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# Southwest Florida Water Management District

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July 28, 2015

TO: Interested Parties

THROUGH: Jason Mickel, Water Supply Manager, Water Resources Bureau

FROM: Jay Yingling, Senior Economist, Water Resources Bureau  
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SUBJECT: 2015 Regional Water Supply Plan: Landscape/Recreation Demand Projections

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## 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.

## 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 right-of-ways, 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 2015 RWSP, 2010 is the baseline year, for the purpose of developing and reporting water

demand projections. This is consistent with the methodology agreed upon by the Water Planning Coordination Group (DEP, 2001). The data for the baseline year consists of reported and estimated usage for a 2010 baseline, whereas data for the years 2015 through 2035 are projected demands (estimated needs).

### **Water Use Data Source**

Baseline data comes from the Water Use Well Package Database (WUWPD) (SWFWMD, 2014). This database includes metered use for Individual Permits and estimated use for General Permits by rule. Only active permits were selected. Currently, there are 6,420 withdrawals (927 unique permits) with L/R permitted uses. Of these, 272 permits had golf course quantities and 655 permits had other recreational use quantities. In the case of Lake and Polk counties, to assure consistency, the demand projections were taken from the Central Florida Water Initiative (CFWI) (St. John's River Water Management District (SJRWMD), South Florida Water Management District (SFWMD), SWFWMD and DEP, 2015).

### **Methodology**

Based on Green Industry Advisory Committee comments received during presentations of the initial projections for the L/R sector that indicated that the golf portion of the projections were too high, it was decided to revise the initial methodologies used for projecting golf and "other landscape/recreation" water demands. Water demand from the L/R sector is correlated with population growth. However, further research into golf demands indicated that future demand is also tied to specific, changing future demographic characteristics such as age, household income and ethnicity. 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 engaged the services of a golf industry consulting firm (Pellucid Corp.) to assist the District in developing a more industry-specific method for projecting demand for golf, and hence the demand for additional golf courses requiring water. Pellucid developed data on the number and size (number of holes) of golf courses within the District from various sources, and also provided access to key demographic data related to per capita play rates based on the demographic variables of interest. The play rates (number of rounds played per year) are based on state-level survey data. An example of play rates varying by demographics is that the population age group 35 to 54 played 1.5 rounds per year in 2010 while those in the age group 55 and above played an average of 5 rounds of golf per year in 2010.

The golf industry's demand projection planning horizon (about 10 years) is a shorter planning horizon than what is required for water demand projections (20 years). Fortunately, the District has access to longer term demographic projections that include projections for the variables required to project future play rates (Woods and Poole Economics, 2015). This data was provided to the consultant to project demands for future rounds of golf in the District and the changes in Eighteen-Hole Equivalent (EHE) golf courses that would be required at the county level to meet the changing demand. Table 1 displays the consultant's 2010 estimates and projections of additional EHEs by county through the planning period.

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A significant finding of the consultant’s analysis is that, while there does appear to be some decline in the industry at the national, and to some extent at the state level in Florida, the data indicates that there will continue to be demand for additional golf courses in the District in the future. While both the consultant and District staff agree that the projected demand may still be somewhat higher than what may actually occur, there is no data upon which to further refine the weighting of demographic factors that may support our opinion that the projected EHE demands will be somewhat lower than the consultant’s EHE projections. Play rates for cross-tabulated demographic subcategories (such as Asian *and* over 55 years of age) are not available, nor are projections of cross-tabulated demographic data. Therefore, the demographically developed play rates and projected rounds were simply averaged across the demographic categories in the absence of any better data to differentially weight their impacts on future golf demand. The revised projected demands, however, are lower than the initial projections developed for this RWSP. The full consultant report is attached in Appendix B along with tables of key data utilized in the consultant effort.

**Table 1. Estimated 2010 and Projected Changes in EHE Golf Courses Through 2035**

County	Base Year 2010	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035	Total Change 2010-2035
Charlotte	20.0	-0.5	2.0	2.0	2.0	1.5	7.0
Citrus	18.0	0.0	2.0	2.0	2.0	2.0	8.0
DeSoto	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Hardee	1.5	0.0	0.0	0.0	0.0	0.0	0.0
Hernando	20.5	-1.0	2.5	2.5	2.5	2.5	9.0
Highlands	16.0	0.0	1.5	1.5	1.5	2.0	6.5
Hillsborough	47.0	0.0	5.0	5.0	4.5	4.5	19.0
Lake	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Levy	2.0	0.0	0.0	0.0	0.0	0.0	0.0
Manatee	34.0	1.0	4.0	3.5	3.5	3.5	15.5
Marion	13.0	0.0	1.5	1.5	1.5	1.5	6.0
Pasco	31.5	0.0	3.5	3.5	3.5	3.5	14.0
Pinellas	43.5	0.0	2.0	1.5	1.0	0.5	5.0
Polk	44.0	2.0	3.5	3.0	3.0	2.5	14.0
Sarasota	48.0	0.0	4.0	4.0	3.5	3.5	15.0
Sumter	27.5	1.5	5.0	5.5	5.5	6.0	23.5
<b>District Total</b>	<b>369.5</b>	<b>3.0</b>	<b>36.5</b>	<b>35.5</b>	<b>34.0</b>	<b>33.5</b>	<b>142.5</b>

Note: Changes in EHEs are rounded to halves (9 holes).

The consultant also indicated that most new golf courses (66 percent) are being constructed in such a manner that might increase their water demand by approximately 15 percent. This is addressed in the demand quantity projections by calculating a base year water use per EHE for each county and then applying the 15 percent increase to the water use per EHE for 66 percent of the EHEs added in a given year. The 15 percent increase was not applied to the water use per EHE for the remaining (34 percent) EHEs added for that year. For example, if the county baseline year water use per EHE was 0.21 mgd and the 2010-2015 change in EHEs was +2, the 2015 demand for the county would be the 2010 baseline demand plus  $(0.21 \text{ mgd/EHE} \times 2 \text{ additional EHEs} \times 0.66 \times 1.15) + (0.21 \text{ mgd/EHE} \times 2 \text{ additional EHEs} \times 0.34)$ . For 2020, the

quantities associated with the additional EHEs would be added to the previously calculated 2015 demand.

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**

County-level population estimates and forecasts were developed from the Woods and Poole Economics 2015 Florida State Profile. Correlation test results suggest a positive association between population and other landscape recreation (non-golf) demand and this association has been used in previous RWSP projections for this water use sector. Therefore, countywide Other L/R water use was assumed to grow at the county's expected growth rate for population.

For example, the baseline 2010 Other L/R demand for Charlotte County was estimated to be 0.709 mgd.<sup>1</sup> According to Woods and Poole, the 2015 population for Charlotte County should be 5.71 percent higher than in 2010.

The 2015 Other L/R forecast is therefore calculated as follows:

$$2015 \text{ Other L/R use} = 0.709 \text{ mgd increased by } 5.71 \text{ percent} = 0.750 \text{ mgd}$$

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.

### **Review**

The District provided technical memoranda and the demand projection tables to permitting staff and stakeholders who would have a more thorough understanding of the permits for which they are responsible. Upon receiving stakeholder comments, the District reviewed suggested changes and, if appropriate, included updates (the most notable of which were changes resulting from input from the golf industry). District staff presented the L/R projections at the September 18, 2014, Green Industry Advisory Committee meeting. Golf course industry representatives commented that the golf course water demand projections and growth rate appeared to be high based on the state of the golfing industry. As a result, the District engaged the services of a golf industry consulting firm to assist with the projection of demand for golf. That work has been completed and incorporated into the demand projections. As Golf and

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<sup>1</sup> To be consistent with previous RWSP projections, an average of 2009, 2010 and 2011 pumpage was used to develop the baseline year quantity. Three years (rather than five) were used to create the average, as going further back in time may introduce significant bias from the building boom era of the mid-2000s.

Other Landscape/Recreation demands were initially projected together as a single demand and then disaggregated based on historical pumpage by the two sectors, the Other Landscape/Recreation demands were revised and projected as described above. The demand drivers for the two sectors were no longer the same and the demands had to be projected separately.

As this is a long-term planning effort, it is important to note that methodology changes based on short-term trends were not taken into account. Comments and suggested changes were only taken into consideration if they were justifiable, defensible, based on historical regression data and long-term trends, and supported by complete documentation.

### **Summary**

The total L/R water use sector (both Golf and Other L/R) is expected to use an additional 32.91 million gallons per day. Average water demand is projected to increase from the 71.04 mgd in 2010 to 103.95 mgd in 2035. We suspect that the projected golf demands may not be fully realized but there is insufficient data to further refine the projections. Districtwide, total average L/R projected demand for 2035 decreased from the initial projection of 108.78 to 103.95 mgd as a result of the revisions to the projections methodologies.

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.

### **References**

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

SJRWMD, SFWMD, SWFWMD and DEP, 2015. *Draft CFWI Regional Water Supply Plan*.

SWFWMD, March 3, 2013. *Water Use Well Package Database*. \\ad.DISTRICT.net\prj\Hydro Eval\Projects\P417 - Groundwater Modeling Support\Well\_Packages\92\_2011\Metadata

Woods and Poole Economics. Florida State Profile, 2015. *State and County Projections to 2050*. [www.woodsandpoole.com/main.php?cat=country](http://www.woodsandpoole.com/main.php?cat=country)

# **APPENDIX A**

## **Landscape/Recreation Demand Projections Tables**

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**Table A-1. 2010-2035 Average (5-in-10) Projected Golf Course Demand (mgd)**

County	2010	2015	2020	2025	2030	2035	Change	% Change
							2010-2035	2010-2035
Charlotte	1.263	1.228	1.367	1.506	1.645	1.749	0.486	38.47%
Citrus	4.369	4.369	4.903	5.437	5.970	6.504	2.134	48.84%
DeSoto	0.169	0.169	0.169	0.169	0.169	0.169	0.000	0.00%
Hardee	0.085	0.085	0.085	0.085	0.085	0.085	0.000	0.00%
Hernando	3.846	3.640	4.155	4.671	5.186	5.702	1.856	48.25%
Highlands	2.001	2.001	2.207	2.413	2.619	2.894	0.893	44.65%
Hillsborough	3.705	3.705	4.138	4.572	4.961	5.351	1.646	44.43%
Lake <sup>1</sup>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00%
Levy	0.241	0.241	0.241	0.241	0.241	0.241	0.000	0.00%
Manatee	2.346	2.422	2.725	2.991	3.256	3.521	1.175	50.10%
Marion	2.831	2.831	3.190	3.549	3.908	4.267	1.436	50.72%
Pasco	2.042	2.042	2.292	2.541	2.791	3.040	0.998	48.84%
Pinellas	1.738	1.738	1.825	1.891	1.935	1.957	0.220	12.63%
Polk <sup>1</sup>	7.577	8.411	9.176	9.932	10.693	11.512	3.934	51.92%
Sarasota	3.682	3.682	4.019	4.356	4.652	4.947	1.265	34.34%
Sumter	0.858	0.909	1.080	1.269	1.457	1.663	0.805	93.91%
<b>District Total</b>	<b>36.754</b>	<b>37.473</b>	<b>41.574</b>	<b>45.622</b>	<b>49.568</b>	<b>53.601</b>	<b>16.848</b>	<b>45.84%</b>

<sup>1</sup>Lake and Polk County estimates and projections derived from Draft CFWI RWSP, Volume 2 (May 2015)

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

County	2010	2015	2020	2025	2030	2035	Change	% Change
							2010-2035	2010-2035
Charlotte	1.642	1.597	1.777	1.958	2.138	2.274	0.632	38.47%
Citrus	5.680	5.680	6.374	7.068	7.761	8.455	2.775	48.84%
DeSoto	0.220	0.220	0.220	0.220	0.220	0.220	0.000	0.00%
Hardee	0.111	0.111	0.111	0.111	0.111	0.111	0.000	0.00%
Hernando	5.000	4.732	5.402	6.072	6.742	7.412	2.412	48.25%
Highlands	2.601	2.601	2.869	3.137	3.405	3.762	1.161	44.65%
Hillsborough	4.817	4.817	5.380	5.943	6.450	6.957	2.140	44.43%
Lake <sup>1</sup>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00%
Levy	0.313	0.313	0.313	0.313	0.313	0.313	0.000	0.00%
Manatee	3.050	3.148	3.543	3.888	4.233	4.578	1.528	50.10%
Marion	3.680	3.680	4.147	4.613	5.080	5.547	1.867	50.72%
Pasco	2.655	2.655	2.979	3.304	3.628	3.952	1.297	48.84%
Pinellas	2.259	2.259	2.373	2.459	2.516	2.544	0.285	12.63%
Polk <sup>1</sup>	NA	NA	NA	NA	NA	14.965	NA	NA
Sarasota	4.787	4.787	5.225	5.663	6.047	6.431	1.644	34.34%
Sumter	1.115	1.182	1.404	1.649	1.895	2.162	1.047	93.91%
<b>District Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>69.682</b>	<b>NA</b>	<b>NA</b>

<sup>1</sup>Lake and Polk County estimates and projections derived from Draft CFWI RWSP, Volume 2 (May 2015)

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

County	2010	2015	2020	2025	2030	2035	Change	% Change
							2010-2035	2010-2035
Charlotte	0.709	0.750	0.803	0.859	0.917	0.975	0.266	37.48%
Citrus	0.185	0.188	0.203	0.219	0.235	0.252	0.066	35.68%
DeSoto	0.347	0.348	0.361	0.375	0.389	0.402	0.055	15.97%
Hardee	0.019	0.020	0.021	0.022	0.023	0.024	0.004	21.44%
Hernando	1.257	1.310	1.428	1.555	1.689	1.827	0.570	45.36%
Highlands	0.400	0.408	0.444	0.483	0.523	0.565	0.166	41.53%
Hillsborough	5.415	5.850	6.348	6.882	7.444	8.019	2.603	48.07%
Lake <sup>1</sup>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00%
Levy	0.036	0.036	0.038	0.040	0.042	0.044	0.008	23.50%
Manatee	10.139	11.073	12.043	13.090	14.204	15.356	5.217	51.45%
Marion	0.696	0.729	0.787	0.849	0.915	0.981	0.285	40.98%
Pasco	1.665	1.759	1.923	2.099	2.286	2.480	0.815	48.98%
Pinellas	1.378	1.410	1.449	1.486	1.522	1.552	0.174	12.63%
Polk <sup>1</sup>	8.063	8.949	9.764	10.568	11.377	12.248	4.186	51.92%
Sarasota	3.365	3.531	3.738	3.954	4.176	4.394	1.029	30.59%
Sumter	0.612	0.732	0.836	0.953	1.086	1.231	0.619	101.12%
<b>District Total</b>	<b>34.286</b>	<b>37.094</b>	<b>40.185</b>	<b>43.434</b>	<b>46.829</b>	<b>50.351</b>	<b>16.065</b>	<b>46.86%</b>

<sup>1</sup>Lake and Polk County estimates and projections derived from Draft CFWI RWSP, Volume 2 (May 2015)

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

County	2010	2015	2020	2025	2030	2035	Change	% Change
							2010-2035	2010-2035
Charlotte	0.894	0.945	1.011	1.082	1.155	1.229	0.335	37.48%
Citrus	0.234	0.237	0.256	0.275	0.296	0.317	0.083	35.68%
DeSoto	0.437	0.438	0.455	0.473	0.491	0.507	0.070	15.97%
Hardee	0.024	0.025	0.026	0.027	0.029	0.030	0.005	21.44%
Hernando	1.584	1.651	1.800	1.959	2.129	2.303	0.718	45.36%
Highlands	0.503	0.514	0.559	0.608	0.660	0.712	0.209	41.53%
Hillsborough	6.823	7.370	7.999	8.671	9.380	10.103	3.280	48.07%
Lake <sup>1</sup>	NA	NA	NA	NA	NA	0.000	NA	NA
Levy	0.045	0.045	0.048	0.050	0.053	0.056	0.011	23.50%
Manatee	12.776	13.952	15.174	16.493	17.897	19.349	6.573	51.45%
Marion	0.877	0.919	0.992	1.070	1.153	1.236	0.359	40.98%
Pasco	2.097	2.217	2.423	2.645	2.881	3.125	1.027	48.98%
Pinellas	1.736	1.777	1.825	1.873	1.918	1.955	0.219	12.63%
Polk <sup>1</sup>	NA	NA	NA	NA	NA	15.355	NA	NA
Sarasota	4.240	4.449	4.710	4.982	5.262	5.537	1.297	30.59%
Sumter	0.771	0.922	1.053	1.201	1.368	1.551	0.780	101.12%
<b>District Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>63.364</b>	<b>NA</b>	<b>NA</b>

<sup>1</sup>Lake and Polk County estimates and projections derived from Draft CFWI RWSP, Volume 2 (May 2015)



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

County	2010	2015	2020	2025	2030	2035	Change	% Change
							2010-2035	2010-2035
Charlotte	1.973	1.978	2.170	2.365	2.562	2.724	0.752	38.11%
Citrus	4.555	4.558	5.106	5.655	6.205	6.755	2.200	48.31%
DeSoto	0.516	0.517	0.531	0.545	0.558	0.571	0.055	10.73%
Hardee	0.105	0.105	0.106	0.107	0.108	0.109	0.004	3.97%
Hernando	5.103	4.950	5.584	6.226	6.875	7.529	2.426	47.54%
Highlands	2.400	2.409	2.651	2.896	3.143	3.459	1.059	44.13%
Hillsborough	9.120	9.555	10.487	11.453	12.406	13.370	4.249	46.59%
Lake <sup>1</sup>	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00%
Levy	0.277	0.277	0.279	0.281	0.283	0.285	0.008	3.05%
Manatee	12.485	13.495	14.768	16.080	17.460	18.878	6.392	51.20%
Marion	3.527	3.560	3.977	4.398	4.822	5.247	1.721	48.80%
Pasco	3.707	3.802	4.215	4.640	5.077	5.520	1.813	48.90%
Pinellas	3.116	3.148	3.274	3.378	3.457	3.509	0.394	12.63%
Polk <sup>1</sup>	15.640	17.360	18.940	20.500	22.070	23.760	8.120	51.92%
Sarasota	7.047	7.213	7.757	8.311	8.828	9.341	2.294	32.55%
Sumter	1.470	1.641	1.916	2.222	2.543	2.894	1.424	96.91%
<b>District Total</b>	<b>71.040</b>	<b>74.567</b>	<b>81.759</b>	<b>89.056</b>	<b>96.398</b>	<b>103.952</b>	<b>32.913</b>	<b>46.33%</b>

<sup>1</sup>Lake and Polk County estimates and projections derived from Draft CFWI RWSP, Volume 2 (May 2015)

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

County	2010	2015	2020	2025	2030	2035	Change	% Change
							2010-2035	2010-2035
Charlotte	2.536	2.542	2.789	3.040	3.294	3.503	0.967	38.12%
Citrus	5.914	5.917	6.629	7.343	8.057	8.772	2.858	48.32%
DeSoto	0.657	0.658	0.675	0.693	0.710	0.727	0.070	10.62%
Hardee	0.135	0.136	0.137	0.138	0.139	0.140	0.005	3.87%
Hernando	6.584	6.383	7.201	8.031	8.870	9.715	3.131	47.55%
Highlands	3.104	3.115	3.428	3.745	4.064	4.475	1.370	44.14%
Hillsborough	11.640	12.187	13.379	14.614	15.830	17.060	5.420	46.56%
Lake <sup>1</sup>	NA	NA	NA	NA	NA	0.000	NA	NA
Levy	0.358	0.358	0.361	0.364	0.366	0.369	0.011	2.96%
Manatee	15.825	17.100	18.717	20.381	22.130	23.927	8.101	51.19%
Marion	4.557	4.599	5.139	5.684	6.232	6.782	2.226	48.85%
Pasco	4.753	4.872	5.402	5.948	6.509	7.077	2.324	48.90%
Pinellas	3.995	4.036	4.198	4.332	4.434	4.500	0.505	12.63%
Polk <sup>1</sup>	NA	NA	NA	NA	NA	30.320	NA	NA
Sarasota	9.026	9.236	9.935	10.646	11.309	11.967	2.941	32.58%
Sumter	1.886	2.104	2.457	2.851	3.262	3.713	1.827	96.86%
<b>District Total</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>133.046</b>	<b>NA</b>	<b>NA</b>

<sup>1</sup>Lake and Polk County estimates and projections derived from Draft CFWI RWSP, Volume 2 (May 2015)

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

County	2010		2015		2020		2025		2030		2035		Change 2010-2035		% Change 2010-2035	
	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	0.105	0.135	0.105	0.136	0.106	0.137	0.107	0.138	0.108	0.139	0.109	0.140	0.004	0.005	3.97%	3.87%
Highlands	2.400	3.104	2.409	3.115	2.651	3.428	2.896	3.745	3.143	4.064	3.459	4.475	1.059	1.370	44.13%	44.14%
Polk <sup>1</sup>	15.640	NA	17.360	NA	18.940	NA	20.500	NA	22.070	NA	23.760	30.320	8.120	NA	51.92%	NA
<b>Total</b>	<b>18.145</b>	<b>NA</b>	<b>19.874</b>	<b>NA</b>	<b>21.697</b>	<b>NA</b>	<b>23.502</b>	<b>NA</b>	<b>25.320</b>	<b>NA</b>	<b>27.328</b>	<b>34.935</b>	<b>9.183</b>	<b>NA</b>	<b>50.61%</b>	<b>NA</b>

<sup>1</sup>Lake and Polk County estimates and projections derived from Draft CFWI RWSP, Volume 2 (May 2015)

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

County	2010		2015		2020		2025		2030		2035		Change 2010-2035		% Change 2010-2035	
	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
Citrus	4.555	5.914	4.558	5.917	5.106	6.629	5.655	7.343	6.205	8.057	6.755	8.772	2.200	2.858	48.31%	48.32%
Hernando	5.103	6.584	4.950	6.383	5.584	7.201	6.226	8.031	6.875	8.870	7.529	9.715	2.426	3.131	47.54%	47.55%
Lake <sup>1</sup>	0.000	NA	0.000	NA	0.000	NA	0.000	NA	0.000	NA	0.000	0.000	0.000	0.000	0.00%	NA
Levy	0.277	0.358	0.277	0.358	0.279	0.361	0.281	0.364	0.283	0.366	0.285	0.369	0.008	0.011	3.05%	2.96%
Marion	3.527	4.557	3.560	4.599	3.977	5.139	4.398	5.684	4.822	6.232	5.247	6.782	1.721	2.226	48.80%	48.85%
Sumter	1.470	1.886	1.641	2.104	1.916	2.457	2.222	2.851	2.543	3.262	2.894	3.713	1.424	1.827	96.91%	96.86%
<b>Total</b>	<b>14.931</b>	<b>NA</b>	<b>14.985</b>	<b>NA</b>	<b>16.861</b>	<b>NA</b>	<b>18.782</b>	<b>NA</b>	<b>20.729</b>	<b>NA</b>	<b>22.711</b>	<b>29.351</b>	<b>7.780</b>	<b>NA</b>	<b>52.11%</b>	<b>NA</b>

<sup>1</sup>Lake and Polk County estimates and projections derived from Draft CFWI RWSP, Volume 2 (May 2015)

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

County	2010		2015		2020		2025		2030		2035		Change 2010-2035		% Change 2010-2035	
	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
Charlotte	1.973	2.536	1.978	2.542	2.170	2.789	2.365	3.040	2.562	3.294	2.724	3.503	0.752	0.967	38.11%	38.12%
Desoto	0.516	0.657	0.517	0.658	0.531	0.675	0.545	0.693	0.558	0.710	0.571	0.727	0.055	0.070	10.73%	10.62%
Manatee	12.485	15.825	13.495	17.100	14.768	18.717	16.080	20.381	17.460	22.130	18.878	23.927	6.392	8.101	51.20%	51.19%
Sarasota	7.047	9.026	7.213	9.236	7.757	9.935	8.311	10.646	8.828	11.309	9.341	11.967	2.294	2.941	32.55%	32.58%
<b>Total</b>	<b>22.021</b>	<b>28.045</b>	<b>23.203</b>	<b>29.536</b>	<b>25.226</b>	<b>32.116</b>	<b>27.300</b>	<b>34.759</b>	<b>29.408</b>	<b>37.443</b>	<b>31.514</b>	<b>40.123</b>	<b>9.493</b>	<b>12.079</b>	<b>43.11%</b>	<b>43.07%</b>

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

County	2010		2015		2020		2025		2030		2035		Change 2010-2035		% Change 2010-2035	
	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
Hillsborough	9.120	11.640	9.555	12.187	10.487	13.379	11.453	14.614	12.406	15.830	13.370	17.060	4.249	5.420	46.59%	46.56%
Pasco	3.707	4.753	3.802	4.872	4.215	5.402	4.640	5.948	5.077	6.509	5.520	7.077	1.813	2.324	48.90%	48.90%
Pinellas	3.116	3.995	3.148	4.036	3.274	4.198	3.378	4.332	3.457	4.434	3.509	4.500	0.394	0.505	12.63%	12.63%
<b>Total</b>	<b>15.943</b>	<b>20.388</b>	<b>16.504</b>	<b>21.095</b>	<b>17.976</b>	<b>22.979</b>	<b>19.472</b>	<b>24.894</b>	<b>20.940</b>	<b>26.772</b>	<b>22.399</b>	<b>28.637</b>	<b>6.456</b>	<b>8.249</b>	<b>40.49%</b>	<b>40.46%</b>

**APPENDIX B**  
**Golf Demand Technical Report**  
**Pellucid Corp.**  
**June 30, 2015**



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BUFFALO GROVE, IL 60089**

June 30, 2015

TO: Mr. Jay Yingling  
Senior Economist  
Water Supply Section  
Southwest Florida Water Management District  
2379 Broad Street  
Brooksville, FL 34604-6899

### **Final Report**

In May, 2015, the Southwest Florida Water Management District (SWFWMD) engaged Pellucid to assist in estimating the future demand for golf courses in the 16 Counties that comprise the SWFWMD jurisdictional area. Included in the scope of the project is an estimate of new golf course construction to meet demand for golf that is anticipated to rise due to population growth projected for the area through 2035. Due to the very small portion of Lake County included in the SWFWMD, we did not include that data in our analysis but the number of 18-hole equivalents in the portion of Lake County in the SWFWMD is likely to remain zero.

For the project, The SWFWMD provided demographic and economic projections<sup>1</sup> outlining the population growth projected for the 16 Counties by age and race and projected numbers of households by household income, along with other data regarding current golf facilities with water permits and other pertinent information. The projected demographic data includes income, age and race. Golf play rates are known to vary by demographic factors such as age and race and economic factors such as household income. Pellucid has used its own proprietary calculations regarding golf participation and rounds demand to analyze the data provided by SWFWMD.

### **Resources**

Pellucid uses a wide variety of source material to assemble its calculations of golf participation and golf facility usage. Not all of the data listed below were used in the projection of changes in 18-hole equivalents but were useful for the purposes of establishing the reasonability of data used and the projection results.

**National Sporting Goods Association (NSGA)** – The NSGA conducts an annual survey to assess recreational activity in the US. They publish an annual report – **Sports**

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<sup>1</sup> Abstracted from Woods and Poole Economics 2015 State Profile: Florida.



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**Participation in the United States** – which Pellucid has licensed since 2005. In addition, the NSGA has provided survey results dating back to 1985 using a consistent set of queries and survey results. This data details state by state golf participation by Age, Income, Ethnicity and Frequency and was provided in the Master Spreadsheet provided to the District. This data, in conjunction with the demographic data, was used to project demand for additional golf holes at the county level.

**Golf Datatech (GDT)** – GDT provides “rounds played” data on a regional basis derived from over 3,000 individual courses reporting monthly rounds activity. The GDT reports also contain specific metropolitan area data including Sarasota and Tampa in the SWFWMD jurisdictional area. The GDT data is used as a component of the proprietary Pellucid “Supply/Demand” report provided for each county in this report.

**Alteryx** – Alteryx provides the demographic and GIS data that Pellucid uses for the base of its proprietary “Golf Local Market Analyzer” (GLMA). “Alteryx is the leader in data blending and advanced analytics software. *Alteryx Analytics* provides analysts with an intuitive workflow for data blending and advanced analytics that leads to deeper insights in hours, not the weeks typical of traditional approaches. More than 700 customers, including Experian, Kaiser, Ford, and McDonald’s, and 200,000+ users worldwide rely on Alteryx daily.” Source – [www.alteryx.com](http://www.alteryx.com). Alteryx demographic and economic data were compared to the data provided by the District for reasonability.

**National Golf Foundation (NGF)** – Pellucid licenses the NGF directory of golf courses which is updated twice annually. This directory is geo-coded and used in Pellucid’s GLMA analytics platform and also includes data regarding “year built”, pricing and degree of difficulty (USGA ratings). This data was used to establish a baseline of courses and holes. Relevant data were provided to the District in individual county “Golf Course List” spreadsheets to support the data used in the Master Spreadsheet demand calculations.

**WeatherBank** – Pellucid has worked with WeatherBank since 2005 using archived hourly weather data from the past 30 years. Every golf course in the US has been geo-coded and matched to its closest official US Weather Reporting Station. Using a proprietary formula based on daylight, precipitation, temperature and a range of other variables; Pellucid has created a “Weather Adjusted Capacity” for every golf course in the US based on “Golf Playable Hours” (GPH).

**Other Sources** – Pellucid also uses data from the PGA of America’s “Performance Track” course reporting service. We also have individual client contact with golf courses across the US and use that data to enhance our GLMA platform where applicable.



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## **Glossary of Terminology**

Pellucid was requested at the beginning of the project to define the terms of art likely to be used. The following terms are used in the report and spreadsheet or were discussed in the development of the analysis.

**Participation** – Percentage of the total population that played golf at least once in the prior year (e.g., number of golfers).

**Frequency** – The average number of annual rounds played by each golfer.

**Play Rate** – The number of rounds played per capita from the general population (not just golfers).

**Private Course** – A golf course not available to the public

**Public Price Course** – The lowest price group of public access facilities based on the range of values for highest 18-hole weekend greens fee

**Public Value Course** – The middle price group of public access facilities based on the range of values for highest 18-hole weekend greens fee

**Public Premium Course** – The highest price group of public access facilities based on the range of values for highest 18-hole weekend greens fee

**Learning and Practice** – A shorter than “championship” course generally an 18 hole facility less than 6,000 yards or 9 hole facility less than 3,000 yards

**Weather Adjusted Capacity (WAC)** – The theoretical capacity of a golf course based on variation of daylight hours, season length and other factors related to weather conditions. The best example of this application is the concept that 2 golf courses across the street both share the same theoretical capacity.

**Course Utilization % (CU%)** - The relationship between actual rounds played vs. the WAC determined above.

**Supply Dilution** – The number and % increase of new holes added to market supply over time

**Consumer Reported Rounds Demand** – Pellucid uses the NSGA survey data to create state by state Participation and Frequency rates. This data is then loaded into the Alteryx Analytics platform. This allows a specific location to be analyzed based on variations in the demographic profile of the specific location. Basically, this provides a better analysis of a local area compared to the base statewide data. It should be noted that the NSGA data tracks prior year’s consumer behavior so the latest 2014 Report used in this study summarizes golfer behavior from 2013.

**Facility Reported Demand** – Based on golf industry data obtained from a variety of sources including the National Golf Foundation, Golf Datatech, PGA Performance Trak, proprietary Pellucid data gathering and other outside reporting sources. These results are generally round counts supplied by golf courses based on actual rounds played results.



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In effect, we have two sources of Rounds Demand estimates. The NSGA data is based on consumer survey behavior related to the demographic composition of the “Resident” population along with the Participation and Frequency rates determined by the NSGA survey results. The “Facility Reported” data from Golf Datatech, PGA Performance Track and other sources includes Rounds played by all golfers including “Non- Resident” and tourists. On a national basis, the relationship between the survey-based NSGA demand estimates and the “Facility Reported rounds is that the consumer survey rounds are about 10% higher than the “Facility Reported” rounds.

In this study, 14 of 15 counties had higher “Facility Reported” rounds indicating a significant amount of “Non-Resident” and/or tourist demand. The notable exception was Hillsborough County which is more densely populated. This is fairly typical of large population centers such as New York and Los Angeles where golf course development is impractical due to land availability and cost. As we will outline later, we project that “Non-Resident” and tourist pressure will be a “neutral” factor and will grow in parallel with overall golf demand through 2035.

### **Methodology**

The first step taken was to establish the appropriate relationships between the Woods & Poole data provided by SWFWMD and the information configuration of both the NSGA survey data and the Alteryx Analytics platform contained in the Pellucid GLMA platform. To accomplish this, we took the ranges in the GLMA and tabulated the corresponding ranges from the Woods & Poole data.



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**Table 1. Cross Reference of GLMA and Woods and Poole County Level Demographic/Economic Data**

<b>Age</b>	<b>Woods and Poole Source Lines</b>
0 – 34	5 – 11
35 – 54	12 – 15
55 +	16 – 22
<b>Income</b>	
\$ 0 - \$34,999	101 – 103
\$ 35K - \$74,999	104 – 106
\$ 75,000 +	107 – 111
<b>Ethnicity</b>	
White	24
Hispanic	28
Black	25
Asian	27
Other	26

We did this for all 15 counties. During that process, we also checked the population data from the Woods & Poole data and compared it to the demographic detail contained in the Alteryx Analytics platform. We did not find any meaningful variations between the two data sets. Since Woods & Poole and Alteryx are both making projections based on the 2010 US Census, there are some variations due to timing, but both companies are widely respected and the variations can be considered minor.

The next step was to create consumer rounds demand estimates based on the demographic composition of each county. Individual county reports from the Pellucid GLMA platform were generated and have been provided to SWFWMD as supporting documentation. The base Participation and Frequency Report uses the state of Florida Participation Rate and Annual Frequency (Rounds Played) for each county. This report also introduces a measure called “Play Rate”, which is a measure of rounds played per capita.

To further refine the estimates for consumer reported demand, Pellucid uses three key variables – Age, Income and Ethnicity. Because a selected geography (county) does not have exactly the same demographic mix as the state; adjusting for these three variables gives a much more accurate estimate of local golf demand. Using the NSGA data, Pellucid establishes the statewide “Play Rate” for each demographic variable. For example, the Play Rate for 0 – 34 Year Old golfers in Florida was 0.8 rounds per capita in 2010 and estimated at 1.0 rounds for 2015. It should be noted that the Income variable is based on Household data – both the number and household income statistics shown in the





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Woods & Poole, NSGA and Pellucid GLMA data. Applying the respective “Play Rate” to each demographic variable effectively creates three distinct rounds demand estimates for each county. This exercise created a blended overall play rate for each county in each five year time step by averaging the rounds estimated for each demographic variable.

Age, Income and Ethnicity reports from the Pellucid GLMA platform were generated for each county. Again, these reports have been provided to SWFWMD.

We also generated “Supply/Demand” reports for each county. These reports show how many golf facilities are in each county and how many “holes” these facilities have. These reports break down Supply by type – Private, Public Premium, Public Value, Public Price and Learning and Practice. The Supply/Demand reports also provide “Facility Reported Rounds” estimates based on course reported usage obtained from the NGF, Golf Datatech and PGA Performance Track data. Using these values, we created a “rounds per hole” factor to create a number for Facility Reported Rounds for each county.

All of this data was then incorporated into a “Master Workbook”. There is a tab for each county along with Summary tabs for Age, Income and Ethnicity. A fourth Summary tab includes our estimate of additional golf course demand through 2035 in units of eighteen-hole equivalents (EHE).

### **Initial Data Analysis**

Our initial data review took place prior to a conference call held on May 29, 2015. In order to conduct our initial review, we organized the Woods and Poole demographic<sup>2</sup> information into ranges compatible with the Pellucid ranges used for determining golf participation. This allows us to apply Age, Income and Ethnicity participation variation and track demographic changes over time.

We then evaluated each county using those three projected demographic variables for the period of 2010 – 2035. We have documented the basic changes in “Play Rate” that occurred in Florida between 2010 and 2015 which reflect the general aging of the golfer base and the influx of people 55+ into Florida over that period.

We then used the 2015 “Play Rate” on a consistent basis and applied that rate to the population data for 2020 – 2035. Here are the highlights of projected increases for the period 2010 - 2035:

- Based on Age, Golf Demand is projected to increase 68.9%
- Based on Income, Golf Demand is projected to increase 92.2%

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<sup>2</sup> For the sake of brevity, demographic data is meant to include household income data as well.



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- Based on Ethnicity, Golf Demand is projected to increase 44.8 %

The lower Ethnicity increase is likely due to the significant growth rate of the Hispanic population and that Hispanics had the next to the lowest play rates of all ethnic groups in both 2010 (0.7 rounds per capita) and 2015 (0.8 rounds per capita). Also note that each county has noticeable variations based on all three demographic criteria.

As part of our initial analysis, we also looked at golf course development in Florida for the period of 2010 – 2014. On a “net” basis, the actual supply of golf facilities and golf holes declined during that period as shown in Table 2. below.

**Table 2. Changes in Florida Golf Facilities and holes 2010 to 2014**

<b>Year</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Facilities	1,052	1,046	1,050	1,044	1,029
Holes	18,630	18,504	18,504	18,117	17,829

This -4.3% decline in the statewide supply of golf holes shown in Table 2. is in line with US data that has shown a net decline in golf holes over the same period. When we look at the specific SWFWMD jurisdictional area, we see 2 closures (9 holes at Pinemoor East in Charlotte and 18 holes at Spring Hill Golf in Hernando) and 1 opening (Streamsong 36 holes in Polk - 2012) between 2010 and 2014. Subsequent to our conference call, we found one 18 hole course (Esplanade - 2014) added at Lakewood Ranch in Manatee County. We also found that a 27 hole facility (Evans Prairie - 2012) had been added at The Villages in Sumter County. So while the number of holes statewide declined by 4.3% between 2010 and 2014, the closures and openings during the same period resulted in a net 54 hole increase in the District.

When coupled with the strong increase shown in “Frequency” and “Play Rate” indicated 2010 – 2015 provided to the District in the county tabs of the Master Spreadsheet; this indicates that the actual golf supply is basically unchanged, if not increased, in the SWFWMD jurisdictional area. **This means that the SWFWMD jurisdictional area did not have the same decline in golf holes as the State of Florida. All of this supports the premise that there will be future golf supply growth in the coming years.**

We also looked at weather data and facility reported rounds played information. On a national basis, facility reported rounds have tracked “Weather Adjusted Capacity” (WAC) since 2010. We looked at both the Tampa and Sarasota markets that are both broken out separately by Golf Datatech in their monthly rounds calculations. As outlined in Table 3. below, Sarasota directionally tracks with Weather Adjusted Capacity. Tampa



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exhibits the same usage pattern and does not show large decreases in rounds that are not associated with weather.

Table 3. The Relationship Between Rounds Played and Weather Adjusted Course Capacity in the Sarasota Market, 2010-2014

	Rounds % Change	WAC % Change
2010	- 8.1%	- 6.0%
2011	+ 10.3%	+ 4.0%
2012	+ 0.1%	+ 3.0%
2013	- 1.2%	- 2.0%
2014	- 0.7%	- 3.6%

Again, the fact that golf rounds played is becoming more weather dependent in the US and currently the SWFWMD markets are exhibiting the same usage pattern needs to be addressed in our findings. However, since the SWFWMD has indicated the their report will be based on “5 in 10” weather factors and the use of Pellucid’s “10 Year Normal WAC calculations will neutralize the annual variations shown above; **it is our opinion that weather will not be a major determining factor in future golf course development in the SWFWMD.**

The other major issue to be determined is anticipated “tourist demand”. This is a very difficult calculation to make involving a comparison of both “consumer based survey demand” components we use for Participation, Frequency and Play Rate and the Facility Reported Rounds data we gather from a variety of industry sources and our own research. This comparison also has a range of results by definition in terms of demographics driven rounds changes between 2010 and 2035– the Facility Reported rounds must be compared with the Age, Income and Ethnicity criteria and create essentially the same range indicated earlier (Age –65.5%, Income = 92.2% and Ethnicity = 44.8%).

On the other hand, absent any concrete tourist data that indicates an abnormal increase or decrease in Florida tourism or seasonality, the current mix of resident and non-resident rounds played is already reflected in the Facility Reported Rounds. This would mean that “tourist and seasonal resident demand” will also be relatively neutral factors in future golf course development. **We discussed this in our May 29<sup>th</sup> conference call as well.**

We attached our “Master Workbook” which contained the detail for each county in advance of our conference call. Also, there were Summary tabs for Age, Income and Ethnicity in the workbook for SWFWMD review. Also attached were individual base reports for each county with the base data used to create the workbook. Reports for



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Sarasota weather were also attached (for review of consistency of changes in rounds with changes in weather).

**Additional Analysis**

During our May 29<sup>th</sup> conference call; we reviewed our initial results and discussed how to summarize the data. The major fundamental decision was to express the future course estimates in “18 hole equivalents” (EHE). In part, this was due to the facility reported rounds data being expressed in “Rounds per EHE” and Jim Koppenhaver’s point that virtually all new golf construction is 18 holes or more for new facilities. We also raised the point that the great majority of new courses are being constructed with a higher degree of difficulty (USGA Slope Rating).

**Table 4. Increase in Courses Developed With Higher USGA Slope Ratings**

	# of Courses			% of Courses			Med. WE GF	
	Pre-1990	Post-1990		Pre-1990	Post-1990		Pre-1990	Post-1990
<b>Slope &lt;125</b>			<b>Slope &lt;125</b>			<b>Slope &lt;125</b>		
- Public	4,874	1,213	- Public	52%	33%	- Public	33	34
- Private	1,172	82	- Private	12%	2%	- Private	45	47
<b>Slope &gt;125</b>			<b>Slope &gt;125</b>			<b>Slope &gt;125</b>		
- Public	1,592	1,761	- Public	17%	48%	- Public	49	64
- Private	1,818	651	- Private	19%	18%	- Private	79	95

Source: Pellucid State of the Industry (2009). Note: “WE GF” equals weekend golf fees.

Based on the data in the “% of Courses” column in Table 4 above, 64% of the courses built prior to 1990 had Slope Ratings below 125 (52% + 12%). Since 1990 this has reversed to where 66% of all new courses built had more difficult Slope Ratings above 125. This will mean that the new courses will most likely be longer and require more irrigated acreage going forward. We will make some recommendations on this issue later in the report.

As we pointed out in Table 2. above, the overall supply of golf holes in the entire state of Florida has declined by -4.3% since 2010. Since the SWFWMD did not see the same decline, and had an increase in holes, this would support the findings that courses in the area were at a sustainable equilibrium and that the demographic mix and growth trends in the jurisdictional area will likely create the pressure for additional golf supply to be built.

One of the other issues raised by SWFWMD was how golf participation in Florida compared to national trends. The Staff indicated that their anecdotal information from current golf course operators indicated a situation of “over-supply” and declining rounds demand. The chart below summarizes the drop in golf participation in the US 1990 – 2013.



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In Table 5, it can be seen that the golf Participation Rate for Florida remained relatively static in comparison to national Participation Rate. While the national rate declined from 9.3% to 7.8% (-1.5), Florida’s rate declined from 8.4% to 8.1% (-.3)<sup>3</sup>. This may help to explain why the golf industry in Florida and the District may not be as affected by the decline in participation nationwide.

**Table 5. National Golf Participation Rate 2010- 2013 (Total Population)**



Source: NSGA and Pellucid, 2015 State of the Industry Report

While Participation is falling nationally, the number of annual rounds being played (Frequency) is increasing. As is shown in Table 6, below, Frequency has actually gone up from 16.5 to 20 rounds per year at the national level since 2003. The “Real World” Participation and Demand data are in millions (Ms). Furthermore, in Florida, the Frequency increase is even more pronounced. Frequency jumped from 24 rounds in 2010 to 30 rounds in 2013. In combination, Participation and Frequency rates help to explain why the industry in Florida remains strong relative to the industry nationwide.

<sup>3</sup> There are very slight differences in the participation rates displayed in Table 5, and those used in the Master Spreadsheet calculations, although the trends are the same. The rates in Table 5 are for the entire population and those in the spreadsheet are for the population aged 7+.



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**Table 6. Example of Net Result of Declining Participation and Increasing Rounds/Year Nationwide**

	<b>Illustrative Example</b>			<b>Real World</b>			
	Base Yr	Curr Yr		2003	2013	% Chng	
	Rds	Rds	% Chng				
Golfer 1	1						
Golfer 2	2	2					
Golfer 3	5	5					
Golfer 4	10						
Golfer 5	20	20					
Golfer 6	25	25					
Golfer 7	30	30					
Golfer 8	30	30					
Golfer 9	40	40					
Golfer 10	50	50					
<b>Golfers</b>	10	8	-25%	<b>Participants (Ms)</b>	29.5	22.9	-29%
<b>Rounds</b>	222	210	-6%	<b>Demand (Ms)</b>	485.4	457.7	-6%
<b>Avg. Freq.</b>	20.3	23.3	13%	<b>Frequency (Rds/Yr)</b>	16.5	20.0	18%

As we analyzed the data, several key points stand out:

- Florida Participation has not suffered the same decline as the US.
- Golf Supply (holes) has declined -4.3% in Florida, which is similar to the US; but Golf Supply in the SWFWMD counties has generally stayed static or increased with an overall increase of 54 holes between 2010 and 2014.
- Golf Frequency has increased in Florida by a greater amount (25% since 2010) compared to a national increase of 21.2% since 2003.

In the final analysis, the data suggests that the Florida golf demographics are basically stronger than those of the entire US. This is also true for the demographics of the SWFWMD jurisdictional area.

Once we were convinced that the underlying demographics are stronger; we turned our attention to quantifying the amount of golf course development that may take place. As a result of our conference call, we agreed to create a demographically driven average number of rounds using the consumer based survey rounds demand.

We did this for each county using the NSGA rounds estimates for Income, Age and Ethnicity and assigning equal weight to each estimate. We took the 2015 average rounds in each county (cell G28 in county tab in spreadsheet) and divided it by the number of Eighteen Hole Equivalents (EHE) to give us an average demand per EHE in each county



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(G30). These numbers vary by county to reflect the different demographic profile for each one.

Essentially, as consumer demand increases by the value of the average demand per EHE; the new demand will trigger the addition of a new EHE. The new value for EHEs is shown for 2020 (J29), 2025 (M29), 2030 (P29) and 2035 (S29) in each county tab.

We created a Course Build Summary Tab in the workbook for these estimates by county. The fractional values in the individual county tabs were rounded to the nearest .5 EHE to reflect the point that virtually all new golf projects are eighteen holes or more, as we showed earlier. Some still, however, are 9-hole courses.

When we applied the county by county values using the averaged demographics, this created an estimate of 38.57% more courses (eighteen-hole equivalents) being added 2010 – 2035.

The last step we took was to address the fact that 5 counties are only partially served by SWFWMD. In the case of Charlotte 99.61%<sup>4</sup> of the population is in the SWFWMD, the difference is insignificant and it was decided to include all course growth in the county in the SWFWMD. We also suggested that course growth in Highlands (90.44%)<sup>3</sup> and Polk (93.04%)<sup>3</sup> be included in SWFWMD based on total population. There is really no way to anticipate where the courses would be added and the 90%+ probability that they would be within the SWFWMD jurisdictional area justifies that inclusion.

Levy and Marion counties are another issue. According to our estimates, there are 468 total holes of supply in Marion County (as of December 2014?). The SWFWMD data shows that there are 234 golf holes in the SWFWMD jurisdictional area. Our data shows 36 holes in Levy County with 18 holes included in the SWFWMD jurisdictional area. We adjusted Marion in the County and Summary Build tab to 234 holes. We did not adjust Levy due to the increase of only 9 holes 2010 – 2035. The net result of adjusting Marion took the total build percentage from 38.89% to 38.57%.

### **Additional Guidance**

We outlined earlier that current golf course development trends should be considered in the SWFWMD water usage projections. As we noted, the courses being built today tend to be more difficult (USGA Slope Ratings above 125). Mostly, this involves adding length which necessarily means additional acreage – increasing yardage from 6,400 yards to 7,400 yards will typically add 15% to the acreage.

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<sup>4</sup> SWFWMD. 2013 Population Estimate and 2015-2035 Projections. July 2014.





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Also of note is the “Tee it Forward” program being promoted by various golf organizations. While older courses typically would have 2 or 3 sets of tees, most new courses will have 4 or 5 sets. This only adds a net of 1 acre of turf (per course), but tees are generally watered with a similar rate to greens; so to the extent that SWFWMD takes turf type into account, allowances for this trend in tee space should be considered.

Our considered opinion is to advise SWFWMD to base the water use estimates for future golf course development on the trends we see in current golf course design. In short, we would suggest using the water use data from more “modern” courses of 7,000 yards+ to estimate use by the future facilities.

### **Conclusion**

Based on the demographic trends for 2010 – 2035 in the SWFWMD jurisdictional area, the demand for golf should increase. This report details the extent of that increase and the reasons for that increase. It is our opinion that the demographic profile of the population will continue to support golf participation in the area in spite of the drop in national participation.

Taken separately, Age and Income levels provide the most support for that growth. Even though Ethnicity will provide less support, rounds demand will continue to increase in spite of high growth in the Hispanic portion of the population.

In looking at each county separately, we were able to identify where the growth in demand will occur on a more localized level. Further, by determining current course utilization levels for each county; we were able to more closely define the local demand characteristics and establish local demand “triggers” to estimate when and where new courses are most likely to be built.

We are comfortable with using the base 2015 Participation percentage for Florida; which has remained relatively static from 2010 – 2015. We project that the future demographic growth in Florida and the SWFWMD jurisdictional area will support Participation staying stable in the coming years. While it is possible that Age dispersion may provide additional increases in Frequency, we are also comfortable using the 2015 Frequency through 2035. Ethnicity dispersion indicates that demand may show a smaller increase; although even that impact will still show an increase in demand.

According to our estimates, the SWFWMD would be realistically justified in projecting potential growth in golf course of up to 38.77% from 2010 to 2035. The table below summarizes the 2010 estimated and projected change in 18 hole equivalents in the





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SWFWMD between 2010 and 2035. Additionally, we have suggested that SWFWMD Staff develop water usage estimates based on current golf course design and specification trends.

**Estimated 2010 and Projected Changes in 18-Hole Golf Course Equivalent**

County	2010	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035
Charlotte	20.0	-0.5	2.0	2.0	2.0	1.5
Citrus	18.0	0.0	2.0	2.0	2.0	2.0
Desoto	3.0	0.0	0.0	0.0	0.0	0.0
Hardee	1.5	0.0	0.0	0.0	0.0	0.0
Hernando	20.5	-1.0	2.5	2.5	2.5	2.5
Highlands	16.0	0.0	1.5	1.5	1.5	2.0
Hillsborough	47.0	0.0	5.0	5.0	4.5	4.5
Lake	0.0	0.0	0.0	0.0	0.0	0.0
Levy	2.0	0.0	0.0	0.0	0.0	0.0
Manatee	34.0	1.0	4.0	3.5	3.5	3.5
Marion	13.0	0.0	1.5	1.5	1.5	1.5
Pasco	31.5	0.0	3.5	3.5	3.5	3.5
Pinellas	43.5	0.0	2.0	1.5	1.0	0.5
Polk	44.0	2.0	3.5	3.0	3.0	2.5
Sarasota	48.0	0.0	4.0	4.0	3.5	3.5
Sumter	27.5	1.5	5.0	5.5	5.5	6.0
<b>Total</b>	<b>369.5</b>	<b>3.0</b>	<b>36.5</b>	<b>35.5</b>	<b>34</b>	<b>33.5</b>

Note: Changes in Eighteen hole equivalents rounded to halves (9 holes)

We would like to thank Jay Yingling, Jonathan Bilby and George Schluterman for all their assistance. It has been a pleasure trying to quantify a very difficult set of estimates using a wide variety of source material.

Please feel free to contact us with any questions.

Respectfully submitted,

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