

Demand Projections for Industrial/Commercial, Mining/Dewatering, Power Generation

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 Planning* (Florida Department of Environmental Protection [FDEP] et al., 2019). This guidance document was produced by representatives from the FDEP 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 District participated in the development of the RWSP for the Central Florida Water Initiative (CFWI) in conjunction with representatives from the FDEP, major stakeholders, and the South Florida and St. John's River water management districts. The CFWI Planning Area includes portions of Lake and Polk counties which are under District jurisdiction. Consequently, the population and water demands for Lake and Polk counties are from the 2025 CFWI RWSP demand projections.

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. Industrial/commercial (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 PG is separated out as an individual use category. While the *Format and Guidelines* (FDEP et al., 2019) 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 2025 RWSP, 2020 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 (FDEP et al., 2019). The data for the baseline year consists of reported and estimated water usage for 2020, whereas data for the years 2025 through 2045 are projected demands (estimated needs).

Data Source

Baseline pumpage data comes from the Water Use Well Package Database (WUWPD) (SWFWMD, 2022). 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 2020 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, Inc., 2022) would likely provide the best overall driver for I/C and M/D 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]). However, the calculated Woods and Poole Economics, Inc. 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, Inc. 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, Inc. 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 below.

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, Inc. GRP forecasts by county. For example, if an I/C facility used 0.30 mgd in 2020 and the county calculated growth factor from 2020 to 2025 was three percent, the 2025 projection for that facility would be 0.31 mgd. Similarly, if the 2025 to 2030 growth factor was four percent, the 2030 projection would be 0.32 mgd. Projected use for 2025 and 2030 were calculated as follows:

$$2025 \text{ projected use} = 0.30 \text{ times } 1.03 = 0.31 \text{ mgd}$$

$$2030 \text{ projected use} = 0.31 \text{ times } 1.04 = 0.32 \text{ mgd}$$

This methodology was used for all institutional, I/C, and M/D permits with one exception. As with the 2020 RWSP, The District utilized mining plans for 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 PG demands, the District used a combination of historic water use and the 2023 10-year site plans for each PG facility. These plans include historic number of customers and megawatt production. Using data for 2016-2020, a 5-year average water use per megawatt was calculated. This value was then applied to a projection of future megawatts by PG facility. The 2023 10-year site plans for each PG facility include projections of future customers and megawatts produced through 2032. The 20-year (2013-2032) average customer growth rate was used to extend the projections of customers through 2045. A calculation of megawatt use per customer was then applied to the projection of customers to arrive at a projection of megawatts by PG facility. Future groundwater demand for 2025-2045 was calculated by applying the (2016-2020) average water use per megawatt to the projected megawatts specific to each PG facility.

The water use sectors addressed in this appendix are not significantly affected by drought. Therefore, projections provided are the same for average and drought conditions (FDEP et al., June 2019).

Projections Summary

For PG, Table 2 indicates that Districtwide demand will increase by 7.62 mgd, from 11.42 mgd in 2020 to 19.04 mgd in 2045, an increase of 67 percent. County projection breakdowns and totals for each of the planning regions can be found in Tables 3 through 6.

For the I/C and M/D sectors, Table 7 indicates that Districtwide demand will increase by 26.24 mgd, from 58.02 mgd in 2020 to 84.26 mgd in 2045, an increase of 60.1 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.

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 projections contained herein were presented to the District's Industrial Advisory Committee on August 8, 2023.

Tables

Beginning on page 5 are 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

- Central Florida Water Initiative (CFWI), 2025. *2025 Central Florida Water Initiative Regional Water Supply Plan*.
- Florida Department of Environmental Protection (FDEP) et al., 2019. *Format and Guidelines for Regional Water Supply Planning*. FDEP, Tallahassee, FL.
- Southwest Florida Water Management District (SWFWMD), 2022. *Water Use Well Package Database*. Brooksville, FL.
- Woods and Poole Economics, Inc., 2022. *State and County Projections to 2060*. www.woodsandpoole.com.

Table 1. General five-year growth percentages applied to industrial/commercial, mining/dewatering, and power generation demands

County	2025	2030	2035	2040	2045
Charlotte	2.22%	2.34%	2.21%	2.09%	1.98%
Citrus	2.63%	2.08%	1.94%	1.82%	1.72%
Desoto	0.89%	1.49%	1.50%	1.51%	1.51%
Hardee	1.03%	1.47%	1.41%	1.37%	1.33%
Hernando	3.52%	3.35%	3.29%	3.23%	3.18%
Highlands	2.33%	2.06%	1.98%	1.91%	1.83%
Hillsborough	2.18%	2.49%	2.35%	2.23%	2.13%
Lake	N/A	N/A	N/A	N/A	N/A
Levy	0.82%	1.24%	1.21%	1.18%	1.16%
Manatee	2.13%	2.33%	2.23%	2.15%	2.09%
Marion	2.24%	2.61%	2.53%	2.45%	2.38%
Pasco	3.09%	3.24%	3.15%	3.07%	3.00%
Pinellas	1.50%	1.58%	1.43%	1.30%	1.20%
Polk	N/A	N/A	N/A	N/A	N/A
Sarasota	2.34%	2.21%	2.05%	1.91%	1.79%
Sumter	4.11%	4.11%	4.10%	4.09%	4.09%

Note: Lake and Polk projections are from the 2025 CFWI RWSP.

Table 2. Demand projections by county for power generation (mgd)

							Change	% Change
County	2020	2025	2030	2035	2040	2045	2020-2045	2020-2045
Charlotte	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Citrus	1.410	2.059	2.153	2.325	2.533	2.759	1.349	96%
Desoto	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Hardee	3.002	1.020	1.067	1.107	1.150	1.195	-1.807	-60%
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	2.431	4.895	5.230	5.609	5.989	6.395	3.964	163%
Marion	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Pasco	0.167	0.164	0.171	0.185	0.201	0.219	0.052	31%
Pinellas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Polk ¹	4.413	8.101	8.151	8.245	8.351	8.469	4.056	92%
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	11.4	16.2	16.8	17.5	18.2	19.0	7.6	67%

¹Projections for the SWFWMD portion from the 2025 CFWI RWSP.
Note: Quantities do not include reclaimed or seawater sources.

Table 3. Heartland Planning Region projected power generation demand (5-in-10) (mgd)

							Change	% Change
County	2020	2025	2030	2035	2040	2045	2020-2045	2020-2045
Hardee	3.002	1.020	1.067	1.107	1.150	1.195	-1.807	-60%
Highlands	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Polk ¹	4.413	8.101	8.151	8.245	8.351	8.469	4.056	92%
Total	7.415	9.121	9.218	9.351	9.501	9.664	2.249	30%

¹Projections for the SWFWMD portion from the 2025 CFWI RWSP

Note: Quantities do not include reclaimed or seawater sources.

Table 4. Northern Planning Region projected power generation demand (5-in-10) (mgd)

							Change	% Change
County	2020	2025	2030	2035	2040	2045	2020-2045	2020-2045
Citrus	1.410	2.059	2.153	2.325	2.533	2.759	1.349	96%
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	1.410	2.059	2.153	2.325	2.533	2.759	1.349	96%

¹Projections for the SWFWMD portion from the 2025 CFWI RWSP

Note: Quantities do not include reclaimed or seawater sources.

Table 5. Southern Planning Region projected power generation demand (5-in-10) (mgd)

							Change	% Change
County	2020	2025	2030	2035	2040	2045	2020-2045	2020-2045
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	2.431	4.895	5.230	5.609	5.989	6.395	3.964	163%
Sarasota	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Total	2.431	4.895	5.230	5.609	5.989	6.395	3.964	163%

Note: Quantities do not include reclaimed or seawater sources.

Table 6. Tampa Bay Planning Region projected power generation demand (5-in-10) (mgd)

							Change	% Change
County	2020	2025	2030	2035	2040	2045	2020-2045	2020-2045
Hillsborough	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Pasco	0.167	0.164	0.171	0.185	0.201	0.219	0.052	31%
Pinellas	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Total	0.167	0.164	0.171	0.185	0.201	0.219	0.052	31%

Note: Quantities do not include reclaimed or seawater sources.

Table 7. Districtwide demand projections by county for industrial/commercial and mining/dewatering (5-in-10) (mgd)

							Change	% Change
County	2020	2025	2030	2035	2040	2045	2020-2045	2020-2045
Charlotte	0.163	0.084	0.086	0.087	0.089	0.091	-0.072	-44%
Citrus	0.404	0.389	0.397	0.405	0.412	0.419	0.015	4%
DeSoto	0.656	0.656	0.666	0.676	0.686	0.697	0.040	6%
Hardee	1.456	1.067	9.382	9.383	6.370	6.371	4.915	338%
Hernando	3.330	3.443	3.558	3.676	3.794	3.915	0.585	18%
Highlands	0.097	0.090	0.092	0.094	0.095	0.097	0.000	0%
Hillsborough	12.075	25.030	12.178	12.321	12.459	12.595	0.520	4%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.015	0.015	0.015	0.015	0.016	0.016	0.001	6%
Manatee	4.112	6.149	6.157	6.165	6.173	6.181	2.069	50%
Marion	0.048	0.027	0.027	0.028	0.029	0.029	-0.018	-38%
Pasco	1.052	1.020	1.053	1.086	1.120	1.153	0.101	10%
Pinellas	0.153	0.156	0.158	0.160	0.163	0.164	0.011	7%
Polk ¹	33.480	49.176	53.195	50.948	51.165	51.349	17.869	53%
Sarasota	0.145	0.149	0.152	0.155	0.158	0.161	0.016	11%
Sumter	0.836	0.870	0.906	0.943	0.982	1.022	0.186	22%
District Total	58.022	88.320	88.023	86.143	83.711	84.260	26.238	45%

¹Projections for the SWFWMD portion from the 2025 CFWI RWSP
Note: Quantities do not include reclaimed or seawater sources.

Table 8. Heartland Planning Region projected industrial/commercial and mining/dewatering demand (5-in-10) (mgd)

							Change	% Change
County	2020	2025	2030	2035	2040	2045	2020-2045	2020-2045
Hardee	1.456	1.067	9.382	9.383	6.370	6.371	4.915	338%
Highlands	0.097	0.090	0.092	0.094	0.095	0.097	0.000	0%
Polk ¹	33.480	49.176	53.195	50.948	51.165	51.349	17.869	53%
Total	35.032	50.333	62.669	60.425	57.630	57.817	22.785	65%

¹Projections for the SWFWMD portion from the 2025 CFWI RWSP
Note: Quantities do not include reclaimed or seawater sources.

Table 9. Northern Planning Region projected industrial/commercial and mining/dewatering demand (5-in-10) (mgd)

							Change	% Change
County	2020	2025	2030	2035	2040	2045	2020-2045	2020-2045
Citrus	0.404	0.389	0.397	0.405	0.412	0.419	0.015	4%
Hernando	3.330	3.443	3.558	3.676	3.794	3.915	0.585	18%
Lake ¹	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0%
Levy	0.015	0.015	0.015	0.015	0.016	0.016	0.001	6%
Marion	0.048	0.027	0.027	0.028	0.029	0.029	-0.018	-38%
Sumter	0.836	0.870	0.906	0.943	0.982	1.022	0.186	22%
Total	4.633	4.744	4.904	5.067	5.233	5.401	0.768	17%

¹Projections for the SWFWMD portion from the 2025 CFWI RWSP
Note: Quantities do not include reclaimed or seawater sources.

Table 10. Southern Planning Region projected industrial/commercial and mining/dewatering demand (5-in-10) (mgd)

							Change	% Change
County	2020	2025	2030	2035	2040	2045	2020-2045	2020-2045
Charlotte	0.163	0.084	0.086	0.087	0.089	0.091	-0.072	-44%
DeSoto	0.656	0.656	0.666	0.676	0.686	0.697	0.040	6%
Manatee	4.112	6.149	6.157	6.165	6.173	6.181	2.069	50%
Sarasota	0.145	0.149	0.152	0.155	0.158	0.161	0.016	11%
Total	5.077	7.037	7.061	7.084	7.106	7.129	2.053	40%

Note: Quantities do not include reclaimed or seawater sources.

Table 11. Tampa Bay Planning Region projected industrial/commercial and mining/dewatering demand (5-in-10) (mgd)

							Change	% Change
County	2020	2025	2030	2035	2040	2045	2020-2045	2020-2045
Hillsborough	12.075	25.030	12.178	12.321	12.459	12.595	0.520	4%
Pasco	1.052	1.020	1.053	1.086	1.120	1.153	0.101	10%
Pinellas	0.153	0.156	0.158	0.160	0.163	0.164	0.011	7%
Total	13.280	26.206	13.389	13.567	13.741	13.913	0.632	5%

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	2020 Baseline Usage	2025 Water Demand Projection	2045 Water Demand Projection	Difference 2020-2045
Industrial/Commercial & Mining/Dewatering	58.022	88.320	84.260	26.238
Power Generation	11.423	16.238	19.038	7.614

Note: 2020 baseline usage (mgd) is aggregate data from the Water Use Well Package database (SWFWMD, 2022).