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July 3, 2019

TO: Interested Parties

THROUGH: Jay Hoecker, Water Supply Manager, Water Resources Bureau

FROM: Kevin Wills, Senior Economist, Water Resources Bureau
Ryan Pearson, Economist, Water Resources Bureau

SUBJECT: 2020 Regional Water Supply Plan: Landscape/Recreation Demand Projections

Introduction

Chapter 373, Florida Statutes (F.S.) sets forth the requirement for regional water supply planning. Under the provisions of this chapter, a Regional Water Supply Plan (RWSP) must be developed for those areas where available water supplies are not expected to meet projected demands over a 20-year planning horizon. Guidance for developing projections is contained in the publication, *Format and Guidelines for Regional Water Supply Plans* (Florida Department of Environmental Protection (DEP) et al., June 2009). This guidance document was produced by representatives from the DEP and each of the five water management districts. Following a Districtwide water supply assessment that identified water demands and existing sources, the Governing Board of the Southwest Florida Water Management District (SWFWMD or District) determined the need for a RWSP in the southern ten counties of the District, and the District produced its first RWSP in 2001. The statute requires that the determination of the need for a RWSP be made every five years. Accordingly, in 2003, the Governing Board determined that the need for a RWSP existed in the same ten-county area. Starting with the 2010 edition of the RWSP, the Governing Board has directed District staff to include demand projections for all sixteen counties within the District.

In support of this effort, the Southwest Florida Water Management District (District) participated in the development of the RWSP for the Central Florida Water Initiative (CFWI) in conjunction with representatives from the Florida Department of Environmental Protection (FDEP), major stakeholders and the South Florida and St. John's River water management districts. The CFWI region includes portions of Lake and Polk Counties which are under District jurisdiction. Consequently, the population and water demands for Lake and Polk County are from Draft Central Florida Water Initiative Demand Projections as of October 2018.

Purpose

This memo details the methodology used to develop water demand projections for the Landscape/Recreation (L/R) water use sector within the District. The L/R sector includes water use for parks, large lawns and landscaped areas, cemeteries, medians, public rights-of-way, athletic fields, golf courses, playgrounds and other ornamental or decorative purposes such as fountains and waterfalls.

Background

The District is divided into four planning regions: Heartland, Northern, Southern, and Tampa Bay. The Heartland Planning Region includes Hardee, Highlands, and Polk counties; the Northern Planning Region includes Citrus, Hernando, Lake, Levy, Marion, and Sumter counties; the Southern Planning Region includes Charlotte, DeSoto, Manatee, and Sarasota counties; and the Tampa Bay Planning Region includes Hillsborough, Pasco, and Pinellas counties. For the 2020 RWSP, 2015 is the baseline year, for the purpose of developing and reporting water demand projections. This is consistent with the methodology in the Format and Guidelines (DEP et al., June 2009). The data for the baseline year consists of reported and estimated usage for a 2015 baseline, whereas data for the years 2020 through 2040 are projected demands (estimated needs).

Data Sources

The methodology to develop landscape/recreation water demand projections utilizes many data sources. The District's Estimated Water Use Reports (2011-2015) were used to gather metered plus estimated landscape/recreation water use for each county (SWFWMD, 2011-2015). The University of Florida's Bureau of Economic and Business Research (BEBR) publications (2015 & 2017) were used to gather base year (2015) population and county population projections for the planning horizon (2020 – 2040). In the case of Lake and Polk counties, to assure consistency, the demand projections were taken from the Central Florida Water Initiative (CFWI) Demand Projections (St. John's River Water Management District (SJRWMD), South Florida Water Management District (SFWMD), SWFWMD and DEP, 2018).

Methodology

Water demand from the L/R sector is positively correlated with population growth. However, further research into golf course water demands indicated that future demand is also tied to facility closures, conservation and reclaimed water use and changing future demographic characteristics. To address these findings, it was decided to forecast golf and other landscape/recreation separately. As the CFWI estimates and projections for the overall L/R sector were not divided into golf and other landscape/recreation subsector demands, the total L/R demands for the SWFWMD portions of CFWI counties (Lake and Polk) were divided into golf and other landscape/recreation based upon each county's average historic percent of the total L/R demand within the District.

Golf

The District reviewed historic (2000-2016) metered and estimated golf course water use to identify trends. District golf course water use followed a decreasing trend over the 17-year period, from approximately 50 mgd in 2000 to 32 mgd in 2016. County-level golf course water use was analyzed further to identify if each county followed a similar downward trend. In all but three counties golf course water use was found to be following a decreasing trend. Citrus, Marion and Sumter counties were identified to have increasing trends in golf course water use. For these counties, the projected future demands were developed by increasing the baseline water use by the BEBR county-level population growth rate. For the remaining 13 District counties, the projected future golf course demands were developed by holding the baseline water use constant. For all counties, excluding Polk and Lake, the baseline water use was developed as a 5-year average of metered and estimated golf course water from 2011 to 2015. Baseline water use for Polk and Lake counties is based on 2015 water use (CFWI).

As noted in the section titled, “Drought (1-in-10) Demands”, drought year projections are estimated to be 30 percent higher than average year quantities. The average and drought year golf demand projections by county are displayed in Tables A-1 and A-2 in Appendix A.

Other Landscape/Recreation

The projected water demands for the non-golf course landscape/recreation water use were developed using a combination of historic metered and estimated water use data and county-level projections of population growth during the planning horizon. For all counties, excluding Polk and Lake, the baseline water use was developed as a 5-year average of metered and estimated water use from 2011 to 2015. Baseline water use for Polk and Lake counties is based on 2015 water use (CFWI). The projected future demands were developed by increasing the baseline water use by the BEBR county-level population growth rate.

For example, the baseline 2015 Other L/R demand for Charlotte County was estimated to be 0.549 mgd.¹ According to BEBR, the 2020 population for Charlotte County should be 7.75 percent higher than in 2015.

The 2020 Other L/R forecast is therefore calculated as follows:

$$2020 \text{ Other L/R use} = 0.549 \text{ mgd increased by } 7.75 \text{ percent} = 0.591 \text{ mgd}$$

As noted in the section titled, “Drought (1-in-10) Demands”, drought year projections are estimated to be 26 percent higher than average year quantities. Tables A-3 and A-4 in Appendix A display the projected average and drought year demands for the Other L/R sector.

Drought (1-in-10) Demands

The 1-in-10 year drought event is an event that results in an increase in water demand of a magnitude that would have a 10 percent probability of occurring during any given year. The Format and Guidelines (DEP et al., June 2009) indicate that methodologies for estimating the 1-in-10 year demand for recreational self-supply are similar to methodologies used to estimate agricultural demand. The optimum irrigation requirements for the 1-in-10 year event, as opposed to the average year event, were 30 percent higher for golf courses and 26 percent higher for landscape irrigation. The projected water use for an average year was multiplied by this percentage value to produce a projected water use for a 1-in-10 drought year.

Summary

The total L/R water use sector (both Golf and Other L/R) is expected to use an additional 13.51 million gallons per day. Average water demand is projected to increase from the 57.26 mgd in 2015 to 70.77 mgd in 2040.

Total average and drought year L/R projections are displayed in Tables A-5 and A-6 in Appendix A. Golf and Other L/R demand projections are also presented for the four planning regions in Tables A-7 through A-10 in Appendix A.

¹ For all counties, excluding Polk and Lake, the baseline water use was developed as a 5-year average of metered and estimated golf course water from 2011 to 2015. Baseline water use for Polk and Lake counties is based on 2015 water use (CFWI).

References

DEP et al., June 2009. *Format and Guidelines for Regional Water Supply Plans.*

SJRWMD, SFWMD, SWFWMD and DEP, *Draft 2020 CFWI Regional Water Supply Plan Demand Projections, October 31, 2018.*

SWFWMD, Estimated Water Use Reports (2001-2015)

University of Florida, Florida Estimates of Population 2015, Bureau of Economic and Business Research, April 1, 2015

University of Florida, Projections of Florida Population by County, 2020-2045, with estimates for 2016, Bureau of Economic and Business Research, Volume 50, Bulletin 177, April 2017

APPENDIX A

Landscape/Recreation Demand Projection Tables

Table A-1. 2015-2040 Average (5-in-10) Projected Golf Course Demand (mgd)

County	2015	2020	2025	2030	2035	2040	Change	%
							2015-2040	Change
Charlotte	1.238	1.238	1.238	1.238	1.238	1.238	0.000	0%
Citrus	4.084	4.283	4.459	4.606	4.727	4.822	0.739	18%
Desoto	0.140	0.140	0.140	0.140	0.140	0.140	0.000	0%
Hardee	0.271	0.271	0.271	0.271	0.271	0.271	0.000	0%
Hernando	3.069	3.069	3.069	3.069	3.069	3.069	0.000	0%
Highlands	1.827	1.827	1.827	1.827	1.827	1.827	0.000	0%
Hillsborough	3.200	3.200	3.200	3.200	3.200	3.200	0.000	0%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.171	0.171	0.171	0.171	0.171	0.171	0.000	0%
Manatee	1.650	1.650	1.650	1.650	1.650	1.650	0.000	0%
Marion	2.413	2.539	2.714	2.866	3.003	3.123	0.709	29%
Pasco	1.956	1.956	1.956	1.956	1.956	1.956	0.000	0%
Pinellas	1.330	1.330	1.330	1.330	1.330	1.330	0.000	0%
Polk ¹	4.086	4.086	4.086	4.086	4.086	4.086	0.000	0%
Sarasota	3.329	3.329	3.329	3.329	3.329	3.329	0.000	0%
Sumter	2.443	2.977	3.551	4.069	4.563	4.994	2.551	104%
District Total	31.208	32.065	32.991	33.808	34.561	35.206	3.999	13%

¹ Projections for the SWFWMD portion from Draft CFWI RWSP (10/31/18)

Table A-2. 2010-2035 Drought (1-in-10) Projected Golf Course Demand (mgd)

County	2015	2020	2025	2030	2035	2040	Change	%
							2015-2040	Change
Charlotte	1.610	1.610	1.610	1.610	1.610	1.610	0.000	0%
Citrus	5.309	5.568	5.796	5.988	6.145	6.269	0.960	18%
Desoto	0.182	0.182	0.182	0.182	0.182	0.182	0.000	0%
Hardee	0.352	0.352	0.352	0.352	0.352	0.352	0.000	0%
Hernando	3.990	3.990	3.990	3.990	3.990	3.990	0.000	0%
Highlands	2.375	2.375	2.375	2.375	2.375	2.375	0.000	0%
Hillsborough	4.160	4.160	4.160	4.160	4.160	4.160	0.000	0%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.223	0.223	0.223	0.223	0.223	0.223	0.000	0%
Manatee	2.145	2.145	2.145	2.145	2.145	2.145	0.000	0%
Marion	3.137	3.301	3.528	3.725	3.904	4.059	0.922	29%
Pasco	2.543	2.543	2.543	2.543	2.543	2.543	0.000	0%
Pinellas	1.728	1.728	1.728	1.728	1.728	1.728	0.000	0%
Polk ¹	5.312	5.312	5.312	5.312	5.312	5.312	0.000	0%
Sarasota	4.328	4.328	4.328	4.328	4.328	4.328	0.000	0%
Sumter	3.176	3.870	4.617	5.290	5.932	6.493	3.316	104%
District Total	40.570	41.685	42.888	43.950	44.929	45.768	5.199	13%

¹ Projections for the SWFWMD portion from Draft CFWI RWSP (10/31/18)

Table A-3. Projected Average (5-in-10) Other L/R Demand (mgd)

County	2015	2020	2025	2030	2035	2040	Change	%
							2015-2040	Change
Charlotte	0.549	0.591	0.627	0.658	0.684	0.708	0.159	29%
Citrus	0.230	0.242	0.252	0.260	0.267	0.272	0.042	18%
Desoto	0.185	0.191	0.195	0.199	0.203	0.206	0.021	11%
Hardee	0.020	0.020	0.020	0.020	0.020	0.020	0.000	2%
Hernando	1.153	1.246	1.334	1.410	1.480	1.540	0.387	34%
Highlands	0.340	0.355	0.369	0.381	0.390	0.396	0.057	17%
Hillsborough	5.246	5.806	6.344	6.819	7.222	7.598	2.352	45%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.041	0.042	0.043	0.044	0.045	0.046	0.005	13%
Manatee	8.202	8.629	9.223	9.739	10.206	10.612	2.410	29%
Marion	0.761	0.800	0.855	0.903	0.947	0.984	0.224	29%
Pasco	1.569	1.721	1.865	1.989	2.104	2.207	0.638	41%
Pinellas	0.846	0.866	0.879	0.891	0.902	0.907	0.061	7%
Polk ¹	3.123	3.544	3.934	4.254	4.564	4.844	1.721	55%
Sarasota	3.204	3.438	3.633	3.791	3.922	4.022	0.818	26%
Sumter	0.589	0.718	0.857	0.982	1.101	1.205	0.615	104%
District Total	26.056	28.208	30.430	32.341	34.057	35.567	9.511	37%

¹ Projections for the SWFWMD portion from Draft CFWI RWSP (10/31/18)

Table A-4. Projected Drought (1-in-10) Other L/R Demand (mgd)

County	2015	2020	2025	2030	2035	2040	Change	%
							2015-2040	Change
Charlotte	0.691	0.745	0.790	0.829	0.862	0.892	0.200	29%
Citrus	0.290	0.304	0.317	0.327	0.336	0.343	0.053	18%
Desoto	0.233	0.240	0.246	0.251	0.256	0.259	0.026	11%
Hardee	0.025	0.025	0.025	0.025	0.025	0.025	0.001	2%
Hernando	1.453	1.570	1.681	1.777	1.865	1.941	0.488	34%
Highlands	0.428	0.448	0.465	0.480	0.491	0.499	0.072	17%
Hillsborough	6.610	7.315	7.993	8.592	9.100	9.574	2.964	45%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.051	0.053	0.054	0.056	0.057	0.058	0.007	13%
Manatee	10.335	10.872	11.620	12.271	12.860	13.372	3.037	29%
Marion	0.959	1.008	1.078	1.138	1.193	1.240	0.282	29%
Pasco	1.977	2.168	2.351	2.507	2.651	2.781	0.804	41%
Pinellas	1.066	1.091	1.108	1.123	1.137	1.142	0.076	7%
Polk ¹	3.935	4.465	4.957	5.360	5.751	6.103	2.168	55%
Sarasota	4.037	4.332	4.577	4.777	4.942	5.067	1.031	26%
Sumter	0.743	0.905	1.079	1.237	1.387	1.518	0.775	104%
District Total	32.831	35.542	38.342	40.750	42.912	44.815	11.984	37%

¹ Projections for the SWFWMD portion from Draft CFWI RWSP (10/31/18)

Table A-5. 2010-2035 Average (5-in-10) Projected Total L/R Demand (mgd)

County	2015	2020	2025	2030	2035	2040	Change	%
							2015-2040	Change
Charlotte	1.787	1.830	1.865	1.896	1.922	1.946	0.159	9%
Citrus	4.314	4.524	4.710	4.866	4.994	5.094	0.780	18%
Desoto	0.325	0.331	0.335	0.339	0.343	0.345	0.021	6%
Hardee	0.291	0.291	0.291	0.291	0.291	0.291	0.000	0%
Hernando	4.222	4.315	4.403	4.480	4.549	4.609	0.387	9%
Highlands	2.167	2.182	2.196	2.208	2.217	2.223	0.057	3%
Hillsborough	8.446	9.005	9.544	10.019	10.422	10.798	2.352	28%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.212	0.213	0.214	0.215	0.216	0.217	0.005	2%
Manatee	9.852	10.279	10.873	11.389	11.857	12.263	2.410	24%
Marion	3.174	3.339	3.569	3.769	3.950	4.107	0.933	29%
Pasco	3.525	3.677	3.822	3.946	4.060	4.163	0.638	18%
Pinellas	2.175	2.195	2.209	2.221	2.232	2.236	0.061	3%
Polk ¹	7.209	7.630	8.020	8.340	8.650	8.930	1.721	24%
Sarasota	6.533	6.767	6.962	7.120	7.251	7.351	0.818	13%
Sumter	3.033	3.695	4.408	5.050	5.664	6.199	3.166	104%
District Total	57.264	60.273	63.421	66.149	68.618	70.774	13.510	24%

¹ Projections for the SWFWMD portion from Draft CFWI RWSP (10/31/18)

Table A-6. 2015-2035 Drought (1-in-10) Projected Total L/R Demand (mgd)

County	2015	2020	2025	2030	2035	2040	Change	%
							2015-2040	Change
Charlotte	2.301	2.355	2.400	2.439	2.472	2.502	0.200	9%
Citrus	5.599	5.872	6.113	6.315	6.481	6.612	1.013	18%
Desoto	0.415	0.422	0.427	0.433	0.438	0.441	0.026	6%
Hardee	0.377	0.377	0.377	0.377	0.377	0.378	0.001	0%
Hernando	5.443	5.560	5.671	5.767	5.855	5.931	0.488	9%
Highlands	2.803	2.823	2.841	2.855	2.866	2.875	0.072	3%
Hillsborough	10.770	11.475	12.153	12.751	13.260	13.734	2.964	28%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.274	0.275	0.277	0.278	0.279	0.280	0.007	2%
Manatee	12.480	13.017	13.766	14.416	15.005	15.517	3.037	24%
Marion	4.096	4.309	4.606	4.864	5.097	5.300	1.204	29%
Pasco	4.520	4.711	4.894	5.050	5.194	5.324	0.804	18%
Pinellas	2.794	2.819	2.836	2.851	2.865	2.871	0.076	3%
Polk ¹	9.247	9.777	10.269	10.672	11.062	11.415	2.168	23%
Sarasota	8.364	8.660	8.905	9.105	9.269	9.395	1.031	12%
Sumter	3.919	4.774	5.696	6.526	7.319	8.010	4.091	104%
District Total	73.401	77.227	81.230	84.700	87.841	90.583	17.182	23%

¹ Projections for the SWFWMD portion from Draft CFWI RWSP (10/31/18)

Table A-7. Projected L/R Demand in the Heartland Planning Region (5-in-10) and (1-in-10) (mgd)

County	2015		2020		2025		2030		2035		2040		Change 2015-2040		% Change 2015-2040	
	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10
Hardee	0.291	0.377	0.291	0.377	0.291	0.377	0.291	0.377	0.291	0.377	0.291	0.378	0.000	0.001	0%	0%
Highlands	2.167	2.803	2.182	2.823	2.196	2.841	2.208	2.855	2.217	2.866	2.223	2.875	0.057	0.072	3%	3%
Polk ¹	7.209	9.247	7.630	9.777	8.020	10.269	8.340	10.672	8.650	11.062	8.930	11.415	1.721	2.168	24%	23%
Total	9.666	12.427	10.103	12.977	10.507	13.486	10.839	13.904	11.158	14.306	11.444	14.667	1.778	2.241	18%	18%

¹ Projections for the SWFWMD portion from Draft CFWI RWSP (10/31/18)

Table A-8. Projected L/R Demand in the Northern Planning Region (5-in-10) and (1-in-10) (mgd)

County	2015		2020		2025		2030		2035		2040		Change 2015-2040		% Change 2015-2040	
	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	1-10	5-10	1-10	5-10
Citrus	4.314	5.599	4.524	5.872	4.710	6.113	4.866	6.315	4.994	6.481	5.094	6.612	0.78	1.01	18%	18%
Hernando	4.222	5.443	4.315	5.560	4.403	5.671	4.480	5.767	4.549	5.855	4.609	5.931	0.39	0.49	9%	9%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0%	0%
Levy	0.212	0.274	0.213	0.275	0.214	0.277	0.215	0.278	0.216	0.279	0.217	0.280	0.01	0.01	2%	2%
Marion	3.174	4.096	3.339	4.309	3.569	4.606	3.769	4.864	3.950	5.097	4.107	5.300	0.93	1.20	29%	29%
Sumter	3.033	3.919	3.695	4.774	4.408	5.696	5.050	6.526	5.664	7.319	6.199	8.010	3.17	4.09	104%	104%
Total	14.955	19.331	16.087	20.791	17.305	22.363	18.380	23.751	19.373	25.032	20.227	26.133	5.272	6.803	35%	35%

¹ Projections for the SWFWMD portion from Draft CFWI RWSP (10/31/18)

Table A-9. Projected L/R Demand in the Southern Planning Region (5-in-10) and (1-in-10) (mgd)

County	2015		2020		2025		2030		2035		2040		Change 2015-2040		% Change 2015-2040	
	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	1-10	5-10	1-10	5-10
Charlotte	1.787	2.301	1.830	2.355	1.865	2.400	1.896	2.439	1.922	2.472	1.946	2.502	0.159	0.200	9%	9%
Desoto	0.325	0.415	0.331	0.422	0.335	0.427	0.339	0.433	0.343	0.438	0.345	0.441	0.021	0.026	6%	6%
Manatee	9.852	12.480	10.279	13.017	10.873	13.766	11.389	14.416	11.857	15.005	12.263	15.517	2.410	3.037	24%	24%
Sarasota	6.533	8.364	6.767	8.660	6.962	8.905	7.120	9.105	7.251	9.269	7.351	9.395	0.818	1.031	13%	12%
Total	18.496	23.560	19.206	24.454	20.035	25.498	20.745	26.393	21.373	27.184	21.905	27.854	3.408	4.295	18%	18%

Table A-10. Projected L/R Demand in the Tampa Bay Planning Region (5-in-10) and (1-in-10) (mgd)

County	2015		2020		2025		2030		2035		2040		Change 2015-2040		% Change 2015-2040	
	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	5-10	1-10	1-10	5-10	1-10	5-10
Hillsborough	8.446	10.770	9.005	11.475	9.544	12.153	10.019	12.751	10.422	13.260	10.798	13.734	2.352	2.964	28%	28%
Pasco	3.525	4.520	3.677	4.711	3.822	4.894	3.946	5.050	4.060	5.194	4.163	5.324	0.638	0.804	18%	18%
Pinellas	2.175	2.794	2.195	2.819	2.209	2.836	2.221	2.851	2.232	2.865	2.236	2.871	0.061	0.076	3%	3%
Total	14.146	18.084	14.878	19.005	15.574	19.883	16.185	20.652	16.714	21.319	17.198	21.929	3.051	3.845	22%	21%

