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September 5, 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: Industrial/Commercial, Power Generation and Mining/Dewatering 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. The statute requires that the determination of the need for a RWSP be made every five years. 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. Starting with the 2010 edition of the RWSP, as directed by the Governing Board, District staff included 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 industrial/commercial (I/C), power generation (PG), and mining/dewatering (M/D) interests within the District. I/C uses include chemical manufacturing, food processing, and miscellaneous I/C uses. While diversified, much of the water used in food processing can be attributed to citrus and other agricultural crops. For the most part, chemical manufacturing is closely associated with phosphate mining and consists mainly of phosphate processing. Several different products are

mined within the District's boundaries, including phosphate, limestone, shell, and sand. For the purposes of the water supply planning process, thermoelectric power generation is separated out as an individual use category. While the Format and Guidelines (DEP et al., June 2009) identified 0.1 million gallons per day (mgd) as the mandatory reporting threshold for the I/C and M/D categories, the District examined and included all permitted or reported uses, regardless of the quantity in projecting demand. The decision to include all water use permits (WUPs), regardless of size, resulted from a belief that projection accuracy would be improved by capturing all available water use data.

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 starting point, or 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 water usage for 2015, whereas data for the years 2020 through 2040 are projected demands (estimated needs).

Data Source

Baseline pumpage data comes from the Water Use Well Package Database (WUWPD) (SWFWMD, 2017). This database includes metered use for individual/general permits and estimated use for small general permits. These quantities are for consumptive use of groundwater and fresh surface water. Recirculated water is not considered consumptive use, nor is the use of circulated seawater, and they are not included in the baseline and projected demand. The WUWPD does not include the use of reclaimed water; therefore, reclaimed water is not included in the baseline or demand projections.

Methodology

As with the 2015 RWSP, it was decided that a general economic driver, such as a growth rate factor derived from the Gross Regional Product (GRP) (Woods and Poole Economics, 2017) would likely provide the best overall driver for industrial, commercial and mining activities. The GRP is the market value of all final goods and services produced within a region (e.g. state, county, Metropolitan Statistical Area (MSA), etc.). However, the calculated Woods and Poole Economics five-year growth rates produced projections that were significantly higher than, and out of line with, previous projections and actual data. It was noticed that the one-year calculated Woods and Poole Economics growth rates were generally in the 2.5 percent to 3.5 percent range, or very close to the 3.0 percent over five-year growth rate used in previous RWSPs but had the added advantage of growth rates varying at the county level and across time. In the absence of other better data, it was decided to use the Woods and Poole Economics one-year growth rate as a proxy for the previously used 3.0 percent over five-year growth rate across the board. The growth factors used for all sectors by county and year are found in Table 1 in the attached Appendix.

Water use projections were developed for all sectors by multiplying water use data from the WUWPD by the growth factor based on the Woods and Poole Economics GRP forecasts by county. For example, Cemex Construction Material, LLC (WUP# 7871) in Charlotte County reported using 0.006 mgd in 2015. This is a permit for a cement or concrete batch plant. Using

the Charlotte County GRP-based growth factors in Table 1, this permit's demand is projected to grow 2.88 percent from 2015 to 2020, and 3.00 percent from 2020 to 2025. Projected use for 2020 and 2025 were calculated as follows:

$$2020 \text{ projected use} = 6,000 \text{ times } 1.0288 = 6,420 \text{ gallons per day (0.00642 mgd)}$$

$$2025 \text{ projected use} = 6,420 \text{ times } 1.03 = 6,613 \text{ gallons per day (0.00661 mgd)}$$

This methodology was used for all institutional, I/C, and M/D permits with one exception. As with the 2015 RWSP, The District consulted with the Mosaic Company to develop projections of I/C and M/D water demands associated with each of its processing facilities and mining operations. The objective was to better reflect the movement of pumpage across counties as their mines and demands shifted locations during the RWSP 20-year period of analysis.

For power generation demands, the District used a combination of historic water use and the 2018 10-year site plans for each power generation facility. These plans include historic number of customers and megawatt production. Using data for 2011-2015, a 5-year average water use per megawatt was calculated. This value is then applied to a projection of future megawatts by power generation facility. The 2018 10-year site plans for each power generation facility include projections of future customers and megawatts produced through 2027. The 20-year (2008-2027) average customer growth rate was used to extend the projections of customers through 2040. A calculation of megawatt use per customer is then applied to the projection of customers to arrive at a projection of megawatts by power generation facility. Future groundwater demand for 2020-2040 is calculated by applying the (2011-2015) average water use per megawatt to the projected megawatts specific to each power generation facility

The water use sectors addressed in the technical memorandum are not significantly affected by drought. The projections provided are the same for average and drought conditions (DEP et al., June 2009).

Projections Summary

For power generation, Table 2 in the Appendix indicates that Districtwide demand will increase by 3.0 mgd from 14.4 in 2015 to 17.4 mgd in 2040, an increase of 21 percent. County projection breakdowns and totals for each of the planning regions can be found in Tables 3 through 6 in the Appendix.

For the I/C and M/D sectors, Table 7 in the Appendix indicates that Districtwide demand will increase by 14.2 mgd from 78.4 mgd in 2015 to 92.5 mgd in 2040, an increase of 18 percent. County I/C and M/D projection breakdowns and totals for each of the planning regions can be found in Tables 8 through 11 in the Appendix.

Review

Upon receiving any additional stakeholder comments, the District will review suggested changes and, if appropriate, include updates. As this is a long-term planning effort, it is important to note that methodology changes based on short-term trends are not considered. Comments and suggested changes will only be taken into consideration if they are justifiable, defensible, based on historical regression data and long-term trends, and/or supported by complete documentation. The projection methods were presented to District staff and the Industrial Advisory Committee

(August 14, 2018). The projections contained herein were provided to the District's Industrial Advisory Committee on November 6, 2018.

Appendix

The appendix includes all the tables referenced above. In addition to the tables referenced, Table 12 breaks down the projected demands for the two sectors for selected years Districtwide.

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, June 19, 2017. *Water Use Well Package Database*.
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Woods and Poole Economics. Florida State Profile, 2017. *State and County Projections to 2040*.
www.woodsandpoole.com/main.php?cat=country

APPENDIX A

Industrial/Commercial, Power Generation and Mining/Dewatering Demand Projection Tables

Table 1. *General Five-Year Growth Percentages Applied to I/C, M/D and PG Demands*

County	2020	2025	2030	2035	2040
Charlotte	2.88%	3.00%	2.73%	2.49%	2.32%
Citrus	2.14%	2.69%	2.54%	2.36%	2.19%
Desoto	1.41%	2.23%	2.20%	2.14%	2.10%
Hardee	1.84%	1.93%	1.87%	1.77%	1.69%
Hernando	2.37%	2.66%	2.40%	2.19%	2.10%
Highlands	2.43%	2.29%	2.14%	1.97%	1.81%
Hillsborough	2.93%	2.75%	2.56%	2.38%	2.26%
Lake	N/A	N/A	N/A	N/A	N/A
Levy	2.44%	2.26%	2.15%	2.06%	1.99%
Manatee	3.13%	3.34%	3.10%	2.89%	2.74%
Marion	2.42%	2.08%	1.90%	1.70%	1.54%
Pasco	3.09%	2.67%	2.45%	2.30%	2.23%
Pinellas	1.44%	1.29%	1.16%	1.04%	0.94%
Polk	N/A	N/A	N/A	N/A	N/A
Sarasota	2.23%	2.54%	2.43%	2.29%	2.14%
Sumter	5.22%	3.61%	3.53%	3.39%	3.25%

Note: Lake and Polk projections are from Draft CFWI RWSP

Table 2. Demand Projections by County for Power Generation (mgd)

County	2015	2020	2025	2030	2035	2040	Change	% Change
							2015-2040	2015-2040
Charlotte	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Citrus	2.944	1.797	1.852	1.960	2.079	2.206	-0.738	-25%
DeSoto	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Hardee	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Hernando	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Highlands	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Hillsborough	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Manatee	3.595	3.688	3.919	4.171	4.397	4.636	1.041	29%
Marion	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Pasco	0.258	0.342	0.347	0.356	0.366	0.377	0.118	46%
Pinellas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Polk ¹	7.621	9.944	9.998	10.065	10.134	10.208	2.587	34%
Sarasota	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Sumter	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
District Total	14.418	15.771	16.116	16.551	16.976	17.427	3.009	20.87%

¹ Projections for the SWFWMD portion from Draft CFWI RWSP

Note: Quantities do not include reclaimed or seawater sources.

Table 3. Heartland Planning Region Projected Power Generation Demand (5-in-10) (mgd)

County	2015	2020	2025	2030	2035	2040	Change	% Change
							2015-2040	2015-2040
Hardee	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Highlands	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Polk ¹	7.621	9.944	9.998	10.065	10.134	10.208	2.587	34%
Total	7.621	9.944	9.998	10.065	10.134	10.208	2.587	34%

¹ Water demand projections for Seminole Electric Cooperative, Inc., facilities in Hardee County were developed and included as part of the totals reflected for the Industrial/Commercial water use category and are based on Industrial/Commercial methodology; using Power Generation methodology, projected demands for the Cooperative's facilities would range from 1.08 mgd in 2020 to 1.17 mgd in 2040.

² Projections for the SWFWMD portion from the 2020 CFWI RWSP.

Note: Quantities do not include reclaimed or seawater sources.

Note: Quantities do not include reclaimed or seawater sources.

Table 4. Northern Planning Region Projected Power Generation Demand (5-in-10) (mgd)

County	2015	2020	2025	2030	2035	2040	Change	% Change
							2015-2040	2015-2040
Citrus	2.944	1.797	1.852	1.960	2.079	2.206	-0.738	-25%
Hernando	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Marion	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Sumter	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Total	2.944	1.797	1.852	1.960	2.079	2.206	-0.738	-25%

¹ Projections for the SWFWMD portion from Draft CFWI RWSP

Note: Quantities do not include reclaimed or seawater sources.

Table 5. Southern Planning Region Projected Power Generation Demand (5-in-10) (mgd)

County	2015	2020	2025	2030	2035	2040	Change	% Change
							2015-2040	2015-2040
Charlotte	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
DeSoto	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Manatee	3.595	3.688	3.919	4.171	4.397	4.636	1.041	29%
Sarasota	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Total	3.595	3.688	3.919	4.171	4.397	4.636	1.041	29%

Note: Quantities do not include reclaimed or seawater sources.

Table 6. Tampa Bay Planning Region Projected Power Generation Demand (5-in-10) (mgd)

County	2015	2020	2025	2030	2035	2040	Change	% Change
							2015-2040	2015-2040
Hillsborough	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Pasco	0.258	0.342	0.347	0.356	0.366	0.377	0.118	46%
Pinellas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Total	0.258	0.342	0.347	0.356	0.366	0.377	0.118	46%

Note: Quantities do not include reclaimed or seawater sources.

Table 7. Districtwide Demand Projections by County for I/C and M/D (5-in-10) (mgd)

County	2015	2020	2025	2030	2035	2040	Change	% Change
							2015-2040	2015-2040
Charlotte	0.137	0.083	0.086	0.088	0.090	0.092	-0.044	-32%
Citrus	0.220	0.225	0.231	0.236	0.242	0.247	0.027	13%
DeSoto	0.593	0.602	0.615	0.629	0.642	0.656	0.062	10%
Hardee	3.983	2.423	2.429	11.498	11.072	8.063	4.080	102%
Hernando	5.419	5.547	5.694	5.831	5.959	6.084	0.665	12%
Highlands	0.109	0.101	0.104	0.106	0.108	0.110	0.001	1%
Hillsborough	17.486	24.972	25.141	12.569	12.723	12.873	-4.614	-26%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.005	0.006	0.006	0.006	0.006	0.006	0.001	11%
Manatee	4.993	6.153	6.165	9.552	9.563	9.574	4.581	92%
Marion	0.010	0.010	0.010	0.010	0.010	0.011	0.001	10%
Pasco	0.978	0.951	0.976	1.000	1.023	1.046	0.068	7%
Pinellas	0.189	0.192	0.194	0.196	0.198	0.200	0.011	6%
Polk ¹	43.202	50.104	50.457	54.452	52.204	52.410	9.208	21%
Sarasota	0.369	0.304	0.312	0.319	0.326	0.333	-0.036	-10%
Sumter	0.699	0.736	0.762	0.789	0.816	0.843	0.143	20%
District Total	78.393	92.408	93.182	97.282	94.984	92.548	14.155	18%

¹ Projections for the SWFWMD portion from Draft CFWI RWSP
 Note: Quantities do not include reclaimed or seawater sources.

Table 8. Heartland Planning Region Projected I/C and M/D Demand (5-in-10) (mgd)

County	2015	2020	2025	2030	2035	2040	Change	% Change
							2015-2040	2015-2040
Hardee	3.983	2.423	2.429	11.498	11.072	8.063	4.080	102%
Highlands	0.109	0.101	0.104	0.106	0.108	0.110	0.001	1%
Polk ¹	43.202	50.104	50.457	54.452	52.204	52.410	9.208	21%
Total	47.295	52.628	52.990	66.056	63.384	60.583	13.288	28%

¹ Projections for the SWFWMD portion from Draft CFWI RWSP
 Note: Quantities do not include reclaimed or seawater sources.

Table 9. Northern Planning Region Projected I/C and M/D Demand (5-in-10) (mgd)

County	2015	2020	2025	2030	2035	2040	Change	% Change
							2015-2040	2015-2040
Citrus	0.220	0.225	0.231	0.236	0.242	0.247	0.027	13%
Hernando	5.419	5.547	5.694	5.831	5.959	6.084	0.665	12%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.005	0.006	0.006	0.006	0.006	0.006	0.001	11%
Marion	0.010	0.010	0.010	0.010	0.010	0.011	0.001	10%
Sumter	0.699	0.736	0.762	0.789	0.816	0.843	0.143	20%
Total	6.353	6.523	6.703	6.873	7.033	7.190	0.837	13%

¹ Projections for the SWFWMD portion from Draft CFWI RWSP
 Note: Quantities do not include reclaimed or seawater sources.

Table 10. Southern Planning Region Projected I/C and M/D Demand (5-in-10) (mgd)

County	2015	2020	2025	2030	2035	2040	Change	% Change
							2015-2040	2015-2040
Charlotte	0.137	0.083	0.086	0.088	0.090	0.092	-0.044	-32%
DeSoto	0.593	0.602	0.615	0.629	0.642	0.656	0.062	10%
Manatee	4.993	6.153	6.165	9.552	9.563	9.574	4.581	92%
Sarasota	0.369	0.304	0.312	0.319	0.326	0.333	-0.036	-10%
Total	6.092	7.142	7.178	10.588	10.622	10.655	4.563	75%

Note: Quantities do not include reclaimed or seawater sources.

Table 11. Tampa Bay Planning Region Projected I/C and M/D Demand (5-in-10) (mgd)

County	2015	2020	2025	2030	2035	2040	Change	% Change
							2015-2040	2015-2040
Hillsborough	17.486	24.972	25.141	12.569	12.723	12.873	-4.614	-26%
Pasco	0.978	0.951	0.976	1.000	1.023	1.046	0.068	7%
Pinellas	0.189	0.192	0.194	0.196	0.198	0.200	0.011	6%
Total	18.653	26.114	26.311	13.765	13.944	14.119	-4.534	-24%

Note: Quantities do not include reclaimed or seawater sources.

Table 12. *Baseline Usage and Water Demand Projections in 16-County Area (mgd)*

Water Use by Use Category	2015 Baseline Usage	2020 Water Demand Projection	2040 Water Demand Projection	Difference 2015-2040
Industrial/Commercial & Mining/Dewatering	78.393	92.408	92.548	14.155
Power Generation	14.418	15.771	17.427	3.009

Notes: 2015 Baseline usage (mgd) is aggregate data from the Water Use Well Package database, (2017).