0.00%	100.00%
1990	69.40%	7.08%	16.24%	0.00%	7.27%	0.00%	100.00%
1991	70.00%	7.09%	16.07%	0.00%	6.84%	0.00%	100.00%
1992	71.54%	7.06%	15.21%	0.00%	6.20%	0.00%	100.00%
1993	70.07%	6.99%	16.37%	0.00%	6.57%	0.00%	100.00%
1994	70.47%	7.26%	14.88%	0.00%	7.39%	0.00%	100.00%
1995	68.56%	7.81%	16.41%	0.00%	7.23%	0.00%	100.00%
1996	69.67%	8.12%	15.63%	0.00%	6.59%	0.00%	100.00%
1997	70.03%	8.09%	15.62%	0.00%	6.25%	0.00%	100.00%
1998	69.10%	8.57%	16.56%	0.00%	5.77%	0.00%	100.00%
1999	72.57%	6.80%	15.17%	0.00%	5.45%	0.00%	100.00%
2000	71.67%	6.09%	15.91%	0.00%	6.34%	0.00%	100.00%
2001	71.52%	5.21%	16.90%	0.00%	6.37%	0.00%	100.00%
2002	72.70%	4.44%	16.52%	0.00%	6.33%	0.00%	100.00%
2003	68.36%	5.58%	18.47%	0.00%	7.59%	0.00%	100.00%
2004	70.61%	5.42%	16.49%	0.00%	7.47%	0.00%	100.00%
2005	70.72%	5.52%	16.45%	0.00%	7.18%	0.13%	100.00%
2006	69.94%	5.68%	17.01%	0.00%	7.35%	0.03%	100.00%
2007	68.45%	6.27%	16.17%	0.00%	9.05%	0.05%	100.00%
2008	69.22%	6.67%	16.51%	0.00%	7.42%	0.18%	100.00%
2009	68.92%	6.92%	16.47%	0.00%	7.60%	0.09%	100.00%
2010	67.13%	8.13%	17.18%	0.00%	7.44%	0.12%	100.00%
2011	67.61%	7.51%	16.89%	0.00%	7.74%	0.25%	100.00%
2012	67.69%	6.74%	17.33%	0.00%	7.54%	0.70%	100.00%
2013	67.59%	7.15%	17.84%	0.00%	7.33%	0.08%	100.00%
2014	66.89%	7.92%	18.31%	0.00%	6.67%	0.21%	100.00%
2015	65.53%	7.52%	20.34%	0.00%	6.30%	0.31%	100.00%

### Percent of Total Demand by Type of Use (2015)

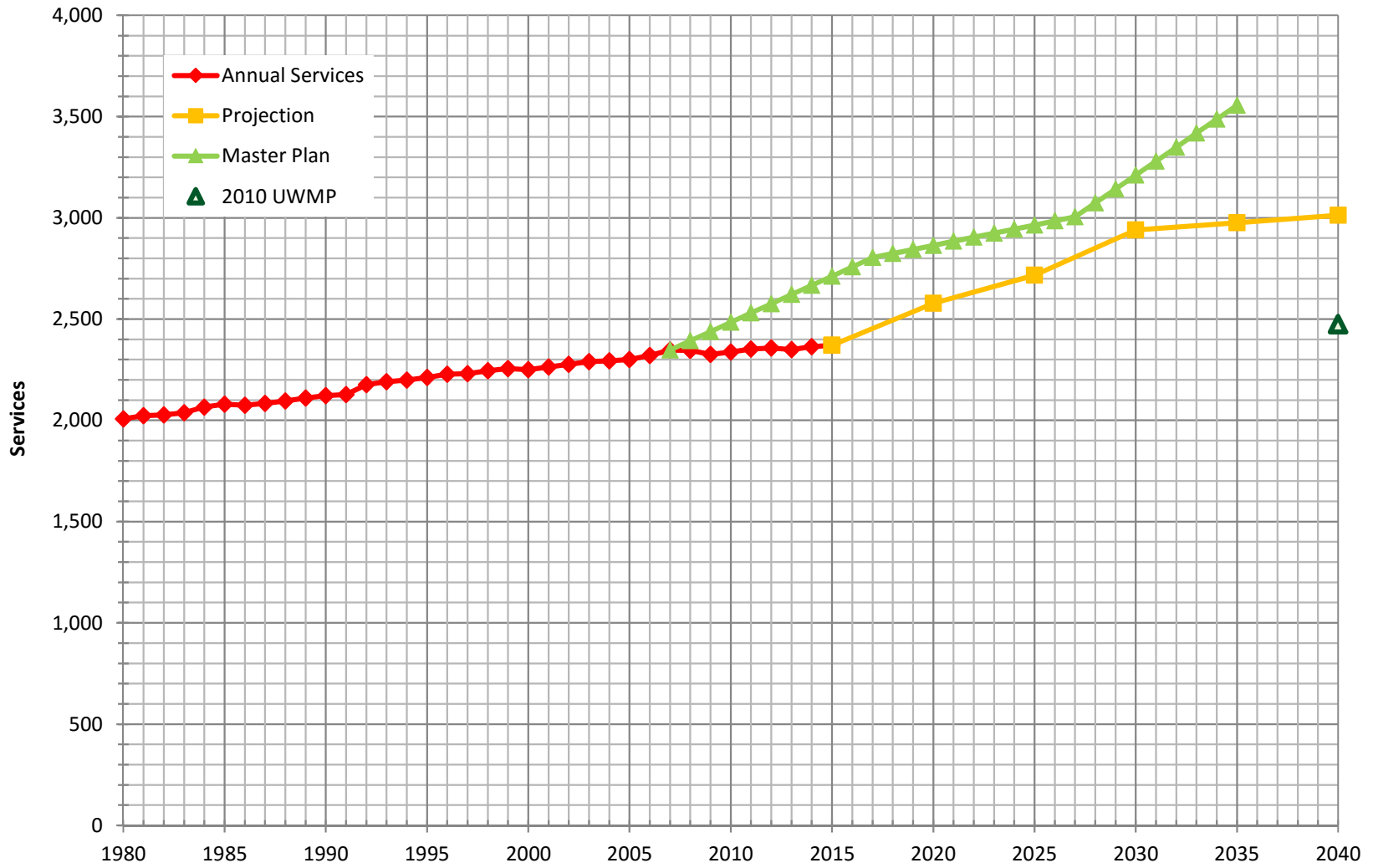


**California Water Service Company - Willows Districts**  
**Water Supply and Demand Analysis and Projections**  
**Percentage of Total Demand**

Worksheet 7

Year	Residential	Multi Res	Commercial	Industrial	Government	Other	Unaccounted	Percent Total
1980	71.25%	1.64%	13.79%	0.00%	5.20%	0.11%	8.00%	100.00%
1981	68.89%	2.76%	14.61%	0.00%	5.70%	0.04%	8.00%	100.00%
1982	66.67%	3.14%	15.83%	0.00%	6.31%	0.05%	8.00%	100.00%
1983	68.87%	3.27%	15.04%	0.00%	4.81%	0.00%	8.00%	100.00%
1984	69.22%	2.80%	14.75%	0.00%	5.15%	0.09%	8.00%	100.00%
1985	68.85%	2.82%	14.68%	0.00%	5.60%	0.05%	8.00%	100.00%
1986	66.39%	4.61%	14.97%	0.00%	6.03%	0.00%	8.00%	100.00%
1987	64.60%	5.40%	15.46%	0.00%	6.54%	0.00%	8.00%	100.00%
1988	64.69%	5.73%	15.29%	0.00%	6.30%	0.00%	8.00%	100.00%
1989	64.30%	6.38%	15.48%	0.00%	5.83%	0.00%	8.00%	100.00%
1990	63.85%	6.52%	14.94%	0.00%	6.69%	0.00%	8.00%	100.00%
1991	64.40%	6.52%	14.78%	0.00%	6.30%	0.00%	8.00%	100.00%
1992	65.81%	6.50%	13.99%	0.00%	5.70%	0.00%	8.00%	100.00%
1993	64.47%	6.43%	15.06%	0.00%	6.04%	0.00%	8.00%	100.00%
1994	64.83%	6.68%	13.69%	0.00%	6.80%	0.00%	8.00%	100.00%
1995	63.07%	7.18%	15.10%	0.00%	6.65%	0.00%	8.00%	100.00%
1996	64.09%	7.47%	14.38%	0.00%	6.06%	0.00%	8.00%	100.00%
1997	64.43%	7.45%	14.37%	0.00%	5.75%	0.00%	8.00%	100.00%
1998	63.57%	7.88%	15.24%	0.00%	5.31%	0.00%	8.00%	100.00%
1999	66.77%	6.26%	13.96%	0.00%	5.02%	0.00%	8.00%	100.00%
2000	65.93%	5.60%	14.63%	0.00%	5.83%	0.00%	8.00%	100.00%
2001	65.80%	4.79%	15.55%	0.00%	5.86%	0.00%	8.00%	100.00%
2002	66.89%	4.09%	15.20%	0.00%	5.82%	0.00%	8.00%	100.00%
2003	62.89%	5.13%	16.99%	0.00%	6.98%	0.00%	8.00%	100.00%
2004	64.96%	4.99%	15.17%	0.00%	6.87%	0.00%	8.00%	100.00%
2005	65.06%	5.08%	15.14%	0.00%	6.60%	0.12%	8.00%	100.00%
2006	64.34%	5.23%	15.65%	0.00%	6.76%	0.03%	8.00%	100.00%
2007	62.97%	5.77%	14.88%	0.00%	8.33%	0.05%	8.00%	100.00%
2008	63.68%	6.13%	15.19%	0.00%	6.83%	0.17%	8.00%	100.00%
2009	63.41%	6.36%	15.15%	0.00%	6.99%	0.08%	8.00%	100.00%
2010	61.76%	7.48%	15.80%	0.00%	6.84%	0.11%	8.00%	100.00%
2011	62.21%	6.91%	15.54%	0.00%	7.12%	0.23%	8.00%	100.00%
2012	62.27%	6.20%	15.94%		6.94%	0.65%	8.00%	100.00%
2013	62.19%	6.58%	16.42%		6.75%	0.07%	8.00%	100.00%
2014	62.08%	7.35%	17.00%		6.19%	0.19%	7.19%	100.00%
2015	61.09%	7.01%	18.96%		5.88%	0.29%	6.77%	100.00%

### Historical & Projected Services



**California Water Service Company - Willows Districts**  
**Water Supply and Demand Analysis and Projections**

Customer Category	Selected Trend	Growth Rate	Actual Services				Projected Services					
			2000	2005	2010	Base Year 2015	2015	2020	2025	2030	2035	2040
SFR	SFR_F 10 Yr. Avg.+Planned Dev	1.09%	1,913	1,952	1,976	2,016	2,016	2,218	2,350	2,572	2,607	2,642
MFR	MFR_F 5 Yr. Avg.+Planned Dev	1.28%	22	22	34	35	35	40	45	46	47	48
COM	COM_A Zero Growth Rate	0.00%	270	281	270	267	267	267	267	267	267	267
IND	IND_A Zero Growth Rate	0.00%	0	0	0	0	0	0	0	0	0	0
GOV	GOV_B 0.0025	0.25%	46	45	52	48	48	49	49	50	50	51
OTH	OTH_B 0.0025	0.25%	0	1	5	6	6	6	6	6	6	6
<b>TOTAL</b>	<b>Average growth rate 2012-2040</b>	<b>0.97%</b>	<b>2,250</b>	<b>2,301</b>	<b>2,337</b>	<b>2,371</b>	<b>2,371</b>	<b>2,578</b>	<b>2,717</b>	<b>2,940</b>	<b>2,976</b>	<b>3,013</b>

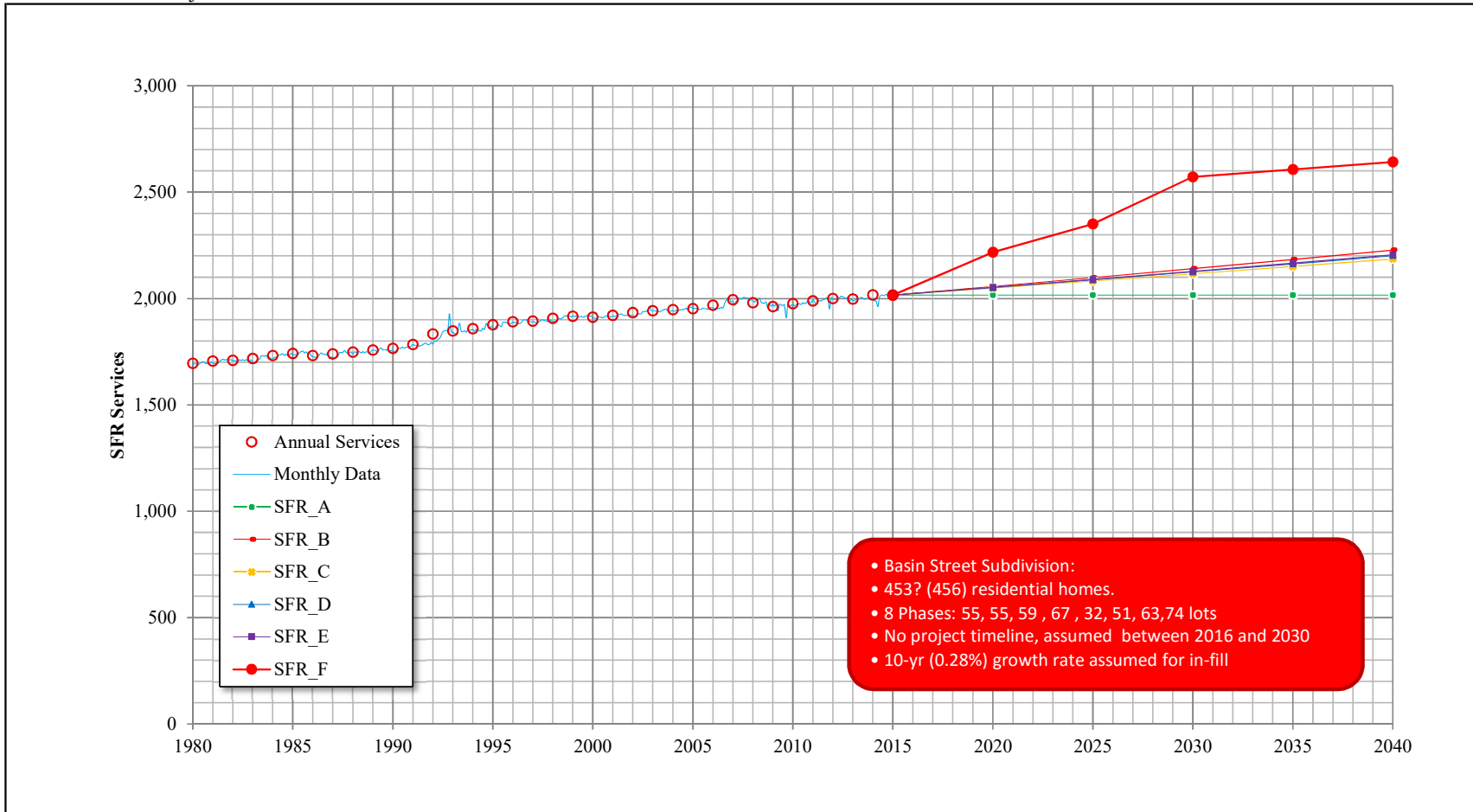
Notes:

		Percent of Total									
COM		12.0%	12.2%	11.6%	11.2%	11.2%	10.3%	9.8%	9.1%	9.0%	8.8%
GOV		2.0%	2.0%	2.2%	2.0%	2.0%	1.9%	1.8%	1.7%	1.7%	1.7%

# California Water Service Company - Willows Districts

## Water Supply and Demand Analysis and Projections

### SFR Historical & Projected Services



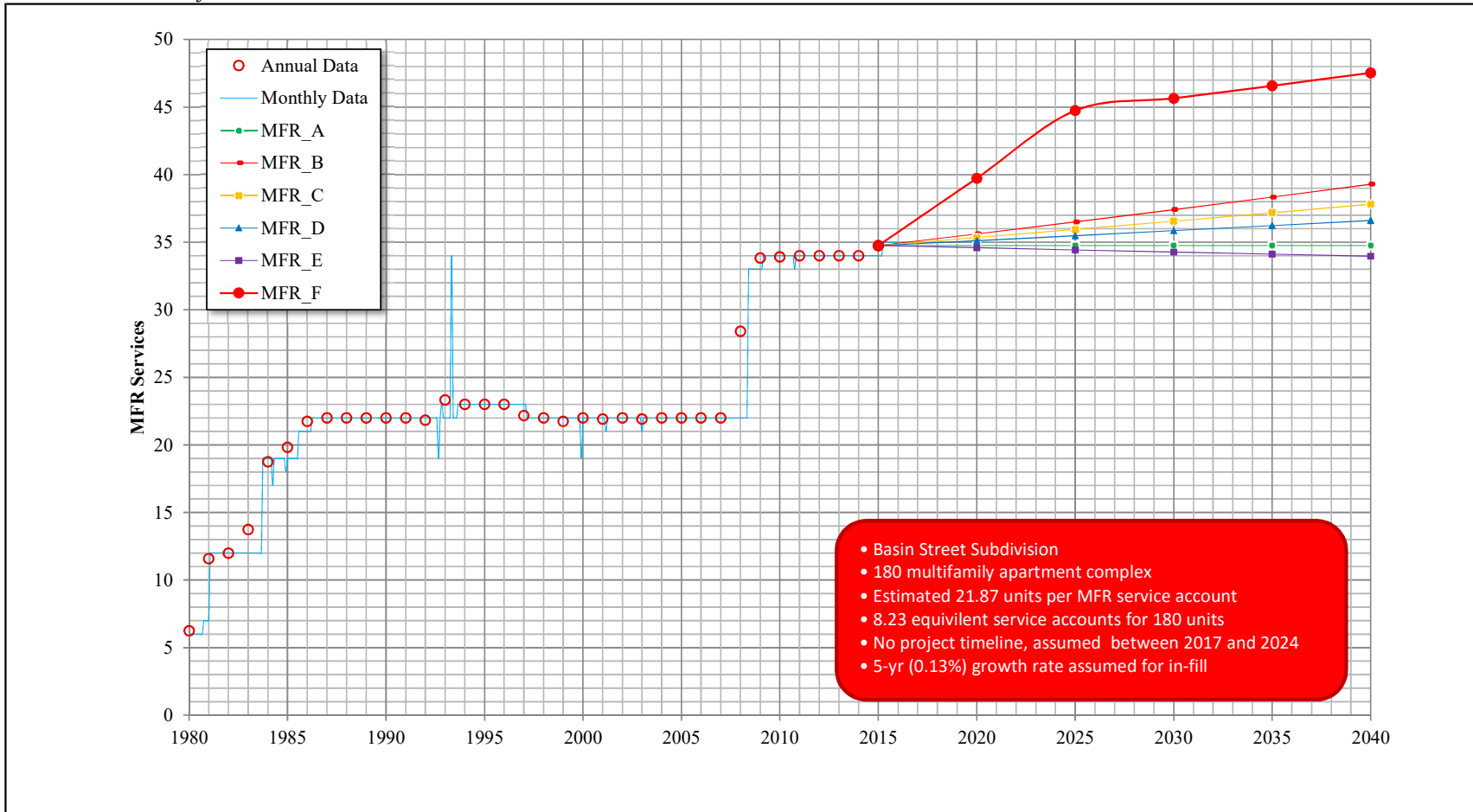
Customer Category	Trend	Growth Rate	Actual				Projected					
			2000	2005	2010	Base Year 2015	Services 2015	Services 2020	Services 2025	Services 2030	Services 2035	Services 2040
SFR	SFR_A	Zero Growth Rate	1,913	1,952	1,976	2,016	2016	2016	2016	2016	2016	2016
	SFR_B	5 Yr. Avg.				2,016	2016	2056	2098	2140	2183	2227
	SFR_C	10 Yr. Avg.				2,016	2016	2049	2082	2116	2151	2186
	SFR_D	15 Yr. Avg.				2,016	2016	2052	2088	2125	2163	2201
	SFR_E	20 Yr. Avg.				2,016	2016	2052	2090	2127	2166	2205
	> SFR_F	10 Yr. Avg.+Planned Dev				2,016	2016	2218	2350	2572	2607	2642



# California Water Service Company - Willows Districts

## Water Supply and Demand Analysis and Projections

### MFR Historical & Projected Services



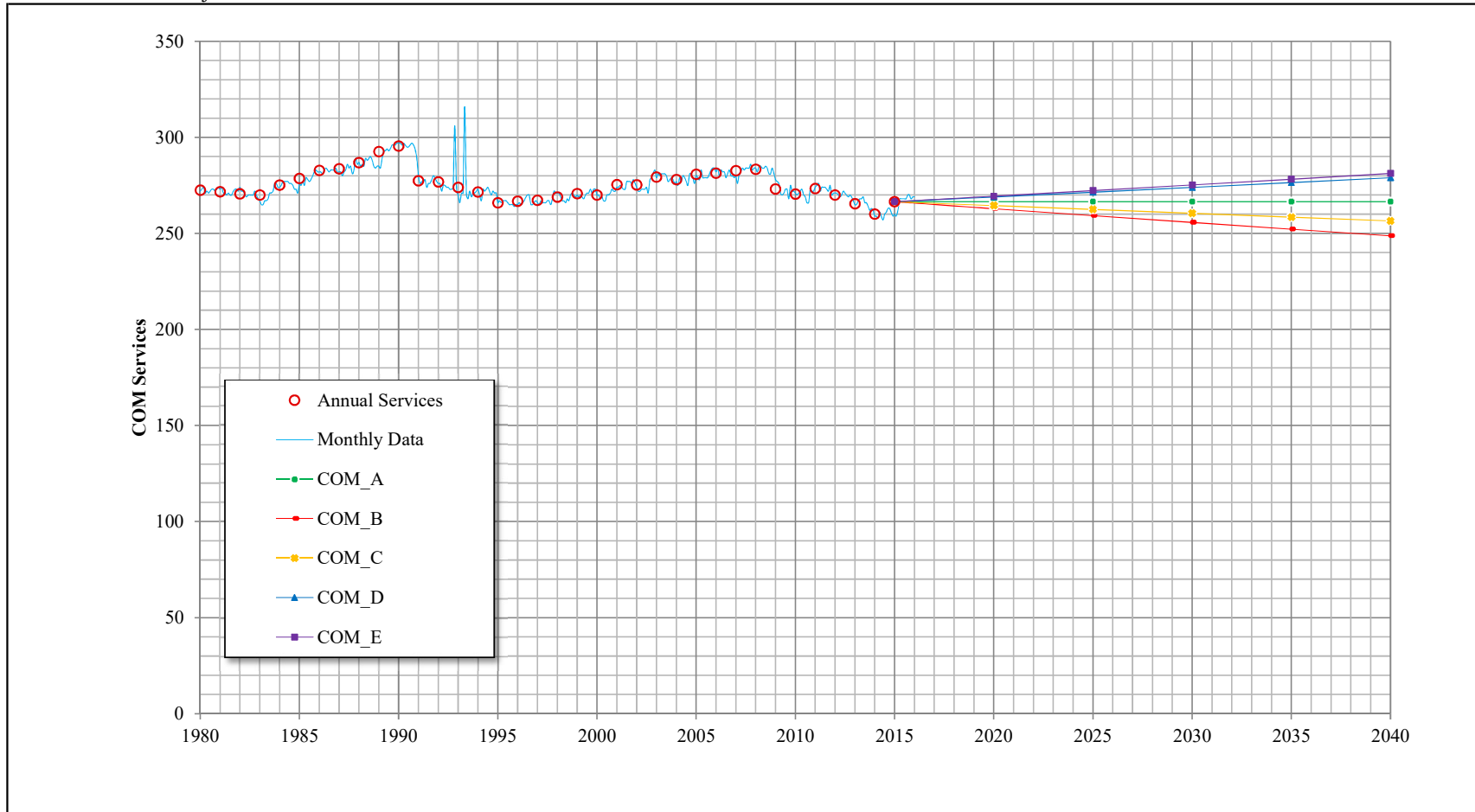
- Basin Street Subdivision
- 180 multifamily apartment complex
- Estimated 21.87 units per MFR service account
- 8.23 equivalent service accounts for 180 units
- No project timeline, assumed between 2017 and 2024
- 5-yr (0.13%) growth rate assumed for in-fill

Customer Category	Trend	Growth Rate	Actual				Projected					
			2000	2005	2010	Base Year 2015	Services 2015	Services 2020	Services 2025	Services 2030	Services 2035	Services 2040
MFR			22	22	34	35	35	35	35	35	35	35
	MFR_A	Zero Growth Rate				35	35	35	35	35	35	35
	MFR_B	5 Yr. Avg.				35	35	36	36	37	38	39
	MFR_C	10 Yr. Avg.				35	35	35	36	37	37	38
	MFR_D	15 Yr. Avg.				35	35	35	35	36	36	37
	MFR_E	20 Yr. Avg.				35	35	35	34	34	34	34
	> MFR_F	5 Yr. Avg.+Planned Dev				35	35	40	45	46	47	48

# California Water Service Company - Willows Districts

## Water Supply and Demand Analysis and Projections

### COM Historical & Projected Services

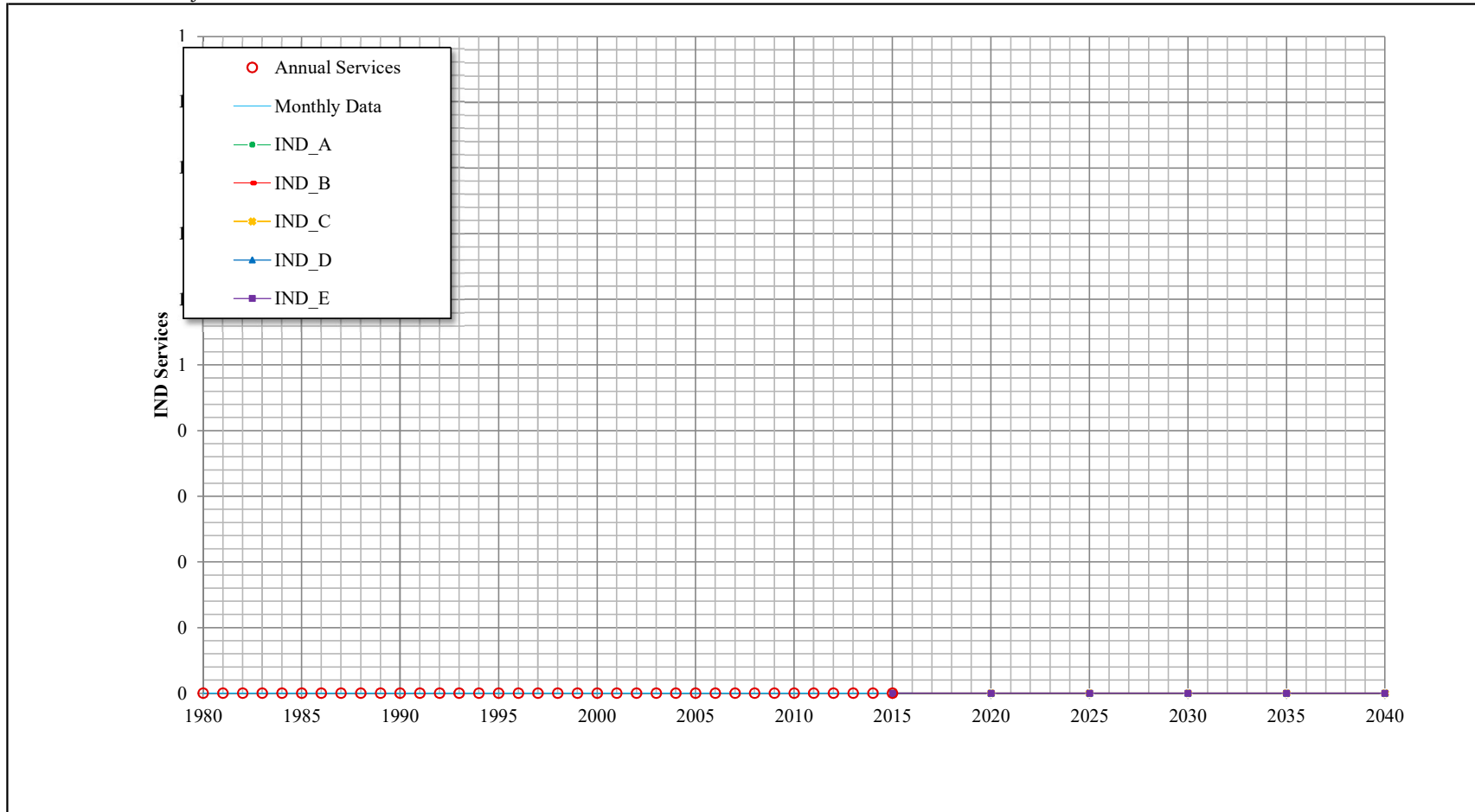


Customer Category	Trend	Growth Rate	Actual				Projected					
			2000	2005	2010	Base Year 2015	Services 2015	Services 2020	Services 2025	Services 2030	Services 2035	Services 2040
COM	>	COM_A	270	281	270	267	267	267	267	267	267	267
		COM_B				267	267	263	259	256	252	249
		COM_C				267	267	264	262	260	258	256
		COM_D				267	267	269	271	274	276	279
		COM_E				267	267	269	272	275	278	281

# California Water Service Company - Willows Districts

## Water Supply and Demand Analysis and Projections

IND Historical & Projected Services

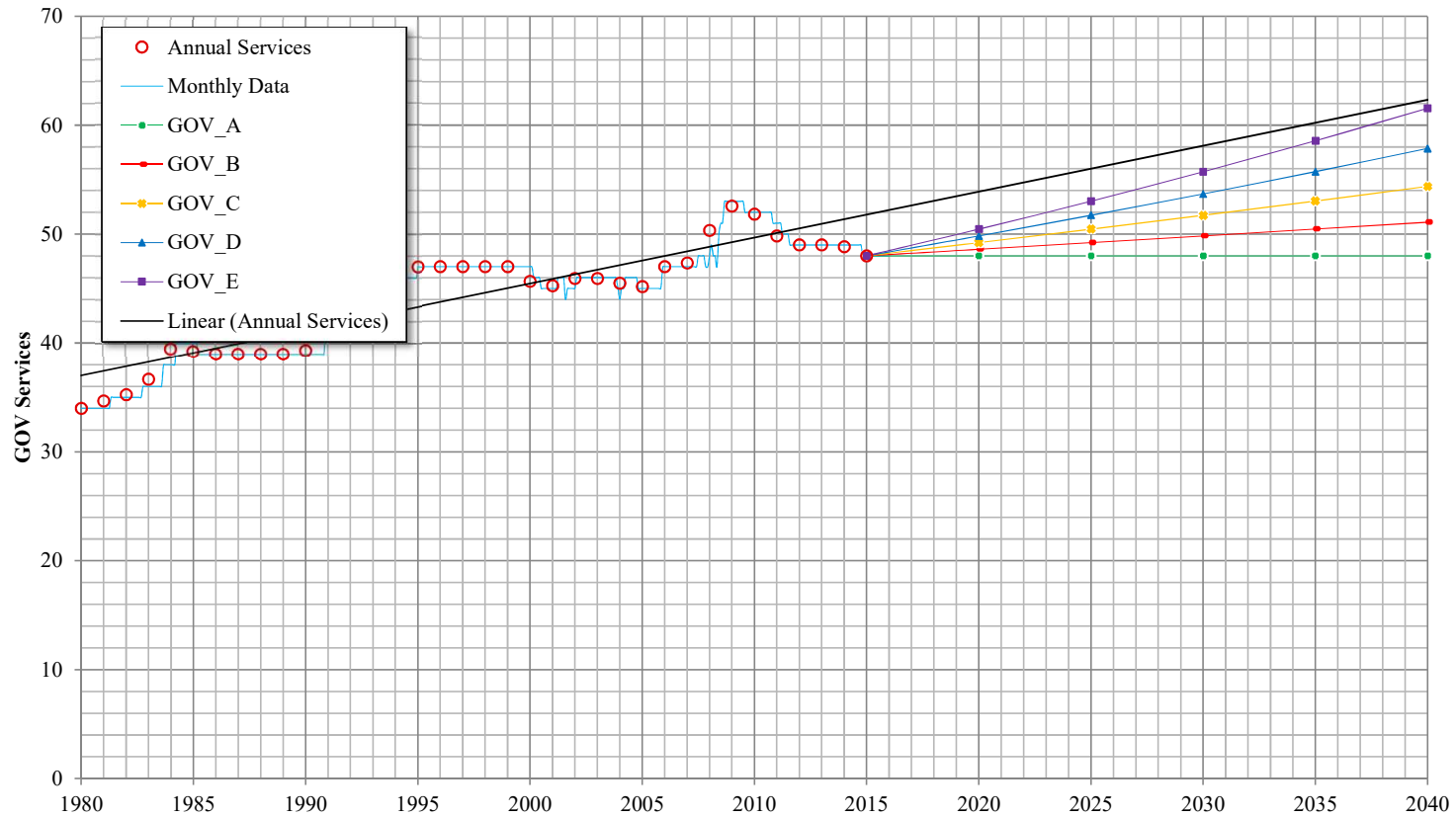


Customer Category	Trend		Growth Rate	Actual				Projected						
				2000	2005	2010	Base Year 2015	Services 2015	Services 2020	Services 2025	Services 2030	Services 2035	Services 2040	
IND	>	IND_A	Zero Growth Rate	0.00%	0	0	0	0	0	0	0	0	0	0
		IND_B	0.25%	0.25%	0	0	0	0	0	0	0	0	0	0
		IND_C	0.50%	0.50%	0	0	0	0	0	0	0	0	0	0
		IND_D	0.75%	0.75%	0	0	0	0	0	0	0	0	0	0
		IND_E	1.00%	1.00%	0	0	0	0	0	0	0	0	0	0

# California Water Service Company - Willows Districts

## Water Supply and Demand Analysis and Projections

### GOV Historical & Projected Services

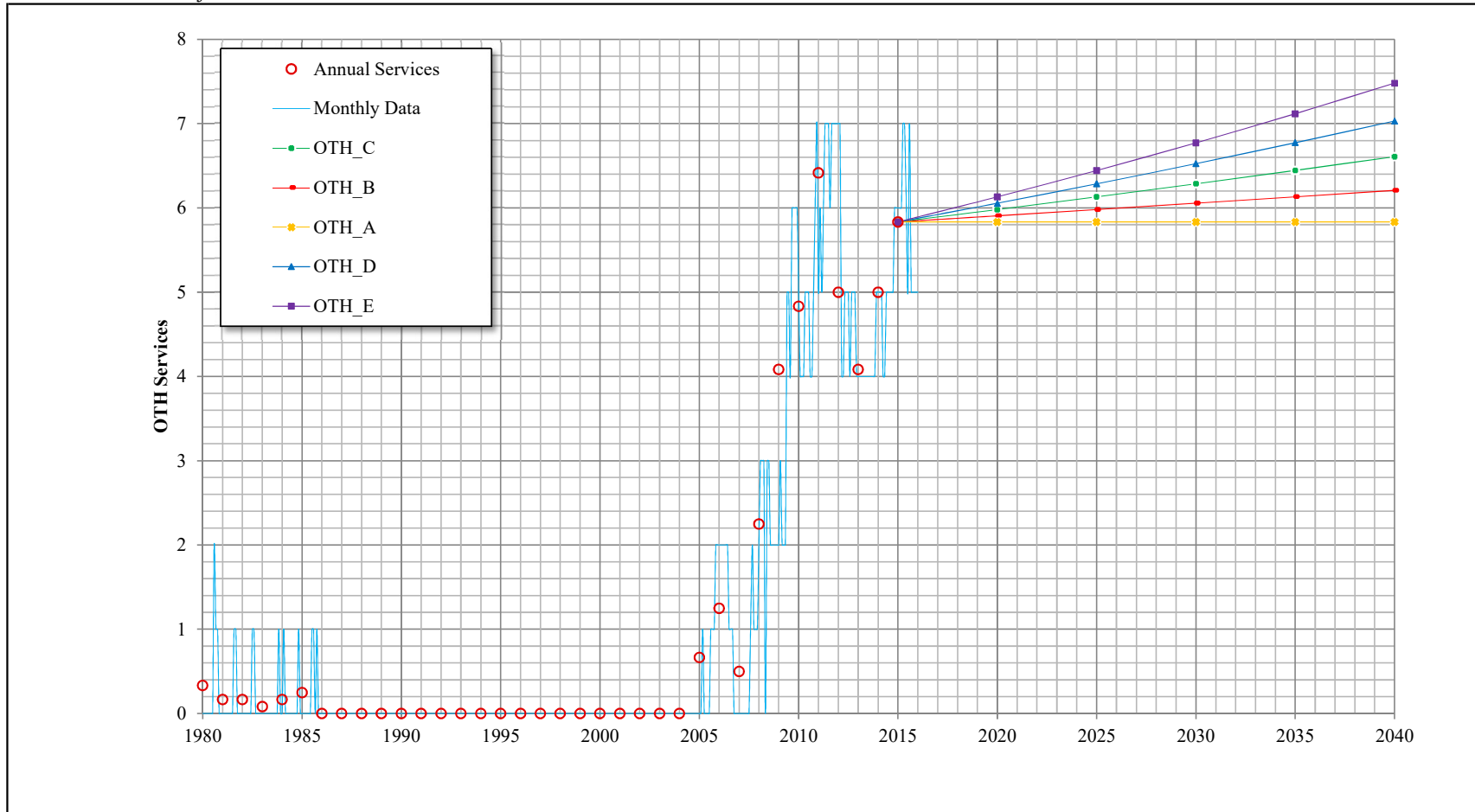


Customer Category	Trend		Growth Rate	Actual				Projected					
				2000	2005	2010	Base Year	Services	Services	Services	Services	Services	Services
							2015	2015	2020	2025	2030	2035	2040
GOV		GOV_A	Zero Growth Rate	46	45	52	48	48	48	48	48	48	48
	>	GOV_B	0.25%				48	48	49	49	50	50	51
		GOV_C	0.50%				48	48	49	50	52	53	54
		GOV_D	0.75%				48	48	50	52	54	56	58
		GOV_E	1.00%				48	48	50	53	56	59	62

### California Water Service Company - Willows Districts

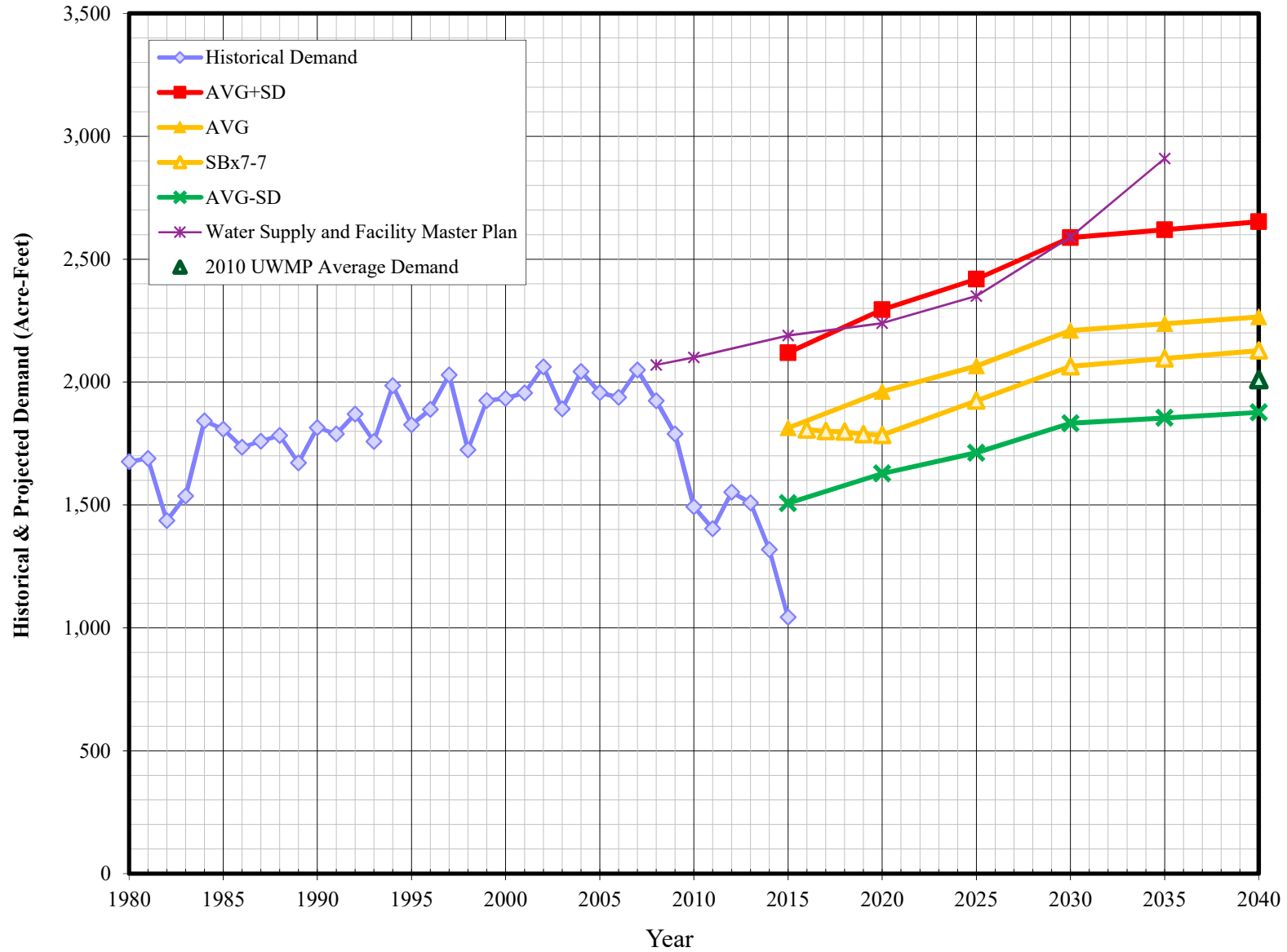
#### Water Supply and Demand Analysis and Projections

##### OTH Historical & Projected Services



Customer Category	Trend		Growth Rate	Actual				Projected							
				2000	2005	2010	Base Year 2015	Services	Services	Services	Services	Services	Services		
								2015	2020	2025	2030	2035	2040		
OTH				0	1	5	6								
	>	OTH_A	Zero Growth Rate	0.00%			6	6	6	6	6	6	6	6	6
		OTH_B	0.25%	0.25%			6	6	6	6	6	6	6	6	6
		OTH_C	0.50%	0.50%			6	6	6	6	6	6	6	7	7
		OTH_D	0.75%	0.75%			6	6	6	6	7	7	7	7	7
		OTH_E	1.00%	1.00%			6	6	6	6	7	7	7	7	7

# Historical & Projected Demand (WIL)

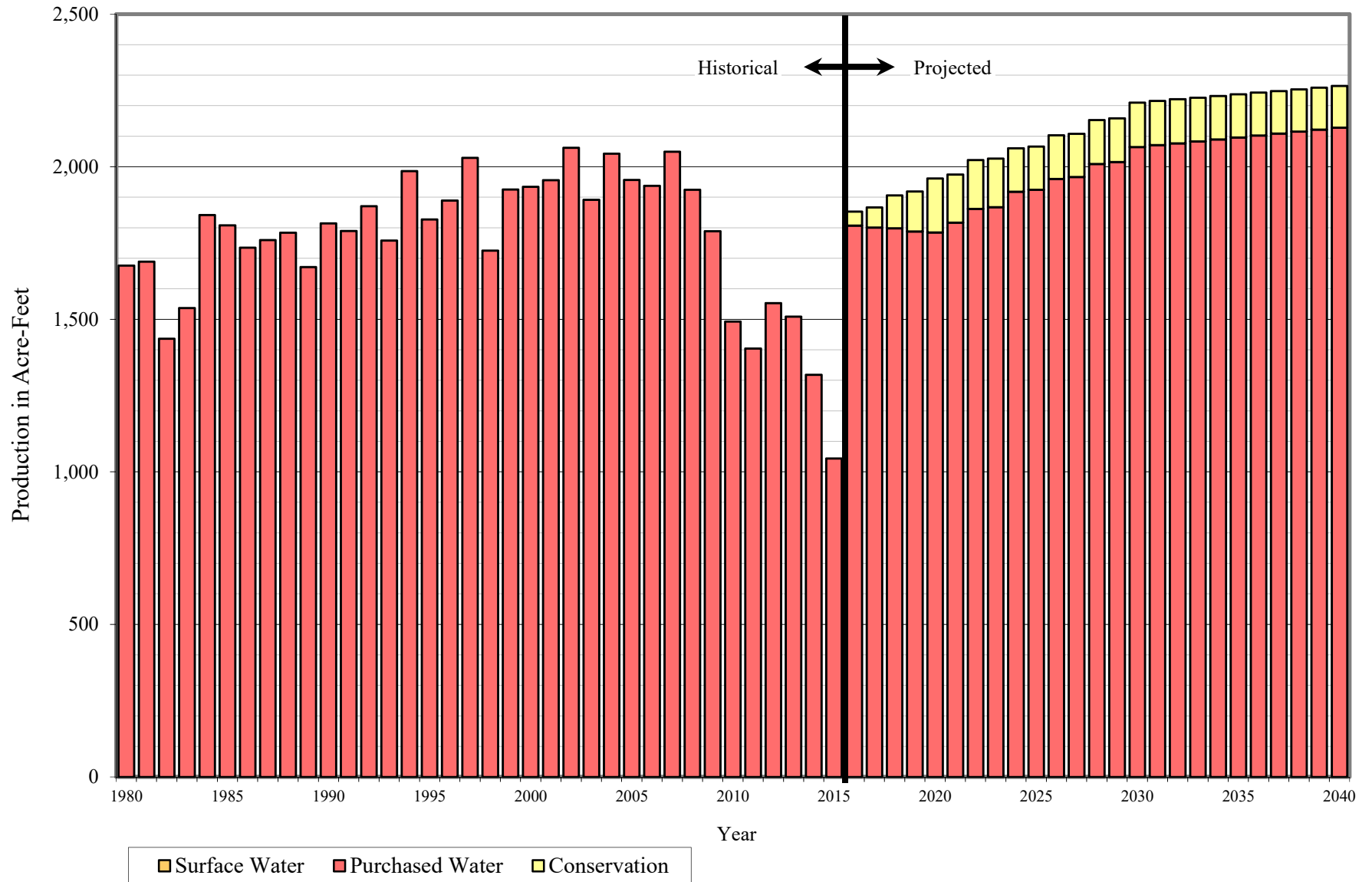


**California Water Service Company - Willows Districts**  
**Water Supply and Demand Analysis and Projections**  
 Actual & Projected Demand in Acre-Feet

Worksheet 9

Customer Category	Actual Demand (AFY)								Projected Demand (AFY)					
	1980	1985	1990	1995	2000	2005	2010	2015	2015	2020	2025	2030	2035	2040
SFR	1,194	1,245	1,158	1,152	1,275	1,273	922	638	1,335	1,468	1,556	1,703	1,726	1,749
									1,143	1,257	1,332	1,458	1,478	1,498
									951	1,046	1,109	1,213	1,229	1,246
MFR	27	51	118	131	108	99	112	73	174	199	224	229	233	238
									134	153	172	176	179	183
									94	107	121	123	126	128
COM	231	265	271	276	283	296	236	198	289	289	289	289	289	289
									263	263	263	263	263	263
									237	237	237	237	237	237
IND	0	0	0	0	0	0	0	0	0	0	0	0	0	0
									0	0	0	0	0	0
									0	0	0	0	0	0
GOV	87	101	121	121	113	129	102	61	144	146	148	149	151	153
									123	124	126	127	129	131
									102	103	104	106	107	108
OTH	2	1	0	0	0	2	2	3	11	11	11	11	12	12
									7	7	7	7	7	7
									3	3	3	3	3	3
UAWF	134	145	145	146	155	157	119	71	166	181	190	206	209	211
									144	156	165	178	180	183
									121	132	139	150	152	154
TOTAL (AFY)	1,676	1,808	1,814	1,827	1,934	1,957	1,493	1,044	2,119	2,294	2,419	2,588	2,620	2,652
									1,813	1,961	2,066	2,210	2,237	2,265
									1,508	1,628	1,712	1,832	1,854	1,877
TOTAL (MGD)	1.496	1.614	1.620	1.631	1.726	1.747	1.332	0.932	1.892	2.048	2.159	2.310	2.339	2.368
									1.619	1.751	1.844	1.973	1.997	2.022
									1.346	1.454	1.529	1.636	1.655	1.675

# Historical and Projected Distribution of Demand by Source





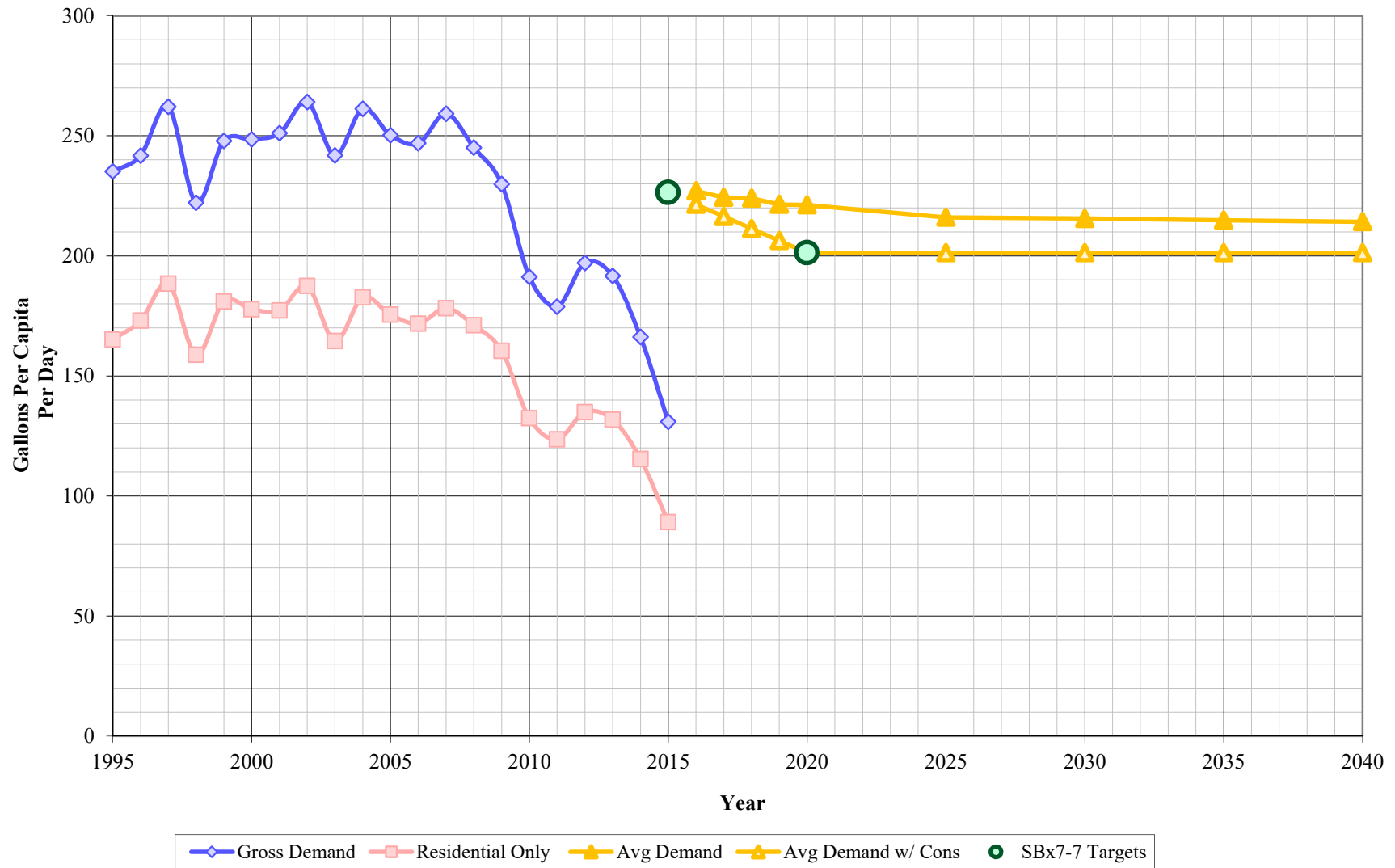
**California Water Service Company - Willows Districts**  
**Water Supply and Demand Analysis and Projections**  
**Historical and Projected Distribution of Demand by Source**

Worksheet 10

Year	Ground Water		Conservation		Total	
	MGD	AFY	MGD	AFY	MGD	AFY
1980	1.50	1,676			1.50	1,676
1981	1.51	1,689			1.51	1,689
1982	1.28	1,436			1.28	1,436
1983	1.37	1,537			1.37	1,537
1984	1.64	1,842			1.64	1,842
1985	1.61	1,808			1.61	1,808
1986	1.55	1,735			1.55	1,735
1987	1.57	1,759			1.57	1,759
1988	1.59	1,783			1.59	1,783
1989	1.49	1,671			1.49	1,671
1990	1.62	1,814			1.62	1,814
1991	1.60	1,790			1.60	1,790
1992	1.67	1,870			1.67	1,870
1993	1.57	1,758			1.57	1,758
1994	1.77	1,985			1.77	1,985
1995	1.63	1,827			1.63	1,827
1996	1.69	1,889			1.69	1,889
1997	1.81	2,029			1.81	2,029
1998	1.54	1,725			1.54	1,725
1999	1.72	1,925			1.72	1,925
2000	1.73	1,934			1.73	1,934
2001	1.75	1,956			1.75	1,956
2002	1.84	2,062			1.84	2,062
2003	1.69	1,892			1.69	1,892
2004	1.82	2,043			1.82	2,043
2005	1.75	1,957			1.75	1,957
2006	1.73	1,937			1.73	1,937
2007	1.83	2,049			1.83	2,049
2008	1.72	1,924			1.72	1,924
2009	1.60	1,789			1.60	1,789
2010	1.33	1,493			1.33	1,493

Year	Ground Water		Conservation		Total	
	MGD	AFY	MGD	AFY	MGD	AFY
2011	1.25	1,404			1.25	1,404
2012	1.39	1,553			1.39	1,553
2013	1.35	1,509			1.35	1,509
2014	1.18	1,318			1.18	1,318
2015	0.93	1,044			0.93	1,044
2016	1.61	1,807		0.04 46	1.65	1,853
2017	1.61	1,800		0.06 66	1.67	1,866
2018	1.61	1,798		0.10 108	1.70	1,906
2019	1.60	1,788		0.12 131	1.71	1,919
2020	1.59	1,785		0.16 177	1.75	1,961
2021	1.62	1,817		0.14 158	1.76	1,974
2022	1.66	1,861		0.14 160	1.80	2,022
2023	1.67	1,868		0.14 159	1.81	2,027
2024	1.71	1,918		0.13 142	1.84	2,060
2025	1.72	1,924		0.13 141	1.84	2,066
2026	1.75	1,960		0.13 143	1.88	2,103
2027	1.76	1,966		0.13 142	1.88	2,108
2028	1.79	2,009		0.13 144	1.92	2,153
2029	1.80	2,015		0.13 143	1.93	2,158
2030	1.84	2,064		0.13 146	1.97	2,210
2031	1.85	2,070		0.13 145	1.98	2,215
2032	1.85	2,077		0.13 144	1.98	2,221
2033	1.86	2,083		0.13 143	1.99	2,226
2034	1.87	2,089		0.13 142	1.99	2,232
2035	1.87	2,096		0.13 141	2.00	2,237
2036	1.88	2,102		0.13 140	2.00	2,243
2037	1.88	2,109		0.12 139	2.01	2,248
2038	1.89	2,115		0.12 138	2.01	2,254
2039	1.89	2,122		0.12 137	2.02	2,259
2040	1.90	2,128		0.12 136	2.02	2,265

# Per Capita Consumption (WIL)



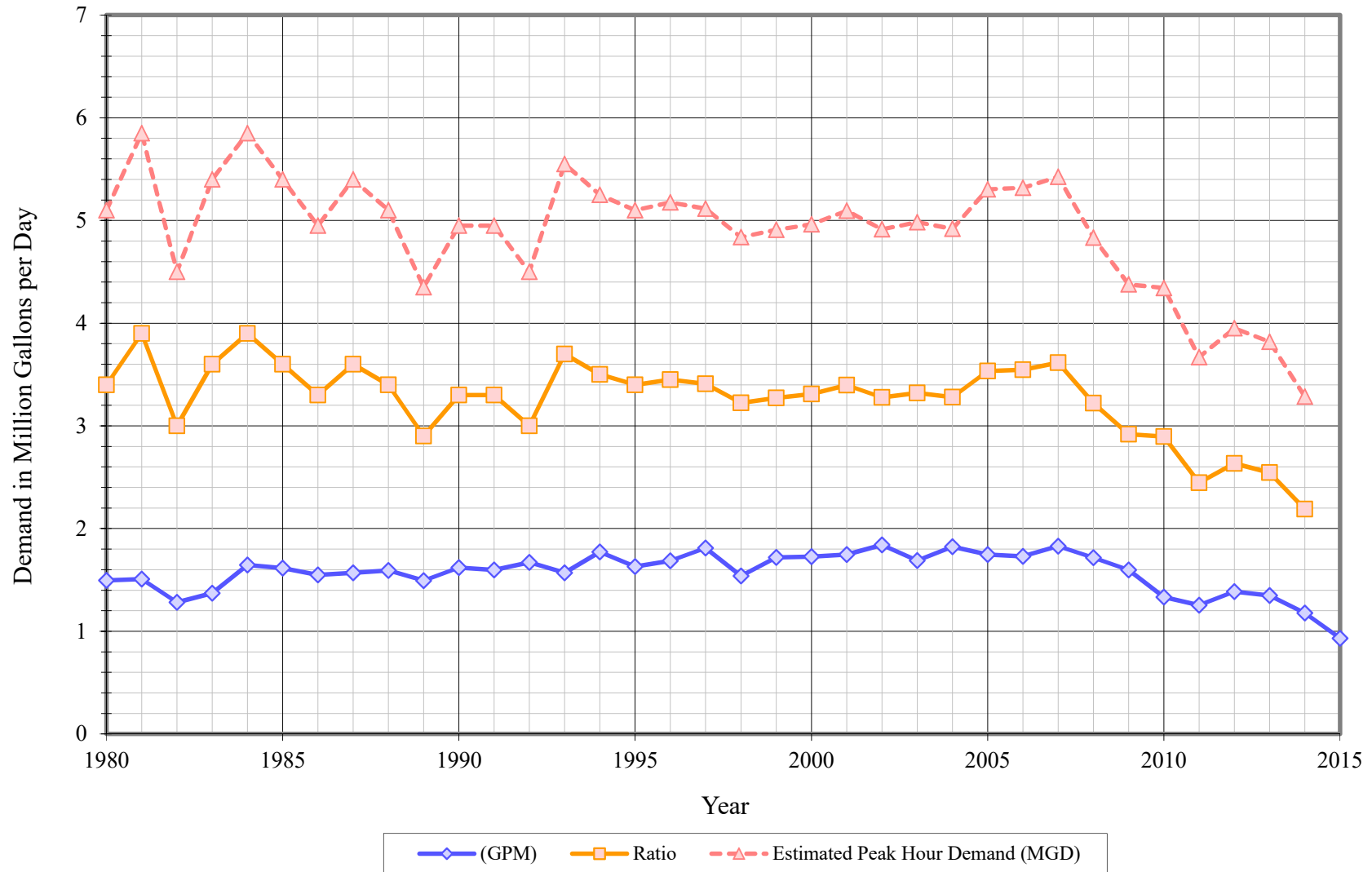
**California Water Service Company - Willows Districts**  
**Water Supply and Demand Analysis and Projections**  
**Per Capita Water Demand Calculation**

Worksheet 15

Year	POP	Historical				Projected			
		Gross Demand		Residential Only		Avg Demand		Avg Demand w/ Cons	
		Usage (AFY)	Per Capita (GPCPD)	Usage (AFY)	Per Capita (GPCPD)	Demand (AFY)	Per Capita (GPCPD)	Demand (AFY)	Per Capita (GPCPD)
1995	6,936	1,827	235	1,283	165				
1996	6,974	1,889	242	1,352	173				
1997	6,910	2,029	262	1,458	188				
1998	6,931	1,725	222	1,233	159				
1999	6,934	1,925	248	1,406	181				
2000	6,946	1,934	249	1,383	178				
2001	6,953	1,956	251	1,380	177				
2002	6,973	2,062	264	1,464	187				
2003	6,982	1,892	242	1,287	165				
2004	6,982	2,043	261	1,429	183				
2005	6,979	1,957	250	1,372	176				
2006	7,007	1,937	247	1,348	172				
2007	7,058	2,049	259	1,409	178				
2008	7,008	1,924	245	1,343	171				
2009	6,945	1,789	230	1,248	160				
2010	6,967	1,493	191	1,034	132				
2011	7,005	1,404	179	970	124				
2012	7,035	1,553	197	1,063	135				
2013	7,028	1,509	192	1,037	132				
2014	7,077	1,318	166	915	115				
2015	7,118	1,044	131	711	89				
2016	7,285					1,853	227	1,807	221
2017	7,427					1,866	224	1,800	216
2018	7,595					1,906	224	1,798	211
2019	7,737					1,919	221	1,788	206
2020	7,915					1,961	221	1,785	201
2025	8,535					2,066	216	1,924	201
2030	9,155					2,210	216	2,064	201
2035	9,296					2,237	215	2,096	201
2040	9,439					2,265	214	2,128	201

<i>SBx7-7 Targets</i>	
2015	226
2020	201

## Average Day, Maximum Day, Peak Demand



**California Water Service Company - Willows Districts**  
**Water Supply and Demand Analysis and Projections**  
**Historical and Projected Average Day, Maximum Day, and Peak Demand**

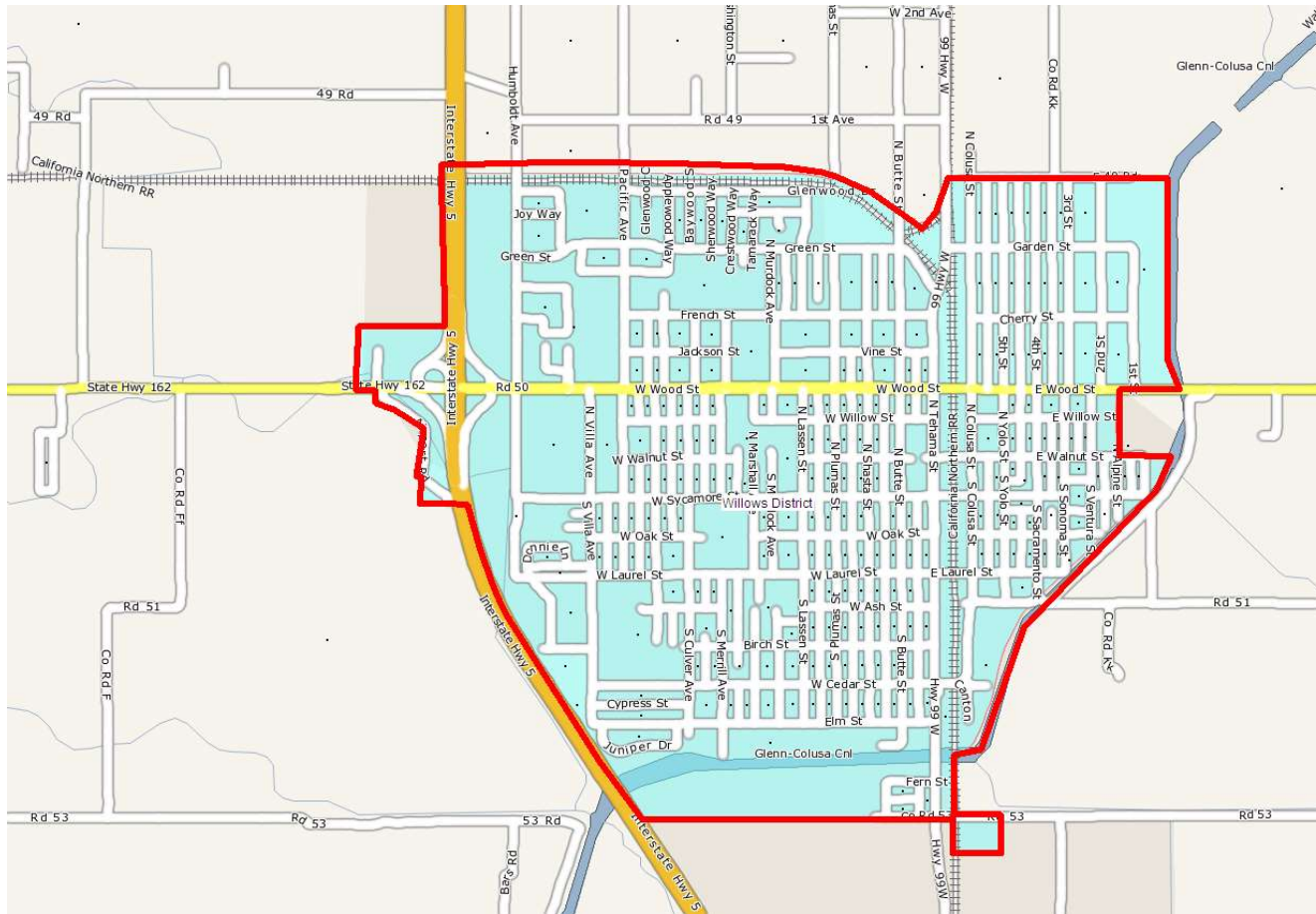
Worksheet 11

Year	Historical Annual Demand		Average Day Demand		Maximum Day Demand		MDD ADD Ratio	Estimated Peak Hour Demand		PHD MDD Ratio	PHD ADD Ratio	Measured Peak Hour Demand		PHD MDD Ratio
	(AFY)	(MGY)	(MGD)	(GPD)	(MGD)	(GPD)		(MGD)	(GPM)			(MGD)	(GPM)	
1980	1,676	546	1.50	745	3.40	1,693	2.27	5.10	3,542	1.50	3.41			
1981	1,689	550	1.51	745	3.90	1,927	2.59	5.85	4,063	1.50	3.88			
1982	1,436	468	1.28	633	3.00	1,480	2.34	4.50	3,125	1.50	3.51			
1983	1,537	501	1.37	673	3.60	1,767	2.62	5.40	3,750	1.50	3.94			
1984	1,842	600	1.64	796	3.90	1,888	2.37	5.85	4,063	1.50	3.56			
1985	1,808	589	1.61	776	3.60	1,731	2.23	5.40	3,750	1.50	3.35			
1986	1,735	565	1.55	746	3.30	1,590	2.13	4.95	3,438	1.50	3.20			
1987	1,759	573	1.57	754	3.60	1,728	2.29	5.40	3,750	1.50	3.44			
1988	1,783	581	1.59	760	3.40	1,623	2.14	5.10	3,542	1.50	3.20			
1989	1,671	545	1.49	707	2.90	1,374	1.94	4.35	3,021	1.50	2.92			
1990	1,814	591	1.62	763	3.30	1,555	2.04	4.95	3,438	1.50	3.06			
1991	1,790	583	1.60	751	3.30	1,552	2.07	4.95	3,438	1.50	3.10			
1992	1,870	609	1.67	767	3.00	1,378	1.80	4.50	3,125	1.50	2.70			
1993	1,758	573	1.57	716	3.70	1,689	2.36	5.55	3,854	1.50	3.54			
1994	1,985	647	1.77	806	3.50	1,592	1.97	5.25	3,646	1.50	2.96			
1995	1,827	595	1.63	737	3.40	1,537	2.08	5.10	3,542	1.50	3.13			
1996	1,889	615	1.69	757	3.45	1,549	2.05	5.18	3,594	1.50	3.07			
1997	2,029	661	1.81	812	3.41	1,529	1.88	5.12	3,552	1.50	2.82			
1998	1,725	562	1.54	686	3.23	1,437	2.09	4.84	3,359	1.50	3.14			
1999	1,925	627	1.72	762	3.27	1,451	1.90	4.91	3,409	1.50	2.86			
2000	1,934	630	1.73	767	3.31	1,471	1.92	4.96	3,447	1.50	2.88			
2001	1,956	637	1.75	771	3.40	1,501	1.95	5.09	3,538	1.50	2.92			
2002	2,062	672	1.84	809	3.28	1,439	1.78	4.91	3,413	1.50	2.67			
2003	1,892	616	1.69	738	3.32	1,450	1.97	4.98	3,459	1.50	2.95			
2004	2,043	666	1.82	795	3.28	1,430	1.80	4.92	3,417	1.50	2.70			
2005	1,957	638	1.75	759	3.54	1,536	2.02	5.30	3,682	1.50	3.04			
2006	1,937	631	1.73	746	3.55	1,528	2.05	5.32	3,694	1.50	3.08			
2007	2,049	668	1.83	780	3.62	1,541	1.98	5.42	3,767	1.50	2.96			
2008	1,924	627	1.72	733	3.22	1,374	1.88	4.83	3,355	1.50	2.81			
2009	1,789	583	1.60	687	2.92	1,255	1.83	4.38	3,040	1.50	2.74			
2010	1,493	486	1.33	570	2.90	1,239	2.17	4.34	3,016	1.50	3.26			
2011	1,404	457	1.25	533	2.45	1,040	1.95	3.67	2,548	1.50	2.93			
2012	1,553	506	1.39	588	2.63	1,117	1.90	3.95	2,744	1.50	2.85			
2013	1,509	492	1.35	573	2.55	1,083	1.89	3.82	2,651	1.50	2.83			
2014	1,318	430	1.18	498	2.19	926	1.86	3.29	2,281	1.50	2.79			
2015	1,044	340	0.93	393										
10 year Average (2001-2010)			1.71	739	3.30	1,429	1.94	4.95	3,374	1.50	2.97			
5 year Average (2006-2010)			1.64	703	3.24	1,387	1.98	4.86	3,438	1.50	2.91			

# California Water Service Company - Willows Districts

## Water Supply and Demand Analysis and Projections

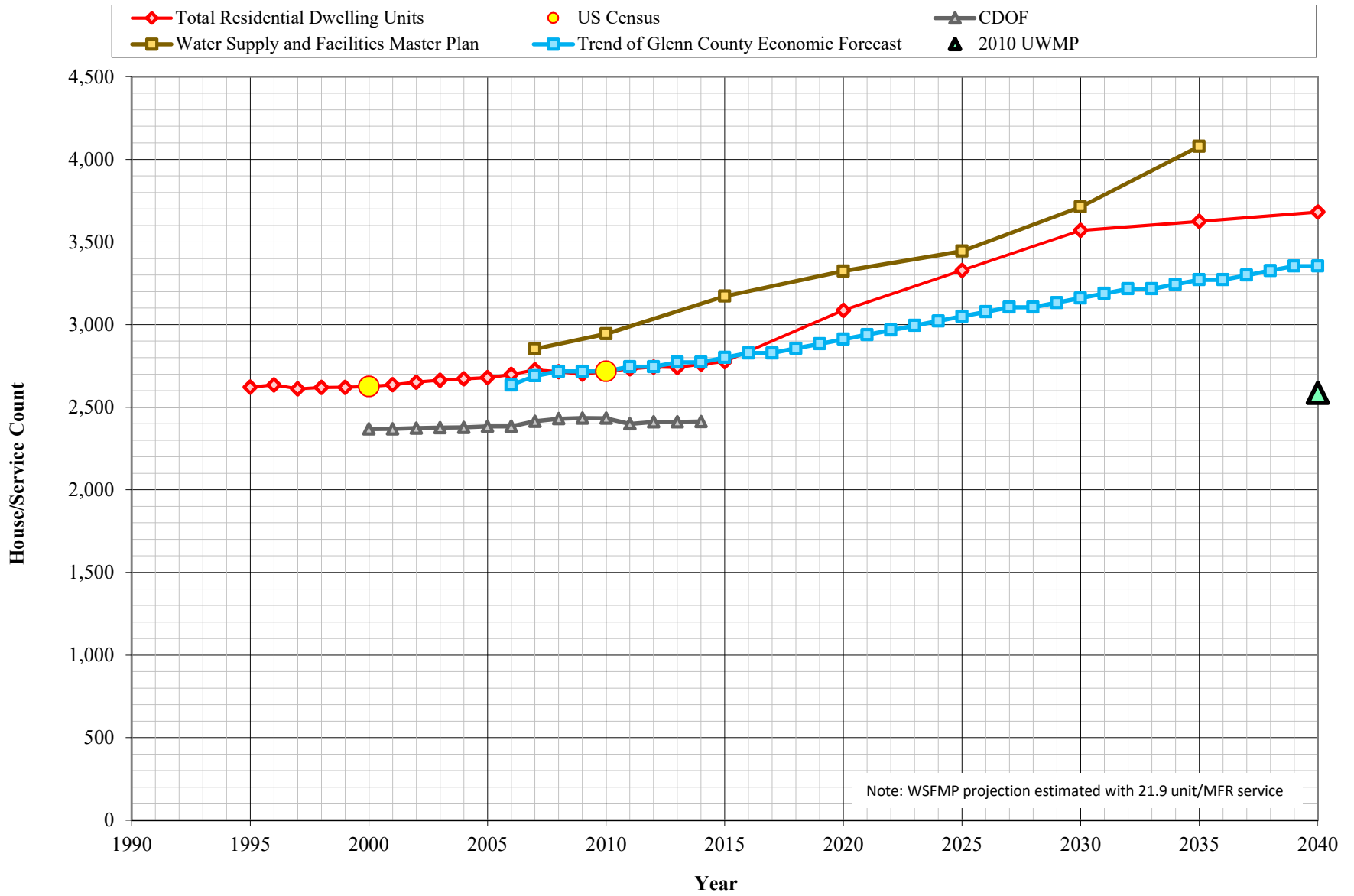
### MarPlot Summary



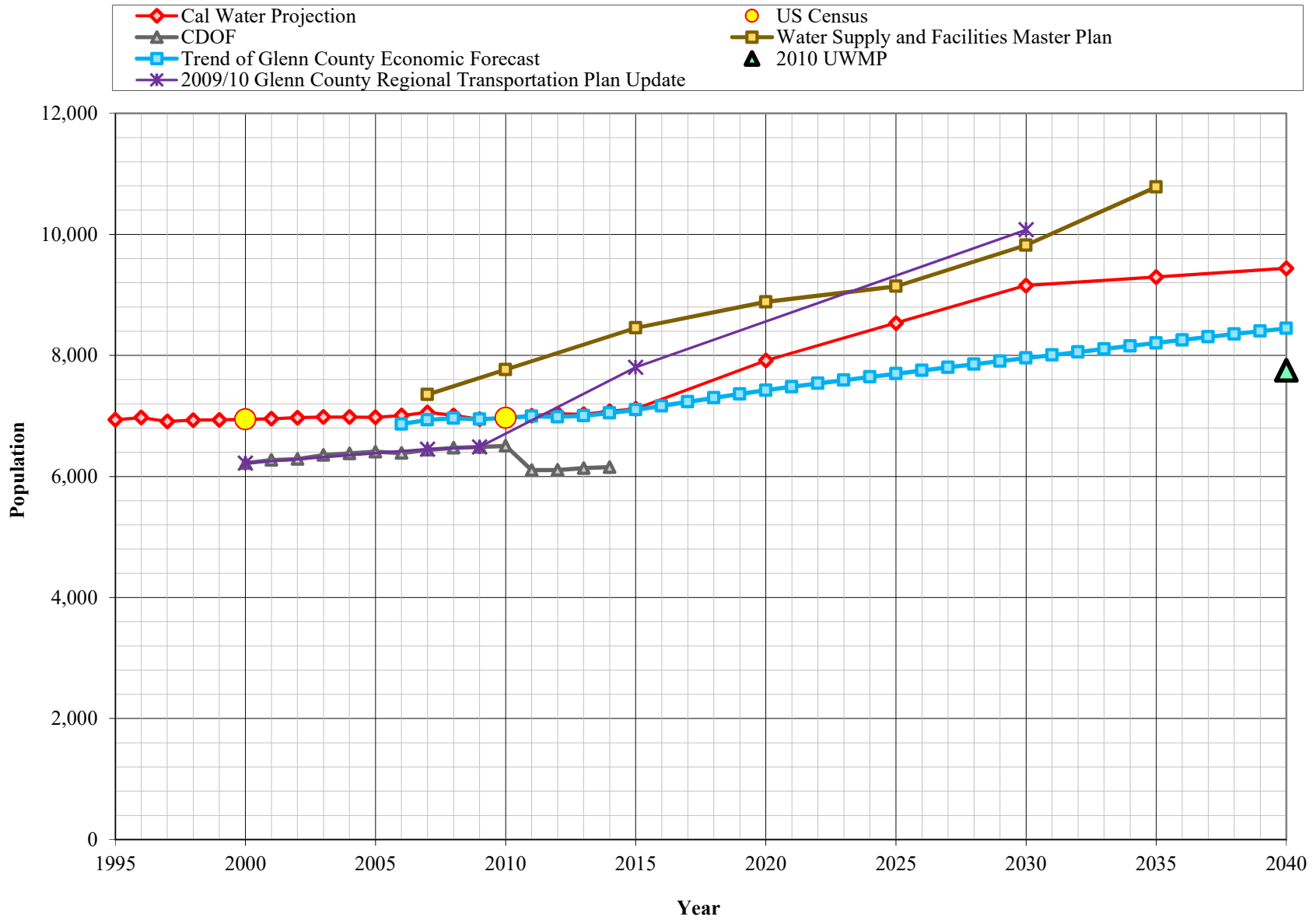
System	US Census 2000 Summary				US Census 2010 Summary				2000-2010 Change		
	Census Blocks	Population	Housing Units (HU)	Density	Census Blocks	Population	Housing Units (HU)	Density	Percentage Population Change	Percentage HU Change	Density Change
Willows	164	6,946	2,625	2.65	238	6,967	2,717	2.56	0.3%	3.5%	-3.1%
	164	6,946	2,625	2.65	238	6,967	2,717	2.56	0.3%	3.5%	-3.1%

MARPLOT disclaimer: The population and housing number given above are only rough estimates. They are based on the US Census Blocks. Although Census Blocks are polygons, MARPLOT uses the centroid, or center point, rather than the entire polygon. If a Census Block centroid is within any of the MARPLOT selected objects, the population and housing numbers for that block are tallied, even if only part of the block is within the selected object. It is possible for a block not be counted if its centroid is not within selected objects, even though part of the block is within the selected objects.

# Housing Projections



# Population Projections





**California Water Service Company - Willows Districts**  
**Water Supply and Demand Analysis and Projections**  
**Population Estimate**

Year	US Census		Persons per Housing Unit	Single Family Residential	Multi Family Residential			Flat Rate Residential
	Population	Housing Units		Services (DU)	Services	Units (DU)	Unit Density	Services (DU)
2000	6,946	2,625	2.646	1,045	22	712	32.4	868
2010	6,967	2,717	2.564	1,435	34	741	21.8	541
	0.3%	3.5%	-3.1%	37.4%	54.2%	4.0%	-32.6%	-37.7%

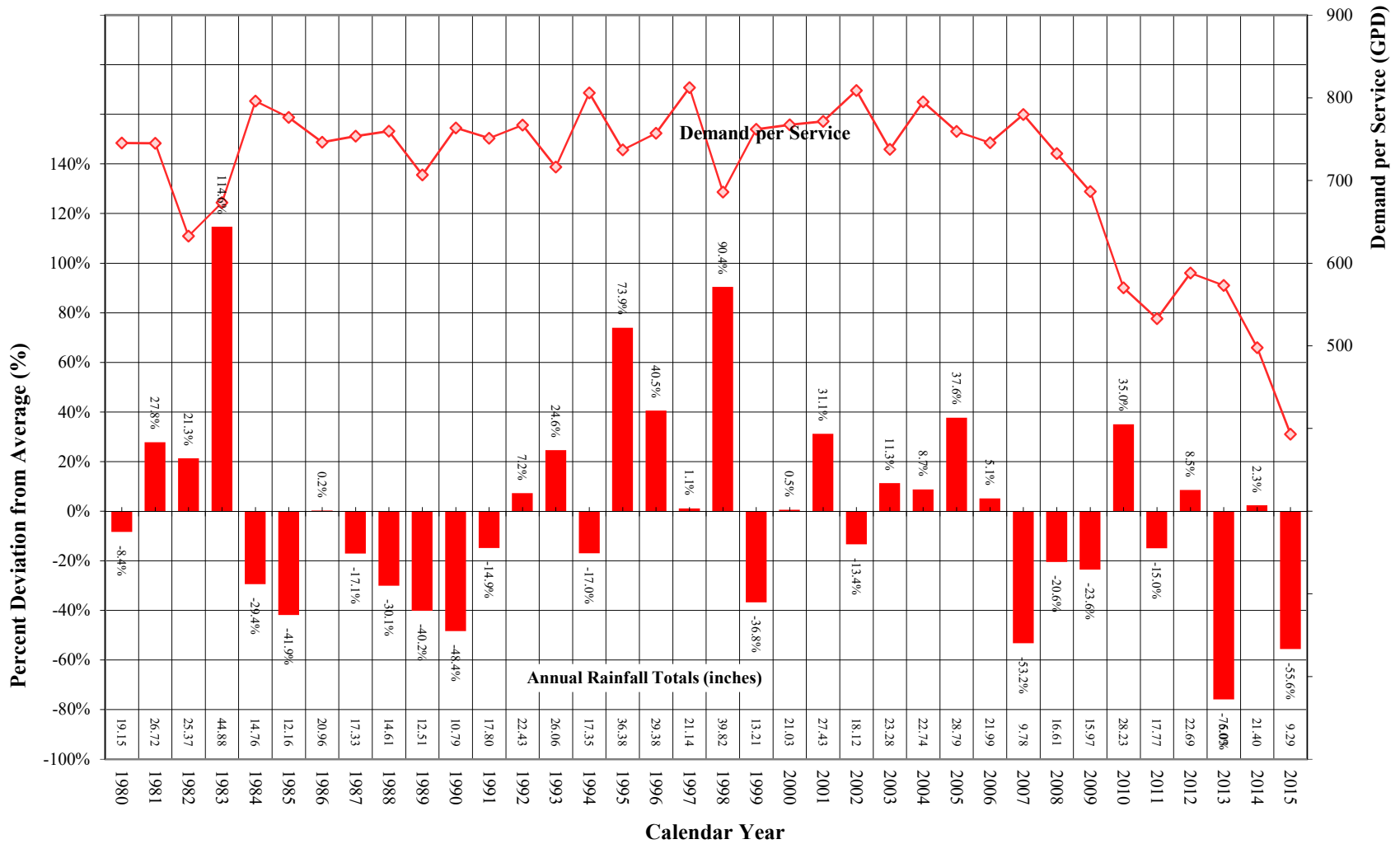
Year	Single Family Residential Services (DU)	Multi Family Residential			Flat Rate Residential Services (DU)	Total Residential Dwelling Units	Persons per Housing Unit	Estimated District Population
		Services	Residential Units (DU)	Unit Density				
1995	925	23	745	32.4	951	2,621	2.646	6,936
1996	965	23	745	32.4	925	2,635	2.646	6,974
1997	989	22	718	32.4	904	2,611	2.646	6,910
1998	1,017	22	712	32.4	890	2,619	2.646	6,931
1999	1,037	22	704	32.4	879	2,621	2.646	6,934
2000	1,045	22	712	32.4	868	2,625	2.646	6,946
2001	1,057	22	715	32.6	864	2,636	2.638	6,953
2002	1,073	22	718	32.6	860	2,652	2.630	6,973
2003	1,090	22	721	32.9	852	2,664	2.622	6,982
2004	1,104	22	724	32.9	844	2,672	2.613	6,982
2005	1,110	22	727	33.0	843	2,679	2.605	6,979
2006	1,134	22	729	33.2	835	2,698	2.597	7,007
2007	1,169	22	732	33.3	825	2,726	2.589	7,058
2008	1,219	28	735	25.9	761	2,716	2.581	7,008
2009	1,347	34	738	21.8	615	2,700	2.572	6,945
2010	1,435	34	741	21.8	541	2,717	2.564	6,967
2011	1,597	34	744	21.9	392	2,732	2.564	7,005
2012	1,733	34	744	21.9	267	2,743	2.564	7,035
2013	1,890	34	744	21.9	107	2,741	2.564	7,028
2014	1,965	34	744	21.9	51	2,760	2.564	7,077
2015	2,016	35	760	21.9	0	2,776	2.564	7,118
2020	2,218	40	869	21.9	0	3,087	2.564	7,915
2025	2,350	45	978	21.9	0	3,329	2.564	8,535
2030	2,572	46	998	21.9	0	3,570	2.564	9,155
2035	2,607	47	1,019	21.9	0	3,625	2.564	9,296
2040	2,642	48	1,039	21.9	0	3,681	2.564	9,439

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Notes: linear extrapolation used to estimated MFR-DU from 2000. Estimate extend until 2011 due to reclassification, afterwards a constant MFR Unit Density is used.

# Comparison of Annual Rainfall to Historical Average



**California Water Service Company - Willows Districts**  
**Water Supply and Demand Analysis and Projections**  
 Temperature & Rainfall History

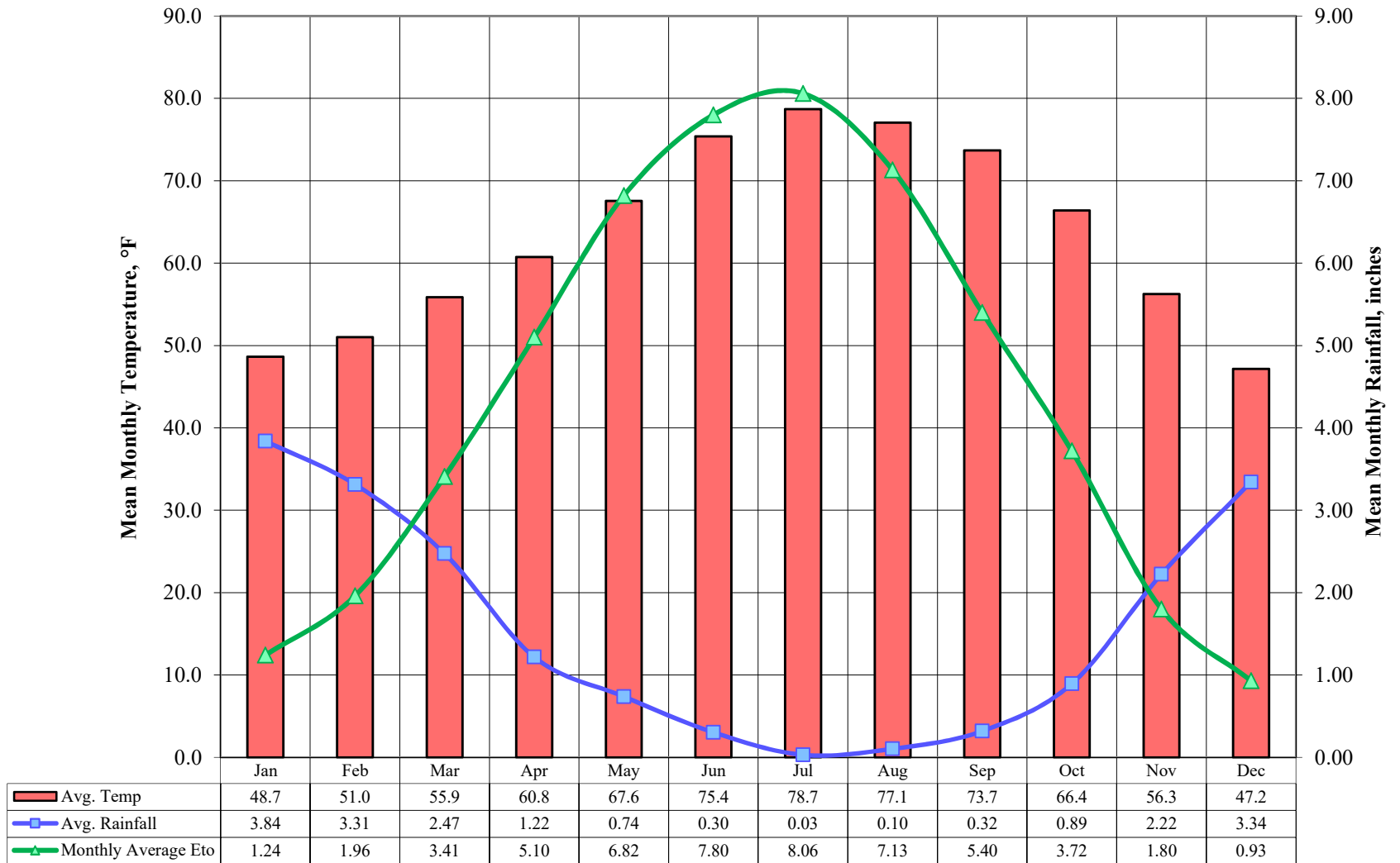
Year	Precipitation		Temperature			Demand per Service (gpd)	Percent of Average Demand
	Annual (in)	Percent Variation	Tmax (°F)	Tmin (°F)	Mean (°F)		
1980	19.15	-8.4%	91.90	36.50	64.2	745	4.7%
1981	26.72	27.8%	94.90	38.30	66.6	745	4.6%
1982	25.37	21.3%	90.80	33.00	61.9	633	-11.2%
1983	44.88	114.6%	92.70	36.90	64.8	673	-5.5%
1984	14.76	-29.4%	96.60	36.50	66.6	796	11.8%
1985	12.16	-41.9%	95.10	33.80	64.5	776	9.0%
1986	20.96	0.2%	94.10	35.90	65.0	746	4.8%
1987	17.33	-17.1%	93.00	35.50	64.3	754	5.8%
1988	14.61	-30.1%	97.30	35.90	66.6	760	6.7%
1989	12.51	-40.2%	93.20	33.20	63.2	707	-0.7%
1990	10.79	-48.4%	95.70	29.00	62.4	763	7.2%
1991	17.80	-14.9%	95.10	33.80	64.5	751	5.5%
1992	22.43	7.2%	96.20	35.20	65.7	767	7.7%
1993	26.06	24.6%	93.30	35.30	64.3	716	0.6%
1994	17.35	-17.0%	94.30	35.30	64.8	806	13.2%
1995	36.38	73.9%	93.00	41.00	67.0	737	3.5%
1996	29.38	40.5%	96.20	38.70	67.5	757	6.3%
1997	21.14	1.1%	93.60	38.70	66.2	812	14.1%
1998	39.82	90.4%	96.00	33.90	65.0	686	-3.7%
1999	13.21	-36.8%	91.30	36.00	63.7	762	7.0%
2000	21.03	0.5%	92.50	37.50	65.0	767	7.8%
2001	27.43	31.1%	93.60	35.50	64.6	771	8.3%
2002	18.12	-13.4%	94.40	37.70	66.1	809	13.6%
2003	23.28	11.3%	97.70	38.70	68.2	738	3.6%
2004	22.74	8.7%	93.10	39.10	66.1	795	11.7%
2005	28.79	37.6%	98.30	38.50	68.4	759	6.6%
2006	21.99	5.1%	97.90	37.70	67.8	746	4.7%
2007	9.78	-53.2%	93.60	33.20	63.4	780	9.5%
2008	16.61	-20.6%	95.00	34.90	65.0	733	2.9%
2009	15.97	-23.6%	95.20	36.10	65.7	687	-3.6%
2010	28.23	35.0%	93.60	41.80	67.7	570	-19.9%
2011	17.77	-15.0%	93.80	35.30	64.6	533	-25.2%
2012	22.69	8.5%	95.70	36.80	66.3	588	-17.4%
2013	5.03	-76.0%	96.00	32.10	64.1	573	-19.5%
2014	21.40	2.3%	96.90	38.00	67.5	498	-30.1%
2015	9.29	-55.6%	95.40	38.30	66.9	393	-44.8%
2016							
2017							
2018							
2019							
2020							

Precipitation (1895 - present)						Monthly Average Eto
	Mean	High	Year	Low	Year	
	in.	in.	-	in.	-	
Jan	3.84	16.52	1995	0.03	2007	1.24
Feb	3.31	16.07	1998	0.00	1964	1.96
Mar	2.47	9.65	1983	0.00	1956	3.41
Apr	1.22	5.34	2006	0.00	1909	5.10
May	0.74	4.53	1998	0.00	1904	6.82
Jun	0.30	1.71	1967	0.00	1957	7.80
Jul	0.03	1.22	1974	0.00	1960	8.06
Aug	0.10	1.21	1968	0.00	1957	7.13
Sep	0.32	3.35	1912	0.00	1903	5.40
Oct	0.89	4.42	1957	0.00	1905	3.72
Nov	2.22	7.60	1983	0.00	1929	1.80
Dec	3.34	10.26	2002	0.00	1956	0.93
Annual	18.80	44.88	1983	5.03	2013	53.30

Temperature (1895 - present)			
	Tmax	Tmin	Mean
	°F	°F	°F
Jan	69.5	27.8	48.7
Feb	68.5	33.5	51.0
Mar	75.5	36.2	55.9
Apr	82.2	39.3	60.8
May	90.2	44.9	67.6
Jun	98.9	51.9	75.4
Jul	102.1	55.3	78.7
Aug	99.6	54.5	77.1
Sep	96.6	50.8	73.7
Oct	87.6	45.2	66.4
Nov	76.1	36.4	56.3
Dec	65.3	29.0	47.2
Annual	102.1	27.8	65.0

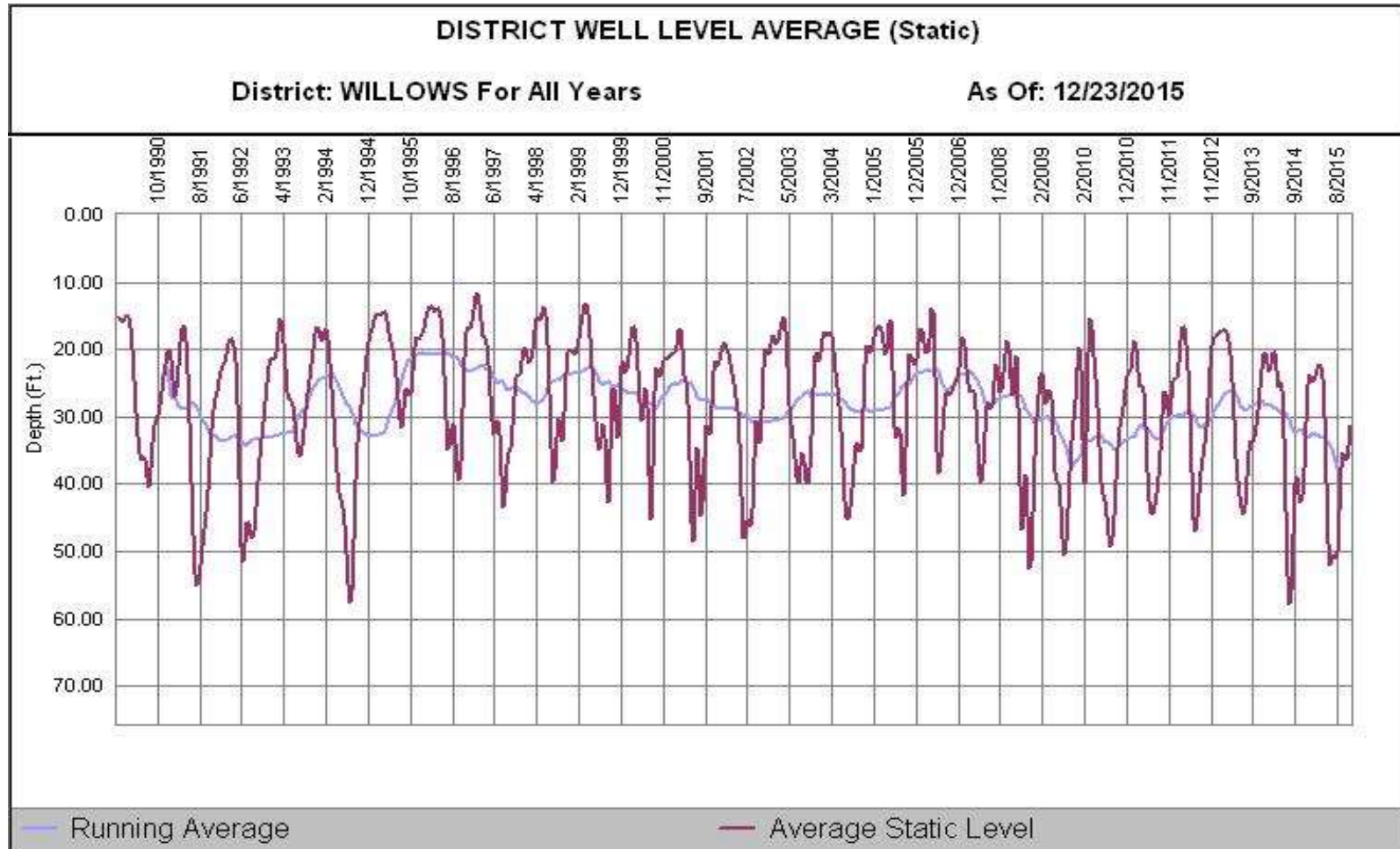
- 1) Eto values based on California Irrigation Management Information System (CIMIS), <http://www.cimis.water.ca.gov/cimis/welcome.jsp>, EvapoTranspiration (Eto) Zones Map, Zone 12
- 2) PPT, Tmax, Tmin obtained from PRISM where, PPT is total monthly rainfall, Tmax is average of maximum temperatures for given month, and Tmin is average of minimum temperatures for given month
- 3) Percent variation based on average of 1980 to present values

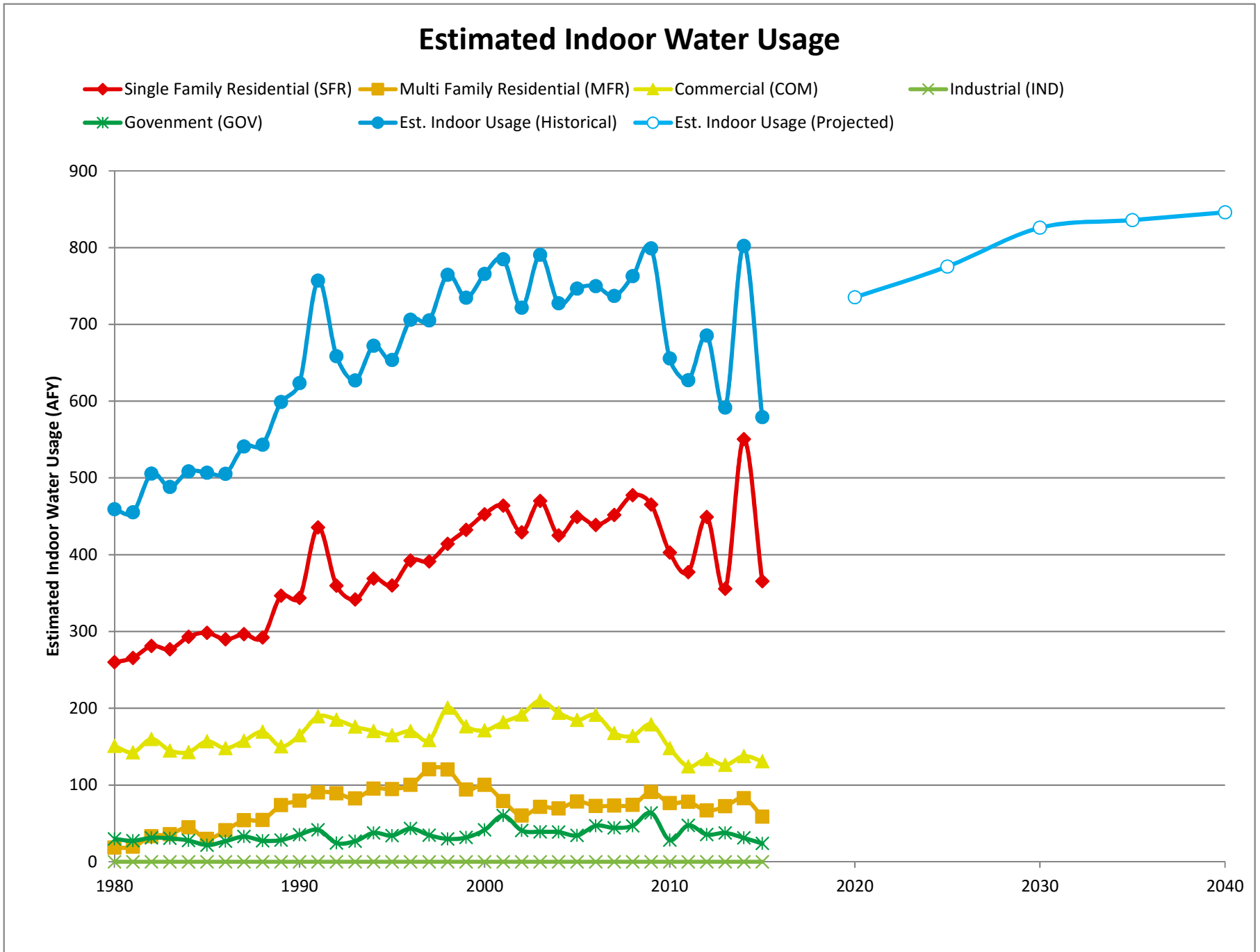
## Average Monthly Temperature, Rainfall, and Monthly Eto



# California Water Service Company - Willows Districts Water Supply and Demand Analysis and Projections

## Groundwater Production Facilities





**California Water Service Company - Willows Districts**  
**Water Supply and Demand Analysis and Projections**

**Estimated Indoor/Outdoor Water Usage**

Year	Single Family Residential (SFR)								Multi Family Residential (MFR)				Commercial (COM)			
	SFR Jan Usage	Metered SFR Indoor Use (Annualized 90% of January Total)			Indoor Flat Rate Usage (AFY)	Total SFR Indoor Usage			MFR Jan Usage	MFR Indoor Use (Annualized 90% of January Total)			COM Jan Usage	COM Indoor Use (Annualized 90% of January Total)		
		JAN (CCF)	AFY	AF/Serv		AFY	GPD/Serv	%		(CCF)	AFY	GPD/Serv		%	(CCF)	AFY
1980	2,675	66	0.153	194	260	137	22%	748	19	2,649	68%	6,089	151	495	65%	
1981	2,795	69	0.156	196	266	139	23%	792	20	1,513	42%	5,747	142	468	58%	
1982	2,977	74	0.164	207	281	147	29%	1,344	33	2,479	74%	6,448	160	527	70%	
1983	3,233	80	0.161	197	277	144	26%	1,446	36	2,328	71%	5,844	145	479	63%	
1984	3,721	92	0.169	201	293	151	23%	1,810	45	2,137	87%	5,760	143	463	53%	
1985	3,906	97	0.171	201	298	153	24%	1,205	30	1,345	59%	6,329	157	503	59%	
1986	3,888	96	0.167	193	290	149	25%	1,652	41	1,681	51%	5,966	148	467	57%	
1987	4,152	103	0.170	193	296	152	26%	2,180	54	2,193	57%	6,355	158	496	58%	
1988	4,362	108	0.167	184	292	149	25%	2,194	54	2,207	53%	6,828	169	527	62%	
1989	5,380	133	0.197	213	347	176	32%	2,978	74	2,996	69%	6,059	150	458	58%	
1990	5,502	136	0.195	207	344	174	30%	3,212	80	3,232	67%	6,647	165	498	61%	
1991	7,178	178	0.244	258	436	218	38%	3,647	90	3,669	77%	7,637	189	610	72%	
1992	6,341	157	0.196	203	360	175	29%	3,600	89	3,650	73%	7,464	185	597	71%	
1993	6,336	157	0.185	185	342	165	30%	3,325	82	3,154	73%	7,095	176	573	66%	
1994	7,114	176	0.198	192	369	177	29%	3,839	95	3,694	72%	6,872	170	560	63%	
1995	7,158	177	0.192	182	360	171	31%	3,823	95	3,679	72%	6,649	165	554	60%	
1996	8,081	200	0.208	192	392	185	32%	4,036	100	3,884	71%	6,864	170	570	63%	
1997	8,247	204	0.207	187	391	185	30%	4,861	121	4,854	80%	6,391	158	529	54%	
1998	8,905	221	0.217	193	414	194	38%	4,880	120	4,880	88%	8,090	201	666	76%	
1999	9,441	234	0.226	198	432	201	34%	3,796	94	3,863	78%	7,112	176	582	66%	
2000	9,973	247	0.237	205	453	211	36%	4,043	100	4,068	93%	6,901	171	566	60%	
2001	10,296	255	0.241	209	464	216	36%	3,192	79	3,224	84%	7,336	182	590	60%	
2002	9,607	238	0.222	191	429	198	31%	2,424	60	2,439	71%	7,733	192	622	61%	
2003	10,641	264	0.242	206	470	216	40%	2,889	72	2,918	74%	8,468	210	671	65%	
2004	9,723	241	0.218	184	425	195	32%	2,799	69	2,816	68%	7,828	194	623	63%	
2005	10,295	255	0.230	194	449	205	35%	3,167	79	3,186	79%	7,447	185	587	62%	
2006	10,192	253	0.223	186	439	199	35%	2,935	73	2,953	72%	7,718	191	607	63%	
2007	10,683	265	0.227	187	452	202	35%	2,951	73	2,969	62%	6,761	168	530	55%	
2008	11,861	294	0.241	184	478	215	39%	2,994	74	2,332	63%	6,615	164	517	56%	
2009	12,883	319	0.237	146	465	212	41%	3,665	91	2,398	80%	7,219	179	585	66%	
2010	11,800	293	0.204	110	403	182	44%	3,080	76	2,010	68%	5,963	148	488	63%	
2011	12,222	303	0.190	74	377	169	43%	3,150	78	2,051	80%	5,011	124	406	57%	
2012	15,691	389	0.225	60	449	200	46%	2,698	67	1,756	70%	5,400	134	443	54%	
2013	13,572	336	0.178	19	355	159	38%	2,915	72	1,898	73%	5,087	126	424	51%	
2014	21,643	537	0.273	14	551	244	67%	3,337	83	2,172	85%	5,548	138	472	61%	
2015	14,740	365			365			2,375	59			5,279	131			
2016					449	193			77	1,969			130	436		
2017					451	193			82	1,969			130	436		
2018					464	193			82	1,969			130	436		
2019					466	193			87	1,969			130	436		
2020					480	193			88	1,969			130	436		
2025					508	193			99	1,969			130	436		
2030					556	193			101	1,969			130	436		
2035					564	193			103	1,969			130	436		
2040					572	193			105	1,969			130	436		

Note: GPD/Service is estimated as the average of the last 5 years for given customer class.

**California Water Service Company - Willows Districts**  
**Water Supply and Demand Analysis and Projections**

**Estimated Indoor/Outdoor Water Usage**

Year	Industrial (IND)				Government (GOV)			
	IND Jan Usage	IND Indoor Use (Annualized 90% of January Total)			GOV Jan Usage	GOV Indoor Use (Annualized 90% of January Total)		
	(CCF)	AFY	GPD/Serv	%	(CCF)	AFY	GPD/Serv	%
1980	0	0			1,203	30	783	34%
1981	0	0			1,105	27	706	28%
1982	0	0			1,262	31	792	35%
1983	0	0			1,234	31	745	41%
1984	0	0			1,121	28	628	29%
1985	0	0			880	22	496	22%
1986	0	0			1,081	27	614	26%
1987	0	0			1,326	33	753	29%
1988	0	0			1,108	27	629	24%
1989	0	0			1,142	28	648	29%
1990	0	0			1,426	35	802	29%
1991	0	0			1,681	42	842	37%
1992	0	0			992	25	483	23%
1993	0	0			1,085	27	525	25%
1994	0	0			1,518	38	730	28%
1995	0	0			1,377	34	648	28%
1996	0	0			1,748	43	823	38%
1997	0	0			1,403	35	661	30%
1998	0	0			1,202	30	566	33%
1999	0	0			1,282	32	604	33%
2000	0	0			1,675	42	812	37%
2001	0	0			2,424	60	1,186	52%
2002	0	0			1,649	41	795	34%
2003	0	0			1,576	39	760	30%
2004	0	0			1,564	39	761	28%
2005	0	0			1,385	34	679	27%
2006	0	0			1,894	47	892	36%
2007	0	0			1,784	44	834	26%
2008	0	0			1,895	47	833	36%
2009	0	0			2,570	64	1,082	51%
2010	0	0			1,146	28	489	28%
2011	0	0			1,913	47	850	47%
2012	0	0			1,437	36	649	33%
2013	0	0			1,520	38	687	37%
2014	0	0			1,257	31	570	38%
2015	0	0			964	24		
2016						37	689	
2017						37	689	
2018						37	689	
2019						37	689	
2020						37	689	
2025						38	689	
2030						38	689	
2035						39	689	
2040						39	689	

Estimated Indoor/Outdoor Usage			
Est. Indoor Usage	Est. Outdoor Usage	Est. Indoor Usage	Est. Outdoor Usage
AFY	AFY	%	%
459	1,217	27%	73%
455	1,234	27%	73%
506	931	35%	65%
488	1,048	32%	68%
509	1,333	28%	72%
507	1,301	28%	72%
505	1,229	29%	71%
541	1,218	31%	69%
543	1,240	30%	70%
599	1,072	36%	64%
624	1,191	34%	66%
757	1,033	42%	58%
659	1,212	35%	65%
627	1,131	36%	64%
672	1,313	34%	66%
654	1,173	36%	64%
706	1,183	37%	63%
705	1,324	35%	65%
765	960	44%	56%
735	1,191	38%	62%
766	1,168	40%	60%
785	1,171	40%	60%
722	1,340	35%	65%
791	1,101	42%	58%
727	1,315	36%	64%
747	1,210	38%	62%
750	1,188	39%	61%
737	1,312	36%	64%
763	1,161	40%	60%
799	990	45%	55%
656	837	44%	56%
627	776	45%	55%
685	867	44%	56%
592	917	39%	61%
802	516	61%	39%
579	465	55%	45%
694	1,159	37%	63%
700	1,166	38%	62%
714	1,192	37%	63%
721	1,198	38%	62%
735	1,226	37%	63%
775	1,290	38%	62%
826	1,384	37%	63%
836	1,401	37%	63%
846	1,419	37%	63%



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