A
Demand Projections

The South Florida Water Management District (SFWMD) completes the complex process of water demand projection in coordination with staff from local governments, utilities, other agencies and stakeholder groups. This appendix provides the methods and detailed water demand projections developed for this plan update.

NOTE

Perceived discrepancies in table totals are due to rounding.

This appendix presents water demand assessments for the following six water use categories:

- Public Water Supply (PWS)
- Domestic Self-Supply (DSS)
- Agricultural (AGR) Self-Supply
- Industrial/Commercial/Institutional (ICI) Self-Supply
- Recreational/Landscape (REC) Self-Supply
- Power Generation (PWR) Self-Supply

The PWS category encompasses potable water supplied by water treatment facilities with average production rates greater than 0.1 million gallons per day (MGD). Within the Lower East Coast (LEC) Planning Area, there are 52 PWS utilities. The PWS systems, both public and private, supply potable water to all types of customers for all types of land uses. Within the PWS category, net demand refers to finished water demand and is measured by the amount of water leaving a treatment facility.

The remaining five water use categories are self-supplied. DSS includes utilities whose average flow is less than 0.1 MGD and households whose source of potable water is a single private well. AGR Self-Supply includes water demand for crop irrigation. ICI Self-Supply refers to self-supplied business operations and institutional operations such as schools and hospitals. REC Self-Supply includes irrigation demand for large landscaped areas such as community and homeowner association common grounds, ball fields, parks, cemeteries, and golf courses. The PWR Self-Supply category is water used at power plants primarily for cooling purposes.

Demand for each water use category in this update is calculated in two ways: gross and net demand. Gross water demand, also known as raw water demand, is the volume of water withdrawn from the natural system that has been allocated in a CUP. Gross demand includes the water needed for all consumptive uses as well as the water lost to treatment transmission and system inefficiencies. Net water demand, commonly referred to as finished water demand, is the volume of water needed to meet the actual consumption demand of end users.

REMAINING DATA SOURCES AND METHODS

In general, the preparation of water demand estimates and projections are highly dependent on population and land use activities information. For example, estimates of irrigated acreages are fundamental to projecting water supply demand for the AGR Self-Supply category, while information about existing and future projections of population are key to estimating reasonable PWS water demand.

In order to meet the planning goal, the water supply needs of existing and future reasonable-beneficial uses are based on meeting those needs in a 1-in-10 year drought event (Paragraph 373.709(2)(a)1, Florida Statutes [F.S.]). Water demand base year estimates for 2010 and projections through 2030 in five-year increments for average rainfall conditions and 1-in-10 year drought conditions are provided in this appendix. Data sources for each category may include the *Florida 2010 Census of Population and Housing* (U.S. Census Bureau 2010), municipal planning documents, PWS utility information, Consumptive Use Permitting files, and federal and state agency reports. Specific data set sources, analysis methods, and applications for projections are provided within this appendix by use category.

PUBLIC WATER SUPPLY AND DOMESTIC SELF-SUPPLY

The following sections describe the methodology used to estimate and project population, PWS and DSS water use categories' raw and finished water demands for Palm Beach, Broward, Miami-Dade, Monroe, and Hendry counties. Monroe County's water supply needs are met solely by PWS, while the water needs of the portion of Hendry County within the LEC Planning Area are met solely by DSS.

Population Projection Methodology

Population projections form the initial and key step in developing demand projections, especially for the PWS and DSS water use categories.

2010 Population Estimates

An important element of water supply planning is to use the best available data to estimate future populations. The projections used in this plan update are believed to represent a reasonable balance of long- and short-term factors affecting the development of the LEC Planning Area. However, there is always uncertainty in 20-year population projections as growth patterns within the area could change significantly. Factors such as global and local economic trends, housing demand, migration and immigration patterns, and cultural shifts all have an effect on populations within a county and state.

The base year for this update is 2010. The 2010 Census count of total population as reported by the United States Census Bureau is the basis for the 2010 population estimates as reported by the University of Florida's Bureau of Economic and Business Research (BEBR). The 2010 BEBR estimates for permanent resident population (BEBR 2011) are the basis for estimating 2030 populations for each county in the LEC Planning Area. **Table A-1** provides BEBR population projections for the low, medium, and high ranges for 2015–2040 for the LEC Planning Area. The 2010 population estimates for each of the LEC Planning Area counties are as follows:

- Palm Beach County: 1,340,134 residents
- Broward County: 1,748,066 residents
- Miami-Dade County: 2,496,435 residents
- Monroe County: 73,090 residents

Only a portion of Hendry County is included in the LEC Planning Area. Therefore the BEBR projections for the entire county are not applicable. The 2010 population for Hendry County relies upon the estimate in the *2005–2006 Lower East Coast Water Supply Plan Update* (2005–2006 LEC Plan; SFWMD 2006), which was 1,279 people.

Table A-1. BEBR population projections for the LEC Planning Area for 2010–2040.

	Projections					
	2015	**2020**	**2025**	**2030**	**2035**	**2040**
Palm Beach County						
Low	1,342,600	1,367,700	1,383,900	1,389,700	1,384,900	1,370,900
Medium	1,394,300	1,482,900	1,568,500	1,648,000	1,720,000	1,786,000
High	1,454,500	1,605,600	1,761,400	1,919,200	2,077,300	2,236,700
Broward County						
Low	1,736,800	1,726,300	1,710,600	1,689,000	1,661,600	1,632,900
Medium	1,788,200	1,834,500	1,877,700	1,916,200	1,949,700	1,982,500
High	1,844,200	1,946,700	2,048,900	2,149,600	2,248,100	2,349,700
Miami-Dade County						
Low	2,528,700	2,564,400	2,590,900	2,606,400	2,610,300	2,604,100
Medium	2,600,900	2,722,900	2,841,400	2,952,800	3,055,100	3,150,200
High	2,685,100	2,891,800	3,103,400	3,317,200	3,531,500	3,747,400
Monroe County						
Medium	72,200	71,200	70,200	69,300	68,500	67,700

2010 Public Water Supply Utility Service Areas

After county populations were established, maps of areas served by each PWS utility were developed using data from the SFWMD Water Use Regulatory Database, water supply facility work plans, the 2005–2006 LEC Plan Update, and maps from the counties and PWS utilities. These maps show the areas currently served by the utilities. Service area maps were then verified by the PWS utilities during follow-up meetings and correspondences with planning, operations, and geographic information system (GIS) staff. Information supplied by the PWS utilities was especially important to identify current and future areas served. In many instances, there are differences between areas actually served and franchised or legislated service areas. The focus on areas served by PWS utilities improves the accuracy of distributing county base populations into PWS and DSS populations. Maps of these service areas are provided in **Appendix F**. Expanded future service areas were addressed in the population projections.

The populations residing outside of areas served by PWS utilities were included in DSS population estimates, because United States Census data no longer include the sources of water for households including those using individual wells. For this plan update, it was assumed that all populations outside PWS service areas had self-supplied potable water.

A few utilities, most notably the Town of Jupiter and Village of Tequesta in Palm Beach County, serve a small portion of Martin County's population, which is in the Upper East Coast Planning Area. To provide the best population served estimates, these populations are included in the populations served by utilities in Palm Beach County in this plan update. In addition, some residents in far western Palm Beach County and the portion of Hendry County within the LEC Planning Area are served by Clewiston Public Utilities (formerly served by U.S. Sugar) and are included in the *2012 Lower West Coast Water Supply Plan Update* (SFWMD 2012b). Lastly, the remaining population in eastern Hendry County in the LEC Planning Area not served by the Clewiston Public Utility is self-supplied, therefore no demand for PWS will be reported for Hendry County in this plan.

Distribution of Census Block Data across 2010 PWS Utility Service Areas

The 2010 population reported by the United States Census Bureau (2010) was distributed into each PWS utility service area (**Table A-2**) by using census block data, which captures population in relatively small geographic areas (bounded by streets and prominent physical features) as the basic unit for analysis. Seasonal residents, prison inmates, migrant workers, and tourists were not included in permanent population estimates provided by the 2010 Census count.

Table A-2. 2010 LEC Planning Area permanent resident population estimates.

County	PWS Utility or DSS	2010 Population
Palm Beach	**Palm Beach County PWS Utilities**	
	A.G. Holley State Hospital	32
	Boca Raton, City of	107,224
	Boynton Beach, City of	102,512
	Delray Beach Water and Sewer Department, City of	63,341
	Glades Utility Authority	25,051
	Golf, Village of	2,755
	Highland Beach, Town of	3,631
	Jupiter, Town of	70,840
	Lake Worth Utilities, City of	45,137
	Lantana, Town of	10,348
	Manalapan, Town of	2,421
	Mangonia Park, Town of	1,888
	Maralago Cay	1,008
	Palm Beach County Water Utilities Department	468,417
	Palm Springs, Village of	45,204
	Riviera Beach, City of	37,757
	Seacoast Utility Authority	87,686
	Tequesta, Village of	11,581
	Wellington Public Utilities Department	55,408
	West Palm Beach Public Utilities, City of	109,301
	Palm Beach County PWS Total	**1,251,542**
	Palm Beach County DSS Total	**68,592**
	Palm Beach County Total	**1,320,134**
Broward	**Broward County PWS Utilities**	
	Broward County Water & Wastewater Services	182,334
	Cooper City Utility Department, City of	28,543
	Coral Springs, City of	58,029
	Coral Springs Improvement District	36,969
	Dania Beach, City of	14,840
	Davie, Town of	27,548
	Deerfield Beach, City of	51,842
	Fort Lauderdale, City of	212,945
	Hallandale Beach, City of	37,113
	Hillsboro Beach, Town of	1,875
	Hollywood, City of	186,798
	Lauderhill, City of	58,114

Table A-2. Continued.

County	PWS Utility or DSS	2010 Population
Broward (continued)	Margate, City of	58,314
	Miramar, City of	116,715
	North Lauderdale, City of	32,994
	North Springs Improvement District	34,895
	Parkland Utilities, Inc.	2,161
	Pembroke Pines, City of	152,002
	Plantation, City of	91,812
	Pompano Beach, City of	79,917
	Royal Utility Company	3,234
	Seminole Tribe of Florida Utility	1,368
	Sunrise, City of	211,403
	Tamarac, City of	56,064
	Tindall Hammock Irrigation and Soil Conservation District	2,639
	Broward County PWS Total	**1,740,468**
	Broward County DSS	**7,598**
	Broward County Total	**1,748,066**
Miami-Dade	**Miami-Dade County PWS Utilities**	
	Americana Village	1,582
	Florida City Water and Sewer Department	11,230
	Homestead, City of	65,679
	Miami-Dade Water & Sewer Department	2,141,885
	North Miami, City of	90,397
	North Miami Beach, City of	161,968
	Miami-Dade County PWS Total	**2,472,741**
	Miami-Dade County DSS Total	**23,694**
	Miami-Dade County Total	**2,496,435**
Monroe	**Monroe County PWS Utility**	
	Florida Keys Aqueduct Authority	73,090
	Monroe County PWS Total	**73,090**
	Monroe County DSS Total	**N/A**
	Monroe County Total	**73,090**
Hendry	**Hendry County PWS**	**N/A**
	Hendry County DSS	**1,279**
	Hendry County Total	**1,279**
LEC Planning Area Total		**5,639,004**

To determine the census blocks within the area served by each PWS utility, the geographic areas represented by census blocks and PWS utility service areas were input as polygon layers into the SFWMD GIS and overlaid. The imagery or latest available one-foot natural color aerial photography was used as a background and assisted the geographer in allocating census blocks to appropriate PWS service areas. The latest photography available was from 2009 for Palm Beach, Broward, and Miami-Dade counties. 2011 imagery was available for portions of rural Palm Beach County. When more current photography was not available, the one-meter natural color aerial photography from the United States Geological Survey (USGS) 2004–2005 digital ortho quarter quads was used. After allocating census blocks, population was then calculated for each PWS area served and for DSS users.

2030 County Populations

To prepare population projections, 2030 populations needed to be developed for each county within the LEC Planning Area. Paragraph 373.709(2)(a)1, F.S., prescribes the use of population projections in determining needs in regional water supply plans:

> Population projections used for determining public water supply needs must be based upon the best available data. In determining best available data, the district shall consider the University of Florida's Bureau of Economic and Business Research (BEBR) medium population projections and any population projection data and analysis submitted by a local government pursuant to the public workshop described in subsection (1) if the data and analysis support the local government's comprehensive plan. Any adjustment of or deviation from the BEBR projections must be fully described, and the original BEBR data must be presented along with the adjusted data.

To project population for 2030, the BEBR population medium growth forecasts reported for 2010 (BEBR 2011) for each county were used (**Table A-1**). Additional sources of population information from LEC county governments or PWS utilities not accounted for in the BEBR medium projections were identified. Where population projection data captured higher population counts for 2030 than medium BEBR, projections were adjusted upwards, if appropriate and consistent with local water supply planning programs.

2030 PWS Utility Service Areas

The 2010 PWS utility service areas were updated to include proposed changes from 2010 to 2030. Sources of information included CUPs and modifications, and discussions and correspondence with PWS utility staff. Very few utility service area boundaries are expected to change over the next 20 years.

Distribution of Census Block Data across 2030 PWS Utility Service Area

To determine the 2030 permanent resident population estimates, the PWS utility service area portion (percentage) of the total county 2010 Census population estimate was

multiplied by the 2030 medium population projection. Planned changes to utility service areas were compared to census blocks and adjusted as needed.

Five-Year Incremental Projections

For the required five-year incremental projections within the 20-year planning horizon of this plan update, census block data from the 2010 Census count (U.S. Census Bureau 2010) were used as the principal means of distributing 2030 county control populations to the various PWS future service areas within the LEC Planning Area counties. Five-year incremental population projections for each PWS utility are based upon a linear interpolation of the change in population from the 2010 estimates to 2030 adjusted projections.

For example, a PWS service area with a 2010 population estimate of 10,000 people and a projected growth rate of 25 percent would have a 2030 population projection of 12,500 people (**Table A-3**). Linear interpolation of the change in population is calculated as 25 percent divided by four five-year intervals or a 6.25 percent increase every five years.

Table A-3. Example of five-year incremental projections applied to a PWS service area.

Year	2010	2015	2020	2025	2030
Population	10,000	10,625	11,250	11,875	12,500

The medium BEBR growth rate was selected as the most appropriate means to distribute population growth to the required five-year periods for each PWS utility. For the complete five-year incremental population numbers, see **Table A-7** below.

Water Demand Projection Methodology

Historical PWS Utility Raw Water Withdrawal and Finished Treated Water Data

Both raw water withdrawn for PWS and finished treated water produced for PWS are calculated. This approach captures situations when gross and net demands differ, and independently verifies efficiency. For example, urban demand for finished treated water may be met with brackish water sources found in the Floridan aquifer. Because of losses incurred during treatment processes, raw water withdrawals from brackish water sources are typically 20–25 percent greater compared to the same volume of finished water from freshwater sources.

To determine historical withdrawals by all PWS utilities in the LEC Planning Area, raw water withdrawal data were obtained from the SFWMD Water Use Regulatory Database for 2010. This includes raw water withdrawn from the Surficial Aquifer System (SAS), including the Biscayne aquifer and Floridan aquifer. Surface water withdrawal data from Clear Lake

by the City of West Palm Beach were also gathered and incorporated into the historical withdrawal information.

To gather the finished treated water produced by PWS, data was extracted from the 2010 Florida Department of Environmental Protection (FDEP) monthly operating reports available from the FDEP compliance reports website, which is at http://www.dep.state.fl.us/water/drinkingwater/flow.htm. Five years of data were analyzed to understand trends in water use. Factors reflected in this data include the economic downturn, water shortages, empty housing stock, and implementation of year-round irrigation rules. Analysis concluded that 2010 most fairly represents the historical use trend that will continue into the future.

As with the draft PWS service area maps and populations, each utility and local government within the LEC Planning Area was provided with the 2010 estimates and projections for the PWS and DSS categories produced by the methods described below. In several cases, the utilities were able to provide input on their respective demands and projections that resulted in adjustments to the estimated demand. Many of these data exchanges took place during follow-up meetings, telephone conferences, and email correspondences. Revisions resulting from this coordination comprise the final projections published in this update.

Finished and Raw Water Demand Projections

For each PWS utility, 2010 raw water withdrawals were compared to the 2010 FDEP data (http://www.dep.state.fl.us/water/drinkingwater/flow.htm) for finished water production to calculate the raw to finished water ratio for each LEC PWS utility (**Table A-4**). These factors give a basis to compare and contrast PWS and can be applied for other types of analyses to convert from finished water production to raw water withdrawals. However, a more useful statistic is finished to raw, which describes the efficiency of the various treatment trains employed by the PWS (**Table A-5**). For DSS, the finished to raw ratio is assumed to be 0.96.

Per Capita Use Rate

The planning PCUR expresses the total annual finished water used in 2010 divided by the permanent population in 2010. This method incorporates the finished water supplied by the PWS utility and consumed by seasonal residents and tourists, PWS utility supplied for industrial, commercial, and institutional use, and the losses incurred in water delivery. Irrigation demand for PWS-served households that do not use PWS for irrigation was not assessed due to the lack of available data. The planning PCURs for DSS within each county were assumed to be the same as for the countywide PWS utility average. **Table A-6** provides PCURs for 2010.

Each utility may have specific demographics, seasonality, and distribution characteristics that may be analyzed in detail to better quantify PCURs of specific user categories. A more localized, in-depth analysis of use may be used to focus water conservation efforts

and assist in determining water use permit allocations. Therefore, the PCURs were part of the information provided to utilities for review.

Table A-4. Raw to finished water ratio for each PWS utility.

County	PWS Utility/DSS	Raw:Finished
Palm Beach County	**Palm Beach County PWS Utilities**	
	A.G. Holley State Hospital	1.17
	Boca Raton, City of	1.23
	Boynton Beach, City of	1.06
	Delray Beach Water and Sewer Department, City of	1.04
	Glades Utility Authority	1.35
	Golf, Village of	1.28
	Highland Beach, Town of	1.52
	Jupiter, Town of	1.25
	Lake Worth Utilities, City of	1.07
	Lantana, Town of	1.00
	Manalapan, Town of	1.25
	Mangonia Park, Town of	1.00
	Maralago Cay	1.04
	Palm Beach County Water Utilities Department	1.14
	Palm Springs, Village of	1.05
	Riviera Beach, City of	1.01
	Seacoast Utility Authority	1.03
	Tequesta, Village of	1.23
	Wellington Public Utilities Department	1.16
	West Palm Beach Public Utilities, City of	1.00
	Palm Beach County DSS	1.04
Broward County	**Broward County PWS Utilities**	
	Broward County Water & Wastewater Services	1.09
	Cooper City Utility Department, City of	1.27
	Coral Springs, City of	1.05
	Coral Springs Improvement District	1.14
	Dania Beach, City of	1.06
	Davie, Town of	1.02
	Deerfield Beach, City of	1.02
	Fort Lauderdale, City of	1.11
	Hallandale Beach, City of	1.02
	Hillsboro Beach, Town of	1.16
	Hillsboro Beach, Town of	1.16
	Hollywood, City of	1.16
	Lauderhill, City of	1.04

Table A-4. Continued.

County	PWS Utility	Raw:Finished
Broward County (continued)	Margate, City of	1.37
	Miramar, City of	1.10
	North Lauderdale, City of	1.04
	North Springs Improvement District	1.04
	Parkland Utilities, Inc.	1.02
	Pembroke Pines, City of	1.02
	Plantation, City of	1.21
	Pompano Beach, City of	1.07
	Royal Utility Company	1.18
	Seminole Tribe of Florida	1.02
	Sunrise, City of	1.16
	Tamarac, City of	1.05
	Tindall Hammock Irrigation and Soil Conservation District	1.66
	Broward County DSS	1.04
Miami-Dade County	**Miami-Dade County PWS Utilities**	
	Americana Village	1.04
	Florida City Water and Sewer Department	1.01
	Homestead, City of	1.00
	Miami-Dade Water & Sewer Department	1.02
	North Miami, City of	1.26
	North Miami Beach, City of	1.12
	Miami-Dade DSS	1.04
Monroe County	**Monroe County PWS Utilities**	
	Florida Keys Aqueduct Authority	1.07
Hendry County	**Hendry County DSS**	1.04

Table A-5. Finished to raw water ratio for each PWS utility.

County	PWS Utility	Finished:Raw
Palm Beach County	**Palm Beach County PWS Utilities**	
	A.G. Holley State Hospital	0.85
	Boca Raton, City of	0.81
	Boynton Beach, City of	0.94
	Delray Beach Water and Sewer Department, City of	0.96
	Glades Utility Authority	0.74
	Golf, Village of	0.78
	Highland Beach, Town of	0.66
	Jupiter, Town of	0.80
	Lake Worth Utilities, City of	0.93
	Lantana, Town of	1.00
	Manalapan, Town of	0.80
	Mangonia Park, Town of	1.00
	Maralago Cay	0.97
	Palm Beach County Water Utilities Department	0.88
	Palm Springs, Village of	0.95
	Riviera Beach, City of	0.99
	Seacoast Utility Authority	0.97
	Tequesta, Village of	0.81
	Wellington Public Utilities Department	0.86
	West Palm Beach Public Utilities, City of	1.00
	Palm Beach County DSS	0.96
Broward County	**Broward County PWS Utilities**	
	Broward County Water & Wastewater Services	0.92
	Cooper City Utility Department, City of	0.78
	Coral Springs, City of	0.95
	Coral Springs Improvement District	0.88
	Dania Beach, City of	0.95
	Davie, Town of	0.98
	Deerfield Beach, City of	0.98
	Fort Lauderdale, City of	0.90
	Hallandale Beach, City of	0.98
	Hillsboro Beach, Town of	0.87
	Hollywood, City of	0.86
	Lauderhill, City of	0.96

Table A-5. Continued.

County	PWS Utility	Finished:Raw
Broward County (continued)	Margate, City of	0.73
	Miramar, City of	0.91
	North Lauderdale, City of	0.96
	North Springs Improvement District	0.96
	Parkland Utilities, Inc.	0.98
	Pembroke Pines, City of	0.98
	Plantation, City of	0.82
	Pompano Beach, City of	0.93
	Royal Utility Company	0.85
	Seminole Tribe of Florida	0.98
	Sunrise, City of	0.86
	Tamarac, City of	0.95
	Tindall Hammock Irrigation and Soil Conservation District	0.60
	Broward County DSS	0.96
Miami-Dade County	**Miami-Dade County PWS Utilities**	
	Americana Village	0.96
	Florida City Water and Sewer Department	0.99
	Homestead, City of	1.00
	Miami-Dade Water & Sewer Department	0.98
	North Miami, City of	0.80
	North Miami Beach, City of	0.90
	Miami-Dade DSS	0.96
Monroe County	**Monroe County PWS Utilities**	
	Florida Keys Aqueduct Authority	0.93
Hendry County	**Hendry County DSS**	0.96

Table A-6. Per capita use rate for 2010.

County	PWS Utility	2010 PCUR
Palm Beach County	**Palm Beach County PWS Utilities**	
	A.G. Holley State Hospital	
	Boca Raton, City of	320
	Boynton Beach, City of	131
	Delray Beach Water and Sewer Department, City of	232
	Glades Utility Authority	195
	Golf, Village of	145
	Highland Beach, Town of	372
	Jupiter, Town of	188
	Lake Worth Utilities, City of	98
	Lantana, Town of	171
	Manalapan, Town of	440
	Mangonia Park, Town of	168
	Maralago Cay	182
	Palm Beach County Water Utilities Department	111
	Palm Springs, Village of	84
	Riviera Beach, City of	173
	Seacoast Utility Authority	201
	Tequesta, Village of	235
	Wellington Public Utilities Department	105
	West Palm Beach Public Utilities, City of	255
	Palm Beach County PWS Average	**165**
	Palm Beach County DSS	**156**
	Palm Beach County Average	**165**
Broward County	**Broward County PWS Utilities**	
	Broward County Water & Wastewater Services	106
	Cooper City Utility Department, City of	95
	Coral Springs, City of	114
	Coral Springs Improvement District	103
	Dania Beach, City of	154
	Davie, Town of	146
	Deerfield Beach, City of	191
	Fort Lauderdale, City of	190
	Hallandale Beach, City of	146
	Hillsboro Beach, Town of	351
	Hollywood, City of	111
	Lauderhill, City of	95

Table A-6. Continued.

County	PWS Utility	2010 PCUR
Broward County (continued)	Margate, City of	98
	Miramar, City of	97
	North Lauderdale, City of	76
	North Springs Improvement District	124
	Parkland Utilities, Inc.	113
	Pembroke Pines, City of	78
	Plantation, City of	127
	Pompano Beach, City of	170
	Royal Utility Company	98
	Seminole Tribe of Florida	810
	Sunrise, City of	116
	Tamarac, City of	105
	Tindall Hammock Irrigation and Soil Conservation District	158
	Broward County PWS Average	**123**
	Broward County DSS	**123**
	Broward County Average	**123**
Miami-Dade County	**Miami-Dade County PWS Utilities**	
	Americana Village	138
	Florida City Water and Sewer Department	156
	Homestead, City of	157
	Miami-Dade Water & Sewer Department	141
	North Miami, City of	117
	North Miami Beach, City of	125
	Miami-Dade PWS Average	**140**
	Miami-Dade DSS	**138**
	Miami-Dade County Average	**140**
Monroe County	**Monroe County PWS Utilities**	
	Florida Keys Aqueduct Authority	**225**
	PWS Average	**225**
	Monroe County Average	**225**
Hendry County	**Hendry County DSS**	**1,094**
	Hendry County Average	**1,094**
LEC Planning Area PWS Average		**104**

2030 Projected Raw and Finished Demand

For each PWS utility, 2030 finished (net) water demand was calculated by multiplying the 2030 permanent population for each PWS utility by the PCUR for 2010. This conservative assumption reflects the expectation that PCUR will remain constant over the next 20 years. Several utilities do expect declines in PCUR based on implementation of conservation and reuse projects replacing demand for treated finished water and requested lower future PCURs. To determine raw water demand for average conditions for each PWS utility, finished water projections were multiplied by the raw to finished percent in **Table A-4** to calculate raw (gross) water demand.

Average Rainfall and 1–and–10 year Drought Conditions

Finally, average rainfall conditions for net and gross water projections were modified to calculate 1-in-10 year drought condition demand. A 1-in-10 year drought is defined by diminished rain and increased evapotranspiration (ET) relative to the historical record for a particular location from Tables V-2-1, V-2-3, V-2-5, and V-2-7 in the *Districtwide Water Supply Assessment* (SFWMD 1998). The effect of 1-in-10 year drought conditions is expected to increase demand in each county as follows:

- Palm Beach County: 1.109
- Broward County: 1.101
- Miami-Dade County: 1.087
- Monroe County: 1.031
- Hendry County: 1.049

Projection Results

Table A-7 provides PWS utility and DSS five-year incremental population projections for the LEC Planning Area. **Table A-8** presents finished (net) water demand under average rainfall conditions, while **Table A-9** provides the finished water needs under 1-in-10 year drought conditions. In the same manner, **Table A-10** presents estimated gross (raw) water withdrawals under average rainfall conditions, while **Table A-11** provides gross water withdrawals under 1-in-10 year drought conditions.

Table A-7. PWS and DSS population projections for the LEC Planning Area.

County	PWS Utility or DSS	Population Projections				
		2010	2015	2020	2025	2030
Palm Beach	**Palm Beach County PWS Utilities**					
	A.G. Holley State Hospital	32	34	36	38	40
	Boca Raton, City of	107,224	113,881	120,539	127,196	133,854
	Boynton Beach, City of	102,512	108,877	115,242	121,607	127,972
	Delray Beach Water and Sewer Department, City of	63,341	67,274	71,207	75,139	79,072
	Glades Utility Authority	25,051	26,607	28,164	29,720	31,276
	Golf, Village of	2,755	2,926	3,097	3,268	3,439
	Highland Beach, Town of	3,631	3,856	4,082	4,307	4,533
	Jupiter, Town of	70,840	78,532	86,224	93,916	101,608
	Lake Worth Utilities, City of	45,137	47,940	50,742	53,545	56,347
	Lantana, Town of	10,348	10,991	11,633	12,276	12,918
	Manalapan, Town of	2,421	2,571	2,722	2,872	3,022
	Mangonia Park, Town of	1,888	2,005	2,122	2,240	2,357
	Maralago Cay	1,008	1,071	1,133	1,196	1,258
	Palm Beach County Water Utilities Department	468,417	497,518	526,618	555,719	584,819
	Palm Springs, Village of	45,204	48,011	50,817	53,624	56,431
	Riviera Beach, City of	37,757	40,101	42,446	44,790	47,134
	Seacoast Utility Authority	87,686	93,130	98,575	104,019	109,464
	Tequesta, Village of	11,581	12,463	13,345	14,226	15,108
	Wellington Public Utilities Department	55,408	58,848	62,289	65,729	69,169
	West Palm Beach Public Utilities, City of	109,301	116,087	122,874	129,660	136,447
	Palm Beach County PWS Total	**1,251,542**	**1,332,723**	**1,413,907**	**1,495,087**	**1,576,268**
	Palm Beach County DSS Total	**68,592**	**69,264**	**70,087**	**70,909**	**71,732**
	Palm Beach County Total	**1,320,134**	**1,401,987**	**1,483,994**	**1,565,996**	**1,648,000**
Broward	**Broward County PWS Utilities**					
	Broward County Water & Wastewater Services	182,334	187,250	192,166	197,082	201,997
	Cooper City Utility Department, City of	28,543	29,229	29,916	30,602	31,288
	Coral Springs, City of	58,029	59,424	60,820	62,215	63,610
	Coral Springs Improvement District	36,969	37,858	38,747	39,636	40,525
	Dania Beach, City of	14,840	15,197	15,554	15,911	16,267
	Davie, Town of	27,548	43,434	59,320	75,205	91,091
	Deerfield Beach, City of	51,842	53,089	54,335	55,582	56,828
	Fort Lauderdale, City of	212,945	217,995	223,045	228,095	233,145
	Hallandale Beach, City of	37,113	38,005	38,898	39,790	40,683
	Hillsboro Beach, Town of	1,875	1,920	1,965	2,010	2,055
	Hollywood, City of	186,798	192,679	198,559	204,440	210,320
	Lauderhill, City of	58,114	59,511	60,909	62,306	63,704

Table A-7. Continued.

County	PWS Utility or DSS	Population Projections				
		2010	2015	2020	2025	2030
Broward (cont.)	Margate, City of	58,314	59,716	61,118	62,521	63,923
	Miramar, City of	116,715	120,970	125,225	129,479	133,734
	North Lauderdale, City of	32,994	33,787	34,581	35,374	36,167
	North Springs Improvement District	34,895	35,734	36,573	37,412	38,251
	Parkland Utilities, Inc.	2,161	2,213	2,265	2,317	2,369
	Pembroke Pines, City of	152,002	155,657	159,312	162,967	166,622
	Plantation, City of	91,812	94,703	97,595	100,486	103,377
	Pompano Beach, City of	79,917	81,841	83,765	85,689	87,613
	Royal Utility Company	3,234	3,312	3,390	3,467	3,545
	Seminole Tribe of Florida Utility	1,368	1,401	1,434	1,467	1,500
	Sunrise, City of	211,403	216,486	221,570	226,653	231,736
	Tamarac, City of	56,064	57,412	58,760	60,108	61,456
	Tindall Hammock Irrigation and Soil Conservation District	2,639	2,702	2,766	2,829	2,893
	Broward County PWS Total	**1,740,468**	**1,801,525**	**1,862,588**	**1,923,643**	**1,984,701**
	Broward County DSS Total	**7,598**	**7,781**	**7,963**	**8,146**	**8,329**
	Broward County Total	**1,748,066**	**1,809,306**	**1,870,551**	**1,931,789**	**1,993,030**
Miami-Dade	**Miami-Dade County PWS Utilities**					
	Americana Village	1,582	1,654	1,727	1,799	1,871
	Florida City Water and Sewer Department	11,230	11,743	12,256	12,770	13,283
	Homestead, City of	65,679	68,681	71,682	74,684	77,686
	Miami-Dade Water & Sewer Department	2,141,885	2,239,773	2,337,660	2,435,548	2,533,436
	North Miami, City of	90,397	94,528	98,660	102,791	106,922
	North Miami Beach, City of	161,968	169,370	176,772	184,175	191,577
	Miami-Dade County PWS Total	**2,472,741**	**2,585,749**	**2,698,757**	**2,811,767**	**2,924,775**
	Miami-Dade County DSS Total	**23,694**	**24,777**	**25,860**	**26,943**	**28,025**
	Miami-Dade County Total	**2,496,435**	**2,610,526**	**2,724,617**	**2,838,710**	**2,952,800**
Monroe	**Monroe County PWS Utility**					
	Florida Keys Aqueduct Authority	73,090	72,143	71,195	70,248	69,300
	Monroe County PWS Total	**73,090**	**72,143**	**71,195**	**70,248**	**69,300**
	Monroe County DSS Total	**0**	**0**	**0**	**0**	**0**
	Monroe County Total	**73,090**	**72,143**	**71,195**	**70,248**	**69,300**
	Hendry County PWS Total	**0**	**0**	**0**	**0**	**0**
Hendry	**Hendry County DSS Total**	**1,279**	**1,320**	**1,360**	**1,401**	**1,441**
	Hendry County Total	**1,279**	**1,320**	**1,360**	**1,401**	**1,441**
LEC Planning Area PWS Total		**5,537,841**	**5,792,140**	**6,046,447**	**6,300,745**	**6,555,042**
LEC Planning Area DSS Total		**101,163**	**103,142**	**105,270**	**107,399**	**109,527**
LEC Planning Area Total		**5,639,004**	**5,895,282**	**6,151,717**	**6,408,144**	**6,664,571**

Table A-8. Finished (net) water demand projections for PWS and DSS under average rainfall conditions in the LEC Planning Area.

County	PWS Utility or DSS	Finished (Net) Water Demand Projections – Average Rainfall Conditions (MGD)				
		2010	2015	2020	2025	2030
Palm Beach	**Palm Beach County PWS Utilities**					
	A.G. Holley State Hospital	0.07	0.08	0.08	0.09	0.09
	Boca Raton, City of	34.31	36.44	38.57	40.70	42.83
	Boynton Beach, City of	13.43	14.26	15.10	15.93	16.76
	Delray Beach Water and Sewer Department, City of	14.70	15.61	16.52	17.43	18.34
	Glades Utility Authority	4.88	5.19	5.49	5.80	6.10
	Golf, Village of	0.40	0.42	0.45	0.47	0.50
	Highland Beach, Town of	1.35	1.43	1.52	1.60	1.69
	Jupiter, Town of	13.32	14.76	16.21	17.66	19.10
	Lake Worth Utilities, City of	4.42	4.70	4.97	5.25	5.52
	Lantana, Town of	1.77	1.88	1.99	2.10	2.21
	Manalapan, Town of	1.07	1.13	1.20	1.26	1.33
	Mangonia Park, Town of	0.32	0.34	0.36	0.38	0.40
	Maralago Cay	0.18	0.19	0.21	0.22	0.23
	Palm Beach County Water Utilities Department	51.99	55.22	58.45	61.68	64.91
	Palm Springs, Village of	3.80	4.03	4.27	4.50	4.74
	Riviera Beach, City of	6.53	6.94	7.34	7.75	8.15
	Seacoast Utility Authority	17.62	18.72	19.81	20.91	22.00
	Tequesta, Village of	2.72	2.93	3.14	3.34	3.55
	Wellington Public Utilities Department	5.82	6.18	6.54	6.90	7.26
	West Palm Beach Public Utilities, City of	27.87	29.60	31.33	33.06	34.79
	Palm Beach County PWS Total	**206.57**	**220.05**	**233.55**	**247.03**	**260.50**
	Palm Beach County DSS Total	**10.71**	**10.84**	**10.97**	**11.10**	**11.23**
	Palm Beach County Total	**217.28**	**230.89**	**244.52**	**258.13**	**271.73**
Broward	**Broward County PWS Utilities**					
	Broward County Water & Wastewater Services	19.25	19.86	20.47	21.09	21.70
	Cooper City Utility Department, City of	2.71	2.78	2.84	2.91	2.97
	Coral Springs, City of	6.62	6.77	6.93	7.09	7.25
	Coral Springs Improvement District	3.81	3.90	3.99	4.08	4.17
	Dania Beach, City of	2.29	2.34	2.40	2.45	2.51
	Davie, Town of	4.02	6.34	8.66	10.98	13.30
	Deerfield Beach, City of	9.90	10.14	10.38	10.62	10.85
	Fort Lauderdale, City of	40.46	41.42	42.38	43.34	44.30
	Hallandale Beach, City of	5.42	5.55	5.68	5.81	5.94
	Hillsboro Beach, Town of	0.66	0.67	0.69	0.71	0.72
	Hollywood, City of	20.73	21.39	22.04	22.69	23.35
	Lauderhill, City of	5.52	5.65	5.79	5.92	6.05

Table A-8. Continued.

County	PWS Utility or DSS	Finished (Net) Water Demand Projections – Average Rainfall Conditions (MGD)				
		2010	2015	2020	2025	2030
Broward (cont.)	Margate, City of	5.71	5.85	5.99	6.13	6.26
	Miramar, City of	11.32	11.73	12.15	12.56	12.97
	North Lauderdale, City of	2.51	2.57	2.63	2.69	2.75
	North Springs Improvement District	4.33	4.43	4.54	4.64	4.74
	Parkland Utilities, Inc.	0.24	0.25	0.26	0.26	0.27
	Pembroke Pines, City of	11.86	12.14	12.43	12.71	13.00
	Plantation, City of	11.66	12.03	12.39	12.76	13.13
	Pompano Beach, City of	13.59	13.91	14.24	14.57	14.89
	Royal Utility Company	0.32	0.32	0.33	0.34	0.35
	Seminole Tribe of Florida Utility	1.11	1.13	1.16	1.19	1.21
	Sunrise, City of	24.52	25.11	25.70	26.29	26.88
	Tamarac, City of	5.89	6.03	6.17	6.31	6.45
	Tindall Hammock Irrigation and Soil Conservation District	0.42	0.43	0.44	0.45	0.46
	Broward County PWS Total	**214.87**	**222.74**	**230.68**	**238.59**	**246.47**
	Broward County DSS Total	**0.55**	**0.67**	**0.79**	**0.91**	**1.03**
	Broward County Total	**215.42**	**223.41**	**231.47**	**239.5**	**247.5**
Miami-Dade	**Miami-Dade County PWS Utilities**					
	Americana Village	0.22	0.23	0.24	0.25	0.26
	Florida City Water and Sewer Department	1.75	1.83	1.91	1.99	2.07
	Homestead, City of	10.31	10.78	11.25	11.73	12.20
	Miami-Dade Water & Sewer Department	302.43	316.26	330.08	343.90	357.72
	North Miami, City of	10.58	11.06	11.54	12.03	12.51
	North Miami Beach, City of	20.25	21.36	22.48	22.80	24.72
	Miami-Dade County PWS Total	**345.54**	**361.52**	**377.5**	**392.69**	**409.48**
	Miami-Dade County DSS Total	**3.28**	**3.43**	**3.58**	**3.73**	**3.88**
	Miami-Dade County Total	**348.82**	**364.95**	**381.08**	**396.43**	**413.36**
Monroe	**Monroe County PWS Utility**					
	Florida Keys Aqueduct Authority	16.45	16.23	16.02	15.81	15.59
	Monroe County PWS Total	**16.45**	**16.23**	**16.02**	**15.81**	**15.59**
	Monroe County DSS Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Monroe County Total	**16.45**	**16.23**	**16.02**	**15.81**	**15.59**
Hendry	**Hendry County PWS Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Hendry County DSS Total	**1.40**	**1.44**	**1.49**	**1.53**	**1.58**
	Hendry County Total	**1.40**	**1.44**	**1.49**	**1.53**	**1.58**
LEC Planning Area PWS Total		**783.43**	**820.54**	**857.75**	**894.13**	**932.04**
LEC Planning Area DSS Total		**15.94**	**16.38**	**16.83**	**17.27**	**17.72**
LEC Planning Area Total		**799.37**	**836.92**	**874.58**	**911.4**	**949.76**

Table A-9. Finished (net) water demand projections for PWS and DSS under 1-in-10 year drought conditions in the LEC Planning Area.

County	PWS Utility or DSS	Finished (Net) Water Demand Projections – 1-in-10 Year Drought Conditions (MGD)				
		2010	2015	2020	2025	2030
Palm Beach	**Palm Beach County PWS Utilities**					
	A.G. Holley State Hospital	0.08	0.08	0.09	0.09	0.10
	Boca Raton, City of	38.05	40.41	42.78	45.14	47.50
	Boynton Beach, City of	14.89	15.82	16.74	17.67	18.59
	Delray Beach Water and Sewer Department, City of	16.30	17.31	18.32	19.33	20.34
	Glades Utility Authority	5.42	5.75	6.09	6.43	6.76
	Golf, Village of	0.44	0.47	0.50	0.53	0.55
	Highland Beach, Town of	1.50	1.59	1.68	1.78	1.87
	Jupiter, Town of	14.77	16.37	17.98	19.58	21.18
	Lake Worth Utilities, City of	4.91	5.21	5.51	5.82	6.12
	Lantana, Town of	1.96	2.08	2.21	2.33	2.45
	Manalapan, Town of	1.18	1.25	1.33	1.40	1.47
	Mangonia Park, Town of	0.35	0.37	0.40	0.42	0.44
	Maralago Cay	0.20	0.22	0.23	0.24	0.25
	Palm Beach County Water Utilities Department	57.66	61.24	64.83	68.41	71.99
	Palm Springs, Village of	4.21	4.47	4.73	5.00	5.26
	Riviera Beach, City of	7.24	7.69	8.14	8.59	9.04
	Seacoast Utility Authority	19.55	20.76	21.97	23.19	24.40
	Tequesta, Village of	3.02	3.25	3.48	3.71	3.94
	Wellington Public Utilities Department	6.45	6.85	7.25	7.65	8.05
	West Palm Beach Public Utilities, City of	30.91	32.83	34.75	36.67	38.59
	Palm Beach County PWS Total	**229.09**	**244.02**	**259.01**	**273.98**	**288.89**
	Palm Beach County DSS Total	**11.88**	**12.02**	**12.16**	**12.31**	**12.45**
	Palm Beach County Total	**240.97**	**256.04**	**271.17**	**286.29**	**301.34**
Broward	**Broward County PWS Utilities**					
	Broward County Water & Wastewater Services	21.19	21.87	22.54	23.22	23.89
	Cooper City Utility Department, City of	2.99	3.06	3.13	3.20	3.27
	Coral Springs, City of	7.28	7.46	7.63	7.81	7.98
	Coral Springs Improvement District	4.19	4.29	4.39	4.49	4.60
	Dania Beach, City of	2.52	2.58	2.64	2.70	2.76
	Davie, Town of	4.43	6.98	9.54	12.09	14.64
	Deerfield Beach, City of	10.90	11.16	11.43	11.69	11.95
	Fort Lauderdale, City of	44.55	45.60	46.66	47.72	48.77
	Hallandale Beach, City of	5.97	6.11	6.25	6.40	6.54
	Hillsboro Beach, Town of	0.72	0.74	0.76	0.78	0.79
	Hollywood, City of	22.83	23.55	24.27	24.98	25.70
	Lauderhill, City of	6.08	6.22	6.37	6.52	6.66

Table A-9. Continued.

County	PWS Utility or DSS	Finished (Net) Water Demand Projections – 1-in-10 Year Drought Conditions (MGD)				
		2010	2015	2020	2025	2030
Broward (cont.)	Margate, City of	6.29	6.44	6.59	6.75	6.90
	Miramar, City of	12.46	12.92	13.37	13.83	14.28
	North Lauderdale, City of	2.76	2.83	2.89	2.96	3.03
	North Springs Improvement District	4.76	4.88	4.99	5.11	5.22
	Parkland Utilities, Inc.	0.27	0.28	0.28	0.29	0.29
	Pembroke Pines, City of	13.05	13.37	13.68	14.00	14.31
	Plantation, City of	12.84	13.24	13.65	14.05	14.45
	Pompano Beach, City of	14.96	15.32	15.68	16.04	16.40
	Royal Utility Company	0.35	0.36	0.37	0.37	0.38
	Seminole Tribe of Florida Utility	1.22	1.25	1.28	1.31	1.34
	Sunrise, City of	27.00	27.65	28.30	28.95	29.60
	Tamarac, City of	6.48	6.64	6.79	6.95	7.10
	Tindall Hammock Irrigation and Soil Conservation District	0.46	0.47	0.48	0.49	0.50
	Broward County PWS Total	**236.55**	**245.27**	**253.96**	**262.7**	**271.35**
	Broward County DSS Total	**0.61**	**0.74**	**0.87**	**1.00**	**1.14**
	Broward County Total	**237.16**	**246.01**	**254.83**	**263.70**	**272.49**
Miami-Dade	**Miami-Dade County PWS Utilities**					
	Americana Village	0.24	0.25	0.26	0.27	0.28
	Florida City Water and Sewer Department	1.90	1.99	2.08	2.17	2.25
	Homestead, City of	11.21	11.72	12.23	12.75	13.26
	Miami-Dade Water & Sewer Department	328.75	343.77	358.79	373.82	388.84
	North Miami, City of	11.50	12.02	12.55	13.07	13.60
	North Miami Beach, City of	22.01	23.22	24.44	24.78	26.87
	Miami-Dade County PWS Total	**375.61**	**392.97**	**410.35**	**426.86**	**445.10**
	Miami-Dade County DSS Total	**3.56**	**3.73**	**3.89**	**4.05**	**4.22**
	Miami-Dade County Total	**379.17**	**396.70**	**414.24**	**430.91**	**449.32**
Monroe	**Monroe County PWS Utility**					
	Florida Keys Aqueduct Authority	16.96	16.74	16.52	16.30	16.08
	Monroe County PWS Total	**16.96**	**16.74**	**16.52**	**16.30**	**16.08**
	Monroe County DSS Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Monroe County Total	**16.96**	**16.74**	**16.52**	**16.30**	**16.08**
Hendry	**Hendry County PWS Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Hendry County DSS Total	**1.47**	**1.51**	**1.56**	**1.61**	**1.65**
	Hendry County Total	**1.47**	**1.51**	**1.56**	**1.61**	**1.65**
LEC Planning Area PWS Total		**858.21**	**899**	**939.84**	**979.84**	**1021.42**
LEC Planning Area DSS Total		**17.52**	**18**	**18.48**	**18.97**	**19.46**
LEC Planning Area Total		**875.73**	**917**	**958.32**	**998.81**	**1,040.88**

Table A-10. Gross (raw) water demand projections for PWS and DSS under average rainfall conditions in the LEC Planning Area.

County	PWS Utility or DSS	Gross (Raw) Water Demand Projections – Average Rainfall Conditions (MGD)				
		2010	2015	2020	2025	2030
Palm Beach	**Palm Beach County PWS Utilities**					
	A.G. Holley State Hospital	0.08	0.09	0.09	0.10	0.10
	Boca Raton, City of	42.19	44.81	47.43	50.05	52.67
	Boynton Beach, City of	14.23	15.11	15.99	16.88	17.76
	Delray Beach Water and Sewer Department, City of	15.27	16.46	17.66	18.86	20.06
	Glades Utility Authority	6.61	7.02	7.43	7.84	8.26
	Golf, Village of	0.51	0.54	0.57	0.60	0.64
	Highland Beach, Town of	2.05	2.18	2.30	2.43	2.55
	Jupiter, Town of	16.60	17.77	18.94	20.11	21.27
	Lake Worth Utilities, City of	4.75	5.04	5.34	5.63	5.93
	Lantana, Town of	1.77	1.88	1.99	2.10	2.21
	Manalapan, Town of	1.34	1.42	1.50	1.58	1.67
	Mangonia Park, Town of	0.32	0.34	0.36	0.38	0.40
	Maralago Cay	0.19	0.20	0.21	0.23	0.24
	Palm Beach County Water Utilities Department	59.03	62.70	66.37	70.03	73.70
	Palm Springs, Village of	4.00	4.25	4.50	4.75	4.99
	Riviera Beach, City of	6.60	7.01	7.42	7.83	8.24
	Seacoast Utility Authority	18.10	19.22	20.35	21.47	22.60
	Tequesta, Village of	3.34	3.59	3.85	4.10	4.35
	Wellington Public Utilities Department	6.73	7.15	7.57	7.99	8.41
	West Palm Beach Public Utilities, City of	27.94	29.67	31.41	33.14	34.88
	Palm Beach County PWS Total	**231.65**	**246.45**	**261.28**	**276.10**	**290.93**
	Palm Beach County DSS Total	**11.16**	**11.29**	**11.43**	**11.56**	**11.69**
	Palm Beach County Total	**242.81**	**257.74**	**272.71**	**287.66**	**302.62**
Broward	**Broward County PWS Utilities**					
	Broward County Water & Wastewater Services	20.98	21.55	22.11	22.67	23.23
	Cooper City Utility Department, City of	3.46	3.54	3.62	3.71	3.79
	Coral Springs, City of	6.96	7.13	7.29	7.46	7.63
	Coral Springs Improvement District	4.33	4.44	4.54	4.65	4.75
	Dania Beach, City of	2.42	2.48	2.53	2.59	2.65
	Davie, Town of	4.10	6.46	8.83	11.19	13.56
	Deerfield Beach, City of	10.10	10.34	10.59	10.83	11.07
	Fort Lauderdale, City of	44.95	46.02	47.08	48.15	49.21
	Hallandale Beach, City of	5.55	5.68	5.81	5.95	6.08
	Hillsboro Beach, Town of	0.76	0.78	0.80	0.82	0.83
	Hollywood, City of	24.00	24.75	25.51	26.26	27.02
	Lauderhill, City of	5.76	5.90	6.03	6.17	6.31

Table A-10. Continued.

County	PWS Utility or DSS	Gross (Raw) Water Demand Projections – Average Rainfall Conditions (MGD)				
		2010	2015	2020	2025	2030
Broward (cont.)	Margate, City of	7.83	8.02	8.21	8.39	8.58
	Miramar, City of	12.46	12.92	13.37	13.83	14.28
	North Lauderdale, City of	2.60	2.66	2.73	2.79	2.85
	North Springs Improvement District	4.50	4.61	4.72	4.82	4.93
	Parkland Utilities, Inc.	0.25	0.26	0.26	0.27	0.27
	Pembroke Pines, City of	12.13	12.43	12.72	13.01	13.30
	Plantation, City of	14.14	14.59	15.03	15.48	15.92
	Pompano Beach, City of	14.55	14.90	15.25	15.60	15.95
	Royal Utility Company	0.37	0.38	0.39	0.40	0.41
	Seminole Tribe of Florida Utility	1.13	1.16	1.18	1.21	1.24
	Sunrise, City of	28.39	29.58	30.77	31.96	33.15
	Tamarac, City of	6.20	6.35	6.50	6.65	6.80
	Tindall Hammock Irrigation and Soil Conservation District	0.69	0.71	0.73	0.74	0.76
	Broward County PWS Total	238.63	247.62	256.61	265.60	274.57
	Broward County DSS Total	0.57	0.70	0.82	0.95	1.08
	Broward County Total	239.18	248.34	257.42	266.55	275.65
Miami-Dade	**Miami-Dade County PWS Utilities**					
	Americana Village	0.23	0.24	0.25	0.26	0.27
	Florida City Water and Sewer Department	1.78	1.86	1.94	2.02	2.10
	Homestead, City of	10.33	10.80	11.27	11.74	12.21
	Miami-Dade Water & Sewer Department	309.10	323.23	337.35	351.48	365.61
	North Miami, City of	13.28	13.89	14.50	15.10	15.71
	North Miami Beach, City of	22.60	23.85	25.10	25.45	27.59
	Miami-Dade County PWS Total	357.32	373.87	390.41	406.05	423.49
	Miami-Dade County DSS Total	3.42	3.57	3.73	3.88	4.04
	Miami-Dade County Total	360.74	377.44	394.14	409.93	427.53
Monroe	**Monroe County PWS Utility**					
	Florida Keys Aqueduct Authority	17.67	17.47	17.26	17.06	16.86
	Monroe County PWS Total	**17.67**	**17.47**	**17.26**	**17.06**	**16.86**
	Monroe County DSS Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Monroe County Total	**17.67**	**17.47**	**17.26**	**17.06**	**16.86**
Hendry	**Hendry County PWS Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Hendry County DSS Total	**1.46**	**1.50**	**1.55**	**1.60**	**1.64**
	Hendry County Total	**1.46**	**1.50**	**1.55**	**1.60**	**1.64**
LEC Planning Area PWS Total		**845.25**	**885.43**	**925.55**	**964.81**	**1,005.85**
LEC Planning Area DSS Total		**16.61**	**17.06**	**17.53**	**17.99**	**18.45**
LEC Planning Area Total		**861.86**	**902.49**	**943.08**	**982.8**	**1,024.3**

Table A-11. Gross water demand projections for PWS and DSS under 1-in-10 year drought conditions in the LEC Planning Area.

County	PWS Utility or DSS	Gross (Raw) Water Demand Projections – 1-in-10 Year Drought Conditions (MGD)				
		2010	2015	2020	2025	2030
Palm Beach	**Palm Beach County PWS Utilities**					
	A.G. Holley State Hospital	0.09	0.10	0.10	0.11	0.11
	Boca Raton, City of	46.79	49.70	52.60	55.51	58.41
	Boynton Beach, City of	15.78	16.76	17.74	18.72	19.70
	Delray Beach Water and Sewer Department, City of	16.93	18.26	19.59	20.91	22.24
	Glades Utility Authority	7.33	7.79	8.24	8.70	9.16
	Golf, Village of	0.57	0.60	0.64	0.67	0.71
	Highland Beach, Town of	2.27	2.41	2.55	2.69	2.83
	Jupiter, Town of	18.41	19.71	21.00	22.30	23.59
	Lake Worth Utilities, City of	5.27	5.59	5.92	6.25	6.57
	Lantana, Town of	1.96	2.08	2.21	2.33	2.45
	Manalapan, Town of	1.48	1.57	1.67	1.76	1.85
	Mangonia Park, Town of	0.35	0.37	0.40	0.42	0.44
	Maralago Cay	0.21	0.22	0.24	0.25	0.26
	Palm Beach County Water Utilities Department	65.47	69.53	73.60	77.67	81.73
	Palm Springs, Village of	4.44	4.71	4.99	5.26	5.54
	Riviera Beach, City of	7.32	7.78	8.23	8.69	9.14
	Seacoast Utility Authority	20.07	21.32	22.57	23.81	25.06
	Tequesta, Village of	3.70	3.98	4.27	4.55	4.83
	Wellington Public Utilities Department	7.47	7.93	8.39	8.86	9.32
	West Palm Beach Public Utilities, City of	30.99	32.91	34.83	36.76	38.68
	Palm Beach County PWS Total	**256.90**	**273.32**	**289.78**	**306.22**	**322.62**
	Palm Beach County DSS Total	**12.37**	**12.52**	**12.67**	**12.82**	**12.97**
	Palm Beach County Total	**269.27**	**285.84**	**302.45**	**319.04**	**335.59**
Broward	**Broward County PWS Utilities**					
	Broward County Water & Wastewater Services	23.10	23.72	24.34	24.96	25.58
	Cooper City Utility Department, City of	3.81	3.90	3.99	4.08	4.17
	Coral Springs, City of	7.66	7.85	8.03	8.22	8.40
	Coral Springs Improvement District	4.77	4.89	5.00	5.12	5.23
	Dania Beach, City of	2.66	2.73	2.79	2.85	2.92
	Davie, Town of	4.51	7.12	9.72	12.32	14.93
	Deerfield Beach, City of	11.12	11.39	11.65	11.92	12.19
	Fort Lauderdale, City of	49.49	50.66	51.84	53.01	54.18
	Hallandale Beach, City of	6.11	6.25	6.40	6.55	6.69
	Hillsboro Beach, Town of	0.84	0.86	0.88	0.90	0.92
	Hollywood, City of	26.42	27.25	28.08	28.92	29.75
	Lauderhill, City of	6.34	6.49	6.64	6.80	6.95

Table A-11. Continued.

County	PWS Utility or DSS	Gross (Raw) Water Demand Projections – 1-in-10 Year Drought Conditions (MGD)				
		2010	2015	2020	2025	2030
Broward (cont.)	Margate, City of	8.62	8.83	9.04	9.24	9.45
	Miramar, City of	13.72	14.22	14.72	15.22	15.72
	North Lauderdale, City of	2.86	2.93	3.00	3.07	3.14
	North Springs Improvement District	4.95	5.07	5.19	5.31	5.43
	Parkland Utilities, Inc.	0.28	0.28	0.29	0.30	0.30
	Pembroke Pines, City of	13.36	13.68	14.00	14.32	14.64
	Plantation, City of	15.57	16.06	16.55	17.04	17.53
	Pompano Beach, City of	16.02	16.40	16.79	17.17	17.56
	Royal Utility Company	0.41	0.42	0.43	0.44	0.45
	Seminole Tribe of Florida Utility	1.24	1.27	1.30	1.33	1.36
	Sunrise, City of	31.26	32.57	33.88	35.19	36.50
	Tamarac, City of	6.83	7.00	7.16	7.32	7.49
	Tindall Hammock Irrigation and Soil Conservation District	0.76	0.78	0.80	0.82	0.84
	Broward County PWS Total	**262.71**	**272.62**	**282.51**	**292.42**	**302.32**
	Broward County DSS Total	**0.63**	**0.77**	**0.91**	**1.05**	**1.18**
	Broward County Total	**263.34**	**273.439**	**283.42**	**293.47**	**303.50**
Miami-Dade	**Miami-Dade County PWS Utilities**					
	Americana Village	0.25	0.26	0.27	0.28	0.29
	Florida City Water and Sewer Department	1.93	2.02	2.11	2.20	2.28
	Homestead, City of	11.23	11.74	12.25	12.76	13.28
	Miami-Dade Water & Sewer Department	335.99	351.35	366.70	382.06	397.41
	North Miami, City of	14.44	15.10	15.76	16.42	17.08
	North Miami Beach, City of	24.57	25.92	27.28	27.66	29.99
	Miami-Dade County PWS Total	**388.41**	**406.39**	**424.37**	**441.38**	**460.33**
	Miami-Dade County DSS Total	**3.71**	**3.88**	**4.05**	**4.22**	**4.39**
	Miami-Dade County Total	**392.12**	**410.27**	**428.42**	**445.6**	**464.72**
Monroe	**Monroe County PWS Utility**					
	Florida Keys Aqueduct Authority	18.22	18.01	17.80	17.59	17.38
	Monroe County PWS Total	**18.22**	**18.01**	**17.80**	**17.59**	**17.38**
	Monroe County DSS Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Monroe County Total	**18.22**	**18.01**	**17.80**	**17.59**	**17.38**
Hendry	**Hendry County PWS Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	Hendry County DSS Total	**1.53**	**1.58**	**1.63**	**1.67**	**1.72**
	Hendry County Total	**1.53**	**1.58**	**1.63**	**1.67**	**1.72**
LEC Planning Area PWS Total		**926.24**	**970.34**	**1,014.46**	**1,057.61**	**1,102.65**
LEC Planning Area DSS Total		**18.24**	**18.75**	**19.26**	**19.76**	**20.26**
LEC Planning Area Total		**944.48**	**989.09**	**1,033.72**	**1,077.37**	**1,122.91**

AGRICULTURAL SELF-SUPPLY

Agriculture holds a unique place of importance to the in the LEC Planning Area, the state of Florida, and the United States' economy. It hosts the nation's "Winter Bread Basket" and "Salad Bowl" to the nation. In addition, the region's nursery/ornamental industry is the largest in the state and second largest in the country (DCFB 2012).

Modest expansion in overall agricultural acreage, along with a slight rise in water use, is expected in the LEC Planning Area between 2010 and 2030. However, some areas will likely show a decline in agricultural acreage by 2030. Agriculture acreage declines in Broward County and Palm Beach County's Coastal subbasin are expected primarily due to urbanization, while acreage under management increases in the Everglades Agricultural Area (EAA) are expected due to market forces and the slower pace of implementation for changes in land use for water management and restoration projects over the planning horizon. Little change in agricultural acreage and water use is expected in Miami-Dade County, while acreage and water use is expected to rise in Hendry County's western basins area, partially compensating for lands lost to urban development in the eastern portion of the LEC Planning Area since the 2005–2006 LEC Plan Update. Since the 2005–2006 LEC Plan Update, the agricultural area in the LEC Planning Area has experienced impacts from rapid urban development and housing price appreciation, a financial crisis and housing bubble burst, a recession (2008–2009) followed by a slow recovery, and construction activity remaining at low levels. Given the slowdown in the pace of urban development coupled with favorable relative prices for agricultural land, the projections assume a modest expansion in irrigated acres over the 2010 to 2030 period.

Agricultural water use includes water for irrigated, commercially grown crop categories, including 1) citrus, 2) other fruits and nuts, 3) vegetables, melons, and berries, 4) field crops – sugarcane, 5) sod, 6) greenhouse/nursery, 7) pasture and 8) miscellaneous. **Figure A-1** shows these categories with some examples of the major crop types. Due to the complexity of developing agricultural projections and uncertainty over the future recovery of citrus, two scenario ranges of acreage and water demand were used to estimate the agricultural projections for this update.

Projection Methodology

The land use information used to develop the demand estimates includes irrigated agricultural acreage by crop type and by county or subcounty area. The projections assume option lands originally purchased and contemplated for Everglades restoration projects will, where applicable, continue to be used for agricultural purposes in the absence of detailed project restoration plans and schedules.

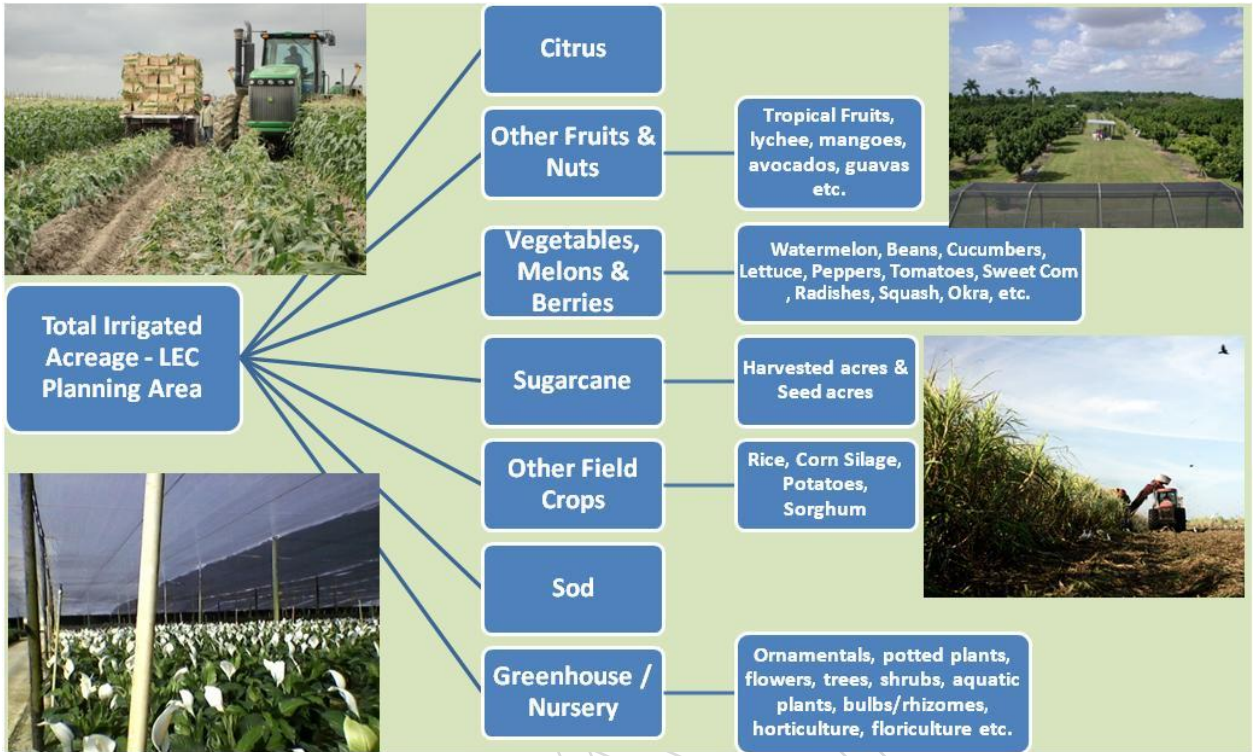

Figure A-1. Commercially grown crops in the LEC Planning Area

Agricultural projections were based on best available data at the time this update was developed. The SFWMD completed the development of AGR Self-Supply demand for the LEC Planning Area in coordination with staff from government agencies and agricultural stakeholders. The projections developed were directly dependent on estimates of existing and proposed irrigated acres.

The AGR Self-Supply demand assessment uses acreage estimates developed as part of the overall GIS land use analysis. To estimate the demand associated with the acreage for each crop, information from SFWMD water supply assessments and previous hydrologic modeling efforts were used to identify soil types, growing seasons, and irrigation system types and efficiencies. For areas partially within LEC Planning Area, land use maps and acreage tallies in specific regions were used to apportion total county crop acreages to areas within the EAA and western basins. Where appropriate, this was accomplished by assuming changes in acreage proportional to the most recently reported acreage ratios. Acreage ratios were developed with the use of SFWMD land use maps.

The projection method involved systematically examining trends in land use and crop type distributions since the 2005–2006 LEC Plan Update was developed (SFWMD 2006). The projections are first based on compiling historic agricultural census acres at five-year intervals (by county and crop type) and comparing these figures to longer-term irrigated acreage patterns compiled by the USGS. Current acreage from regulatory permitting databases and property tax parcels are then compared to fill in more recent years and reveal trends since the 2007 agricultural census. Numerous factors and variables were

considered that could potentially affect the future acreage projections. Among these factors were the following:

- County land use plans and future land use targets including comprehensive master development plans, official maps, stakeholder plans, and special area plans
- Regional specialization (i.e., subtropical climate and fruit orchards)
- Macro and micro economic conditions
- Supply, demand, and commodity price trends
- Consumption trends (tastes and preferences) and production patterns (yields per acre and imports)
- Crop special studies and future scenario outlooks from the University of Florida's Institute of Food and Agricultural Sciences (IFAS), including their Citrus Research and Education Center; United States Department of Agriculture (USDA); Florida Department of Agriculture and Consumer Services (FDACS); etc.
- Inputs from growers, cooperatives, and participants on market conditions and trends
- SFWMD land management and permitting including acquisitions and projects completed since the last plan update, areas targeted for land acquisition and current leasing arrangements, permitted acreage, and permit expirations
- Comparisons of comprehensive development plan acreage to projected acres

The agricultural demand assessment developed acreage estimates from the following data sets, information, and sources:

- USGS time series of irrigated acres by county by crop type
- County-level data and yearly commercial citrus inventories from the *2007 Census of Agriculture for Florida* was used or considered when available (USDA-NASS 2007)
- 2005–2006 LEC Plan Update (SFWMD 2006)
- The SFWMD Water Use Regulatory Database and permit expiration dates
- County land use appraiser/assessment files
- USDA Economic Research Service information, including market outlooks for select crops, agricultural projections to 2020, select yearbooks with historic information (i.e., vegetables and melons yearbook), and inputs and feedback from agricultural economists
- Local agricultural extension offices
- University of Florida's IFAS
- FDACS
- County agricultural economic development coordinators
- Florida Farm Bureau and other agricultural stakeholders

- Other special reports produced by research groups (i.e., Florida Citrus Commission, Florida Department of Corrections) and topical reports on agricultural land use and market trends.
- Commodity pride reports and trends (i.e., World Bank pink sheets)
- The SFWMD acreage estimates developed as part of GIS agricultural land use/crop type analysis (1999 and 2004)

A hierarchy of data preference was used for developing agricultural water use projections, starting with the *2007 Census of Agriculture for Florida* county-level data (USDA-NASS 2007). Census data at five-year intervals going back to 1997 reveals important trends by crop type for each county. Longer-term irrigated acreage data from the USGS, going back to 1985, was also referenced. Where census data was not consistently available for each crop in each county for every year, the 2007 census data was supplemented by other above named sources to fill in and provide informative links to post-census years and more recent trends. Comparisons to SFWMD permitted acreage and permit dates of expiration were also useful to compare acreage distributions for more recent years leading up to 2010. Recent year permit renewals by crop type were also useful to signal market preferences and growers' future expectations. Land use acreage data obtained from county appraiser and assessment files was also referenced for post-census years. The data and reports were also supplemented by field research where possible. For example, the LEC Planning Area agricultural projections subteam toured the Redland area of south Miami-Dade County and noted operations that did not survive the 2008–2009 recession, but would have been included in the 2007 census.

When data from the listed sources were insufficient for indicating trends and no empirical knowledge of future changes in a crop's acreage was available, the acreage for that crop category was projected to remain at its most recently reported. For citrus, a range of acreage projections was used because of the uncertainty over how fast recovery from disease losses will occur over the projection horizon.

AGR Self-Supply demand calculations for this update applied results from Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS), which uses data from the 1965–2000 timeframe. These same model results were also used in the 2005–2006 LEC Plan Update (SFWMD 2006).

AFSIRS calculates the net irrigation requirements for each crop category and irrigation system. As described in the *Recreational/Landscape Self-Supply* section of this appendix, the net irrigation requirement reflects an estimate of the amount of water, expressed in inches per year, that should be delivered to a plant's root zone to sustain yield. The gross irrigation requirement is the amount of water that must be withdrawn from the source in order to be delivered to the plant's root zone. It includes both the net irrigation requirement and the losses incurred irrigating the plant's root zone. Irrigation efficiency as a modeled factor refers to the average percent of total water applied that is delivered to the plant's root zone. This relationship is expressed as follows:

Gross Irrigation Requirement = Net Irrigation Requirement/Irrigation Efficiency

AFSIRS calculates irrigation requirements for an average rainfall year and an 1-in-10 year drought conditions. Historical weather data from rainfall stations that most accurately represent the average rainfall and 1-in-10 year drought conditions for each crop and county combination are used to calculate the irrigation requirements.

Projections of gross irrigation demand are based on an assumed or estimated irrigation system type. The effect of the corresponding irrigation efficiency is based on the interpretation of current ratios and trends. There are three basic types of irrigation systems currently used in south Florida crop production: 1) seepage crown flood, 2) sprinklers, and 3) low volume microirrigation. A weighted irrigation efficiency is calculated for each crop type category based on percent use by acres of the three different irrigation systems, as reported in the SFWMD Water Use Regulatory Database (**Table A-12**).

Table A-12. Estimated irrigation efficiency for each type of irrigation system.

Irrigation Category	Irrigation Efficiency
Low volume microirrigation	0.85
Seepage crown flood	0.50
Sprinkler	0.75

Available water capacity and depth of soil directly affect the effectiveness of rainfall infiltration, which is considered by AFSIRS. Another factor AFSIRS considers explicitly is different types of farm irrigation management strategies, which is combined with soil properties by region and crop type for this analysis. The default AFSIRS soil database includes a generic sandy soil. While the soils vary across the region, sandy soil parameters are used as a simplifying and conservative assumption, and are considered reasonable for planning purposes. The assumption is conservative because it results in higher estimated irrigation requirements in comparison with other soil types, which generally can hold more water.

Example of Water Demand Calculations

A detailed example of water demand calculation procedures is presented in this section. First, the acreage of each crop in each county within the LEC Planning Area was determined. Next, the area-weighted irrigation efficiency for the crop type in a particular county was calculated from irrigation system information contained in the SFWMD Water Use Regulatory Database. **Table A-12** above lists the estimated irrigation efficiency for each of the three categories of irrigation system.

Water use permit data categorized as citrus in a given county show that 23 percent of permittees use low volume irrigation systems, 67 percent use sprinkler systems, and 9 percent use seepage systems. Using the permit data, the area-weighted irrigation efficiency is as follows:

IRR_EFF = (0.23 x 0.85) + (0.67 x 0.75) + (0.09 x 0.50) / (0.23 + 0.67 + 0.09) = 75 percent

Of the water withdrawn (gross demand) for citrus irrigation in the given county, 75 percent is available to the crop. Losses occur due to evaporation, drainage, and line system leakage.

Assuming 90 percent use low volume irrigation systems and 10 percent use seepage systems, the area-weighted irrigation efficiency based on this data is as follows:

IRR_EFF = (0.9 x 0.85) + (0.1 x 0.5) = 81.5 percent

Based on this data, 81.5 percent of the water withdrawn (gross demand) from a surface water or groundwater source is available to the crop.

AFSIRS runs were completed for both the 2005–2006 LEC Plan Update (SFWMD 2006) and this plan update. The AFSIRS output is given as the net irrigation requirement in inches per year, which is the amount of water the crop needs in addition to rainfall. The input to the model is daily rainfall and ET rates in inches. The model results for the 2005–2006 LEC Plan Update used input data for the period from 1965 through 2000. Based on the rainfall and ET data and calculated irrigation requirements, the AFSIRS outputs include irrigation requirements for an average rainfall and 1-in-10 year drought conditions. Fifty percent of the calculated yearly irrigation requirement rates are lower than the average irrigation requirement. Ninety percent of the calculated yearly irrigation requirements are lower than the 1-in-10 year drought conditions irrigation requirement.

Continuing with the county citrus crop example, the average rainfall and 1-in-10 year drought conditions net irrigation requirements calculated by AFSIRS are 10.82 inches per year and 16.01 inches per year, respectively. The AFSIRS average irrigation requirement and 40,000 acres are used to estimate the gross irrigation demand for an average rainfall year for citrus in the county as follows:

Gross Irrigation Requirement (MGD) = Net Irrigation Requirement (MGD)/ Irrigation Efficiency

$$\textbf{Gross Irrigation Requirement (MGD)} = \frac{10.82\ in/yr \times 40{,}000\ acres \times \left[1\ yr/365\ days\right] \times \left[1ft/12\ in\right] \times \left[43{,}560\ ft^2/acre\right] \times \left[7.4805\ gal/ft^3\right]}{0.815} \times 10^{-6} \approx 40\ \text{MGD}^1$$

Projection Results

Citrus

In the LEC Planning Area, most of the citrus acreage is located in Palm Beach County's Coastal subbasin and Hendry County's western basins. Citrus acreage data were gathered from the *2007 Census of Agriculture for Florida* (USDA-NASS 2007). These data focus on citrus production and not on young groves not yet in production, inactive groves, or abandoned groves. **Table A-13** presents the acreage projections for the high growth scenario (adopted in this plan under conservative water supply planning principles), the

[1] Key for equation: ft/in – feet per inch; ft^2/acre – square feet per acre; gal/ft^3 – gallons per cubic foot; in/yr – inches per year; yr – year

projected net irrigation demand under average rainfall and 1-in-10 year drought conditions, and the projected gross irrigation demand (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions. Because of the uncertainty of citrus recovery from greening and canker, two projection scenarios (high and low growth rates) were developed (**Figure A-2**). The scenarios were based on research communicated at a citrus industry research symposium.[2] The high acreage projections assume that over the short term, the trend in productive acreage losses will continue. However, restoration of active bearing and nonbearing productive acreage is assumed to occur between 2015 and 2020 and rise throughout the projection period. Acreage in Palm Beach County's Coastal subbasin is expected to decline significantly, primarily due to competition from urban land uses. No significant increase or decrease in acreage is projected for the other subbasins. Water use in the planning area will decline along with the change in acreage.

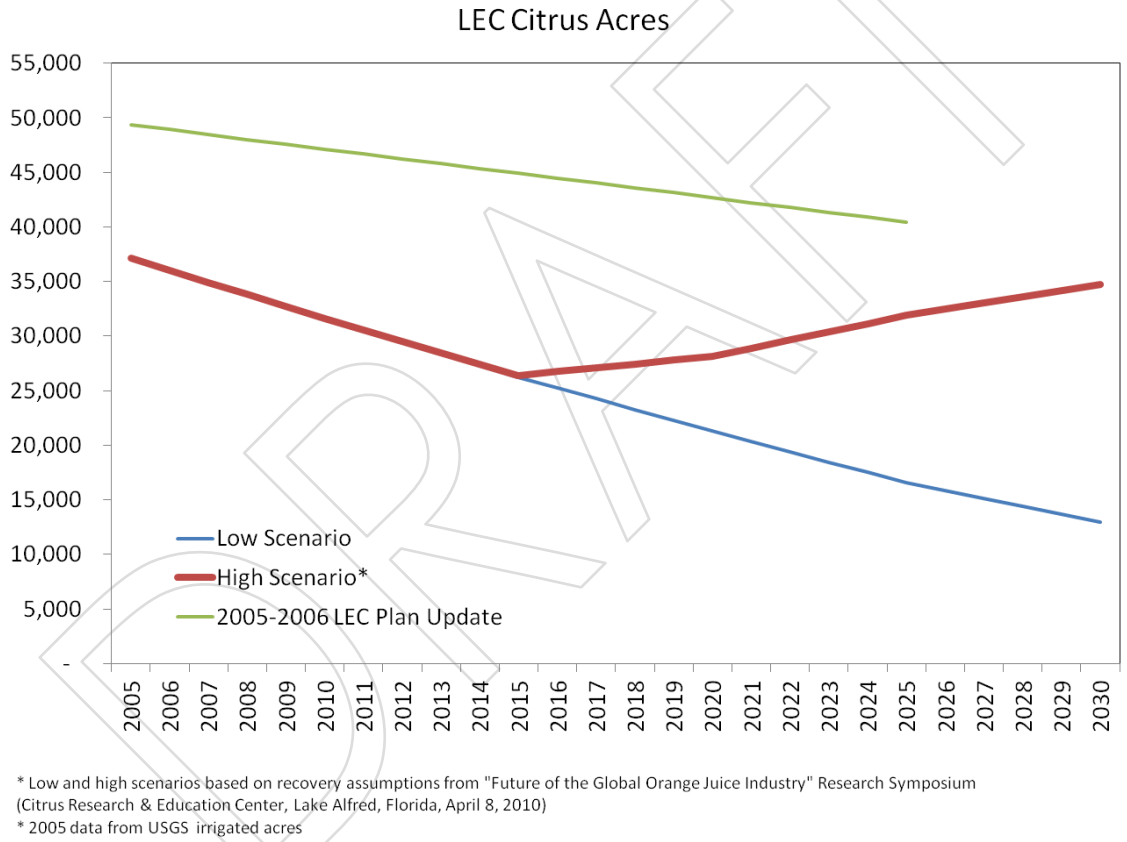

Figure A-2. Citrus acreage within the LEC Planning Area using low and high projection scenarios as well as citrus acreage projected in the 2005–2006 LEC Plan Update.

[2] Future of the Global Orange Juice Industry – Citrus Research and Education Center, Lake Afred, Florida, April 8, 2010.

Table A-13. Gross irrigation requirements for citrus crop acreage in the LEC Planning Area.

Rainfall Year	Water to Sustain Crops (Net Irrigation Requirement; annual inches based on rainfall)	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
		2010	2015	2020	2025	2030
Palm Beach County – Coastal						
	Irrigated Acreage	2,464 acres	2,058 acres	2,193 acres	2,485 acres	2,704 acres
	Net Demand	**Gross Demand (MGD)**				
Average	9.9 inches	3.00	2.10	1.90	1.80	2.00
1-in-10 year drought	15.4 inches	4.47	3.28	3.03	3.02	3.29
Palm Beach County – EAA						
	Irrigated Acreage	10 acres	8 acres	9 acres	10 acres	11 acres
	Net Demand	**Gross Demand (MGD)**				
Average	8.9 inches	0.01	0.01	0.01	0.01	0.01
1-in-10 year drought	16.3 inches	0.02	0.02	0.02	0.02	0.03
Miami-Dade County						
	Irrigated Acreage	717 acres	599 acres	639 acres	724 acres	788 acres
	Net Demand	**Gross Demand (MGD)**				
Average	11.7 inches	0.79	0.64	0.66	0.72	0.79
1-in-10 year drought	17.9 inches	1.21	0.98	1.02	1.12	1.21
Hendry County – Western Basins						
	Irrigated Acreage	28,437 acres	23,745 acres	25,312 acres	28,678 acres	31,202 acres
	Net Demand	**Gross Demand (MGD)**				
Average	15.5 inches	43.70	35.10	35.60	38.90	42.30
1-in-10 year drought	20.8 inches	64.60	53.90	57.50	65.20	70.90
LEC Planning Area Totals						
	Total Irrigated Acreage	31,628 acres	26,410 acres	28,153 acres	31,897 acres	34,705 acres
		Gross Demand (MGD)				
Total average rainfall year		**47.5**	**37.9**	**38.2**	**41.4**	**45.1**
Total 1-in-10 year drought		**70.3**	**58.2**	**61.6**	**69.4**	**75.4**

Other Fruits and Nuts

The major crops in this category are avocados, guavas, mangos, and lychee. Total acreage of other fruits and nuts in the LEC Planning Area is concentrated in Miami-Dade County. A large variety of tropical and exotic fruits are grown in the Redland area of south Miami-Dade County. The humid subtropical climate allows for the growing of exotic tropical and subtropical fruits such as mangos, carambola, longans, mamey sapote, sapodilla, jackfruit, and passion fruit. In fact, Miami-Dade County leads the state in the production of avocados.

These crops are expected to be sustained near current levels given strong consumer demand and favorable farm economics and relative prices. Only a slight decline in acreage is expected, and this will be mostly due to urbanization pressures over the medium term. Given the popularity of these crops particularly among South Florida's diverse group of residents and tourists, and favorable trends in unit consumption demand, the projections assume that total acreage will only decline marginally from 2010 levels by 2030. Consumer demand continues to be strong for avocados, although imports are rising to meet national demand. Basically, these crops are expected to be sustained near current levels given strong consumer demand and favorable farm economics and relative prices. Only a slight decline in acreage is expected, and this will be mostly due to urbanization pressures over the medium term. Water use is also expected to decline only slightly from 2010 levels given the importance of these unique crops to the economy over the planning horizon. **Table A-14** presents the acreage projections, the projected net irrigation demand under average rainfall and 1-in-10 year drought conditions, and the projected gross irrigation demand (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Table A-14. Gross irrigation requirements for other fruits and nuts acreage in the LEC Planning Area.

Rainfall Year	Water to Sustain Crops (Net Irrigation Requirement; annual inches based on rainfall)	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
		2010	2015	2020	2025	2030
Palm Beach County – Coastal						
	Irrigated Acreage	102 acres	130 acres	128 acres	126 acres	124 acres
	Net Demand	**Gross Demand (MGD)**				
Average	9.4 inches	0.09	0.12	0.12	0.12	0.11
1-in-10 year drought	15.0 inches	0.15	0.19	0.19	0.18	0.18
Palm Beach County – EAA						
	Irrigated Acreage	91 acres	117 acres	115 acres	114 acres	111 acres
	Net Demand	**Gross Demand (MGD)**				
Average	8.9 inches	0.12	0.15	0.15	0.15	0.15
1-in-10 year drought	16.3 inches	0.22	0.28	0.28	0.28	0.27
Broward County						
	Irrigated Acreage	80 acres	80 acres	80 acres	80 acres	80 acres
	Net Demand	**Gross Demand (MGD)**				
Average	9.8 inches	0.06	0.06	0.06	0.06	0.06
1-in-10 year drought	16.6 inches	0.10	0.10	0.10	0.10	0.10
Miami-Dade County						
	Irrigated Acreage	8,000 acres	7,965 acres	7,930 acres	7,895 acres	7,850 acres
	Net Demand	**Gross Demand (MGD)**				
Average	12.2 inches	9.68	9.64	9.60	9.55	9.50
1-in-10 year drought	18.3 inches	14.52	14.46	14.39	14.33	14.25
Hendry County – Western Basins						
	Irrigated Acreage	29 acres	29 acres	29 acres	29 acres	29 acres
	Net Demand	**Gross Demand (MGD)**				
Average	15.5 inches	0.04	0.04	0.04	0.04	0.04
1-in-10 year drought	20.8 inches	0.06	0.06	0.05	0.05	0.05
LEC Planning Area Totals						
	Total Irrigated Acreage	8,302 acres	8,321 acres	8,282 acres	8,244 acres	8,194 acres
		Gross Demand (MGD)				
Total average rainfall year		**9.99**	**10.01**	**9.97**	**9.92**	**9.86**
Total 1-in-10 year drought		**15.05**	**15.09**	**15.01**	**14.94**	**14.85**

Vegetables, Melons, and Berries

The agricultural regions comprising the LEC Planning Area are some of the most important winter producers of vegetables in the country. The favorable micro climate allows for multiple and varied crop rotational harvests on prime lands in close proximity to urban markets enabling producers to supply consumers throughout the year. It is estimated that over 90 percent of Miami-Dade County's vegetables are exported out of Florida. In addition, south Florida hospitality and restaurant industries are heavily dependent on vegetable crops produced in the LEC Planning Area.

The chief crops in this category include snap beans, tomatoes, cucumbers, lettuce, peppers, squash, radishes, sweet corn, and tropical vegetables. Vegetable acreage in the LEC Planning Area is concentrated in Palm Beach County, south Miami-Dade County (Redland area), and Hendry County's western basins. Given favorable market conditions and future market outlooks, vegetable acreage throughout the projection period is expected to be sustained at near current levels in Palm Beach and Miami-Dade counties and to increase in Hendry County. Despite the competitive pressure from imports, the lack of urbanization pressure over the near term is favorable to producers seeking to increase production and take advantage of market windows of opportunity. In southern Miami Dade County, SFWMD operational management of the water table facilitates the ability of producers to sow fields at key times to get crops planted enabling harvests to meet seasonal demand. Changes in water use parallel the changes in acreage.

Vegetable acreage projections were requested from agricultural stakeholders and agencies, including University of Florida's IFAS, the FDACS, and the Florida Farm Bureau. Gathered information indicated that vegetable acreage could be negatively impacted due to potential volatility and by competition from imports.

In Palm Beach County, flood irrigation is the primary irrigation type used for small vegetables. Based on the estimated usage of each type of irrigation system shown in water use permits, the irrigation efficiency was assumed to be 50 percent for these kinds of crops. In Miami-Dade County, vegetables are often irrigated with volume or traveling/overhead guns and sprinklers, and drip systems are also used. These systems have higher application efficiencies compared to flood or seepage methods and were represented by a weighted average efficiency factor of 73 percent in the demand projections.

Table A-15 presents the acreage projections, the projected net irrigation demand under average rainfall and 1-in-10 year drought conditions, and the projected gross irrigation demand (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Table A-15. Gross irrigation requirements for vegetables, melons, and berries acreage in the LEC Planning Area.

Rainfall Year	Water to Sustain Crops (Net Irrigation Requirement; annual inches based on rainfall)	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
		2010	2015	2020	2025	2030
Palm Beach County – Coastal						
	Irrigated Acreage	41,580 acres	41,333 acres	41,085 acres	40,838 acres	40,590 acres
	Net Demand	**Gross Demand (MGD)**				
Average	8.9 inches	36.7	36.5	36.3	36.0	35.8
1-in-10 year drought	13.1 inches	54.0	53.7	53.4	53.1	52.7
Palm Beach County – EAA						
	Irrigated Acreage	420 acres	417 acres	415 acres	412 acres	410 acres
	Net Demand	**Gross Demand (MGD)**				
Average	12.0 inches	0.7	0.7	0.7	0.7	0.7
1-in-10 year drought	16.9 inches	1.1	1.0	1.0	1.0	1.0
Broward County						
	Irrigated Acreage	819 acres	811 acres	801 acres	801 acres	801 acres
	Net Demand	**Gross Demand (MGD)**				
Average	9.3 inches	0.8	0.7	0.7	0.7	0.7
1-in-10 year drought	13.6 inches	1.1	1.1	1.1	1.1	1.1
Miami-Dade County						
	Irrigated Acreage	28,000 acres	27,750 acres	27,500 acres	27,250 acres	27,000 acres
	Net Demand	**Gross Demand (MGD)**				
Average	11.3 inches	32.2	32.0	31.7	31.4	31.1
1-in-10 year drought	15.2 inches	43.4	43.0	42.6	42.2	41.8
Hendry County – EAA						
	Irrigated Acreage	7,542 acres	7,768 acres	7,995 acres	8,221 acres	8,447 acres
	Net Demand	**Gross Demand (MGD)**				
Average	16.1 inches	18.1	18.6	19.1	19.7	20.2
1-in-10 year drought	20.3 inches	22.8	23.5	24.1	24.8	25.5
Hendry County – Western Basins						
	Irrigated Acreage	4,169 acres	4,294 acres	4,419 acres	4,544 acres	4,670 acres
	Net Demand	**Gross Demand (MGD)**				
Average	16.1 inches	10.0	10.3	10.6	10.9	11.2
1-in-10 year drought	20.3 inches	12.6	13.0	13.3	13.7	14.1
LEC Planning Area Totals						
	Total Irrigated Acreage	82,530 acres	82,373 acres	82,215 acres	82,066 acres	81,918 acres
		Gross Demand (MGD)				
Total average rainfall year		**98.5**	**98.8**	**99.1**	**99.4**	**99.7**
Total 1-in-10 year drought		**135.0**	**135.3**	**135.5**	**135.9**	**136.2**

Field Crops – Sugarcane

Sugarcane is the principal field crop grown within the LEC Planning Area. Because of its dominance in terms of acreage, sugarcane is discussed separately from "other field crops." For background perspective, **Figure A-3** shows the percentage distribution of agricultural acres by crop type category within the LEC Planning Area.

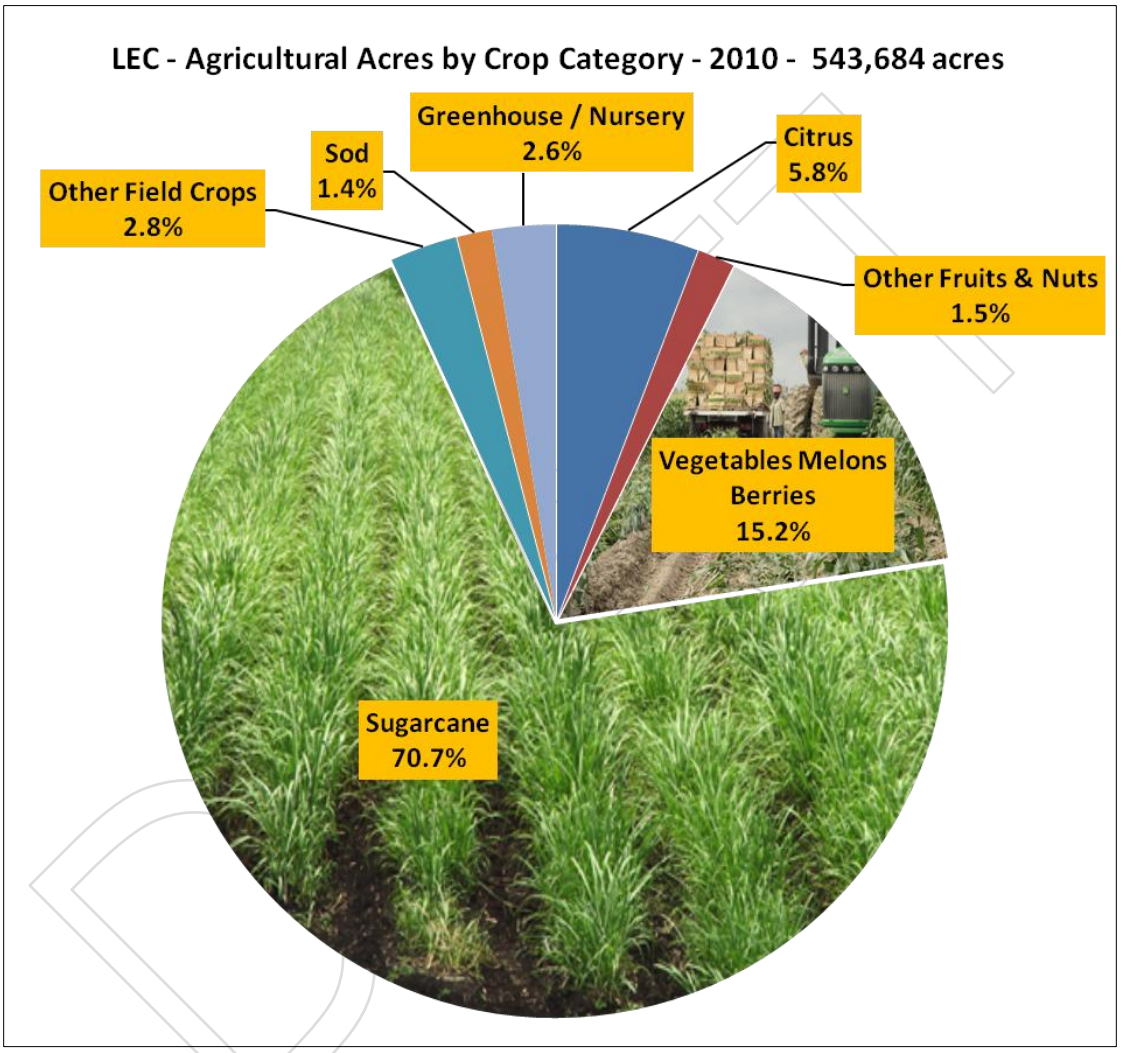

Figure A-3. Percentage distribution of agricultural acres by crop type within the LEC Planning Area.

In the 2005–2006 LEC Plan Update, historical sugarcane acreage data were gathered from annual volumes of the Florida Agricultural Statistics Service *Field Crops Summary*. For this update, a historical time series of irrigated sugarcane acreage by county was obtained from the USGS from 1985 to 2005. This time series was then compared to a time series of United States Department of Agriculture - National Agriculture Statistic Service (USDA-NASS) sugarcane harvested acres from 1985 to 2009. These two data sources were then compared to the most recent acres (2011) obtained from the SFWMD Water Use Regulatory Database and acreage coverage from current county land use maps. The projections assume that SFWMD option lands will continue to be leased for cultivation over the 20-year planning

horizon in the absence of more defined project implementation plans and schedules. Both the 2010 estimated acres and projections took into account acres necessary for rotational purposes and propagation of seed in addition to harvested acres. The permitted acreage dedicated to sugarcane is expected to increase over the next 20 years.

Over the near term, sugar production is expected to rebound from past cold weather events. Rising United States sugarcane consumption is increasingly being satisfied by imports, and domestic production is expected to be stable. **Figure A-4** shows sugarcane production and yield history for Palm Beach County.

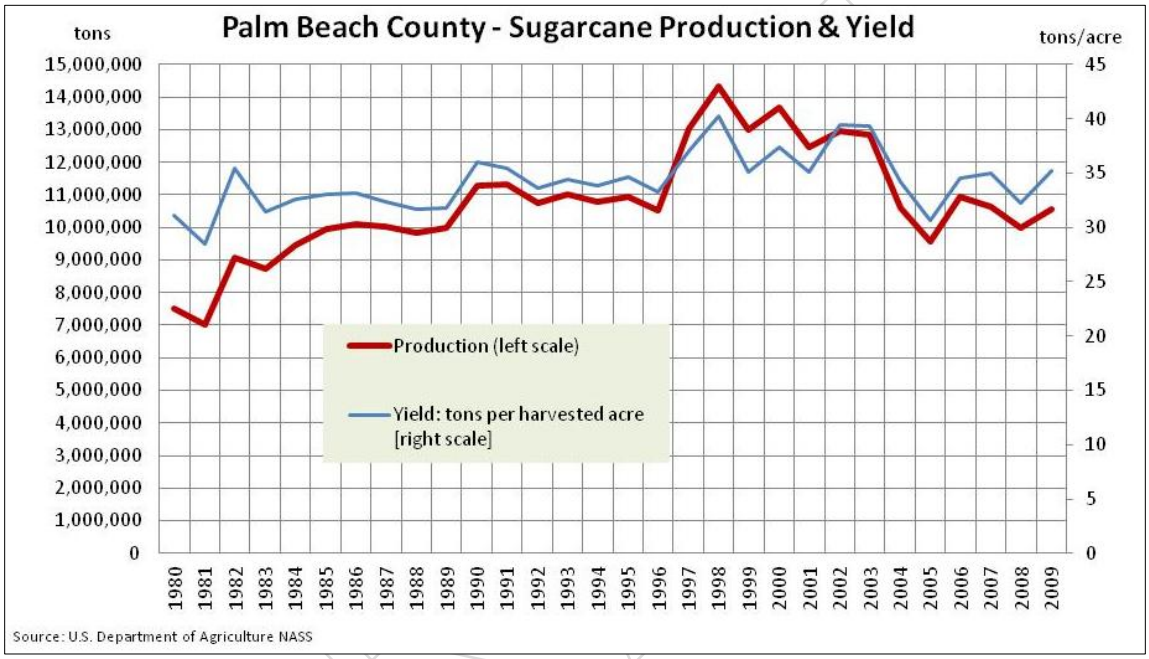

Figure A-4. Sugarcane production and yield history for Palm Beach County.

Sugarcane is initially propagated by planting stalk cuttings and four harvests can be obtained from a planting. The first harvest takes place approximately 13 months after planting and then three ratoons (shoots from the root of the plant after it has been cropped) provide the harvest during the next three years. Sugar production per unit of land surface declines gradually with each harvest. In approximately four years, the increased yields associated with replanting outweigh the lower costs of obtaining the crop from ratoons. Because land may lie fallow for several months between crop rotation cycles, approximately 20 percent of the land associated with sugarcane production will not be harvested in any given year. Additionally, about 1 in 10 acres of sugarcane is grown for seed production.

The largest percentage of sugarcane acreage in south Florida is grown in the muck soils of the EAA within Palm Beach and Hendry counties. In addition, significant acreage occurs on the "sand lands" in Hendry and Glades counties, primarily in the LEC Planning Area.

Flood and seepage irrigation is the predominant irrigation system for sugarcane. Therefore, the irrigation efficiency coefficient applied for this crop in AFSIRS was reported as 50 percent. Water use per acre within each basin also remains the same through the 20-year

planning horizon; therefore, water use parallels the change in acreage. **Table A-16** presents the acreage projections, projected net irrigation demand under average rainfall and 1-in-10 year drought conditions, and projected gross irrigation demand (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Table A-16. Gross irrigation requirements for sugarcane acreage in the LEC Planning Area.

Rainfall Year	Water to Sustain Crops (Net Irrigation Requirement; annual inches based on rainfall)	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
		2010	2015	2020	2025	2030
Palm Beach County – Coastal						
	Irrigated Acreage	4,140 acres	3,000 acres	2,500 acres	1,900 acres	1,900 acres
	Net Demand	**Gross Demand (MGD)**				
Average	6.0 inches	1.8	1.3	1.1	0.8	0.8
1-in-10 year drought	15.4 inches	4.7	3.4	2.9	2.2	2.2
Palm Beach County – EAA						
	Irrigated Acreage	340,860 acres	352,000 acres	362,500 acres	373,100 acres	383,100 acres
	Net Demand	**Gross Demand (MGD)**				
Average	6.0 inches	304.3	314.2	323.6	333.0	342.0
1-in-10 year drought	15.4 inches	780.9	806.4	830.5	854.8	877.7
Hendry County – EAA						
	Irrigated Acreage	20,813 acres	22,263 acres	23,714 acres	25,164 acres	26,615 acres
	Net Demand	**Gross Demand (MGD)**				
Average	6.0 inches	18.6	19.9	21.2	22.5	23.8
1-in-10 year drought	15.4 inches	47.7	51.0	54.3	57.7	61.0
Hendry County – Western Basins						
	Irrigated Acreage	18,287 acres	19,562 acres	20,836 acres	22,111 acres	23,385 acres
	Net Demand	**Gross Demand (MGD)**				
Average	16.2 inches	44.1	47.1	50.2	53.3	56.4
1-in-10 year drought	21.9 inches	59.6	63.7	67.9	72.0	76.2
LEC Planning Area Totals						
	Total Irrigated Acreage	384,100 acres	396,825 acres	409,550 acres	422,275 acres	435,000 acres
		Gross Demand (MGD)				
Total average rainfall year		**368.8**	**382.5**	**396.1**	**409.6**	**423.0**
Total 1-in-10 year drought		**892.9**	**924.5**	**955.6**	**986.7**	**1,017.1**

Field Crops – Other

Other field crops in the LEC Planning Area include primarily rice, potatoes, and tropical field crops. Acreage and water use are projected to rise slightly through 2030. **Table A-17** presents the acreage projections, the projected net irrigation demand under average rainfall and 1-in-10 year drought conditions, and the projected gross irrigation demand (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Table A-17. Gross irrigation requirements for other field crop acreage in the LEC Planning Area.

Rainfall Year	Water to Sustain Crops (Net Irrigation Requirement; annual inches based on rainfall)	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
		2010	2015	2020	2025	2030
Palm Beach County – EAA						
Irrigated Acreage		13,000 acres	14,000 acres	15,000 acres	16,000 acres	17,000 acres
	Net Demand	**Gross Demand (MGD)**				
Average	13.6 inches	26.3	28.3	30.3	32.4	34.4
1-in-10 year drought	19.5 inches	37.7	40.6	43.5	46.4	49.3
Broward County						
Irrigated Acreage		40 acres	40 acres	40 acres	40 acres	40 acres
	Net Demand	**Gross Demand (MGD)**				
Average	7.0 inches	0.0	0.0	0.0	0.0	0.0
1-in-10 year drought	12.4 inches	0.0	0.0	0.0	0.0	0.0
Miami-Dade County						
Irrigated Acreage		1,974 acres	2,142 acres	2,196 acres	2,196 acres	2,196 acres
	Net Demand	**Gross Demand (MGD)**				
Average	8.8 inches	1.7	1.9	1.9	1.9	1.9
1-in-10 year drought	14.0 inches	2.7	3.0	3.0	3.0	3.0
Hendry County – Western Basins						
Irrigated Acreage		65 acres	71 acres	73 acres	73 acres	73 acres
	Net Demand	**Gross Demand (MGD)**				
Average	18.4 inches	0.2	0.2	0.2	0.2	0.2
1-in-10 year drought	23.3 inches	0.2	0.2	0.3	0.2	0.3
LEC Planning Area Totals						
Total Irrigated Acreage		15,079 acres	16,253 acres	17,309 acres	18,309 acres	19,309 acres
		Gross Demand (MGD)				
Total average rainfall year		**28.2**	**30.4**	**32.4**	**34.5**	**36.5**
Total 1-in-10 year drought		**40.6**	**43.8**	**46.8**	**49.6**	**52.6**

Sod Production

Sod projections presented in this appendix refer to irrigated sod. Some sod may be harvested from pastureland, which is not irrigated. Pasture supporting cow-calf operations is typically not irrigated because it is not economical. Some pasture in the coastal areas may include horse farms, ranchettes, etc., which may be irrigated and may have been included with sod production.

For this update, 2005 and 2010 sod acreages were estimated based on data contained in the SFWMD Water Use Regulatory Database and historic acreage trends obtained from the USGS were also compared to building permit time series. Reports from growers indicate that sod production was hit hard by the 2008–2009 recession. Current acreage is down considerably from prerecession levels, and the demand from golf courses and urban landscaping remains depressed. Lead times necessary to prepare land for sod production in response to customer demand have increased. The projections assume that sod acreage will continue to fall over the near-term planning period (through 2015), but eventually recover as the economy grows and urban development resumes a more rapid pace (between 2015 and 2020).

Because the population in the LEC Planning Area is expected to grow, sod demand is expected to rebound from low levels as community development resumes. Sod irrigation is provided by several methods, including low volume, sprinkler, and flood irrigation. Based on the irrigation systems indicated in water use permits, the average irrigation efficiency for sod was calculated to be 50 percent in the EAA within Palm Beach County, 75 percent in Broward County, and 50 percent in Hendry County's western basins.

Growth in sod production and associated water use is expected to decline in coastal Broward County and remain fairly constant in the EAA and Hendry County's western basins, which are the other basins with significant sod production. Irrigation requirements are similar to those for REC Self-Supply uses and, on a per acre basis, do not change over the projection period. **Table A-18** presents the acreage projections, the projected net irrigation demand under average rainfall and 1-in-10 year drought conditions, and the projected gross irrigation demand (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Table A-18. Gross irrigation requirements for sod acreage in the LEC Planning Area.

Rainfall Year	Water to Sustain Crops (Net Irrigation Requirement; annual inches based on rainfall)	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
		2010	2015	2020	2025	2030
Palm Beach County – Coastal						
	Irrigated Acreage	1,953 acres	1,841 acres	2,158 acres	2,474 acres	2,790 acres
	Net Demand	**Gross Demand (MGD)**				
Average	17.2 inches	2.5	2.4	2.8	3.2	3.6
1-in-10 year drought	21.8 inches	3.2	3.0	3.5	4.0	4.5
Palm Beach County – EAA						
	Irrigated Acreage	5,047 acres	4,759 acres	5,576 acres	6,393 acres	7,210 acres
	Net Demand	**Gross Demand (MGD)**				
Average	10.5 inches	7.9	7.4	8.7	10.0	11.3
1-in-10 year drought	18.1 inches	13.6	12.8	15.0	17.2	19.4
Broward County						
	Irrigated Acreage	9 acres	9 acres	9 acres	9 acres	9 acres
	Net Demand	**Gross Demand (MGD)**				
Average	17.7 inches	0.02	0.02	0.02	0.02	0.02
1-in-10 year drought	23.1 inches	0.02	0.02	0.02	0.02	0.02
Miami-Dade County						
	Irrigated Acreage	114 acres	91 acres	110 acres	115 acres	120 acres
	Net Demand	**Gross Demand (MGD)**				
Average	20.2 inches	0.2	0.1	0.2	0.2	0.2
1-in-10 year drought	24.5 inches	0.2	0.2	0.2	0.2	0.2
Hendry County – Western Basins						
	Irrigated Acreage	652 acres	652 acres	652 acres	652 acres	652 acres
	Net Demand	**Gross Demand (MGD)**				
Average	20.5 inches	2.0	2.0	2.0	2.0	2.0
1-in-10 year drought	26.4 inches	2.6	2.6	2.6	2.6	2.6
LEC Planning Area Totals						
	Total Irrigated Acreage	7,775 acres	7,352 acres	8,505 acres	9,643 acres	10,781 acres
		Gross Demand (MGD)				
Total average rainfall year		**12.6**	**11.9**	**13.7**	**15.4**	**17.1**
Total 1-in-10 year drought		**19.6**	**18.6**	**21.3**	**24.0**	**26.7**

Greenhouse / Nursery

This category includes a wide variety of nursery, ornamental, and horticulture/floriculture operations. Crops in this category include palm trees and shrubs grown in the ground, container nurseries producing woody and herbaceous ornamentals in open fields, and greenhouse and shade house nurseries producing foliage plants, orchids, bromeliads, and woody ornamentals for interior spaces. Crops grown in greenhouses may also include vegetables, herbs, fruits, berries, garden plants for sale, cut flowers, and caladium bulbs/rhizomes. The same crops may be grown in the open in a nursery setting where the plants are the product for sale. Sales of these products also fluctuate with economic cycles and conditions tied to the housing market (community development) and urban landscapes, both within and outside of south Florida.

For this update, information from the SFWMD Water Use Regulatory Database, the *2007 Census of Agriculture for Florida* county data (USDA–NASS 2007), USGS historic acreage, and county assessor's office land use data was used to estimate 2010 greenhouse/nursery acreage and project future acreage. The historic data was also compared to economic indicators to assess how the recession impacted greenhouse/nursery acres. The recession took a severe toll on this market segment. Producers in the LEC Planning Area region have adapted to market conditions by carefully controlling costs and by offering value added products and amenities to consumers.

Over the near-term period, the projections are based on assuming a bottoming out in irrigated acres followed by an expansion as the economy recovers over the medium-term horizon. The "U" pattern of projected acres is based on assuming an eventual recovery in the housing market and community developments boosting demand for landscaping and greenhouse/nursery products. Based on the data received, the projected 2010 acreage was assumed to fluctuate with economic cycles throughout the 20-year planning horizon. Greenhouse/nursery irrigation is generally provided by low volume methods. The average irrigation efficiency for this crop category was calculated to be 72 percent in Miami-Dade County, 50 percent in Palm Beach County, 40 percent in Broward County, and 34 percent in Hendry County's western basins.

Estimated greenhouse/nursery acreage and irrigation requirements in the LEC Planning Area are expected to initially decline until the expansion gains more momentum, and then to recover to higher levels later in the projection period (between 2015 and 2020). especially in Palm Beach and Broward counties and remain fairly constant in Miami-Dade County. **Table A-19** presents the acreage projections, the projected net irrigation demand under average rainfall and 1-in-10 year drought conditions, and the projected gross irrigation demand (water withdrawal demand) under average rainfall and 1-in-10 year drought conditions.

Table A-19. Gross irrigation requirements for greenhouse/nursery acreage in the LEC Planning Area.

Rainfall Year	Water to Sustain Crops (Net Irrigation Requirement; annual inches based on rainfall)	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
		2010	2015	2020	2025	2030
Palm Beach County – Coastal						
	Irrigated Acreage	3,798 acres	3,545 acres	3,911 acres	4,277 acres	4,642 acres
	Net Demand	**Gross Demand (MGD)**				
Average	21.2 inches	12.0	11.2	12.3	13.5	14.6
1-in-10 year drought	25.1 inches	14.2	13.3	14.6	16.0	14.6
Palm Beach County – EAA						
	Irrigated Acreage	702 acres	655 acres	723 acres	790 acres	858 acres
	Net Demand	**Gross Demand (MGD)**				
Average	10.5 inches	1.1	1.0	1.1	1.2	1.3
1-in-10 year drought	18.1 inches	1.9	1.8	1.9	2.1	2.3
Broward County						
	Irrigated Acreage	250 acres	172 acres	231 acres	291 acres	350 acres
	Net Demand	**Gross Demand (MGD)**				
Average	22.7 inches	1.1	0.7	1.0	1.2	1.5
1-in-10 year drought	26.4 inches	1.2	0.8	1.1	1.4	1.7
Miami-Dade County						
	Irrigated Acreage	9,000 acres	8,063 acres	8,375 acres	8,688 acres	9,000 acres
	Net Demand	**Gross Demand (MGD)**				
Average	23.3 inches	21.6	19.4	20.1	20.9	21.6
1-in-10 year drought	26.4 inches	24.5	22.0	22.8	23.7	24.5
Hendry County – Western Basins						
	Irrigated Acreage	500 acres	400 acres	600 acres	700 acres	800 acres
	Net Demand	**Gross Demand (MGD)**				
Average	22.7 inches	2.48	1.99	2.98	3.48	3.97
1-in-10 year drought	27.3 inches	3.0	2.4	3.6	4.2	4.8
Monroe County						
	Irrigated Acreage	20 acres	20 acres	20 acres	20 acres	20 acres
	Net Demand	**Gross Demand (MGD)**				
Average	23.3 inches	0.1	0.1	0.1	0.1	0.1
1-in-10 year drought	26.4 inches	0.1	0.1	0.1	0.1	0.1
LEC Planning Area Totals						
	Total Irrigated Acreage	14,270 acres	12,855 acres	13,860 acres	14,766 acres	15,670 acres
		Gross Demand (MGD)				
Total average rainfall year		**38.4**	**34.4**	**37.6**	**40.4**	**43.1**
Total 1-in-10 year drought		**44.9**	**40.4**	**44.1**	**47.5**	**48.0**

Improved Pasture

The SFWMD definition of improved pasture is any pasture with existing or proposed facilities to deliver supplemental irrigation. Information from agricultural stakeholders indicates irrigation of improved pasture usually occurs during dry periods to keep grass alive for the nourishment of cattle because the economic returns associated with cattle production generally do not justify the expense of year-round pasture irrigation.

The 2005–2006 LEC Plan Update stated that irrigation demand was not estimated for improved pasture within the LEC Planning Area because they would only relate to some of the acres some of the time (SFWMD 2006). The SFWMD does not project water demand for improved pasture because of the intermittent demand and the lack of data and information required to properly evaluate this issue. However, interagency and stakeholder agricultural demand subgroups are currently addressing methods for determining intensity of water use in this area as well as procedures for evaluating potential conversion of pasture lands to other agricultural crop categories.

Other Agricultural Uses

For both the 2005–2006 LEC Plan Update and this current update, cattle numbers were obtained from the most current Florida Agricultural Statistics Service *Livestock Summary* (USDA 2011). This update does not present estimates for cattle watering because the volume is insignificant. Aquaculture demand is also not presented because most of the use represents localized flow through in which the water returns to the source from which it was taken.

Summary of Agricultural Results

Although estimates and projections for the agricultural subsections have been discussed in terms of crop use categories, it is also important to summarize the results in terms of total acreage and use by subbasin. On balance, agricultural acreage and water use are expected to rise modestly in the LEC Planning Area by 2030. Some small declines expected in coastal areas will likely be offset by increases in Hendry County and the EAA. The expectation for the loss of additional agricultural acres due to urbanization has been deferred to much later periods over the 20-year planning horizon due to a restrained housing market and a slow economic recovery in south Florida. Competition for agricultural land from developers is simply not as strong compared to the 2005–2006 LEC Plan Update (SFWMD 2006) evaluation environment. More generally, the rapid loss of arable land over the last 10 years throughout the United States has raised the relative value of existing agricultural lands and placed a renewed emphasis on sustainable land management. Declines in Broward County and Palm Beach County's Coastal subbasin are expected primarily due to urbanization. Little change in agricultural acreage and water use is expected in Miami-Dade County and Hendry County's western basins.

The acreages presented in the tables for this update do not include acreages that are historically part of the Lake Okeechobee Service Area (LOSA) that lie in the Lower West Coast, Upper East Coast, and Kissimmee Basin planning areas. In the Lower West Coast Planning Area, and particularly in the East and West Caloosahatchee subbasins, growth is expected in the irrigated acreage in the areas that historically have accessed and used surface water, including water from Lake Okeechobee. In those areas, irrigated crop acreage is projected to increase from 131,900 acres in 2000 to 145,100 in 2025, an increase of slightly over 13,000 acres.

Total irrigated agricultural crop categories and acreage are listed in **Table A-20**. Acreage, total agricultural net irrigation demand, and gross irrigation demand (water withdrawal demand) by subbasin are presented in **Table A-21**.

Table A-20. Crop category and irrigated acreage in the LEC Planning Area.

Crop Category	2010	2015	2020	2025	2030
Citrus	31,628	26,410	28,153	31,897	34,705
Sugarcane	384,100	396,825	409,550	422,275	435,000
Vegetables, melons, and berries	82,530	82,373	82,215	82,066	81,918
Sod	7,775	7,352	8,505	9,643	10,781
Greenhouse/nursery	14,270	12,855	13,860	14,766	15,670
Other fruits & nuts	8,302	8,321	8,282	8,244	8,194
Other field crops	15,079	16,253	17,309	18,309	19,309
LEC Planning Area Total Irrigated Acres	**543,684**	**550,389**	**567,874**	**587,200**	**605,577**

Table A-21. Gross irrigation requirements for all agricultural acreage in the LEC Planning Area.

Rainfall Year	Gross Demand (MGD) (total volume needed for withdrawal including net irrigation demand as well as accounting for system losses and inefficiencies)				
	2010	2015	2020	2025	2030
Palm Beach County – Coastal					
Irrigated Acreage	54,037 acres	51,907 acres	51,975 acres	52,100 acres	52,750 acres
	Gross Demand (MGD)				
Average	56.1	53.6	54.5	55.4	56.9
1-in-10 year drought	80.7	76.9	77.6	78.5	77.5
Palm Beach County – EAA					
Irrigated Acreage	360,130 acres	371,956 acres	384,338 acres	396, 819 acres	408,700 acres
	Gross Demand (MGD)				
Average	340.4	351.8	364.6	377.5	389.9
1-in-10 year drought	835.4	862.9	892.2	921.8	950.0
Broward County					
Irrigated Acreage	1,198 acres	1,112 acres	1,161 acres	1,221 acres	1,280 acres
	Gross Demand (MGD)				
Average	2.0	1.5	1.8	2.0	2.3
1-in-10 year drought	2.4	2.0	2.3	2.6	2.9
Miami-Dade County					
Irrigated Acreage	47,805 acres	46,610 acres	46,750 acres	46,868 acres	46,954 acres
	Gross Demand (MGD)				
Average	66.2	63.7	64.2	64.7	65.1
1-in-10 year drought	86.5	83.6	84.0	84.6	85.0
Hendry County – EAA					
Irrigated Acreage	28,355 acres	30,031 acres	31,709 acres	33,385 acres	35,062 acres
	Gross Demand (MGD)				
Average	36.7	38.5	40.3	42.2	44.0
1-in-10 year drought	70.5	74.5	78.4	82.5	86.5
Hendry County – Western Basins					
Irrigated Acreage	52,139 acres	48,753 acres	51,921 acres	56,787 acres	60,811 acres
	Gross Demand (MGD)				
Average	102.5	96.7	101.6	108.8	116.1
1-in-10 year drought	142.7	135.9	145.3	158.0	169.0
Monroe County					
Irrigated Acreage	20 acres	20 acres	20 acres	20 acres	20 acres
	Gross Demand (MGD)				
Average	0.05	0.05	0.05	0.05	0.05
1-in-10 year drought	0.10	0.10	0.10	0.10	0.10
LEC Planning Area Totals					
Total Irrigated Acreage	543,684 acres	550,389 acres	567,874 acres	587,200 acres	605,577 acres
	Gross Demand (MGD)				
Total average rainfall year	**604.0**	**605.9**	**627.1**	**650.7**	**674.4**
Total 1-in-10 year drought	**1,218.3**	**1,235.9**	**1,279.9**	**1,328.1**	**1,371.0**

INDUSTRIAL/COMMERCIAL/INSTITUTIONAL SELF-SUPPLY

This category includes industrial, commercial, and institutional demands not supported by a public utility. Water used for industrial, commercial, and institutional purposes supplied by utilities is included with PWS demand.

Projection Methodology

In the LEC Planning Area, the water use projection for ICI Self-Supply assumes that growth in self-supply for this region is proportional to the underlying economic activity that generates water demand in population in the area. This ICI Self-Supply use category is comprised of large facilities for production processing with the largest uses being mining (i.e., aggregates industry) and food processing (dominated by the sugar industry). Because of the importance of these large users within the LEC Planning Area, the projection methodology is based on isolating and assessing the relationship between water consumption and expected future growth for these sectors.

Permitted water use in this category was used to determine the current ICI Self-Supply demand. SFWMD historic pumpage data was assessed for each county within the LEC Planning Area. For Palm Beach County, the analysis was based on separating historic pumpage between the sugar industry and "other" ICI Self-Supply users since the sugar industry accounts for a large share of total ICI Self-Supply water use (approximately 50 percent of the county total in 2010). The pumpage reports related to the Palm Beach County sugar industry permittees were isolated and summed. Water use was then plotted against trends in annual sugar production (in tons) and evaluated. The trend showed that the sugar industry's unit water consumption has fallen per ton of sugar produced since 2000 because of improvements in process efficiencies.

Over the projected forecast horizon, the trend in more efficient water use was extrapolated forward such that ICI Self-Supply for Palm Beach County is expected to fall from 5.4 MGD to 3.5 MGD by 2020 and remain at that rate. Nonsugar ICI Self-Supply users are also expected to use less water per unit of output given the adoption of more sustainable practices. The amount of the use was assumed to continue until the permit expiration date for each ICI Self-Supply permit in the SFWMD Water Use Regulatory Database. After that time, the growth in this sector is projected to increase at the rate of population growth.

For Miami-Dade County, the ICI Self-Supply demand analysis was based on first segregating the historic water pumpage for the aggregates industry (i.e., mining, quarrying, and rock washing) and "other" uses. The total water use was dominated by the aggregates industry, which accounted for 94 percent of the county total in 2011. The projection method was based on comparing the aggregates industry production to the aggregates industry historic water pumpage inputs. The *Federal Reserve Index of Industrial Production-Nonmetallic*

Mineral Mining and Quarrying was used for this purpose (FRS 2012). **Figure A-5** shows the historic relationship between these two measures.

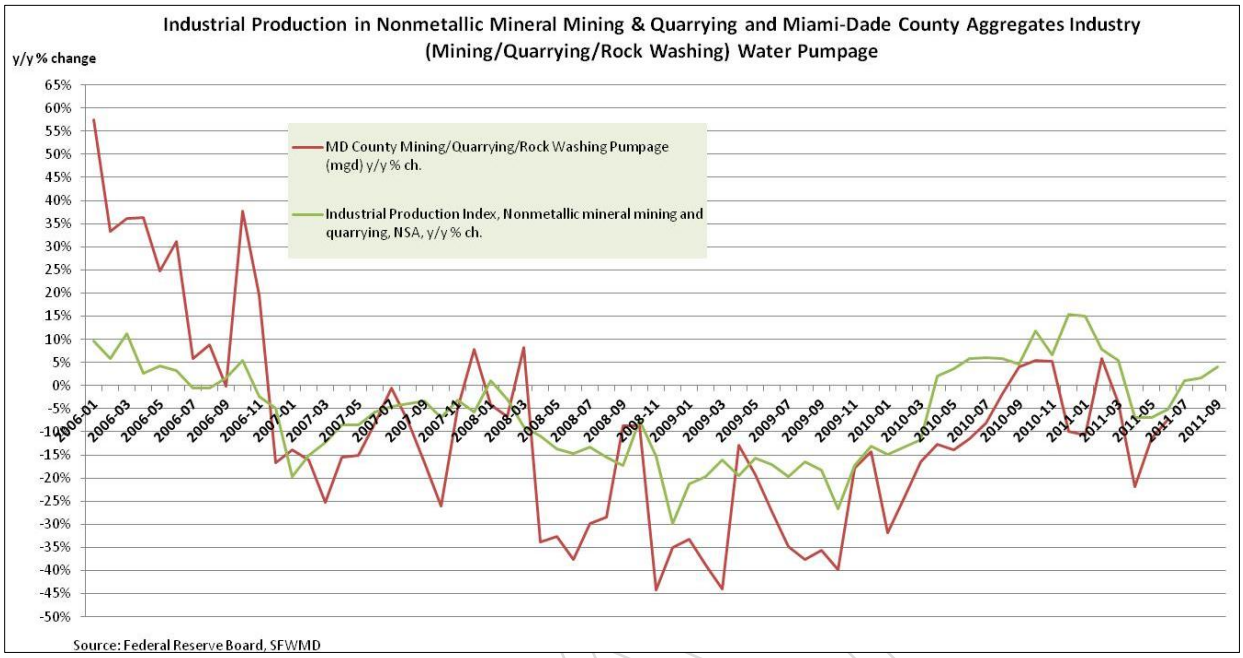

Figure A-5. Industrial production and water pumpage in nonmetallic mineral mining and quarrying for the Miami-Dade County aggregates industry.

Figure A-5 shows that water pumpage for the aggregates ICI Self-Supply segment was correlated with industrial production and the business cycle. To project the future water demand for the ICI Self-Supply segment, an annual water demand equation, based on a fitted statistical function relating water demand to industrial production was applied. Future annual industrial production for the aggregates industry was projected using official forecasts of United States economic growth (gross domestic product) and evaluating the growth rate relationship between mineral mining industrial production and the gross domestic product. The projections assume that projected water demand will follow recurring boom and bust patterns of economic growth out to 2030. For Broward County, the projections assume continued stable water demand for ICI Self-Supply over the 20-year planning horizon. Pumpage reports for Broward County showed demand coming from the Deerfield Park Racing Facility and Casino and from the Deerfield Beach Middle School Park.

Current and future demand calculations include information from the SFWMD Water Use Regulatory Database along with population growth rates for each county. All population numbers are based on the projections for each individual county shown earlier in this appendix. ICI Self-Supply projections assume demand between average rainfall and 1-in-10 year drought conditions remains the same, and that withdrawal demand is equal to user demand so that no distinction is made between net (finished) and gross (raw) water amounts. It should be noted that, depending on the type of ICI Self-Supply user, a large share of water demanded is quickly returned to the system for reuse (i.e., rock washing in the aggregates industry) within the ICI Self-Supply group.

Projection Results

Table A-22 summarizes the ICI Self-Supply demand estimates and projections in the LEC Planning Area in five-year increments during the 20-year planning horizon.

Table A-22. ICI Self-Supply demand projections for 2010–2030.

County	Demand Projections (MGD)				
	2010	2015	2020	2025	2030
Palm Beach	5.4	4.8	3.5	3.5	3.5
Broward	1.59	1.12	1.23	1.32	1.32
Miami-Dade	37.3	34.6	54.0	51.8	51.8
Eastern Hendry	0.0	0.0	0.0	0.0	0.0
Monroe	0.0	0.0	0.0	0.0	0.0
LEC Planning Area Total	**44.3**	**40.5**	**58.8**	**56.6**	**56.6**

RECREATIONAL / LANDSCAPE SELF-SUPPLY

The REC Self-Supply category includes self-supplied irrigation demand for large landscaped recreational areas and golf courses. Landscape irrigation includes water demand for all parks (small to large), communities and homeowner associations with large common areas or a master irrigation system, and areas with large green space such as ball fields, stadiums, and cemeteries. These REC Self-Supply uses are identified through CUPs. With the exception of individual private home landscape irrigation provided by permitted homeowner associations, private home landscape irrigation is not included in this water use category.

A significant portion (approximately 30 percent) of REC Self-Supply water demand will be met by the use of reclaimed water throughout the planning horizon. Not only will this reduce withdrawal demand on the water resources, it may provide additional recharge to the SAS.

Projection Methodology

Landscape and golf course acres were identified using the SFWMD Water Use Regulatory Database. Time series trends of irrigated golf course acreage within the LEC Planning Area by county were reviewed from 1985 through the present and compared to macro economic historic indicators for the region. Macro or development history was depicted by a time series of annual, new, privately owned residential building permits within each LEC Planning Area county. For example, Palm Beach County's building permit activity showed a steady increase from 1990 up until 2003, when they peaked. Permits fell rapidly after this period and bottomed out during the 2008–2009 recession at 10 percent of their peak 2003 level and 18 percent of the 1990 level. Given the recession and housing crisis, followed by a weak economic recovery that has been restrained by a structurally troubled and weak housing market, the demand for new golf courses and existing course expansion has been stagnant. These recent trends are confirmed by reductions in golf rounds played within the

service area (**Figure A-6**). In light of the slowdown in community development that could sustain new courses or course expansions, and the pace of economic recovery over the near- to medium-term period, golf course acreage projection is based on a U-shaped economic recovery pattern that anticipates continued weakness or lack of development capable of supporting golf patronage followed by a slow recovery.

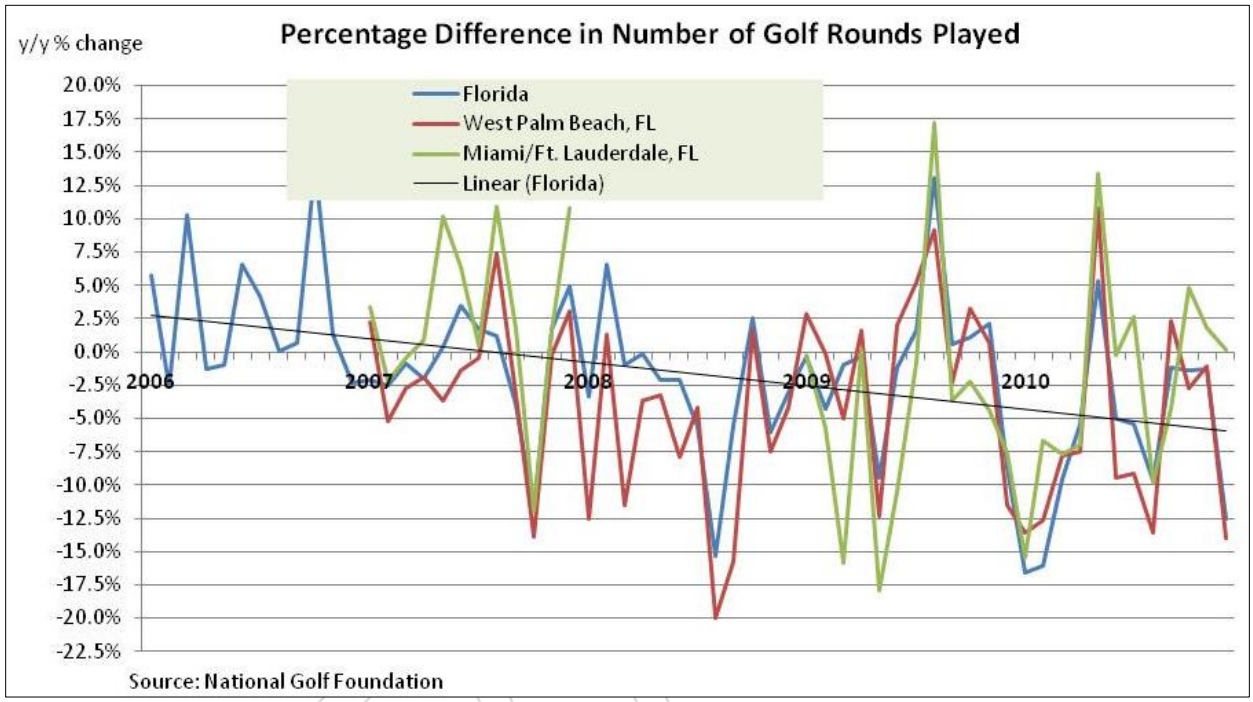

Figure A-6. Percentage difference in number of golf rounds played.

Future demand projections also considered county population growth rates, information provided by local planning officials, and golf course publications. Golf course demand by county are projected separately and added to the other landscape and recreation demands. A slower growth rate was assumed for golf courses than the population growth rate based on industry and local planning estimates of new courses during the 20-year planning horizon.

Historic patterns of growth in acreage for non-golf course landscaping and recreational water use were also evaluated since the 2005–2006 LEC Plan Update (SFWMD 2006). Between 2000 and 2011, these intervening years witnessed a rapid community development expansion that increased the landscape acreage requiring irrigation. This trend was visible in homeowners' association permit applications to irrigate common areas. This period also corresponded to the housing asset price bubble and a development phase characterized by unprecedented urban sprawl with community expansion moving westward within the LEC Planning Area. As a consequence, the SFWMD Water Use Regulatory Database expanded significantly for the REC Self-Supply water use category. Once this acreage was committed to communities, it requires future irrigation and this explains the large increase in water demand since the last plan update for the landscape component of the REC Self-Supply water use category. With the housing correction and bubble burst, the projections assume some marginal declines in the landscape irrigated

acreage category followed by a slight recovery to a plateau over the remainder of the planning horizon. Non-golf course landscaping and recreational water use was assumed to increase at the same rate as the county population, with 2010 used as the base year estimate for the projections, and the 2005 projection from the previous plan update included for comparison.

REC Self-Supply gross and net irrigation demand calculations for this update applied results from the AFSIRS, which uses data from the 1965–2000 time frame (Smajstrla 1990). These model results were used in the 2005–2006 LEC Plan Update (SFWMD 2006) and are used to calculate AGR Self-Supply irrigation demand. The AFSIRS calculates both gross and net irrigation requirements.

Gross Irrigation Requirement = Net Irrigation Requirement / Irrigation Efficiency

Demand was calculated using 36 years of rainfall and potential ET climatic data from appropriate meteorological stations. The analyses also consider soil types, irrigation methods, and strategies. The irrigation system assumed for REC Self-Supply is sprinkler irrigation with 75 percent efficiency, and rainfall and potential ET data for the respective region. The model uses assumed crop coefficients of sod to represent turf and landscape plants, and calculates demand for average rainfall and 1-in-10 year drought conditions for each county.

Projection Results

REC Self-Supply acreage projections are shown in **Table A-23**. The projected net irrigation (user) demand for each area under average rainfall conditions are shown in **Table A-24**, while **Table A-25** shows net irrigation demand under 1-in-10 year drought conditions. Gross irrigation demand (withdrawal demand) under average rainfall conditions is shown in **Table A-26**, while **Table A-27** presents gross demand under 1-in-10 year drought conditions. During the 20-year planning horizon, REC Self-Supply demand will increasingly be met by use of reclaimed water. This will not only reduce withdrawal demand on the water resources but provide additional recharge of the SAS. It is estimated that for 2010, total golf course acreage consists of 25,253 acres in the LEC Planning Area, approximately 30 percent of this total acreage was irrigated in part using reclaimed water (per. comm. with R. Nevulis, SFWMD).

Table A-23. Acreage for REC Self-Supply in the LEC Planning Area.

Area	Acreage (acres)				
	2010	2015	2020	2025	2030
Palm Beach County – Coastal	45,924	44,924	45,731	46,616	47,500
Palm Beach County – EAA	0	0	0	0	0
Broward County	27,700	28,100	28,100	28,100	28,100
Miami-Dade County	8,325	8,375	8,418	8,471	8,525
Hendry County – EAA	0	0	0	0	0
Hendry County – Western Basins	0	0	0	0	0
Monroe County	427.8	428	428	428	428
LEC Planning Area Total	**82,377**	**81,827**	**82,677**	**83,615**	**84,553**

Table A-24. Net irrigation demand under average rainfall conditions for REC Self-Supply in the LEC Planning Area.

Area	Net Irrigation Demand – Average Rainfall Conditions (MGD)				
	2010	2015	2020	2025	2030
Palm Beach County – Coastal	60.5	59.1	60.2	61.4	62.5
Palm Beach County – EAA	0.0	0.0	0.0	0.0	0.0
Broward County	37.7	38.3	38.3	38.3	38.3
Miami-Dade County	12.8	12.9	13.0	13.0	13.1
Hendry County – EAA	0	0	0	0	0
Hendry County – Western Basins	0	0	0	0	0
Monroe County	0.7	0.7	0.7	0.7	0.7
LEC Planning Area Total	**111.6**	**111.0**	**112.1**	**113.3**	**114.6**

Table A-25. Net irrigation demand under 1-in-10 year drought conditions for REC Self-Supply in the LEC Planning Area.

Area	Net Irrigation Demand – 1-in-10 Year Drought Conditions (MGD)				
	2010	2015	2020	2025	2030
Palm Beach County – Coastal	74.8	73.2	74.5	75.9	77.4
Palm Beach County – EAA	0.0	0.0	0.0	0.0	0.0
Broward County	47.2	47.9	47.9	47.9	47.9
Miami-Dade County	15.3	15.4	15.5	15.6	15.7
Hendry County – EAA	0	0	0	0	0
Hendry County – Western Basins	0	0	0	0	0
Monroe County	0.8	0.8	0.8	0.8	0.8
LEC Planning Area Total	**138.1**	**137.2**	**138.6**	**140.2**	**141.7**

Table A-26. Gross irrigation demand under average rainfall conditions for REC Self-Supply in the LEC Planning Area.

Area	Gross Irrigation Demand – Average Rainfall Conditions (MGD)				
	2010	2015	2020	2025	2030
Palm Beach County – Coastal	80.6	78.9	80.3	81.8	83.4
Palm Beach County – EAA	0.0	0.0	0.0	0.0	0.0
Broward County	50.3	51.0	51.0	51.0	51.0
Miami-Dade County	17.1	17.2	17.3	17.4	17.5
Hendry County – EAA	0	0	0	0	0
Hendry County – Western Basins	0	0	0	0	0
Monroe County	0.9	0.9	0.9	0.9	0.9
LEC Planning Area Total	**148.9**	**147.9**	**149.4**	**151.1**	**152.8**

Table A-27. Gross irrigation demand under 1-in-10 year drought conditions for REC Self-Supply in the LEC Planning Area.

Area	Gross Irrigation Demand – 1-in-10 Year Conditions (MGD)				
	2010	2015	2020	2025	2030
Palm Beach County – Coastal	99.7	97.6	99.3	101.2	103.2
Palm Beach County – EAA	0.0	0.0	0.0	0.0	0.0
Broward County	62.9	63.8	63.8	63.8	63.8
Miami-Dade County	20.4	20.5	20.6	20.8	20.9
Hendry County – EAA	0	0	0	0	0
Hendry County – Western Basins	0	0	0	0	0
Monroe County	1.0	1.0	1.0	1.0	1.0
LEC Planning Area Total	**184.1**	**183.0**	**184.8**	**186.9**	**188.9**

POWER GENERATION SELF-SUPPLY

The primary use of water at thermoelectric power plants is for cooling purposes. Additional water uses at power plants include boiler make-up water and ancillary uses, such as domestic-type use by employees.

Florida Power & Light (FPL) is a major electrical power supplier serving three regions within south Florida. FPL uses a diverse mix of fuels at their power plants to generate electricity. FPL currently generates most of its electricity from natural gas. In 2010, three FPL power generation facilities were located within the LEC Planning Area and permitted to withdraw water: FPL West County Energy Center in Palm Beach County, FPL Turkey Point Plant in Miami-Dade County, and Homestead Municipal Power Plant in Miami-Dade County. In the West County and Turkey Point plants, FPL uses natural gas combined cycle technology, which produces electricity from two sources of energy instead of one. In a combined cycle power plant, a gas turbine generator generates electricity, and heat in the exhaust is also used to make process steam, which in turn drives a steam turbine to

generate additional electricity. This technology is about 30 percent more efficient than a traditional steam plant.

The FPL West County Energy Center started serving customers in 2009. After the initial startup period, brackish water and surface water were utilized for the cooling system; however, in 2010, Palm Beach County began providing reclaimed water (approximately 22 to 29 MGD contracted) to this facility for cooling purposes.

FPL increased its power generation capacity at the existing Turkey Point Plant by adding combined cycle generating technology to respond to significant population growth in south Florida. This combined-cycle unit uses groundwater drawn from the Floridan aquifer while the other four units use water from the closed cycle recirculation canal system.

The Homestead Municipal Power Plant is a peaking plant. A peaking plant generally runs only when there is a high demand for electricity. The plant utilizes a once through cooling system and water is withdrawn from the Biscayne aquifer via 10 existing facilities on an as needed basis depending on which diesel generating unit is online. The cooling water discharge point is approximately three miles upstream of the SFMWD salinity control structure S-179 and therefore, the effluent is generally returned to the aquifer locally and not discharged to tide.

In the LEC Planning Area, and in most of south Florida, PWR Self-Supply demand has been met by flow-through cooling using tidal water — not fresh water or brackish groundwater. However, this pattern is changing as new generation or expansion of existing facilities is being evaluated. These plants may utilize different cooling technologies based on environmental, economical, and technically feasible components most appropriate to site-specific conditions. The different process and cooling technologies may require and utilize traditional and alternative water supply sources.

The Cutler, Lauderdale, and Port Everglades FPL plants use seawater, which is not addressed in water supply plans. FPL has removed the 1960s era units at the Riviera Plant and will replace them with new, state-of-the-art high efficiency units. The plant will begin serving customers again in 2014 when it will return to service as a Next Generation Clean Energy Center. The Riviera Plant will use Intracoastal water for once-through cooling water. FPL has submitted an application with plans to remove the existing Port Everglades Plant and repower it. Once completed, the rebuilt facility will be known as the Port Everglades Energy Center. The Port Everglades Plant may use water from the Intracoastal Waterway for once-through cooling purposes as it does currently; however, reclaimed water is also an option.

Projection Methodology

Water demand projections were made in conjunction with FPL to reflect expectations for power demand growth; strategies for obtaining the electricity to meet demand, which leads to estimation of power plant construction; capacity, types, and locations of power plants; types of cooling facilities; and ability to achieve efficiencies in water use. Most of these

factors are subject to considerable uncertainty. The efficacy of meeting demand from freshwater and saltwater sources needs further consideration, as does the cost-effectiveness of design and operational strategies that could significantly reduce water use.

The estimates presented in **Table A-28** include only the generating capacity expected to be located in the LEC Planning Area. Additional capacity has been proposed for areas within the LOSA. This demand was included in the *2011 Upper East Coast Water Supply Plan Update* (SFWMD 2011), *Draft Kissimmee Basin Water Supply Plan Update* (SFWMD 2012a), and *Draft 2012 Lower West Coast Water Supply Plan Update* (SFWMD 2012b). PWR Self-Supply demand is estimated to be the same for average rainfall and 1-in-10 year drought conditions.

Projection Results

Projected PWR Self-Supply water demand is presented in **Table A-28**. These projections are based on current usage and are assumed to remain the same between average rainfall and 1-in-10 year drought conditions. Because no distinction is needed between net (finished) and gross (raw) water in this use category, withdrawal demand is the same.

Table A-28. PWR Self-Supply water demand projections.

County	Water Demand Projections (MGD)				
	2010	2015	2020	2025	2030
FPL West County (existing)[a]	5.2	0	0	0	0
FPL Turkey Point (existing)[b]	5.0	6.0	7.0	8.0	9.0
FPL Proposed[c]	0	0	7.6	15.2	22.8
Homestead Municipal (existing)	1.5	1.5	1.5	1.5	1.5
LEC Planning Area Total	**11.7**	**7.5**	**16.1**	**24.7**	**33.3**

a. This plant started receiving reclaimed water from Palm Beach County in 2010.

b. This is the Turkey Point Plant Unit 5.

c. These projections were estimated using conservative two cycles of concentration and not the five cycles of concentration.

The projections account for potential new generation growth and proposed expansion, which may utilize different cooling technologies based on environmental, economical, and technically feasible evaluations appropriate to site-specific conditions. The different process and cooling technologies may require, and utilize, traditional and alternative water supply sources including captured excess storm water, groundwater from the Floridan aquifer, and reclaimed water when available.

In the 2005–2006 LEC Plan Update, the estimated PWR Self-Supply freshwater demand for 2005 was only 4.5 MGD, but was expected to grow to 102.9 MGD by 2025 to support proposed new power generating facilities (SFWMD 2006). However, FPL's use of seawater, modernization of plants, and the use of reclaimed water when available, has contributed to the decrease in PWR Self-Supply water demand. Saltwater withdrawals at the FPL power plants are not included because the saltwater source does not require a SFWMD permit.

TOTAL PLANNING AREA DEMAND AND PLAN COMPARISONS

Total Planning Area Demand

This section summarizes both the total net (user/customer, finished) demand and total gross (withdrawal, raw) demand in the LEC Planning Area. The projects identified in this update within **Chapter 6** of the Planning Document and **Appendix C** are designed to meet net water demand. **Table A-29** shows net demand and **Table A-30** presents estimated gross water demand from 2005 to 2030 for the LEC Planning Area under average rainfall and 1-in-10 year drought conditions.

Table A-29. Finished (net) water demand by water use category in the LEC Planning Area.

Water Use Category	Finished (Net) Water Demand (MGD)				
	2010	2015	2020	2025	2030
Average Conditions					
Public Water Supply	783.4	820.6	857.7	894.1	932.1
Domestic Self-Supply	15.9	16.4	16.8	17.3	17.7
Agricultural Self-Supply	339.8	339.0	351.4	365.1	378.7
Industrial/Commercial/Institutional Self-Supply	44.3	40.5	58.8	56.6	56.6
Recreational/Landscape Self-Supply	111.6	111.0	112.1	113.3	114.6
Power Generation Self-Supply	11.7	7.5	16.1	24.7	33.3
LEC Planning Area Total	**1,306.7**	**1,335.0**	**1,412.9**	**1,471.1**	**1,533.0**
1-in-10 Year Drought Conditions					
Public Water Supply	858.2	899.0	939.8	979.8	1,021.5
Domestic Self-Supply	17.5	18.0	18.5	19.0	19.5
Agricultural Self-Supply	658.7	663.9	686.7	711.9	736.1
Industrial/Commercial/Institutional Self-Supply	44.3	40.5	58.8	56.6	56.6
Recreational/Landscape Self-Supply	138.1	137.2	138.6	140.2	141.7
Power Generation Self-Supply	11.7	7.5	16.1	24.7	33.3
LEC Planning Area Total	**1,728.5**	**1,766.1**	**1,858.5**	**1,932.2**	**2,008.7**

Table A-30. Gross water demand by water use category in the LEC Planning Area.

Water Use Category	Gross Water Demand (MGD)				
	2010	2015	2020	2025	2030
Average Conditions					
Public Water Supply	845.3	885.2	925.3	964.6	1,005.9
Domestic Self-Supply	16.6	17.1	17.5	18.0	18.5
Agricultural Self-Supply	604.0	605.9	627.1	650.7	674.4
Industrial/Commercial/Institutional Self-Supply	44.3	40.5	58.8	56.6	56.6
Recreational/Landscape Self-Supply	148.9	147.9	149.4	151.1	152.8
Power Generation Self-Supply	11.7	7.5	16.1	24.7	33.3
LEC Planning Area Total	**1,670.8**	**1,704.1**	**1,794.2**	**1,865.7**	**1,941.5**
1-in-10 Year Drought Conditions					
Public Water Supply	926.0	970.1	1,014.2	1,057.3	1,102.4
Domestic Self-Supply	18.2	18.8	19.3	19.8	20.3
Agricultural Self-Supply	1,218.3	1,235.9	1,279.9	1,328.1	1,371.0
Industrial/Commercial/Institutional Self-Supply	44.3	40.5	58.8	56.6	56.6
Recreational/Landscape Self-Supply	184.1	183	184.8	186.9	188.9
Power Generation Self-Supply	11.7	7.5	16.1	24.7	33.3
LEC Planning Area Total	**2,402.6**	**2,445.8**	**2,573.1**	**2,673.4**	**2,772.5**

Comparison of 2005–2006 LEC Plan Update Amendment and Current Update Projected Water Demands

The top part of **Table A-31** compares the projected average rainfall condition gross water demand estimated in the 2005–2006 LEC Plan Update (SFWMD 2006) with those estimated for this update. the bottom half of **Table A-31** does the same for the projected 1-in-10 year drought conditions water demand. The most significant differences between the demand estimates in the 2005–2006 LEC Plan Update and this update relate to the following developments:

- The rise in the total REC Self-Supply total demand is attributable to the landscape component, not golf courses. The landscape component grew rapidly in response to community development and common areas requiring self-supply irrigation between the two plan evaluation periods.

- The small increase in PWR Self-Supply relates to the continued increase in use of alternative sources such as reclaimed water, seawater, and coastal brackish water for thermo-cooling purposes and improvements in process efficiencies (less water demanded per kilowatt hour of energy produced).

Table A-31. End point projections of gross water demand under average rainfall and 1-in-10 year drought conditions in the 2005–2006 LEC Plan Update and this update.

Water Use Category	2005–2006 LEC Plan Update Demand for 2025 (MGD)	2012 LEC Plan Update Demand for 2030 (MGD)
Average Conditions		
Public Water Supply	1,286.5	1,005.9
Domestic Self-Supply	48.9	18.5
Agricultural Self-Supply	689.1	674.4
Industrial/Commercial/Institutional Self-Supply	61.3	56.6
Recreational/Landscape Self-Supply	84.8	152.8
Power Generation Self-Supply	102.6	33.3
LEC Planning Area Total	**2,273.2**	**1,941.5**
1-in-10 Year Drought Conditions		
Public Water Supply	1,363.7	1,102.4
Domestic Self-Supply	51.8	20.3
Agricultural Self-Supply	1,396.4	1,371.0
Industrial/Commercial/Institutional Self-Supply	61.3	56.6
Recreational/Landscape Self-Supply	104.4	188.9
Power Generation Self-Supply	102.6	33.3
LEC Planning Area Total	**3,080.2**	**2,772.5**

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