

Appendix 4B:

**Palm Beach County**  
**10-Year Water Supply Facilities Work Plan**



**Palm Beach County, Florida**  
**Water Utilities Department**

**February 25, 2020**

# **WATER SUPPLY FACILITIES WORK PLAN**

## **1.0 INTRODUCTION**

The purpose of water supply planning is to develop strategies to meet the future water demands of urban and agricultural uses, while also meeting the needs of the environment. The water supply planning process identifies current and future water supply demands, and evaluates several water source options to meet those demands. As mandated by Florida law, regional water supply plans are developed by the five Water Management Districts and associated Water Supply Facilities Work Plans are developed based on the regional plans with a minimum 10-year future planning horizon. A complete update of each regional water supply plan is required every five years. Local governments subject to a regional water supply plan are required by Florida law to identify water supply projects necessary to meet identified existing and future development needs for inclusion in the plan or plan update. By working with the South Florida Water Management District (SFWMD or District) during updates of the Lower East Coast (LEC) Regional Water Supply Plan (LEC Plan), Palm Beach County provides input on those water supply projects that are included in the LEC Plan.

## **2.0 BACKGROUND**

The 2018 Lower East Coast Water Supply Plan Update is one of five long-term comprehensive regional water supply plan updates the SFWMD undertakes approximately every five years. For the 2018 Lower East Coast Water Supply Plan Update, the third update of the 2000 Lower East Coast Plan, the planning horizon is 2040.

The plan update consists of a single-volume planning document, a secondary volume of appendices, and an additional support document. These documents provide a common set of data, such as current and future water demands, assumptions and potential water source options.

Local governments, water users, and utilities use water supply plan updates to modify and update their local comprehensive plans, ordinances, and individual or utility plans. SFWMD will consider updating portions of this plan update more frequently, including the update of water supply project lists, population projections, etc., as circumstances require.

## **3.0 COUNTY'S WATER SUPPLY FACILITIES WORK PLAN**

This 10-year Water Supply Facilities Work Plan (Plan) includes cartographic documents that fully describe the water and wastewater service providers within Palm Beach County. Because of the complexity of the water supply situation in Palm Beach County, the Plan includes an extensive description of the service area and existing facilities and programs, a map depicting all the municipal service providers, water utility authorities including special districts, the County's service area, and unincorporated areas served by other providers.

The information contained in the Plan is presented in accordance with the State-mandated "Water Supply Facilities Work Plan," as required by Section 163.3177(6)(c)3, Florida Statutes (F.S.):

- "The element must identify such alternative water supply projects and traditional water supply projects conservation and reuse necessary to meet water needs identified in s.

373.709(2)(a) within the local government's jurisdiction and include a work plan, covering at least a 10-year planning period, For building public, private, and regional water supply facilities, including development of alternative water supplies, which are identified in the element as necessary to serve existing and new development. The work plan shall be updated, at a minimum, every 5 years within 18 months after the governing board of a water management district approves an updated regional water supply plan."

Regional issues with potential impacts to water supply planning in Palm Beach County are as follows:

- Fresh surface water and groundwater are limited; further withdrawals could have impacts on the regional system, wetlands, existing legal uses, and saltwater intrusion. As a result, additional alternative water supplies need to be developed.
  - Palm Beach County Water Utilities Department (PBCWUD) has a valid consumptive use permit (50-00135-W) through March 2023. The County has already embarked on a schedule to renew and modify this permit to meet future water supply demands over the planning period. Palm Beach County has an extensive reclaimed water system and will continue to aggressively expand its reclaimed water program. Reclaimed water may be used to replace existing consumptive use permits or act as an offset to increased consumptive use withdrawals. Additional identified sources include the Floridan aquifer system for either direct withdrawals, blending, or aquifer storage and recovery (ASR) and the C-51 Reservoir (Chapter 9).
- Surface water allocations from Lake Okeechobee and the Water Conservation Areas are limited in accordance with the Lake Okeechobee Service Area RAA criteria.
  - PBCWUD is not located within the Lake Okeechobee Service Area. It does not currently withdraw water from Lake Okeechobee or the Water Conservation Areas and is not planning on seeking an allocation from these sources in the future.
- Construction of additional storage systems (e.g., reservoirs, aquifer storage and recovery systems) to capture wet season flow volumes will be necessary to increase water availability during dry conditions and attenuate damaging peak flow events from Lake Okeechobee.
  - The County is an active participant in Everglades restoration efforts as well the U.S. Army Corps of Engineers' Lake Okeechobee System Operating Manual (LOSOM) update. As discussed in Chapter 9, ASR is a potential option for future water supply.
- Expanded use of reclaimed water is necessary to meet future water supply demands and the Ocean Outfall Law.
  - As discussed in Chapter 8, PBCWUD has an extensive reclaimed water program and has aggressively sought to expand it. A planned Regional Reclaimed Water System Project with Broward County will help Broward

eliminate ocean outfalls and provide reclaimed water to users in South Palm Beach County. PBCWUD has no ocean outfalls.

- Expanded use of brackish groundwater from the Floridan aquifer system requires careful planning and wellfield management to prevent undesirable changes in water quality.
  - PBCWUD has modified its current Eastern Region consumptive use permit (50-00135-W) to utilize the Floridan aquifer system for blending with its surficial withdrawals and supplement its allocation. The Western Region wellfield (50-06857-W) is managed to rotate wells in order to maintain water quality.

#### **4.0 SERVICE AREA DESCRIPTION**

Historically, Palm Beach County Water Utility Department (PBCWUD) service areas were identified by the original areas served by acquired utilities. Each of the acquired utilities, known then as systems, was numbered. As the County grew, the system designation was dropped in favor of a more descriptive identification by Water Treatment Plant (WTP). The County now consists of a regional operation. PBCWUD'S Eastern Region (50-00135-W) is served by an interconnected distribution system among the existing Wellfields (2, 3, 8, and 9), thereby creating a unified service area. The County's Western Region Distribution System (50-06857-W) is served by Wellfield 11 and provides potable water to the Cities of Belle Glade, Pahokee, and South Bay.

The County's utility service area encompasses approximately 1,800 square miles (832,000 acres) of unincorporated land in Palm Beach County and is shown in **Figure 4.1**. This map also identifies the service area boundaries of all the water providers in the County. Including the County Water Utilities Department, a total of 14 service providers serve the residents of unincorporated County, as shown in **Figure 4.2**. Further information regarding utilities serving unincorporated Palm Beach County including water sources, per capita rates and water supply and infrastructure projects can be found in **Table 4.1**. Palm Beach County has made a concerted effort to coordinate the data used to prepare this Plan with the other utility service providers throughout the County, including those serving in incorporated areas. **Figure 4.3** shows the location of domestic self-supply, areas where customers are served by wells.

**Table 4.1 - Utilities Serving Unincorporated Palm Beach County**

Utility Name	Consumptive Use Permit No.	Per Capita Finished Water (2012-2016)	Water Source	Projects & Infrastructure
Boca Raton	50-00367-W	299	SAS	No projects
Boynton Beach	50-00499-W	119	FAS; SAS	No projects
Delray Beach	50-00177-W	229	FAS; SAS	No projects
Golf	50-00612-W	151	SAS	No projects
Jupiter	50-00010-W	215	FAS; SAS	Surface water recharge system - The final phase of the project includes connecting the regional system to recharge wetlands and recharging the local aquifer.
Lake Worth Beach	50-00234-W	107	FAS; SAS	No projects
Maralago Cay	50-01283-W	225	SAS	No projects
PBCWUD Eastern Region	50-00135-W	111	FAS; SAS	South County Reclaimed Phase I - Construction of a 24-inch diameter reclaimed water transmission pipeline from BCWWS to serve the southern portion of the PBCWUD service area
PBCWUD Western Region	50-06857-W	157	FAS	No projects
Palm Springs	50-00036-W	81	SAS	R.L. Pratt Washwater Recovery Basin - Construct a washwater recovery basin to recycle; Purchase up to 0.30 mgd of bulk water from PBCWUD
Riviera Beach	50-00460-W	184	SAS	Purchase bulk water from PBCWUD or West Palm Beach
Seacoast	50-00365-W	191	FAS; SAS	Construct FAS wells F-6 and F-9 water supply well and connecting raw water transmission main
Tequesta	50-00046-W	309	FAS; SAS	No projects
Wellington	50-00464-W	107	SAS	Phased Reclaim System Expansions - Install additional reuse filter equipment as influent flow increases. It will be a phased project: 1.30 mgd by 2020, 2.90 mgd by 2030 and 6.50 mgd by 2040
West Palm Beach	50-00615-W	243	SAS	C-17 Pump Station - Withdraw from the Congress Avenue Canal and pumping it into the City's adjacent M-Canal (Lake Mangonia); ASR Well Expansion Program - Install up to 3 ASR wells injecting surface water into the FAS (classified as Class V injection wells) and associated monitor wells; Grassy Waters Preserve Water Quality, Diversion, and Storage Improvements

**Source: 2018 Lower East Coast Water Supply Plan Update, Chapter 8 and Appendix E**

**Acronyms**

SAS = surficial aquifer system  
 FAS = Floridan aquifer system  
 BCWWS = Broward County Water and Wastewater Services

ASR = aquifer storage and recovery  
 PBCWUD = Palm Beach County Water Utilities Department  
 WTP = water treatment plant

Figure 4.1 – Utility Service Providers Located Throughout Palm Beach County

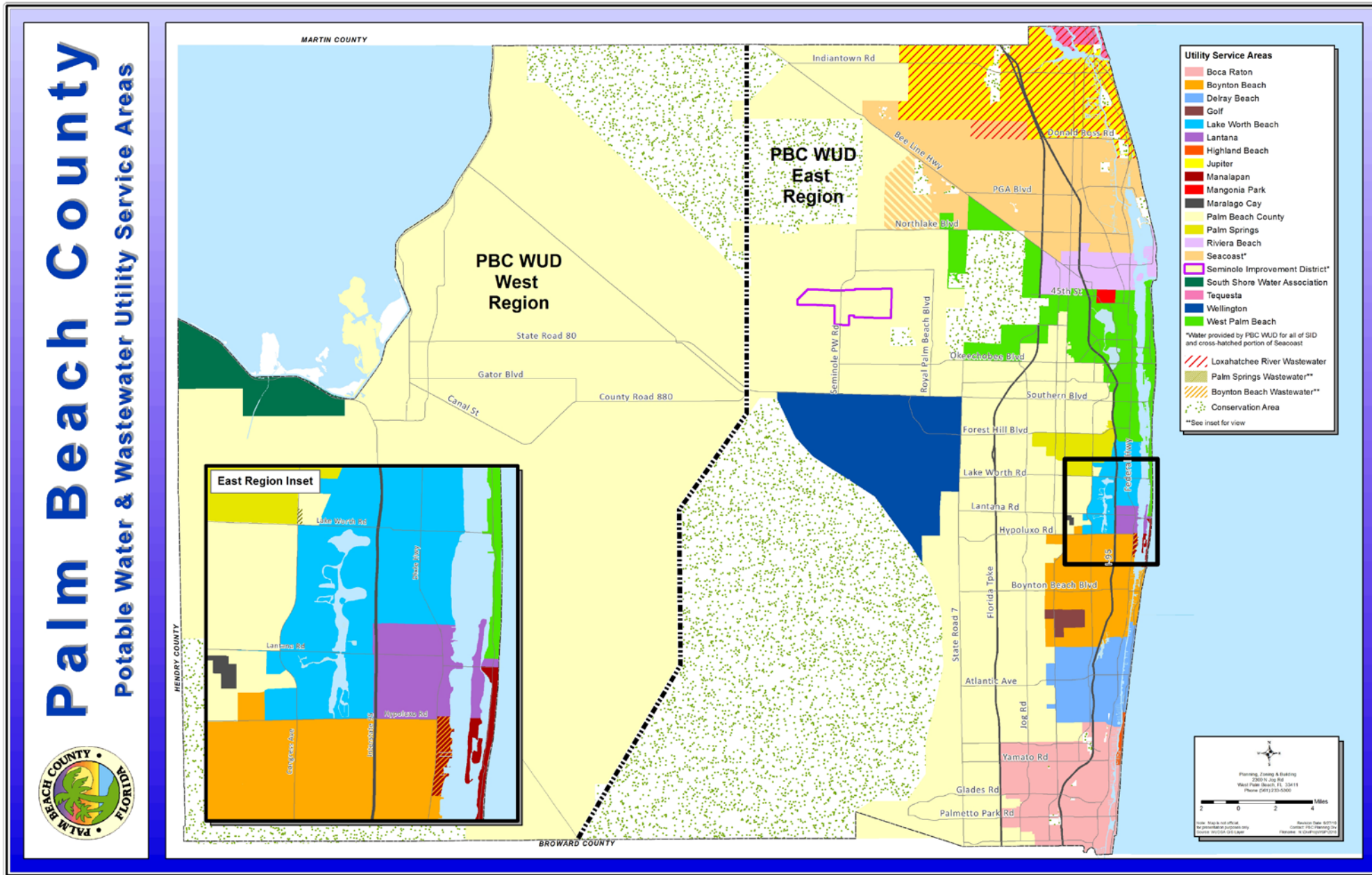
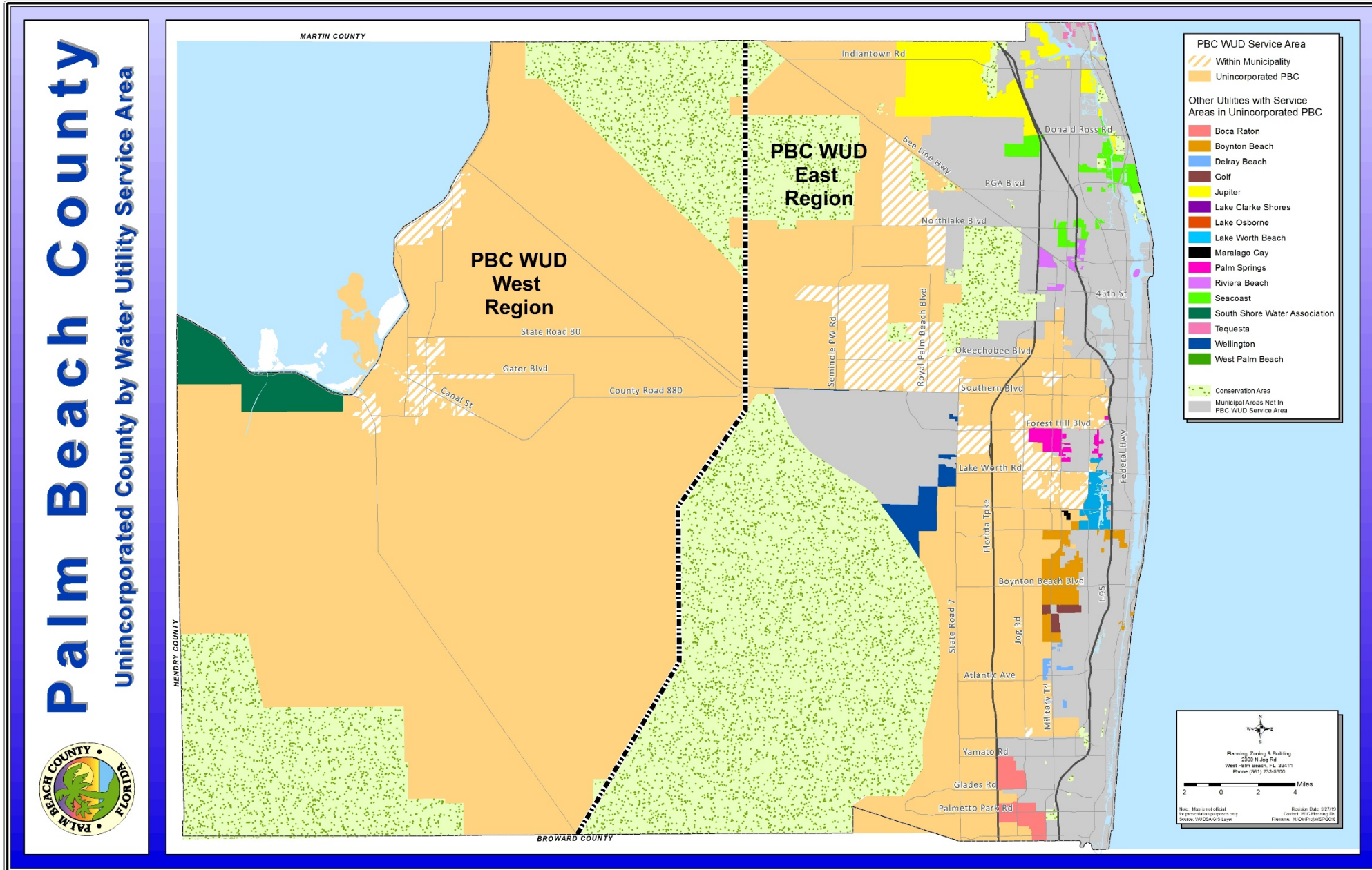


Figure 4.2 – Utility Service Providers Serving Unincorporated Palm Beach County







## 4.1 History of Service Area Expansions

### Comprehensive Plan Amendments:

On August 24, 2004, the County adopted the previous Water Supply Facilities Work Plan to direct the provision of water, reclaimed water, and sewer service to unincorporated areas of Palm Beach County. To address inconsistencies in the county Comprehensive Plan and promote intergovernmental coordination among utility service providers in unincorporated Palm Beach County, the Comprehensive Plan Amendments named the County as the default service provider such that,

- *“The Palm Beach County Water Utilities Department shall provide potable water, reclaimed water and wastewater service to all unincorporated areas of the County except those unincorporated areas where the Palm Beach County Board of County Commissioners has entered or enters into a written agreement that provides utility service area rights to a public or privately owned potable water, reclaimed water, and/or wastewater utility, or in areas where the Palm Beach County Water Utilities Department is specifically excluded from providing utility service by Florida law. Palm Beach County Water Utilities Department shall continue to provide utility services to incorporated areas where service is already being provided by the County, or as provided for under utility service area agreements or as allowed for by law.”*

**Village of Royal Palm Beach:** The County encourages the use of cooperative agreements with other public utilities to ensure the most efficient delivery of public potable water, reclaimed water and wastewater services. In August 2004, the County and the Village of Royal Palm Beach entered into a Utility Franchise and Service Area Agreement (R2004-1802 and R2006-0411). The Utility Franchise Agreement returned portions of the Village’s utility service area back to the County in exchange for a 10% franchise fee on future revenues generated in the returned area. The Utility Franchise Agreement required the County to install backbone potable water and wastewater pipelines within the returned area to provide utility service to a new public park, library, and fire rescue station in the vicinity of Seminole Pratt Whitney Road, and also to provide utility service to additional public and private developments in the returned area to the extent that they have been or will be approved by the Palm Beach County Board of County Commissioners in the future. In April 2006, the County purchased the Village’s water and wastewater utility (R2006-0410). With this acquisition, the service area retained by the Village under the 2004 Franchise Agreement was purchased and became part of the County’s exclusive service area.

**Beeline Community Development District:** In 2004 the Beeline Community Development District (Beeline) expressed a desire to divest its Utility to the County. An Acquisition Agreement was executed between Beeline and the County in February 2005 (R2005-0366). The County acquired the Beeline’s exclusive utility service area, utility water and wastewater system assets, customer base, and assumed the exclusive authority, duty, and obligation to provide retail and wholesale potable water, wastewater, and reclaimed water service within the Beeline’s utility service area.

**Seacoast Utility Authority:** In September 2005, the County entered into a Service Area Agreement (R2005-1769) with Seacoast Utility Authority (Seacoast) defining the service area

boundary between Seacoast and the County. The boundaries agreed to were intended to eliminate or minimize duplication of facilities; provide for orderly growth, expansion and extension of respective water, wastewater, and reclaimed water utility systems. The Agreement benefited existing and future Seacoast and County utility customers by ensuring the most efficient delivery of public utility services. In June 2006, the County entered into a Utility Bulk Service Agreement (R2006-0687) to provide Seacoast with up to five (5) million gallons per day (mgd) of bulk potable water and bulk wastewater service during an initial term of five (5) years. Seacoast has the option to extend the Bulk Agreement for a long-term period of twenty-five (25) years at the same capacity levels. The Bulk Agreement requires that the County install the necessary potable water pipeline improvements. By entering into the Agreement, the Seacoast customers will benefit from the competitively priced bulk water, and existing County utility customers will benefit from the increased revenue.

**City of West Palm Beach:** The County and City of West Palm Beach are parties to a 1989 Agreement (R-89-1657D), along with the Seacoast Utility Authority, which had become contentious due to disagreements among the parties on how the utility service area boundaries should be interpreted. In December 2005, the County and the City of West Palm Beach entered into a Service Area Agreement (R2005-2445) resolving the dispute by defining respective retail utility service areas between the City and the County. The Agreement also defined bulk utility service areas as related to portions of western Palm Beach County. In the Agreement, the City of West Palm Beach is named as sole provider of bulk (not retail) water and wastewater service to a portion of the Acreage. The boundaries agreed to were intended to eliminate or minimize duplication of facilities; provide for orderly growth, expansion and extension of respective water, wastewater, and reclaimed water utility systems. The City further agreed not to provide utility service, retail, bulk or otherwise, within the Everglades Agricultural Area and Loxahatchee Groves Water Control District.

**Seminole Improvement District (City of Westlake):** In June 2006 an Interlocal Agreement was executed between the County and Seminole Improvement District (R2006-0732) (SID). The Agreement resolved the service area disputes by defining clear utility service area boundaries between SID and the County. Pursuant to Chapter 298, Laws of Florida, SID has the exclusive right to provide utility services within SID's legislative boundaries. Under the Agreement, SID will continue serving all of its existing customers but will be precluded from connecting any new customers outside of its legislative boundaries. Existing pipelines and customers located outside SID's boundaries will be transferred to the County over time. In addition to delineating service area territories, the Agreement named the County as SID's exclusive bulk utility service provider. The Agreement allows SID to reserve and purchase up to five (5) million gallons per day of bulk water and wastewater capacity over thirty (30) years. Other considerations afforded the County with this Agreement include: 1) the right of first refusal to acquire SID's retail Utility System, based upon a pre-determined valuation formula; and 2) the right to utilize existing road right-of-way along Seminole Pratt-Whitney Road for construction, operation, maintenance, and replacement of potable water, waste water, and reclaimed water pipelines. In May 2016, Seminole Improvement District abandoned their water treatment facilities and have continued to purchase bulk water from Palm Beach County Water Utilities Department.

**Developer Agreements:** In July and August 2005, the County entered into Development Agreements for three properties located in central Palm Beach County. The Development Agreements defined oversizing fees to be paid to the County related to its Northern Region Pipeline Improvement Project (WUD Nos. 04-125, 04-227, 05-018, 05-061, and 06-050). Palm Beach Aggregates (R2005-1392), Inc., Indian Trail Groves, L.P. (R2005-1391), and Delray Linton Associates, LLC & Exodus 613 LLC (R2005-1608) desire to develop properties in central Palm

Beach County and had a need to utilize the County's transmission pipelines for potable water and wastewater service. These portions of the County's utility service area were acquired through the Palm Beach County/Village of Royal Palm Beach Amended Potable Water, Reclaimed Water and Wastewater Utilities Franchise and Service Area Agreement (R-2004-1802). These Agreements did not grant development approvals nor increase densities for the Property Owners. Potable water and wastewater service will only be provided to the Properties in the future in a manner consistent with any development approvals that may be granted by the Board of County Commissioners.

**Glades Utility Authority:** On May 1, 2013, Palm Beach County formally absorbed the assets of the Glades Utility Authority (GUA) into those of the County. The County acquired the GUAs exclusive utility service area, utility water and wastewater system assets, customer base, and assumed the exclusive authority, duty, and obligation to provide retail and wholesale potable water, wastewater, and reclaimed water service within the GUA's utility service area. The County additionally committed to spend a minimum of \$5 million a year for five years towards the repair and replacement of aged and deteriorated water and wastewater infrastructure in the Glades Region.

The Lake Region Water Treatment Plant in the Glades Region is a 100-percent alternative water source that utilizes reverse osmosis to produce high quality potable water from the Floridan aquifer and does not impact surficial water supplies. The 10 mgd facility retains adequate capacity to serve the existing populations of the Cities of Belle Glade, Pahokee and South Bay, the surrounding unincorporated County, as well as the future additional population increases and development projected to occur in the area, including the anticipated development of an inland logistics center and associated infrastructure.

## 5.0 FINISHED WATER DEMAND PROJECTIONS

As required by the statute, the County has based its population projections on the mid-range population projections prepared by the University of Florida, Bureau of Economic and Business Research (BEBR). However, the LEC Plan Update utilized the population projections issued by BEBR in 2016; this document utilizes the BEBR projections issued in 2018, as these projections represent the 'best available data'.

During the preparation of this Plan, the County Planning Division developed population forecasts for the each utility's service area based on the 2015 Palm Beach County Allocation Model. Since BEBR issues only a single countywide figure for each county, the County's Allocation model then allocates these figures to smaller geographies for localized planning efforts (Traffic Analysis Zones, or TAZs) utilizing existing land use data and potential future growth based on each local governments' adopted future land use maps.

The projected population by utility service area in the County was generated utilizing GIS technology. Using GIS, a layer of the service areas was compared against a layer containing population segregated into the TAZs. Each utility service region was assigned those TAZs that lie within its boundaries, and projections for each service area were obtained. The results of this effort are presented in **Table 5.1**. This exercise ensured the TAZ population data was allocated to the appropriate utility. The information in **Table 5.1** represents the methodology used to balance water supply plans throughout the Lower East Coast Region and is not binding for any entity. The base GIS map layers utilized to generate this table are graphically depicted in **Figure 4.2**. Through coordination with the utility providers during the preparation of this Water Supply Plan, the County Planning and Water Utilities Department staff worked with utility providers to

verify their service area boundaries with each entity, and incorporated information and feedback received into **Table 5.1**.

The self-served population or population served by private potable wells for PBCWUD was estimated using connection data and GIS potable water line data. Population on wells for other service areas was estimated using a GIS layer from SWFMD regarding the utility areas (where there is water line infrastructure in place).

## **5.1 Data and Analysis Requirement**

This Water Supply Plan provides an inventory of potable water and wastewater service providers and their associated service areas throughout Palm Beach County. As previously indicated, utility service areas do not follow municipal boundaries. Fourteen municipal and other providers serve the unincorporated areas of the County, as shown in **Figure 4.2**. The utility service areas are developed with the prevailing goal of eliminating duplication of pipelines and infrastructure.

**Table 5.1** provides the population projections for each of the service providers in the County. PBCWUD includes Seminole Improvement District, Atlantis, and part of Seacoast service areas. Lake Worth Beach includes Lake Osborne service area. Palm Springs includes the Lake Clarke Shores service area. Delray Beach includes Gulfstream service area. West Palm Beach includes Palm Beach and South Palm Beach service areas.

As encouraged by s. 163.3177(6)(c), F.S., the County coordinates with the SFWMD and local municipalities to cooperatively address future population and water supply planning during the preparation of updates to the Work Plan.

**Table 5.1 Population Forecast Throughout Palm Beach County**

Utility	2018		2020		2025		2030	
	Total Pop Served	Unincorp. Pop Served	Total Pop Served	Unincorp. Pop Served	Total Pop Served	Unincorp. Pop Served	Total Pop Served	Unincorp. Pop Served
Boca Raton	116,873	23,519	120,249	23,606	127,315	23,950	132,145	24,171
Boynton Beach	111,908	32,355	115,252	32,969	122,642	36,064	127,632	37,407
<i>Boynton Beach Self-Served (On Wells)</i>	1,324	1,324	1,298	1,298	1,064	1,064	811	811
Delray Beach	69,338	2,265	72,180	2,325	77,538	2,678	81,613	2,796
Golf	2,726	2,477	2,740	2,488	2,774	2,495	2,809	2,527
Highland Beach	3,698	0	3,728	0	3,811	0	3,874	0
Jupiter	75,829	14,030	78,455	14,352	84,362	16,973	89,156	18,839
<i>Jupiter Self-Served (On Wells)</i>	12,249	12,249	12,170	12,170	11,956	11,956	11,557	11,557
Lake Worth Beach	50,272	13,351	51,768	13,845	54,037	14,223	56,051	14,582
Lantana	11,121	0	11,920	0	12,898	0	13,583	0
Manalapan	2,584	0	2,630	0	2,669	0	2,786	0
Mangonia Park	1,976	0	2,030	0	2,212	0	2,505	0
Maralago Cay	1,159	1,159	1,165	1,165	1,178	1,178	1,190	1,190
Palm Springs	50,210	23,826	52,114	24,392	55,820	25,578	57,954	27,109
Riviera Beach	41,139	3,041	42,392	3,146	45,582	3,554	47,652	3,646
Seacoast	91,533	16,638	94,987	17,164	100,727	18,053	105,200	18,681
<i>Seacoast Self Served (On Wells)</i>	636	636	626	626	566	566	516	516
Tequesta	8,449	2,232	8,681	2,264	9,006	2,276	9,286	2,354
Wellington	56,849	2,789	59,442	2,897	63,851	3,234	67,255	3,412
<i>Wellington Self-Served (On Wells)</i>	2,906	621	2,891	616	2,843	585	2,796	556
West Palm Beach	120,589	110	124,452	8	132,900	24	141,506	33
<b>PBC WUD East Region</b>	<b>519,505</b>	<b>427,988</b>	<b>530,964</b>	<b>436,495</b>	<b>561,670</b>	<b>462,165</b>	<b>595,462</b>	<b>487,675</b>
<i>Seminole Improvement District</i>	372	0	1,906	0	5,476	0	9,678	0
<b>PBC WUD West Region</b>	<b>34,018</b>	<b>5,403</b>	<b>34,856</b>	<b>5,476</b>	<b>36,500</b>	<b>5,639</b>	<b>38,020</b>	<b>6,783</b>
<b>PBC WUD Total</b>	<b>553,523</b>	<b>433,391</b>	<b>565,820</b>	<b>441,971</b>	<b>598,170</b>	<b>467,804</b>	<b>633,482</b>	<b>494,458</b>
<i>Self-Served (On Wells)</i>	46,526	43,324	46,010	42,830	45,678	42,698	45,041	42,261
<b>PBC WUD East Vacant Potential</b>	<b>33,814</b>		<b>34,448</b>		<b>35,973</b>		<b>37,758</b>	
<b>PBC WUD West Vacant Potential</b>	<b>2,641</b>		<b>2,691</b>		<b>2,810</b>		<b>2,949</b>	
<b>PBC WUD Total Potential</b>	<b>589,978</b>		<b>602,959</b>		<b>636,953</b>		<b>674,189</b>	
<b>Total Projected Population</b>	<b>1,433,417</b>		<b>1,473,000</b>		<b>1,559,600</b>		<b>1,636,400</b>	
<b>BEBR County Population</b>	<b>1,433,417</b>		<b>1,473,000</b>		<b>1,559,600</b>		<b>1,636,400</b>	

Source: PBC WUD, PBC Planning 2015-2018 Population Allocation Model, 2018 Existing Land Use layer, PBC Property Appraiser, PBC Building/Zoning Division, University of Florida Bureau of Economic and Business Research

The non-PBCWUD water service providers within unincorporated Palm Beach County are identified in **Table 5.1.A**. Pursuant to Policy 3.1-c, the County has entered into written agreements with other entities as shown below in **Table 5.1.A** confirming their rights and responsibilities to provide utility services to the unincorporated areas of the County. The population of unincorporated County served by non-PBCWUD water service providers is shown in **Table 5.1.B**.

**TABLE 5.1.A - PBCWUD Interlocal Agreements**

<b>Unincorporated County Concurrently Service Provider</b>	<b>Effective Date of ILA</b>	<b>ILA Reference</b>	<b>Term of ILA</b>
BOCA RATON	9/3/1996	R-96-1200D	In Perpetuity
BOYNTON BEACH	9/26/2000	R2000-1534	In Perpetuity
DELRAY BEACH	2/25/2003	R2003-0284	In Perpetuity
GOLF	No ILA Executed		
JUPITER	10/04/2011	R-2011-1509	In Perpetuity
LAKE WORTH BEACH	6/12/1990	R-90-926D	In Perpetuity
LAKE CLARKE SHORES	7/27/2009	R2009-1123	7/07/2059
PALM SPRINGS	9/2/1997	R-97-1130D	In Perpetuity
RIVIERA BEACH	No ILA Executed		
SEACOAST	9/12/1989 9/13/2005	R-89-1657D R2005-1769	In Perpetuity 9/13/2055
TEQUESTA	No ILA Executed		
WELLINGTON (ACME)	4/28/1992	R-92-616D	In Perpetuity
WEST PALM BEACH	9/12/1989 12/20/2006 12/07/2010	R-89-1657D R2005-2445 R2010-2045	In Perpetuity 2/20/2030

At present, the County does not have a written service area agreement with the Village of Golf, City of Riviera Beach or the Village of Tequesta. However, Article 6 of the County’s September 13, 2005, agreement with the Seacoast Utility Authority (R2005-1769) addressed the provision of future water utility services for the unincorporated area of Jupiter Farms. Article 6 obligates the County to have sufficient bulk water capacity available to serve the specific unincorporated area adjacent to the Town of Jupiter. The County’s Water Supply Work Plan therefore includes future service to the Jupiter Farms area.

The 2030 unincorporated population projected to be served by the three service providers that currently do not have agreements with the County (Golf, Riviera Beach and Tequesta) is 7,750 people. Each of the providers holds existing water use permits issued by SFWMD with specified water allocations. The County anticipates a sufficient surplus surficial aquifer system water allocation within its current water use permit to meet projected demand for the three service providers through the ten year planning horizon if for some reason the providers are unable to adequately provide for the projected population growth expected in these areas.

**TABLE 5.1.B - Unincorporated PBC Served by Non PBC WUD Providers**

Non-PBC WUD Service Provider	Unincorporated Population Served			
	2018	2020	2025	2030
Boca Raton	23,519	23,606	23,950	24,171
Boynton Beach	32,355	32,969	36,064	37,407
Delray Beach	2,265	2,325	2,678	2,796
Golf	2,477	2,488	2,495	2,527
Jupiter	14,030	14,352	16,973	18,839
Lake Worth Beach	13,351	13,845	14,223	14,582
Maralago Cay	1,159	1,165	1,178	1,190
Palm Springs	23,826	24,392	25,578	27,109
Riviera Beach	3,041	3,146	3,554	3,646
Seacoast	16,638	17,199	18,053	18,681
Tequesta	2,232	2,264	2,276	2,354
Wellington	2,789	2,897	3,234	3,412
West Palm Beach	110	8	24	33
<b>Total Non-PBC WUD Served Unincorporated Population<sup>1</sup></b>	<b>137,792</b>	<b>140,656</b>	<b>150,280</b>	<b>156,747</b>
<b>Non-PBC WUD Served Unincorporated Population without ILA<sup>2</sup></b>	<b>8,909</b>	<b>9,063</b>	<b>9,503</b>	<b>9,717</b>
Potable Water Demand From Non-PBC WUD without ILA (mgd) <sup>3</sup>	1.0	1.0	1.1	1.1
Note 1 - Population values as presented and described in Table 5-1				
Note 2 - Non-PBC WUD Served Unincorporated Population without ILA as presented in Table 5-1A and represents Villages of Golf and Tequesta, the City of Riviera Beach, and Maralago Cay				
Note 3 - Potable Water Demand from Non-PBC WUD without ILA represents Palm Beach County's Level of Potable Water Service of 111 gallons per capita per day multiplied by Non-PBC WUD Served Unincorporated Population without ILA				
Future Non-PBC WUD Served Unincorporated Population <sup>4</sup>	0	2,864	12,488	18,955
Future Non-PBC WUD Served Unincorporated Population without ILA <sup>5</sup>	0	154	594	808
Potable Water Demand from future Non-PBC WUD without ILA (mpg) <sup>6</sup>	0	0.02	0.07	0.09
Note 4 - Represents Projected Population minus 2018 population already being served				
Note 5 - Includes Villages of Golf and Tequesta and the City of Riviera Beach				
Note 6 - Refer to Note 3 for calculation formula				

A more detailed breakdown of the population served by PBCWUD is presented in **Table 5-2** in the following section.

## 5.2 Coordination with LEC Plan

The 2018 population projections resulting from the application of the Palm Beach County Allocation Model utilized in the development of this Work Plan are different than the 2016 BEBR projections utilized by the SFWMD during the preparation of the most recent LEC Update. However, SFWMD staff indicated that the County's allocation methodology and projections utilized by the County are acceptable, and that the District would facilitate a coordinated planning approach with other local governments within the County.

PBCWUD's projected populations through 2030 are shown in **Table 5.2**. In 2030, PBCWUD expects to be providing potable water to 633,482 people as well as a portion of the population that is currently self-served. The projections presented in **Table 5.2** below correspond with the SFWMD's population projections in the LEC Plan.

The population values shown for "Palm Beach County Planning" represent the information presented in **Table 5.1**. The LEC Plan recognizes that the population projections are expected to change over time. The LEC Plan states:

*"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, many recent development proposals throughout the LEC Planning Area, which could significantly change growth patterns within the area, emphasize the uncertainties of 20-year population projections."*

The SFWMD received vast amounts of information from utilities within the planning area throughout the LEC planning process. A determination of future needs for each service area was developed with the finalization of the LEC Plan. Palm Beach County is confident that the population projections and the methodology used in the determination are consistent with the values used by SFWMD in development of the LEC Plan and the goal of providing for the future needs of the unincorporated population.



**Table 5.2 - Population Forecast for PBCWUD**

<b>PBC WUD Served Population</b>	<b>2018</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
Unincorporated County	433,391	441,961	464,807	487,675
Atlantis	2,055	2,104	2,138	2,168
Belle Glade	17,654	17,983	18,477	19,172
Boca Raton	170	226	372	530
Cloud Lake	128	133	139	152
Glen Ridge	213	217	228	239
Greenacres	39,550	40,148	41,116	42,306
Haverhill	2,116	2,232	2,394	2,530
Lake Clarke Shores	340	352	355	361
Loxahatchee Groves	91	235	774	1,333
Pahokee	5,805	5,927	6,218	6,433
Palm Beach Gardens	1,356	1,421	3,296	5,283
Palm Springs	1,309	1,364	1,772	2,939
Royal Palm Beach	33,897	34,372	34,784	36,390
South Bay	5,197	5,251	5,415	5,703
Wellington	9,362	9,461	9,575	9,698
Westlake	372	1,906	5,476	9,678
West Palm Beach	517	527	834	892
<b>Total Population Served by PBC WUD</b>	<b>553,523</b>	<b>565,820</b>	<b>598,170</b>	<b>633,482</b>
<p>The following values represent the population throughout unincorporated Palm Beach County that is self-served via wells. All have the potential to request utility service from PBC WUD at any given time. For conservative facility planning purposes, plants are sized to be able to serve all the self-served population in addition to the population projected throughout the utility service area.</p>				
<b>Self-Served Population</b>	<b>2018</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
Loxahatchee Groves	3,202	3,180	2,980	2,780
Unincorporated PBC/Glades	43,324	42,830	42,698	42,261
<b>Total Self-Served Population</b>	<b>46,526</b>	<b>46,010</b>	<b>45,678</b>	<b>45,041</b>

### 5.3 Contracted Bulk Water Customers/Demands

Utilities continue to recognize the advantages offered through the regionalization of treatment facilities. Sharp increases in operational costs are causing many utilities to find alternative strategies for providing redundancy, ensuring system reliability, and serving peak demands. Frequently, contracting with a larger utility, such as Palm Beach County, to purchase bulk utility capacity is less expensive than constructing, operating, and maintaining new infrastructure. Additionally, determining where to construct new infrastructure and wellfields is becoming problematic for some utilities due to regulatory constraints and other pressures. Other utilities simply require a cushion of time to raise the capital required to expand and construct new treatment plants and water supplies. The impact of bulk water sales to the PBCWUD system is presented in **Table 5.3**.

NOTE: The bulk utility service demands presented in **Table 5.3** are not overlapped or “double-counted” with the population forecast demands presented in the **Tables 5.1, 5.2, and 5.5** because the bulk water will be utilized to serve customers not located within PBCWUD’s utility service area.

**Table 5.3 – PBCWUD Contracted Bulk Water Customers**

Year	Finished Water Demand from Bulk Agreements (mgd)		Atlantis Bulk Agreement 1992 (mgd)		Boynton Beach Bulk Agreement 2013 (mgd)		FPL Bulk Agreement 2007 (mgd)		Lake Clarke Shores 2009 Agreement (mgd)		North Springs Improvement District 2018 Agreement (mgd)		Parkland Bulk Agreement 2007 (mgd)		Seacoast Bulk Agreement 2005 (mgd)		Seminole Improvement District (City of Westlake) Bulk Agreement 2007 (mgd)	
	ADF	MDF	ADF	MDF	ADF	MDF	ADF	MDF	ADF	MDF	ADF	MDF	ADF	MDF	ADF	MDF	ADF	MDF
2015	4.54	18.64	0.73	0.73	1.00	5.00	1.00	1.00	0.80	0.80	0.00	0.00	0.80	1.00	0.11	5.11	0.10	5.00
2016	4.54	18.64	0.73	0.73	1.00	5.00	1.00	1.00	0.80	0.80	0.00	0.00	0.80	1.00	0.11	5.11	0.10	5.00
2017	4.94	19.04	0.73	0.73	1.00	5.00	1.00	1.00	0.80	0.80	0.00	0.00	0.80	1.00	0.51	5.51	0.10	5.00
2018	4.94	19.04	0.73	0.73	1.00	5.00	1.00	1.00	0.80	0.80	0.00	0.00	0.80	1.00	0.51	5.51	0.10	5.00
2019	5.25	19.20	0.73	0.73	1.00	5.00	1.00	1.00	0.80	0.80	0.02	0.02	0.80	1.00	0.66	5.66	0.25	5.00
2020	5.25	19.20	0.73	0.73	1.00	5.00	1.00	1.00	0.80	0.80	0.02	0.02	0.80	1.00	0.66	5.66	0.25	5.00
2021	5.25	19.20	0.73	0.73	1.00	5.00	1.00	1.00	0.80	0.80	0.02	0.02	0.80	1.00	0.66	5.66	0.25	5.00
2022	5.25	19.20	0.73	0.73	1.00	5.00	1.00	1.00	0.80	0.80	0.02	0.02	0.80	1.00	0.66	5.66	0.25	5.00
2023	5.25	19.20	0.73	0.73	1.00	5.00	1.00	1.00	0.80	0.80	0.02	0.02	0.80	1.00	0.66	5.66	0.25	5.00
2024	5.25	19.20	0.73	0.73	1.00	5.00	1.00	1.00	0.80	0.80	0.02	0.02	0.80	1.00	0.66	5.66	0.25	5.00
2025	5.25	19.20	0.73	0.73	1.00	5.00	1.00	1.00	0.80	0.80	0.02	0.02	0.80	1.00	0.66	5.66	0.25	5.00
2026	5.25	19.20	0.73	0.73	1.00	5.00	1.00	1.00	0.80	0.80	0.02	0.02	0.80	1.00	0.66	5.66	0.25	5.00
2027	5.25	19.20	0.73	0.73	1.00	5.00	1.00	1.00	0.80	0.80	0.02	0.02	0.80	1.00	0.66	5.66	0.25	5.00
2028	5.25	19.20	0.73	0.73	1.00	5.00	1.00	1.00	0.80	0.80	0.02	0.02	0.80	1.00	0.66	5.66	0.25	5.00
2029	5.25	19.20	0.73	0.73	1.00	5.00	1.00	1.00	0.80	0.80	0.02	0.02	0.80	1.00	0.66	5.66	0.25	5.00
2030	5.25	19.20	0.73	0.73	1.00	5.00	1.00	1.00	0.80	0.80	0.02	0.02	0.80	1.00	0.66	5.66	0.25	5.00

Source of information is agreements held by Palm Beach County Water Utilities Department  
 ADF = Average Daily Flow; MDF = Maximum Daily Flow

## 5.4 Formerly Self-Served Population

WUD instituted a Special Assessment Program that provides a means by which neighborhoods using private wells for water supply can request public water service. Since 1988, WUD has converted approximately 9,500 properties from wells to potable water (approximately 20,000 customers) via its Special Assessment Program. Palm Beach County will continue to include areas where people utilize private wells for water supply. However, property owners continue to contact PBCWUD to request potable water service. The County anticipates that the following issues will continue to drive people to public utilities verses maintaining private wells.

- **Drought:** Significant recent severe drought periods experienced in South Florida resulted in a negative impact on shallow aquifer wells. Some wells previously constructed by homeowners are drying up or producing less water. Public utility service removes the burden of managing a private well to sustain extreme drought conditions.
- **Water Restrictions:** The imposition of water restrictions by SFWMD results in a number of homeowners seeking public utility service. This is particularly true in areas where reclaimed water is available or scheduled to be available.
- **Hurricanes & Power Outages:** Private wells do not operate effectively following hurricanes and/or power outages unless a homeowner possesses a generator. PBCWUD's Special Assessment Program received a large number of requests from communities on private wells that were impacted by hurricanes or other severe storm events.
- **Marketability:** New immigrants to the County have historically desired public utilities. Having public water and/or sewer service greatly enhances the value of a property. Many people are responding favorably to assessment projects so that the value of their estate will be increased through the provision of public water service.
- **Fire Protection:** Property owners desire the added protection of having fire hydrants near their home to be able to quickly put out fires that may erupt. Also, the escalated cost of homeowner's insurance is somewhat reduced by the presence of fire hydrants near a property.
- **Fuel and Chemical Costs:** Since the LEC Plan update was published, the cost of chemicals and power associated with home-based wells and water treatment equipment continues to increase.

The LEC Plan recognizes the number of self-served people within the County. These people are not assigned to any utility for potable water service. PBCWUD projects that 60-percent of the self-served population will eventually convert to public utility service for the reasons listed above. Since this population is included in the LEC Plan, it is not a new source of water use and instead qualifies as an existing source. A portion of this existing, recognized water use source needs to be reassigned to utilities as more people abandon their wells for public utilities. PBCWUD anticipates that the Special Assessment Program will continue to ramp up and facilitate a portion of the self-served population to become utility customers using public water supplies. This "conversion" is presented in **Table 5.4**. For planning purposes, we have incorporated these "converted" self-served population values into WUD's customer base. This conservative approach provides the added benefit of ensuring an adequate water supply will be available to serve people

desiring to rid themselves of the burden of private well systems. This approach does not affect LEC Plan projections because this population base is clearly represented in the SFWMD model.

**Table 5.4 – Formerly Self-Served Population Consideration**

Year	LEC Plan Identified Self-Supplied Population <sup>1</sup>	PBC Self-Supplied Population <sup>2</sup>	Cumulative Number of Customers added from Special Assessment Program <sup>3</sup>	Served Population by TAZ <sup>4</sup>	Served Population <sup>5</sup>
<b>2015*</b>	<b>70,116</b>	<b>65,900</b>	<b>20,242</b>	<b>537,368</b>	<b>557,610</b>
2016*			20,711	542,753	563,464
2017*			21,180	548,138	569,318
2018			21,649	553,523	575,172
2019			22,007	559,993	582,000
<b>2020</b>	<b>69,865</b>	<b>62,995</b>	<b>22,165</b>	<b>565,820</b>	<b>587,985</b>
2021			22,214	572,290	594,504
2022			22,321	578,760	601,081
2023			22,427	585,230	607,657
2024			22,534	591,700	614,234
<b>2025</b>	<b>70,962</b>	<b>62,107</b>	<b>22,497</b>	<b>598,170</b>	<b>620,667</b>
2026			22,746	605,232	627,978
2027			22,852	612,295	635,147
2028			22,958	619,357	642,315
2029			23,064	626,420	649,484
<b>2030</b>	<b>71,304</b>	<b>60,721</b>	<b>23,134</b>	<b>633,482</b>	<b>656,616</b>

\*Revised from previous Water Supply Plan to reflect more recent data

<sup>1</sup>Represents population throughout the County using private wells for water supply as identified in the LEC plan

<sup>2</sup>PBC "Self-Supplied Population" represents values presented in table 5.1 and differ from LEC due to methodology/data used

<sup>3</sup>Represents the amount of people previously using wells ("self-served") that have connected or may connect to public water supply

<sup>4</sup>"Served Population by TAZ" represents PBCWUD values presented in table 5.1

<sup>5</sup>"Served Population" represents population served by TAZ PLUS population requesting public water in lieu of their wells

## 5.5 Finished Water Demand

PBCWUD's finished water demand was calculated by multiplying the population served per capita rates outlined in the 2018 Lower East Coast Supply Plan. For the Eastern Region Distribution System the per capita rate was 111 gallons per capita per day (gpcd). The Western Region Distribution System per capita rate was 157 gpcd. To accurately reflect the total amount of finished water demand, the forecasted demand from contracted bulk water customers was added to the projected population demand. The demand for the bulk water agreements are served solely by the Eastern Region permit (50-00135-W). PBCWUD expects the current combined finished water demand of 67.97 mgd, for both the Eastern and Western Regions, will increase to 79.88 mgd in 2030 as shown in **Table 5.5**. An equivalent population for 79.88 mgd of finished water would be 703,913 people.

Not all of PBCWUD's finished water demand will be satisfied using the surficial aquifer system as a source water; serving to potentially further lower the demands on the regional water system. The County's robust alternative water resources program will more than likely result with more water being returned to the regional system as is further detailed in Section 8 of this Water Supply Plan

**Table 5.5 PBCWUD Finished Water Demand**

Year	Served Population	Eastern Distribution Served Population	Western Distribution Served Population	Finished Water Demand from Served Population (mgd)		Eastern Distribution System Finished Water Demand from Served Population (mgd)		Western Distribution System Finished Water Demand from Served Population (mgd)		Finished Water Demand from Bulk Agreements (mgd)		Total Finished Water Demand (mgd)		Equivalent Population Potentially Served by PBCWUD
				ADF	MDF	ADF	MDF	ADF	MDF	ADF	MDF	ADF	MDF	
<b>2015</b>	<b>557,610</b>	<b>524,172</b>	<b>33,438</b>	<b>63.43</b>	<b>79.29</b>	<b>58.18</b>	<b>72.73</b>	<b>5.25</b>	<b>6.56</b>	<b>4.54</b>	<b>18.64</b>	<b>67.97</b>	<b>97.93</b>	<b>598,466</b>
2016	563,464	529,833	33,631	64.09	80.11	58.81	73.51	5.28	6.60	4.54	18.64	68.63	98.75	604,320
2017	569,318	535,493	33,825	64.75	80.94	59.44	74.30	5.31	6.64	4.94	19.04	69.69	99.97	613,777
2018	575,172	541,154	34,018	65.41	81.76	60.07	75.09	5.34	6.68	4.94	19.04	70.34	100.80	619,631
2019	582,000	547,563	34,437	66.19	82.73	60.78	75.97	5.41	6.76	5.25	19.20	71.44	101.93	629,297
<b>2020</b>	<b>587,985</b>	<b>553,129</b>	<b>34,856</b>	<b>66.87</b>	<b>83.59</b>	<b>61.40</b>	<b>76.75</b>	<b>5.47</b>	<b>6.84</b>	<b>5.25</b>	<b>19.20</b>	<b>72.12</b>	<b>102.79</b>	<b>635,282</b>
2021	594,504	559,319	35,185	67.61	84.51	62.08	77.61	5.52	6.91	5.25	19.20	72.86	103.71	641,802
2022	601,081	565,567	35,514	68.35	85.44	62.78	78.47	5.58	6.97	5.25	19.20	73.60	104.64	648,378
2023	607,657	571,815	35,842	69.10	86.37	63.47	79.34	5.63	7.03	5.25	19.20	74.35	105.57	654,954
2024	614,234	578,063	36,171	69.84	87.30	64.16	80.21	5.68	7.10	5.25	19.20	75.09	106.50	661,531
<b>2025</b>	<b>620,667</b>	<b>584,167</b>	<b>36,500</b>	<b>70.57</b>	<b>88.22</b>	<b>64.84</b>	<b>81.05</b>	<b>5.73</b>	<b>7.16</b>	<b>5.25</b>	<b>19.20</b>	<b>75.82</b>	<b>107.42</b>	<b>667,964</b>
2026	627,978	591,174	36,804	71.40	89.25	65.62	82.03	5.78	7.22	5.25	19.20	76.65	108.45	675,276
2027	635,147	598,039	37,108	72.21	90.26	66.38	82.98	5.83	7.28	5.25	19.20	77.46	109.46	682,444
2028	642,315	604,903	37,412	73.02	91.27	67.14	83.93	5.87	7.34	5.25	19.20	78.27	110.47	689,612
2029	649,484	611,768	37,716	73.83	92.28	67.91	84.88	5.92	7.40	5.25	19.20	79.08	111.48	696,781
<b>2030</b>	<b>656,616</b>	<b>618,596</b>	<b>38,020</b>	<b>74.63</b>	<b>93.29</b>	<b>68.66</b>	<b>85.83</b>	<b>5.97</b>	<b>7.46</b>	<b>5.25</b>	<b>19.20</b>	<b>79.88</b>	<b>112.49</b>	<b>703,913</b>

Finished Water Demand based upon PBCWUD per capita rates found in the SFWMD 2018 Lower East Coast Supply Plan

Per Capita Rates: Eastern Distribution 111 gpcd; Western Distribution 157 gpcd

Finished Water Demand from Bulk Agreements is representative of values presented in Table 5.3

\*2015 Forward the PBCWUD Population includes the former GUA (Cities of Pahokee, South Bay, and Belle Glade) which is now the PBCWUD Western Region service area.

## 5.6 Water Treatment Plants

Palm Beach County Water Utilities Department has five existing water treatment plants (WTP 2, 3, 8, 9 and 11) that are permitted to provide approximately 113.4 million gallons per day (mgd) of finished water capacity for consumer demand. **Table 5.6** provides general information for each of the active WTPs. **The County's water distribution system is interconnected throughout its service area, excluding the Glades Region.**

The interconnected Eastern Region Distribution System (50-00135-W) is represented by WTP 2, 3, 8 and 9, where finished water can be pumped from any plant to meet customer demands. The permitted capacity of this system is 87 MGD. Both the Floridan and surficial aquifer systems are sources of water in for the Eastern Region. Raw water capacity for the wellfields in this system is 122 MGD.

The Western Region Distribution System (Glades Region; CUP 50-06857-W) is separate and served only by WTP 11. This system has a permitted capacity of 10 MGD. All wells in this system pull water from the Floridan aquifer system. Raw water capacity for the wellfields in this system is 8 MGD.

### 5.6.1 Eastern Region Distribution System

**Water Treatment Plant 2** is a lime softening plant and ion exchange plant with a total treatment capacity of 16.4 MGD. Lime softening and ion exchange (IXOM resin) treatment capacities are 16.4 mgd and 10.0 mgd respectively. Ion exchange is a treatment process in addition to lime softening and does not add additional treatment capacity.

**Water Treatment Plant 3** is a membrane softening plant with a total treatment capacity of 30.0 mgd with a 15 percent raw water bypass blend. Membrane softening accounts for 25.5 mgd while the remaining 4.5 mgd is for raw water blending.

**Water Treatment Plant 8** is a lime softening and ion exchange plant with a total treatment capacity of 30.0 mgd. Lime softening and ion exchange (Tonka resin) treatment capacities are 30.0 mgd and 30.0 mgd respectively. Ion exchange is a treatment process in addition to lime softening and does not add additional treatment capacity.

**Water Treatment Plant 9** is a membrane softening plant with a total treatment capacity of 26.88 mgd with a 15 percent raw water bypass blend. Membrane softening accounts for 23.88 mgd while the remaining 3.0 mgd is for raw water blending.

### 5.6.2 Western Region Distribution System

**Water Treatment Plant 11** is a reverse osmosis plant with a total treatment capacity of 10.0 mgd.



## 6.0 RAW WATER DEMAND PROJECTIONS

Based upon the results of extensive comprehensive planning, master planning, and expected population growth, Palm Beach County has developed a capital improvements program to ensure adequate water supply and water treatment facilities will be available to satisfy projected demand through the year 2030.

Over the last five years Palm Beach County Water Utilities Department's Eastern Region has operated with an average finished water per capita usage of 111 gpcd. When the current consumptive use permit was issued in 2003, the finished water per capita usage was approximately 126 gpcd. A significant factor in the reduction of per capita demand has been the implementation of the Water Utility Department's Water Conservation Program. The Program includes an aggressive inclining block rate structure that was updated in 2007 to achieve further conservation benefits, customer outreach efforts, and the enforcement of the County's irrigation ordinance adopting the South Florida Water Management District's Year-Round Landscape Irrigation Conservation Rule (Chapter 40E-24, F.A.C.). Palm Beach County staff will review the County's existing landscape irrigation ordinance, determine the actions necessary to update the ordinance to align with SFWMD's year-round landscape irrigation rule and develop an action plan to update the County's landscape irrigation ordinance. The finished water per capita rate for the Western Region reflects a usage of 157 gpcd. Per capita rates are based on the 2018 Lower East Coast Supply Plan are averaged from 2012 to 2016 values.

Additionally, at those Eastern Region County facilities utilizing membrane treatment technology (WTP 3 and 9), the raw water per capita rate is increased by 11.8% to 146.5 gpcd. The increased raw water per capita is attributed to the membrane process that produces higher quality water by generating a concentrated waste stream. The waste stream is equivalent to 15 percent of the incoming raw water flow. Palm Beach County has instituted a program to optimize recycling of the membrane waste into its reclaimed water program.

A summary of Palm Beach County's facility capacity analysis is presented in **Table 6.1 (Eastern Region)** and **Table 6.2 (Western Region)** for each of the 5-year planning increments. Palm Beach County's facility expansion strategy has been designed to have a surplus condition for both raw water and finished water facilities throughout the 10-year planning period. The County's operating strategy is to divide the system-wide demand as equally as possible among the treatment plants in the Eastern Region Distribution System. This strategy optimizes facility operations and provides a level of equilibrium for operations.

**Table 6.1 - Eastern Region Facility Capacity Analysis**

<b>Facility Capacity Analyses</b>	<b>2018</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
PBCWUD East Region Population	519,505	530,964	561,670	595,462
Cumulative Self-Served Conversions (Wells)	21,649	22,165	22,497	23,134
Total Eastern Region Population Served <sup>1</sup>	541,154	553,129	584,167	618,596
Demand per Capita (gpd) <sup>2</sup>	111	111	111	111
Contracted Finished Water Bulk Demand (mgd)	4.94	5.25	5.25	5.25
Total Finished Water Average Daily Demand (mgd)	65	67	70	74
<b>Total Raw Water Average Daily Demand (mgd)<sup>3</sup> = Finished Water x 1.11</b>	<b>72</b>	<b>74</b>	<b>78</b>	<b>82</b>
Available Raw Water Facility Capacity (mgd) <sup>4</sup>	122	122	122	122
Raw Water Facility Capacity Surplus <sup>5</sup>	50	48	44	40
Permitted Raw Water Allocation (mgd annual average) <sup>6</sup>	87	87	87	87
Total Raw Water Average Daily Demand (mgd)	72	74	78	82
<b>Permitted Water Available<sup>7</sup></b>	<b>15</b>	<b>13</b>	<b>9</b>	<b>5</b>

<sup>1</sup> Population Served represents projected retail customers and self-served conversions, Table 5-4.

<sup>2</sup> Demand per Capita based upon population served.

<sup>3</sup> ADF raw water = 1.11 \* ADF FW (per historical and capacity-based analyses)

<sup>4</sup> Raw Water Facility Capacity = Wellfield Capacity with two largest wells out of service for each individual wellfield.

<sup>5</sup> Calculated by subtracting average daily demand from available facility capacity.

<sup>6</sup> Permitted allocation from Permit #50-00135-W..

<sup>7</sup> PBCWUD is projecting to meet and exceed the AWS requirements contained in Permit #50-00135 as presented in Tables 8.2 and 8.4.

**Table 6.2 - Western Region Facility Capacity Analysis**

<b>Facility Capacity Analyses</b>	<b>2018</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
Western Region Population Served <sup>1</sup>	34,018	34,856	36,500	38,020
Demand per Capita (gpd) <sup>2</sup>	157	157	157	157
Total Finished Water Average Daily Demand (mgd)	5	5	6	6
<b>Total Raw Water Average Daily Demand (mgd)<sup>3</sup> = Finished Water x 1.31</b>	<b>7</b>	<b>7</b>	<b>8</b>	<b>8</b>
Available Raw Water Facility Capacity (mgd) <sup>4</sup>	8	8	8	8
Raw Water Facility Capacity Surplus <sup>5</sup>	1	1	0	0
Permitted Raw Water Allocation (mgd annual average) <sup>6</sup>	10	10	10	10
Total Raw Water Average Daily Demand	7	7	8	8
<b>Permitted Water Available</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>

<sup>1</sup> Population Served represents projected retail customers and self-served conversions, Table 5-4.

<sup>2</sup> Demand per Capita based upon population served.

<sup>3</sup> ADF raw water = 1.31 \* ADF FW (per historical and capacity-based analyses)

<sup>4</sup> Raw Water Facility Capacity = Wellfield Capacity with two largest wells out of service for each individual wellfield.

<sup>5</sup> Calculated by subtracting average daily demand from available facility capacity.

<sup>6</sup> Permitted allocation from Permit #50-06857-W.

## **7.0 RAW WATER SOURCE IDENTIFICATION**

### **Eastern Region**

Palm Beach County WUD's 20-year Consumptive Water Use Permit (50-00135-W) supporting the Eastern Region was issued on March 13, 2003 and expires on March 13, 2023. The permit authorizes withdrawals to meet the future reasonable-beneficial demands of 569,000 residents with a per capita use rate of 153 gallons per capita per day. The full allocation is available from the surficial aquifer system with supplementary water supplied by the Floridan aquifer system as described in this Section.

The County acknowledges the District's Regional Water Availability Rule adopted in 2007 (RWA Rule) [Ref. Applicant's Handbook Subsection 3.2.1.E.]. The County will address the RWA Rule and permitting requirements during renewal of the County's Water Use Permit 50-00135-W which expires in 2023.

PBCWUD committed to the development of approximately 33 MGD of alternative water supply under maximum month pumping conditions (Exhibit 16), including ASR and reclaimed water. Due to PBCWUD's commitment to AWS, this volume has been far exceeded. As of 2019, a maximum of 62.9 MGD of AWS available (Table 8.3).

The County is planning to implement alternative sources above and beyond the mandated quantities. The exact use of each component is dependent upon actual customer demands. For example, if finished water demands are significantly reduced, PBCWUD will not have as much raw wastewater to utilize for reclaimed water as desired. Additionally, PBCWUD is not moving forward with the ASR program as this system is proving to be inefficient. PBCWUD will continue to aggressively expand its reclaimed water program. The County will satisfy its Water Use Permit requirements and intends to remain a leader in the field of alternative water supplies as long as it is technically feasible and viable.

PBCWUD provided SFWMD reasonable assurances that the Utility's proposed use is consistent with the prevention plan for the Biscayne aquifer as described in Rule 40E-8.421(4) of the Florida Administrative Code (FAC). Specifically, the modeling results indicate the area of influence of the four wellfields (excluding Royal Palm Beach and Lake Region wellfields) does not extend to the coastal saline water interface and will not result in saline water intrusion, consistent with the Biscayne aquifer minimum flows and levels (MFL) prevention plan. Additionally, the proposed use will not lower coastal canal stages.

### **Western Region**

Palm Beach County WUD's 20-year Consumptive Water Use Permit (50-06857-W) supporting the Western Region was issued on October 12, 2005 and expires on October 12, 2025. The permit authorizes withdrawals to meet the future reasonable-beneficial demands of 42,115 residents across the Cities of Belle Glade, Pahokee, and South Bay with a per capita use rate of 224 gallons per capita per day. The full allocation is available from the Floridan aquifer system.

The permit has been modified several times since issuance to update proposed withdrawal facilities and address concerns over upconing of saline water. The permit is not subject to any of the District's Restricted Allocation Area or Source of Limited Availability criteria due to a combination of its location and withdrawal source.

## **7.1 SURFICIAL WELLFIELDS**

A description of each active wellfield is given below and is consistent with current operations and those forthcoming in a consumptive use permit modification. The wellfields previously associated with PBCWUD Wellfields 1 and 7, (decommissioned in 2002), were assigned to Wellfield 8 and the wells are numbered accordingly. However, due to the location of these wells and the absence of raw water piping to physically connect the wells with Wellfield 8, they were plugged and abandoned in 2002 (WUD 00-136). Well 10 and the associated wellfields have been decommissioned and water provision to the service area is being supplied by Wellfield 8.

The surficial aquifer system (Fish, 1988; Fish and Stewart, 1991) comprises a sequence of highly permeable limestone, quartz sand, shell, and terrigenous mudstone of Pliocene to Holocene age. It is unconfined and generally extends from land surface to 200 below land surface. Rainfall and seepage from canals, lakes, the Everglades, and other wetlands recharge the surficial aquifer system (SAS). The surficial aquifer system has been divided into separate aquifers and semi-confining (leaky) units of quartz sand, terrigenous mudstone, and limestone (Fish, 1988; Fish and Stewart, 1991). The Fort Thompson Formation, Anastasia Formation, and Key Largo Limestone yield the most water and constitute the prolific Biscayne aquifer. The Biscayne aquifer generally is considered to extend northward from southeastern Monroe County and southernmost Miami-Dade County into southern Palm Beach County. In southern Palm Beach County, the Anastasia and Fort Thompson Formations compose the Biscayne aquifer and does not extend into central and northern Palm Beach County. However, a moderately to highly transmissive limestone sequence forms its lateral hydrogeologic equivalent and has been defined as the non-Biscayne production zone (Shine and others, 1989).

### **7.1.1 Wellfield 2**

Wellfield 2 is located to the east of Pinehurst Drive just north of 10<sup>th</sup> Avenue North in West Palm Beach. PBCWUD has 16 existing surficial aquifer system wells with a withdrawal capacity of 22.6 MGD and has proposed 21 other surficial aquifer system wells. Seven of the existing wells are being relocated/replaced. The proposed wells have a design capacity of 39.3 MGD. New wells are scheduled in preparation for the future WTP 2 expansion to 10 MGD of membrane treatment. WTP 2 will be expanded from 16.4 MGD to an ultimate capacity of 25 MGD and 30 MGD buildout capacity. Well design is scheduled for FY 2023 and construction in FY 2024.

PBCWUD and PBC Parks and Recreation have worked closely in the area of Wellfield 2 to design the Cholee Park lake system. This lake system will provide recharge to the groundwater in the vicinity of the wellfield and promote wetland preservation within the park. PBCWUD's and Lake Worth Drainage District's 20-year water use permits required both groups to work together for design and construction of a new pump station along the SFWMD's C-51 Canal to maintain water elevations at 13.0 feet NGVD. This pump station became fully operational in 2005.

### **7.1.2 Wellfield 3**

Wellfield 3 is currently located between Florida's Turnpike and just east of Jog Road between the LWDDs L-29 and L-31 canals. The eastern portion of the wellfield was constructed during the 1970's and consists of wells 3W-1 through 3W-7. Since 1988, the County has added nineteen wells, 3W-8 through 3W-10 at the Wellfield 3 site; 3W-20 and 3W-21 along Jog Road; 3W-11 and 3W-12 along the L-30 canal; 3W-13 through 3W-18 near the SRWRF site; and 3W-23 through 3W-29 along Hagen Ranch Road. In 2001 wells 3W-1 through 3W-7 were up-rated to 1,000 gallons per minute and ten new production wells were constructed in 2003 (WUD 00-136). The production wells provide raw water adequate for the planned expansion of WTP 3. PBCWUD

constructed four new production wells in 2008 to ensure the wellfield serving WTP 3 has adequate capacity at all times.

PBCWUD currently has 32 existing surficial aquifer system wells with a withdrawal capacity of 48.5 MGD and has proposed one (1) other surficial aquifer system well. Six of the existing wells are being relocated/replaced. Two of the existing wells have pending screen replacements. The proposed well has a design capacity of 1.44 MGD.

### **7.1.3 Wellfield 8**

Wellfield 8 is located along Florida's Turnpike between Belvedere Road and Okeechobee Boulevard. Wells have been installed in increments since 1982. Wells formerly associated with the County's WTPs 1 and 7 but could not be efficiently used to supply WTP 8 with raw water. Wells 8W-19 and 8W-20 located directly east of the WTP 8 site were also abandoned.

PBCWUD currently has 25 existing surficial aquifer system wells with a withdrawal capacity of 36.0 MGD. Four of the existing wells are being relocated/replaced and another four of have pending screen replacements.

### **7.1.4 Wellfield 9**

Wellfield 9 is located south of W Palmetto Park Road in the vicinity of the Boca Dunes Golf course and along the north side of the Hillsboro Canal, west of State Road 7 N. PBCWUD currently has 30 existing surficial aquifer system wells with a withdrawal capacity of 48.4 MGD. Two of the existing wells are being relocated/replaced while five of the existing wells are pending screen replacements.

## **7.2 FLORIDAN WELLFIELDS**

The Floridan aquifer system is one of the most productive aquifers in the United States and underlies all of Florida and parts of Georgia and South Carolina for a total area of about 100,000 square miles. The Floridan aquifer system consists of an extensive sequence of thickly bedded Tertiary-aged limestone, and less abundant dolomites, that are connected by varying degrees. The system in western Palm Beach County consists of Ocala Limestone, Avon Park Formation, Oldsmar Formation, and locally the Suwannee Limestone. The base of the Floridan aquifer system is generally placed at the top of the uppermost evaporate (anhydrite) bed in the Cedar Keys Formation, which occurs approximately 3,500 feet below ground surface in the Lake Region Plant area (Miller, 1986). Regionally, the Floridan aquifer system contains the upper, middle and lower producing zones. The Upper Floridan aquifer (UFA) is the production zone of choice for PBCWUD withdrawals as it is the most accessible, productive, and freshest source. Based on data compiled at the near WTP 11, the UFA is present from approximately -940 to -1,440 ft NGVD.

### **7.2.1 Wellfield 2**

An ASR well is currently proposed for Wellfield 2 and will not be constructed in the current planning period. The proposed design capacity is 2.2 MGD.

### **7.2.2 Wellfield 3**

As part of the Wellfield 3, PBCWUD constructed an ASR well in 1999. Known as Southern Region Operations Center (SROC) ASR well, the design capacity is 2.2 MGD. The purpose of this well has since changed to future use as an Upper Floridan aquifer blending well due the uncertainty of environmental, technical, or economic or feasibility of ASR.

### **7.2.3 Wellfield 8**

An ASR well is currently proposed for Wellfield 8 and will not be constructed in the current planning period. The proposed design capacity is 5.0 MGD.

### **7.2.4 Wellfield 9**

The East Hillsboro Canal ASR well (WUD 98-66, Florida Department of Environmental Protection WACS Facility ID 97730) was constructed to store 5 MGD of raw water to mitigate peak water supply demands at WTP 9. The ASR Well has been modified to be used as a blending well.

### **7.2.5 Wellfield 11**

Raw water is withdrawn from the Upper Floridian aquifer (UFA) via 11 wells located along State Highway 715 north of Hooker Highway. Plant capacity will not be increased; however, system efficiency will increase, allowing for more effective utilization of the facility and flexibility in the operation of the existing wellfield to abate concerns over upconing of saline water. Well 11 construction was completed in 2019.

## 8.0 ALTERNATIVE WATER RESOURCES PROGRAM

The County is actively and aggressively implementing alternative water resource projects. This program supports the SFWMD LEC Plan for reducing reliance on the regional shallow aquifer system including demand reducing, supply management, and augmentation techniques. The County is proactively expanding alternative water resources that address both innovative supply sources and reuse of wastewater.

The County's alternative water resources program is multifaceted in that many benefits are realized:

- Minimizing dependence upon the surficial aquifer system and the regional water supply system;
- Implementing a robust water conservation plan;
- Maintaining a steady raw water supply for water treatment plants;
- Reducing the amount of fresh water drained from the land and discharged to the ocean;
- Minimizing stressing of wellfields;
- Minimizing the "net" quantity of water withdrawn from the surficial aquifer system;
- Providing landscaping water supply during drought conditions;
- Reducing reliance upon deep injection well system;
- Providing habitat for migratory birds and waterfowl and endangered species;
- Providing passive recreation opportunities for the public;
- Increasing suburban green space.

Water supply in South Florida requires a complex and difficult balancing of a multitude of considerations. As the number of customers served by PBCWUD increases, the associated increase in demand must be balanced with permitted aquifer allocations. When the County received its 20-year water use permit in 2003, the future bulk customer market and the regionalization of utility service were not front-line topics. Therefore, PBCWUD is attempting to serve more people with the same baseline allocations. This situation expedites the County's need to cultivate and implement new innovative water supply projects.

The purpose of the County's Alternative Water Resources Program encompasses a myriad of issues. The Department's top goals for the program are as follows:

**Reduce impact on the "regional system".** All urban and environmental users are ultimately reliant upon the "regional system" as defined as Lake Okeechobee and the downstream Water Conservation Areas. Whether a direct user, such as LWDD, or an indirect user, such as PBCWUD, the more water supply sources made, the longer our existing resources will remain viable.

**Implement real water conservation.** Water conservation is the key to maintaining the health and productivity of the Surficial and Floridan aquifer systems. Promoting water conservation equipment, techniques, and practices will benefit customers economically and maintain a realistic water demand picture for utilities. PBCWUD promotes conservation through a variety of means including an inverted rate structure, conservation ordinance, public education, and offering low-cost kits to its customers to reduce water use in their homes.

Recently, Ordinance 2018-002 adopted in February 2018, updated existing authority governing landscaping and irrigation including the installation of native and drought-tolerant plant materials in appropriate areas; the use of water conserving irrigation practices; and, the adherence to



landscape installation standards and maintenance procedures that promote water conservation following SFWMD's Waterwise Florida Landscapes publication.

The inclining block rate structures are intended to promote water conservation and encourage the efficient use of water, both potable and alternative. Since October 2007, a commodity fee for reclaimed water was implemented by PBCWUD to encourage conservation and to adsorb some of the effluent disposal costs previously borne by wastewater customers. These rate structures show the County is committed to conservation efforts of not only our traditional water source but also our alternative water supply.

#### PBCWUD Conservation Plan

1. Limitation of lawn and ornamental irrigation hours: Palm Beach County passed an Irrigation Ordinance (93-A) that restricts landscape irrigation to between the hours of 5:00 pm and 9 am seven days per week.
2. Use of Xeriscape Principles: The Palm Beach County Land Development Code, Article 7 Landscaping, references the District's most recent Waterwise Florida Landscapes guide in the selection of new plantings.
3. Ultra-Low Volume Plumbing Fixture Requirements: The County Building Code requires ultra-low volume plumbing fixtures in all new construction.
4. Water Conservation Based Rate Structures: PBCWUD has had a conservation-based rate structure for over a decade that includes increasing block rates as a means of reducing demands. The rate structure also includes a commodity fee for reclaimed water to encourage conservation.
5. Leak Detection Programs: PBCWUD completes an unaccounted-for water and leak detection program on an annual basis. The program results have indicated that system leakage is well below industry standards for the Eastern Region permit (50-00135-W). For the Western Region (50-06857-W) which has water loss above industry standards, PBCWUD has an ongoing and aggressive infrastructure improvement program to reduce water loss.
6. Requirements of Rain Sensor Override for New Lawn Sprinkler Systems: The County Building Code requires any person who purchases and installs an automatic lawn sprinkler system to operate and maintain a rain sensor device or automatic switch that will override the irrigation system with the occurrence of adequate rainfall.
7. Water Conservation Public Education Programs: PBCWUD distributes brochures, educational videos, staff display booths at local fairs, provides water conservation information on an internet site, and hosts tours of Wakodahatchee Wetlands to promote conservation within the community. PBCWUD also posts information in the form of signs, press releases, and messages about water conservation and water quality. Messages are often placed on a flyer or directly on utility bills.
8. Analysis of Economic, Environmental, and Technical Feasibility of Reusing Reclaimed and/or Recycled Water: PBCWUD's commitment to reclamation of water is shown by our use of wetland treatment facilities, a mandatory reclaimed water use service area (Reclaimed Water Ordinance 97-12), expansion of treatment facilities, and implementation of other methods of water conservation. A more detailed explanation of PBCWUD's commitment to reclaimed water is given in Section 8.1, below.
9. A Schedule and Processes for Implementing, Assessing, and Periodically Updating the Water Conservation Plan: PBCWUD revisits our conservation programs on an as needed basis depending on factors such as regulatory updates.
10. Any Other Appropriate Elements: PBCWUD has demonstrated a strong willingness to invest the resources necessary to expand our alternative water supplies. This is best demonstrated by the commitments made to the District in our existing consumptive use permit and investments in reclaimed water.

**Long-term planning for water availability.** PBCWUD is continually planning for the long-term viability of its water supply. We have already begun the process of renewing our consumptive use permit. Having a permit for at least a 20-year duration goes a long way in planning and budgeting capital projects. PBCWUD is keenly aware of the environmental concerns facing our residents and actively participates in the dynamic regulatory and legislative process. Water resources previously earmarked for urban users have already been set aside for environmental purposes. Alternative Water Resources help utilities make decisions and construct new infrastructure required to serve growth while protecting the water resources.

**Mitigate localized wellfield impacts.** Lake augmentation projects greatly assist with recharging the surficial aquifer system and mitigating localized wellfield impacts. This type of project has the added benefit of reducing the amount of fresh water discharged to tide. Capturing otherwise discharged stormwater, results with more local aquifer recharge, less regional stormwater pumping and energy costs, and an enhanced oceanic ecology. Lake augmentation projects often promote intergovernmental cooperation and provide a mechanism to join community partnerships.

**Maximize funding opportunities.** By planning alternative water resource projects in advance, opportunities for cost-sharing among agencies and external funding agreements can be fully realized. The County has been working toward a Comprehensive Alternative Water Resources Program since 1990. PBCWUD anticipates increasing its alternative water supplies from 42 mgd in 2015 to 57 mgd in 2030. In 2018, the County's Eastern Region raw water demand was 72 mgd. This demand was easily satisfied with its current surficial aquifer system allocation of 87 mgd. However, by 2030 the County's Eastern Region raw water demand is projected to increase to 82 mgd due to regionalization, County-wide growth, and expansion of the County's utility service area. The 87 mgd of surficial aquifer system supply permitted through March 2023 will be sufficient to satisfy raw water demand. Alternative water resources have become a major component of the Department's Capital Program. By constructing alternative resources in advance of actual water demand, PBCWUD will remain in a positive position with respect to accommodating utility service requests from residents, municipalities, businesses, and bulk customers. PBCWUD and SFWMD have cooperated to develop a 20-year alternative water resources program that was included in the 2006 LEC Plan, 2013 LEC Plan and 2018 LEC Plan. Approximately \$40 Million has been invested into the alternative water supply program. To aid expansion efforts, PBCWUD continues to aggressively seek grants through local, state and federal agencies for the implementation of various alternative water supply projects. As described below, PBCWUD continues to develop alternative supply projects that diversify the water resources of the County and benefit the regional system.

The County's Alternative Water Resources Program is diverse and encompasses many types of projects including: reclaimed water, created wetlands, aquifer storage and recovery wells, brackish source water wells, stormwater diversion and impoundment, lake augmentation, and agricultural water reuse.

## **8.1 Reclaimed Water Systems**

Palm Beach County currently has one of the largest reclaimed water systems in southeast Florida and has an aggressive plan to expand this program. On July 11, 2006, the Palm Beach County Board of County Commissions adopted an Ordinance amending Chapter 27, Article IX of the Palm Beach County Code (codifying Palm Beach County Ordinance 97-12), expanding the mandatory reclaimed water service area to ten square miles around SRWRF. New developments constructed within the mandatory reclaimed water service area are required to install and use

reclaimed water for irrigation. The County is proactively working towards providing a cost effective means for existing developments to convert to reclaimed water. Interest is expected to increase with time as implementation costs are reduced. Additionally, the County continues to work with the South Florida Water Management District to ensure that existing developments convert to reclaimed water as it comes available, pursuant to conditions included in the consumptive use permits issued to those developments.

The County has expanded the reclaimed water system at the Southern Region Water Reclamation Facility (SRWRF) over the last ten years to be the largest in Southeast Florida, with a maximum filtration capacity of 35 MGD. Over the next few years PBCWUD will continue to increase its reclaimed water capacity and expand the distribution network. It will also undertake projects to achieve the interconnection of the reclaimed network, for example, the conversion of a pump station at Morikami Gardens from potable to reclaimed, which will allow for greater distribution within the larger reclaimed network.

#### West County Energy Center Reclaimed Project

In 2008, Palm Beach County and Florida Power and Light (FPL) entered into an agreement providing for the extension of reclaimed water lines to FPL's West County Energy Center. As a result of the implementation of the project, Palm Beach County supplies 22 mgd (27 mgd peak day) of reclaimed water to FPL from the East Central Regional Reclamation Facility for use in cooling three natural gas combined cycle power units generating 3,800 megawatts of power. The provision of reclaimed water has allowed FPL to avoid the need to construct a reverse osmosis water treatment plant that would have produced water from the Floridan aquifer system at a significant cost.

#### Palm Beach County / Broward County Reclaimed Water Project

Many wastewater utilities in Southeast Florida currently operate reclaimed water systems, including both Broward County Water and Wastewater Services (BC) and the Palm Beach County Water Utilities Department (PBC). As regulatory entities seek to expand the quantity of water being reclaimed, additional reuse systems are being placed into service, with customers usually located within the immediate areas adjacent to reclaimed water generation facilities.

BC and PBC have embarked on an effort requiring BC to deliver reclaimed water from its North Regional Wastewater Treatment Plant (NRWWTP) to Large Users (generally defined as Golf Courses) in the northern Broward County and southern Palm Beach County area. This regional approach will benefit both agencies as:

- BC is committed to supplying reclaimed water to Large Users in the NRWWTP service area as recommended by the Broward County Effluent Disposal and Reclaimed Water Master Plan dated November 2010 as well as the June 2013 Ocean Outfall Rule Detailed Plan to DEP.
- PBC desires to make reclaimed water available to Large Users in the southern PBC (Boca Raton) area, but lacks a local wastewater facility to service this need

In April of 2016, the Palm Beach County Board of County Commissioners approved an Interlocal Agreement with Broward County for a Regional Reclaimed Water System. A reclaimed water transmission line from Broward County's northern wastewater treatment plant to serve the PBCWUD southern service area. Upon completion, the Regional Reclaim Water System is expected increase the reclaim water capacity in Palm Beach County by a maximum of 10.51 MGD.

BC and PBC anticipate that the potential benefits resulting from more efficient regional implementation via accruing economies of scale will be significant. The reclaimed water will then be provided to several identified golf courses and HOAs for irrigation needs. Accompanying positive impacts to the surficial aquifer system will result from the elimination of approximately 20 mgd in permitted capacity as the project is implemented.

## **8.2 Created Wetland Systems**

Palm Beach County operates the 50-acre Wakodahatchee Wetland and the 75-acre Green Cay Wetland. The wetlands systems are designed to process highly treated secondary effluent with advanced natural biological processes to further reduce nutrient levels. Treated water from the wetlands percolates into the surficial aquifer system, where it recharges the local groundwater. The wetlands are valuable in providing vegetated and open water habitat for migratory birds and waterfowl in this region. The benefit to the Regional System resulting from reduced surface water leakage due to implementation of the created wetland systems was determined based upon cooperative modeling of the system by PBCWUD and SFWMD.

## **8.3 Stormwater Diversion and Impoundment – Lake Augmentation**

The residential Riverbridge community, located near the WTP 2 wellfield, constructed its lake system at a non-optimum control elevation. SFWMD, Palm Beach County and LWDD entered into a Memorandum of Understanding to cooperatively address this situation by designing and constructing a pump station to divert water from the C-51 Canal into the LWDD E-2E Canal system, maintaining area canal elevations at 13' NGVD.

The County, in conjunction with LWDD and the SFWMD, additionally implements a program to recharge the aquifer via lake augmentation. The beneficial recharge maintains surface water elevations in the lakes at a set design elevation. The lakes at Riverbridge are hydraulically connected to the Pines State Park (PSP) Canal by two existing outfalls. Additionally, the PSP Canal and other area water bodies also directly affect the lake levels in Cholee Park. For a 1-in-10-year drought condition, the rate of aquifer recharge occurring under existing pumping conditions (12.64 mgd) is 1.89 mgd at Riverbridge and 1.34 mgd at neighboring Cholee Park, assuming both water bodies are maintained at elevation 13 feet NGVD.

SFWMD, PBCWUD and LWDD additionally have a Memorandum of Understanding to address a similar issue in the southwest Boca Raton area involving the communities of Boca Heights, Boca Springs, Boca County Estates and Meadow Lakes. PBCWUD is authorized to divert and impound less than 1 mgd from the Hillsboro Canal via the E-1W South Canal for storage within the communities existing stormwater systems (lakes).

## **8.4 Program Summary**

The combined use of the alternative water resource projects discussed herein is presented in **Tables 8.1 through 8.4**. For average daily flow conditions, PBCWUD anticipates utilizing approximately 57 mgd of alternative water supplies by 2030. This evaluation conservatively estimates the flow for AWS projects. The quantity of AWS projects planned to be implemented by PBCWUD greatly exceed those required in its 20-year water use permit as shown in **Tables 8.2 and 8.4**. PBCWUD has gone above and beyond the terms and conditions agreed to with SFWMD in 2003. **Given these additional AWS projects and conservative assumptions, PBCWUD is confident that it will not exceed its current surficial aquifer system water allocation of 87 mgd (annual average day).**

Similarly conservative estimates were used to evaluate maximum daily demands and corresponding AWS projects. The information presented in **Table 8.3** clearly demonstrates that **PBCWUD will not exceed its current maximum day surficial aquifer system allocation of 129 mgd**. Alternative water resources play an important role in PBCWUD's master planning process for providing adequate water supply, satisfying projected finished water demands, and minimizing the use of deep well injection.

The PBCWUD Alternative Water Resource Projects included in the LEC Plan are shown in **Table 8.5**. The timing of these projects may vary depending upon the demand of wastewater as well as customer demand.

For the purpose of this water supply plan, alternative water resource projects have been projected to 2025, reflecting the current horizon projections of Exhibits 16 and 17 of the consumptive use permit as well as the PBCWUD Capital Improvement Program. New Exhibit 16 and 17 projections are to be developed upon the renewal of the consumptive use permit.

**Table 8.1 - Summary of AWS Program for Average Daily Flow Conditions**

Year	Western Region (50-06857-W)		Eastern Region (50-00135-W)							Total ADF AWS Available (mgd)
	ADF FW Demand (mgd)	ADF RW Demand (mgd)	Floridan Aquifer (mgd)	FAS Blended Water (mgd)	FPL Reclaimed Water (mgd)	SRWRF Reclaimed Water (mgd)	CRRWF Reclaimed Water (mgd)	Wetlands Recharge (mgd)	Broward County Reclaimed Water (mgd)	
<b>2015</b>	<b>67.97</b>	<b>71.46</b>	<b>6.88</b>	<b>0.00</b>	<b>15.13</b>	<b>17.17</b>	<b>0.85</b>	<b>1.85</b>	<b>0.00</b>	<b>41.88</b>
2016	68.63	72.20	6.92	0.00	14.71	14.57	0.60	1.73	0.00	38.53
2017	69.69	72.93	6.96	0.00	12.56	14.66	0.61	1.48	0.00	36.27
2018	70.34	73.67	7.00	0.00	14.85	14.34	0.53	2.18	0.00	38.9
2019	71.44	74.55	7.08	0.00	19.00	16.50	2.00	1.50	0.00	46.08
<b>2020</b>	<b>72.12</b>	<b>75.32</b>	<b>7.17</b>	<b>0.00</b>	<b>19.00</b>	<b>16.50</b>	<b>2.00</b>	<b>1.50</b>	<b>0.00</b>	<b>46.17</b>
2021	72.86	76.15	7.24	0.00	19.00	16.50	2.00	1.50	0.00	46.24
2022	73.60	76.99	7.30	0.00	19.00	16.50	2.00	1.50	2.00	48.3
2023	74.35	77.82	7.37	0.00	19.00	16.50	2.00	1.50	2.00	48.37
2024	75.09	78.66	7.44	0.00	19.00	16.50	2.00	1.50	2.00	48.44
<b>2025</b>	<b>75.82</b>	<b>79.48</b>	<b>7.51</b>	<b>0.00</b>	<b>19.00</b>	<b>16.50</b>	<b>2.00</b>	<b>1.50</b>	<b>2.00</b>	<b>48.51</b>
<b>2026</b>	76.65	80.41	7.57	0.00	19.00	16.50	2.00	1.50	2.00	48.57
<b>2027</b>	77.46	81.32	7.63	0.00	19.00	16.50	2.00	1.50	2.00	48.63
<b>2028</b>	78.27	82.22	7.69	0.00	19.00	16.50	2.00	1.50	2.00	48.69
<b>2029</b>	79.08	83.13	7.76	0.00	19.00	16.50	2.00	1.50	10.50	57.26
<b>2030</b>	<b>79.88</b>	<b>84.04</b>	<b>7.82</b>	<b>0.00</b>	<b>19.00</b>	<b>16.50</b>	<b>2.00</b>	<b>1.50</b>	<b>10.50</b>	<b>57.32</b>

ADF FW demand includes retail customer and bulk wholesale account flows per Table 5.5.

PBCWUD Eastern Region: ADF raw water = 1.11 \* ADF FW (per historical and capacity-based analyses).

PBCWUD Western Region: ADF raw water = 1.31 \* ADF FW (per historical and capacity-based analyses).

Surficial Aquifer Withdrawal = ADF RW demand minus Floridan Aquifer & FAS Blended Water withdrawals.

PBCWUD's Water Use Permit 50-00135-W Allocates an ADF Surficial Aquifer Withdrawal of 87mgd.

PBCWUD's Water Use Permit 50-06857-W Allocates an ADF Floridan Aquifer Withdrawal of 10 mgd.

SRWRF reclaimed water and wetlands recharge values based upon Exhibit 16 of SFWMD 50-00135-W Permit.

**Table 8.2 – Additional AWS Projects Projected for Regional System (ADF)**

Year	SFWMD WUP 50-00135-W Requirements (ADF mgd)				Floridan Aquifer <sup>1</sup> (mgd)	FAS Blended Water (mgd)	FPL Reclaimed (mgd)	SRWRF Reclaimed Water (mgd)	CRRWF Reclaimed Water (mgd)	Wetlands Recharge (mgd)	Broward County Reclaimed Water (mgd)	Total ADF AWS Available (mgd)
	Reclaimed	Wetlands	ASR	Total								
2015	12.00	1.50	0.00	13.50	6.88	0.00	19.00	17.17	0.85	1.85	0.00	45.75
2016	12.50	1.50	0.00	14.00	6.92	0.00	19.00	14.57	0.60	1.73	0.00	42.82
2017	13.00	1.50	0.00	14.50	6.96	0.00	19.00	14.66	0.61	1.48	0.00	42.71
2018	13.50	1.50	0.00	15.00	7.00	0.00	19.00	14.34	0.53	2.18	0.00	43.05
<b>2019</b>	<b>14.00</b>	<b>1.50</b>	<b>0.00</b>	<b>15.50</b>	<b>7.08</b>	<b>0.00</b>	<b>19.00</b>	<b>16.50</b>	<b>2.00</b>	<b>1.50</b>	<b>0.00</b>	<b>46.08</b>
2020	14.00	1.50	0.00	15.50	7.17	0.00	19.00	16.50	2.00	1.50	0.00	46.17
2021	14.50	1.50	0.00	16.00	7.24	0.00	19.00	16.50	2.00	1.50	0.00	46.24
2022	15.00	1.50	0.00	16.50	7.30	0.00	19.00	16.50	2.00	1.50	2.00	48.30
2023	15.50	1.50	0.00	17.00	7.37	0.00	19.00	16.50	2.00	1.50	2.00	48.37
<b>2024</b>	<b>16.00</b>	<b>1.50</b>	<b>0.00</b>	<b>17.50</b>	<b>7.44</b>	<b>0.00</b>	<b>19.00</b>	<b>16.50</b>	<b>2.00</b>	<b>1.50</b>	<b>2.00</b>	<b>48.44</b>
2025	16.00	1.50	0.00	17.50	7.51	0.00	19.00	16.50	2.00	1.50	2.00	48.51
2026	16.00	1.50	0.00	17.50	7.57	0.00	19.00	16.50	2.00	1.50	2.00	48.57
2027	16.00	1.50	0.00	17.50	7.63	0.00	19.00	16.50	2.00	1.50	2.00	48.63
2028	16.00	1.50	0.00	17.50	7.69	0.00	19.00	16.50	2.00	1.50	2.00	48.69
2029	16.00	1.50	0.00	17.50	7.76	0.00	19.00	16.50	2.00	1.50	10.50	57.26
2030	16.00	1.50	0.00	17.50	7.82	0.00	19.00	16.50	2.00	1.50	10.50	57.32
<b>Amount Above &amp; Beyond Water Use Permit:</b>					<b>0.00</b>	<b>0.00</b>	<b>19.00</b>	<b>0.50</b>	<b>2.00</b>	<b>0.00</b>	<b>10.50</b>	<b>32.00</b>

Permit did not assume expansion of SRWRF reclaimed.

<sup>1</sup>Floridan Aquifer quantities reflect amounts generated at Water Treatment Plant 11 (Not included in calculation above and beyond WUP requirements) for 50-06857-W only

SFWMD = South Florida Water Management District; WUP = Water Use Permit;

ADF = Average Daily Flow; FW = Finished Water; RW = Raw Water; ASR = Aquifer Storage and Recovery; AWS = Alternative Water Supply

SRWRF = Southern Region Water Reclamation Facility; CRRWF = Central Region Reclaimed Water Facility

**Note: Total ADF AWS Available is a combination of the totals for Eastern Region (50-00135-W) and Western Region (50-06857-W) AWS Programs.**

**Table 8.3 - Summary of AWS Program for Maximum Daily Flow Conditions**

Year	MDF Demand (mgd)		Western Region (50-06857-W)	Eastern Region (50-00135-W)						Total MDF AWS Available (mgd)
	FW	RW	Floridan Aquifer (mgd)	FAS Blended Water (mgd)	FPL Reclaimed Water (mgd)	SRWRF Reclaimed Water (mgd)	CRRWF Reclaimed Water (mgd)	Wetlands Recharge (mgd)	Broward County Reclaimed Water (mgd)	
<b>2015</b>	<b>98.79</b>	<b>115.59</b>	<b>8.60</b>	<b>0.00</b>	<b>27.00</b>	<b>22.60</b>	<b>2.50</b>	<b>2.20</b>	<b>0.00</b>	<b>62.90</b>
2016	99.63	116.57	8.70	0.00	27.00	23.30	2.50	2.20	0.00	63.70
2017	100.87	118.02	8.80	0.00	27.00	24.00	2.50	2.20	0.00	64.50
2018	101.72	119.01	9.00	0.00	27.00	24.80	3.00	2.20	0.00	66.00
2019	102.73	120.20	9.10	0.00	27.00	25.60	3.00	2.20	0.00	66.90
<b>2020</b>	<b>103.71</b>	<b>121.35</b>	<b>9.30</b>	<b>0.00</b>	<b>27.00</b>	<b>25.60</b>	<b>3.00</b>	<b>2.20</b>	<b>0.00</b>	<b>67.10</b>
2021	104.55	122.32	9.50	0.00	27.00	25.60	5.00	2.20	0.00	69.30
2022	105.39	123.30	9.80	0.00	27.00	25.60	5.00	2.20	3.50	73.10
2023	106.22	124.28	10.00	0.00	27.00	25.60	5.00	2.20	3.50	73.30
2024	107.06	125.26	10.00	0.00	27.00	25.60	5.00	2.20	3.50	73.30
<b>2025</b>	<b>107.89</b>	<b>126.23</b>	<b>10.00</b>	<b>0.00</b>	<b>27.00</b>	<b>25.60</b>	<b>6.00</b>	<b>2.20</b>	<b>3.50</b>	<b>74.30</b>
2026	108.87	127.38	10.00	0.00	27.00	25.60	6.00	2.20	3.50	74.30
2027	109.84	128.52	10.00	0.00	27.00	25.60	6.00	2.20	3.50	74.30
2028	110.82	129.66	10.00	0.00	27.00	25.60	6.00	2.20	3.50	74.30
2029	111.79	130.80	10.00	0.00	27.00	25.60	6.00	2.20	15.00	85.80
<b>2030</b>	<b>112.77</b>	<b>131.94</b>	<b>10.00</b>	<b>0.00</b>	<b>27.00</b>	<b>25.60</b>	<b>6.00</b>	<b>2.20</b>	<b>15.00</b>	<b>85.80</b>

ADF = Average Daily Flow; MDF = Maximum Daily Flow; FW = Finished Water; RW = Raw Water; ASR = Aquifer Storage and Recovery

SFWMD = South Florida Water Management District

MDF FW demand includes retail customer and bulk wholesale account flows per Table 5.5.

MDF FW = 1.25 \* ADF FW (per historical flow data).

PBCWUD Eastern Region: MDF raw water = 1.11 \* ADF FW (per historical and capacity-based analyses).

PBCWUD Western Region: MDF raw water = 1.31 \* ADF FW (per historical and capacity-based analyses).

Surficial Aquifer Withdrawal = ADF RW demand minus Floridan Aquifer & FAS Blended Water withdrawals.

PBCWUD's Water Use Permit 50-00135-W Allocates a MDF Surficial Aquifer Withdrawal of 129 mgd.

SRWRF reclaimed water, wetlands recharge, & ASR values based upon Exhibit 17 of SFWMD 50-00135-W Permit).



**Table 8.4 – Additional AWS Projects Projected for Regional System (MDF)**

Year	SFWMD WUP 50-00135-W Requirements (MDF mgd)				Floridan Aquifer <sup>1</sup> (mgd)	FAS Blended Water (mgd)	FPL Reclaimed (mgd)	SRWRF Reclaimed Water (mgd)	CRRWF Reclaimed Water (mgd)	Wetlands Recharge (mgd)	Broward County Reclaimed Water (mgd)	Total MDF AWS Available (mgd)
	Reclaimed	Wetlands	ASR	Total								
2015	16.00	2.20	5.00	23.20	6.60	0.00	19.00	19.40	2.50	2.20	0.00	49.70
2016	16.50	2.20	6.00	24.70	6.70	0.00	19.00	20.00	2.50	2.20	0.00	50.40
2017	17.00	2.20	7.00	26.20	6.80	0.00	19.00	20.60	2.50	2.20	0.00	51.10
2018	17.50	2.20	8.00	27.70	6.90	0.00	19.00	21.30	3.00	2.20	0.00	52.40
<b>2019</b>	<b>18.20</b>	<b>2.20</b>	<b>9.00</b>	<b>29.40</b>	<b>7.00</b>	<b>0.00</b>	<b>19.00</b>	<b>21.90</b>	<b>3.00</b>	<b>2.20</b>	<b>0.00</b>	53.10
2020	18.50	2.20	11.00	31.70	7.20	0.00	19.00	21.90	3.00	2.20	0.00	53.30
2021	19.00	2.20	12.00	33.20	7.40	0.00	19.00	21.90	5.00	3.50	0.00	56.80
2022	19.50	2.20	13.00	34.70	7.50	0.00	19.00	21.90	5.00	3.50	3.50	60.40
2023	20.00	2.20	14.00	36.20	7.70	0.00	19.00	21.90	5.00	3.50	3.50	60.60
<b>2024</b>	<b>20.80</b>	<b>2.20</b>	<b>15.50</b>	<b>38.50</b>	<b>7.70</b>	<b>0.00</b>	<b>19.00</b>	<b>21.90</b>	<b>5.00</b>	<b>3.50</b>	<b>3.50</b>	<b>60.60</b>
2025	21.00	2.20	15.50	38.70	7.70	0.00	19.00	21.90	6.00	3.50	3.50	61.60
2026	21.00	2.20	15.50	38.70	7.70	<b>0.00</b>	19.00	21.90	6.00	3.50	3.50	61.60
2027	21.00	2.20	15.50	38.70	7.70	<b>0.00</b>	19.00	21.90	6.00	3.50	3.50	61.60
2028	21.00	2.20	15.50	38.70	7.70	<b>0.00</b>	19.00	21.90	6.00	3.50	3.50	61.60
2029	21.00	2.20	15.50	38.70	7.70	<b>0.00</b>	19.00	21.90	6.00	3.50	15.00	73.10
<b>2030</b>	<b>21.00</b>	<b>2.20</b>	<b>15.50</b>	<b>38.70</b>	<b>7.70</b>	<b>0.00</b>	<b>19.00</b>	<b>21.90</b>	<b>6.00</b>	<b>3.50</b>	<b>15.00</b>	73.10
<b>Amount Above &amp; Beyond Water Use Permit:</b>					<b>0.00</b>	<b>-15.50</b>	<b>19.00</b>	<b>0.90</b>	<b>6.00</b>	<b>1.30</b>	<b>15.00</b>	<b>26.70</b>

Reclaimed water flow limiting factor is raw wastewater generated.

<sup>1</sup>Floridan Aquifer quantities reflect amounts generated at Water Treatment Plant 11 (Not included in calculation above and beyond WUP requirements) for 50-06857-W only

SFWMD = South Florida Water Management District; WUP = Water Use Permit;

ADF = Average Daily Flow; FW = Finished Water; RW = Raw Water; ASR = Aquifer Storage and Recovery; AWS = Alternative Water Supply

SRWRF = Southern Region Water Reclamation Facility; CRRWF = Central Region Reclaimed Water Facility

**Note: Total MDF AWS Available is a combination of the totals for Eastern Region (50-00135-W) and Western Region (50-06857-W) AWS Programs.**

**Table 8.5 - Proposed Long-Term Lower East Coast Water Supply Projects (\$millions)**

Project	Capacity (MGD)	Estimated Cost (\$ millions) <sup>3</sup>	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Central Region Phase II	3	TBD											
<b>Reclaimed Water Piping Program</b>	<b>20</b>	<b>\$6.50</b>	<b>\$0.50</b>	<b>\$0.50</b>	<b>\$0.50</b>	<b>\$0.50</b>	<b>\$0.50</b>	<b>\$0.50</b>	<b>\$0.50</b>	<b>\$0.50</b>	<b>\$0.50</b>	<b>\$1.00</b>	<b>\$1.00</b>
Southern Region AWT Expansion	15	TBD											
WTP 2 Wellfield/Plant Expansion to Floridan Aquifer	15	TBD											
Northern Plant/Floridan Wellfield Project	10	TBD											
Lake Region WTP	10	TBD											
<b>Broward County Reclaimed</b>	<b>2/10.5<sup>1</sup></b>	<b>\$46<sup>2</sup></b>						<b>\$11.00</b>	<b>\$14.00</b>		<b>\$11.00</b>		<b>\$10.00</b>
Lake Region Water Plant Phase II	10	TBD											
<b>TOTAL PROGRAM</b>	<b>93</b>	<b>\$6.50</b>	<b>\$0.50</b>	<b>\$0.50</b>	<b>\$0.50</b>	<b>\$0.50</b>	<b>\$0.50</b>	<b>\$11.50</b>	<b>\$14.50</b>	<b>\$0.50</b>	<b>\$11.50</b>	<b>\$1.00</b>	<b>\$11.00</b>

<sup>1</sup> Years 1 through 7 following the initiation date the capacity will be 2 MGD, Year 8 and forward the capacity will increase to 10.5 MGD

<sup>2</sup> Project Cost to be financed by Broward County

<sup>3</sup> Projects with estimated costs listed as "TBD" are outside the current 10-year planning horizon.

## **9.0 POTENTIAL ALTERNATIVE WATER RESOURCES**

PBCWUD has developed and continues to investigate additional potential alternative water resource projects and approaches as part of the County's Alternative Water Supply Program. Those opportunities are articulated below but are not currently planned for this Work Plan period.

### **9.1 Aquifer Storage and Recovery Wells**

Palm Beach County has completed construction of two dual-purpose ASR wells as the result of a cooperative effort with SFWMD: the five (5) mgd ASR well located along the Hillsboro Canal serving the WTP 9 wellfield and the two (2) mgd ASR well located at the Water Treatment Plant No. 3 serving the WTP 3 wellfield. PBCWUD does not intend to utilize these ASR wells as a reclaimed water source, given that they have provided insufficient in practice. These wells are currently dual permitted by the SFWMD for blending brackish water and raw water from the Floridan Aquifer.

### **9.2 Regional Storage – C-51 Reservoir Project**

As described in the 2018 Lower East Coast Water Supply Plan, the C-51 Reservoir project is a public-private partnership being developed by PWS utilities and water supply authorities for use as an AWS source in southeastern Florida that captures and stores excess surface water runoff from the C-51 Basin for beneficial uses. The proposed C-51 Reservoir is a rock mine owned by Palm Beach Aggregates in central Palm Beach County, north of the C-51 Canal in Palm Beach County and adjacent to the SFWMD's L-8 flow equalization basin. Water that otherwise would be discharged to Lake Worth Lagoon would be diverted into the C-51 Reservoir during wet periods and released into the C-51 Canal during dry periods to meet demands.

The C-51 Reservoir project has been divided into two phases. The mining operation for Phase 1 is complete and designed to store an estimated 14,000 acre-feet of surface water and provide 35 mgd of canal/SAS recharge near PWS withdrawals. The Florida Department of Environmental Protection has issued a diversion and impoundment consumptive use permit and an environmental resource permit for construction and operation of Phase 1. Phase 2 of the project could provide an additional 46,000 acre-feet of storage, most likely for natural systems [Section 373.4598, F.S.]. PWS utilities have executed agreements with the property owners to purchase capacity as part of total reservoir storage. The utilities have received or are processing modifications to their water use permits to reflect this AWS source as a means for meeting future demands.

## **10.0 Climate Change and Water Supply**

Southeast Florida is widely considered one of the most vulnerable regions to the impacts of climate and sea level rise as a result of several unique geographic characteristics, including low land elevations, flat topography, porous geology and dense coastal development. Climate change and sea level rise are expected to present significant challenges relating to water resource planning, management and infrastructure development throughout the region, including Palm Beach County. Palm Beach County is actively working to address these challenges and is a member of the Southeast Florida Regional Climate Change Compact.

The Palm Beach County Water Utilities Department anticipates a number of climate change impacts and is actively undertaking measures to adapt to and mitigate those impacts. PBCWUD has identified the following impacts as the most likely to affect its operations and service area:

- Sea Level Rise resulting in salt water intrusion and flooding impacting easterly utilities and necessitating PBCWUD having the ability to provide water and/or technical assistance to affected areas.
- Increased tropical storm activity (frequency and intensity) necessitating investment in heightened resiliency for PBCWUD water and wastewater infrastructure.
- Changing precipitation patters resulting in more frequent and extended dry periods and increased inflow and infiltration during extended wet periods.
- Increased water demands resulting from increases in temperature, precipitation, population growth and environmental migration.

PBCWUD is implementing a program that includes several adaptation components to address the anticipated climate change impacts. The components include:

#### Diversification of Water Resources

PBCWUD is actively diversifying its water resources and undertaking steps to ensure that existing facilities and infrastructure operate more efficiently and effectively. In addition to the expansion of the current reclaimed water system, PBCWUD has also improved the management of existing water supply resources. Improved wellfield management is another facet of the suite of techniques that PBCWUD is utilizing to provide adaptive management in responding to possible future climate change impacts. A smart wellfield program is currently being piloted involving the installation of hardware (such as VFDs, instrumentation and updated communications equipment), smart probes and technology that will improve efficiency and aid in increasing water quality. PBCWUD additionally contributes to discussions with SFWMD and its federal partners regarding the role of Everglades Restoration in combating the impacts of climate change and ensuring that the water supply component of Everglades Restoration is successfully achieved. These approaches secure the ability of PBCWUD to provide water supply within its service area as well as to allow the supply of other communities with potable water as necessary to address the impacts of salt water intrusion on the water resources available to coastal utilities.

#### Climate Resilience Planning

To adapt to the increased wind and water impacts resulting from increased tropical storm activity, PBCWUD has implemented measures to harden facilities and infrastructure, ensure continued operations during times of emergency, and to achieve rapid post-disaster recovery. PBCWUD has invested in improvements at its Water Treatment Plants, Operations Centers, Southern Region Water Reclamation Facility and 2 pump stations. These improvements plan for resiliency to withstand Category 4-5 storm events. Additionally, PBCWUD has an active design build contract for emergency rebuilding following a storm event and has invested in the construction of a Central Monitoring Facility containing dispatch services, SCADA and monitoring networks to ensure continued operation during a storm event. Future efforts include climate resiliency projects in the PBCWUD Western Region service area and continued upgrades to the existing infrastructure.

#### Targeted Asset Management and Strategic Planning

PBCWUD instituted an aggressive program of asset management to address possible rapid increases in population, replacement of aging infrastructure, management of inflow and infiltration events, integration of new technologies and pursuit of energy efficiency. The utility is additionally

undertaking an update of its Strategic Plan to provide a planning framework for the direction of the utility over a five-year period.

Through the implementation of the above program, PBCWUD is confident that it will achieve its goal of being a sustainable and climate resilient utility capable of adapting to those climate impacts that may arise within the planning horizon of this Water Supply and Facilities Work Plan.

## **11.0 CONCLUSIONS**

Palm Beach County and the SFWMD have developed a water supply strategy that will 1) ensure infrastructure is expanded properly to accompany growth and protect the environment, 2) ensure adequate capital financing is in place, and 3) minimize application time and expense so that the focus is on implementing the plan. The overall water supply plan combines utility planning with regional water supply planning. This Water Supply Facilities Work Plan provides a clear road map of efforts to be undertaken by PBCWUD over the ten-year planning horizon.

In the Eastern Region, any potential impacts to the regional system will be completely offset with the alternative water supply (AWS) projects identified in the existing PBCWUD consumptive use permit. Those water quantities identified in this plan that are required to serve future projected demands in Palm Beach County's eastern region through the year 2030 are less than those already authorized for consumptive use.

PBCWUD has developed a financially feasible plan to continue to design, permit, construct, and implement its extensive AWS program. The AWS program has been incorporated into the Department's annual capital budget and will continue to be a major component of PBCWUD's ongoing effort to streamline water supply throughout its service area territory and to its wholesale customers. Projects identified as part of the AWS program are an integral component of the County's Comprehensive Plan. The capital costs associated with the continued implementation of the program will be incorporated into the Capital Improvement Element of the County's Comprehensive Plan.

PBCWUD continues to investigate innovative and cost-effective alternative water supply projects with a variety of agencies and to implement asset management, program management, technological innovation and smart utility programs that will ensure that PBCWUD will continue to be a leading "Utility of the Future." PBCWUD is in an optimal position to meet the demands of future growth, ensure the continued viability of its existing infrastructure, meet pressing needs in certain areas of the service area and succeed in achieving maximum efficiency and effectiveness in the current and future operation of the utility.

# Appendix

# E

## Public Water Supply Utility Summaries

This appendix provides summaries of the Public Water Supply (PWS) utilities that provide 0.10 million or greater gallons per day (mgd) of net (finished) potable water for the Lower East Coast (LEC) Planning Area (**Table E-1**). For this *2018 Lower East Coast Water Supply Plan Update* (2018 LEC Plan Update), South Florida Water Management District (SFWMD) staff updated the utility summaries from the 2013 LEC Plan Update with data from the Florida Department of Environmental Protection (FDEP 2017) and the SFWMD's water use regulatory database. In addition, the proposed water supply projects were updated based on utility reports provided to the SFWMD in November 2017 and through direct communication with utilities between 2016 and 2018. To help explain the information in the utility summaries, a sample profile with descriptions is provided. The utility summaries are ordered alphabetically by county for easy navigation. **Figures E-1 to E-3** show the locations of the PWS wellfields for Palm Beach, Broward, and Miami-Dade counties, respectively, and precede each county's utility summaries. Potential future water conservation savings are addressed in **Chapter 3** and not included in the utility summaries herein.

### INFO

#### Acronyms

ASR – aquifer storage and recovery

BCWWS – Broward County Water and Wastewater Services

BCWWS-SRW – Broward County Water and Wastewater Services South Regional Wellfield

FAS – Floridan aquifer system

FCAA – Florida Keys Aqueduct Authority

FPL – Florida Power & Light

MDWASD – Miami-Dade Water and Sewer Department

PBCWUD – Palm Beach County Water Utilities Department

RO – reverse osmosis

SAS – surficial aquifer system

WTP – water treatment plant

Table E-1. Summary of the public water supply utilities with a capacity of 0.10 mgd or greater in the LEC Planning Area.

Supply Entity/Facility	SFWMD Permit Number	Gross (Raw) Water (mgd)			FDEP PWS ID	Rated Net (Finished) Capacity (mgd)
		Annual Allocation	SAS	FAS		
<b>Palm Beach County</b>						
Boca Raton, City of	50-00367-W	51.54	51.54	0.00	4500130	70.00
Boynton Beach, City of	50-00499-W	20.86	16.58	6.42	4500145	29.64
Delray Beach Water and Sewer Department, City of	50-00177-W	19.10	19.10	1.50	4500351	26.00
Golf, Village of	50-00612-W	0.69	0.69	0.00	4501528	0.86
Highland Beach, Town of	50-00346-W	3.15	0.00	3.15	4500609	3.00
Jupiter, Town of	50-00010-W	24.41	18.80	11.71	4501491	30.00
Lake Worth Utilities, City of	50-00234-W	11.25	5.25	6.00	4500773	17.40
Lantana, Town of	50-00575-W	2.48	2.48	0.00	4500784	3.84
Manalapan, Town of	50-00506-W	1.92	0.58	1.34	4500840	2.35
Mangonia Park, Town of	50-00030-W	0.58	0.58	0.00	4500841	1.08
Maralago Cay	50-01283-W	0.27	0.27	0.00	4500062	0.42
Palm Beach County Water Utilities Department	50-00135-W	86.99	79.99	7.00	4504393	103.28
Palm Beach County Water Utilities Department Western Region	50-06857-W	9.43	0.00	9.43	4505005	10.00
Palm Springs, Village of	50-00036-W	4.62	4.62	0.00	4501058	10.00
Riviera Beach, City of	50-00460-W	9.08	9.08	0.00	4501229	17.50
Seacoast Utility Authority	50-00365-W	26.92	22.30	8.90	4501124	30.50
Tequesta, Village of	50-00046-W	4.37	1.10	3.43	4501438	6.33
Wellington Public Utilities Department	50-00464-W	8.02	8.02	0.00	4500014	12.80
West Palm Beach Public Utilities, City of <sup>a</sup>	50-00615-W	41.20 <sup>a</sup>	41.20	0.00	4501559	47.00
<b>Palm Beach County Total</b>		<b>326.88</b>	<b>282.18</b>	<b>58.88</b>		<b>422.00</b>
<b>Broward County</b>						
Broward County WWS District 1	06-00146-W	13.90	10.04	3.86	4060167	16.00
Broward County WWS District 2A/North Regional Wellfield	06-01634-W	22.06	17.50	4.60	4060163	40.00
Broward County WWS South Regional Wellfield <sup>b</sup>	06-01474-W	15.64	15.64	0.00	N/A <sup>b</sup>	N/A <sup>b</sup>
Cooper City Utility Department, City of	06-00365-W	4.55	4.55	0.00	4060282	7.00
Coral Springs, City of	06-00102-W	9.44	9.44	0.00	4060290	16.00
Coral Springs Improvement District	06-00100-W	5.42	5.42	0.00	4060291	7.40
Dania Beach, City of	06-00187-W	1.10	1.10	0.00	4060253	5.02
Davie, Town of	06-00134-W	19.85	5.02	14.83	4060344	10.00
Deerfield Beach, City of	06-00082-W	14.74	11.91	4.00	4060254	23.60
Fort Lauderdale, City of	06-00123-W	61.19	52.55	8.64	4060486	90.00
Hallandale Beach, City of	06-00138-W	4.03	4.03	0.00	4060573	16.00
Hillsboro Beach, Town of	06-00101-W	0.88	0.88	0.00	4060615	2.25
Hollywood, City of	06-00038-W	39.38	24.80	8.68	4060642	59.50
Lauderhill, City of	06-00129-W	8.72	7.70	1.02	4060787	16.00
Margate, City of	06-00121-W	9.30	9.30	0.00	4060845	13.50
Miramar, City of	06-00054-W	18.87	15.15	3.15	4060925	17.75
North Lauderdale, City of	06-00004-W	3.65	3.65	0.00	4060976	7.50
North Springs Improvement District	06-00274-W	5.18	5.18	0.00	4064390	6.80
Parkland Utilities, Inc.	06-00242-W	0.35	0.35	0.00	4061957	0.58



Supply Entity/Facility	SFWMD Permit Number	Gross (Raw) Water (mgd)			FDEP PWS ID	Rated Net (Finished) Capacity (mgd)
		Annual Allocation	SAS	FAS		
Pembroke Pines, City of	06-00135-W	15.60	15.60	0.00	4061083	18.00
Plantation, City of	06-00103-W	17.24	17.24	0.00	4061121	24.00
Pompano Beach, City of	06-00070-W	17.75	17.75	0.00	4061129	50.00
Royal Utility Corporation	06-00003-W	0.48	0.48	0.00	4061517	1.00
Seminole Tribe of Florida – Hollywood <sup>c</sup>	N/A <sup>c</sup>	0.53	0.53	0.00	N/A <sup>c</sup>	N/A <sup>c</sup>
Sunrise, City of	06-00120-W	40.07	29.09	10.98	4061408 <sup>d</sup>	51.50
Tamarac, City of	06-00071-W	7.58	7.58	0.00	4061429	16.00
Tindall Hammock Irrigation and Soil Conservation District	06-00170-W	0.74	0.74	0.00	4060419	1.00
<b>Broward County Total</b>		<b>358.24</b>	<b>293.22</b>	<b>60.60</b>		<b>516.40</b>
Miami-Dade County						
Americana Village	13-02004-W	0.26	0.26	0.00	4131403	0.50
Florida City Water and Sewer Department	13-00029-W	2.08	2.08	0.00	4130255	4.00
Homestead, City of	13-00046-W	10.55	10.55	0.00	4130645	19.20
Miami-Dade Water and Sewer Department	13-00017-W	386.07	349.50	36.60	4130871 <sup>e</sup>	461.43
North Miami, City of	13-00059-W	17.27	9.30	7.97	4130977	9.30
North Miami Beach, City of	13-00060-W	38.38	26.31	12.07	4131618	32.00
<b>Miami-Dade County Total</b>		<b>454.61</b>	<b>398.00</b>	<b>56.64</b>		<b>526.43</b>
Monroe County						
Florida Keys Aqueduct Authority <sup>f</sup>	13-00005-W	23.97	17.79	9.70	4134357	29.80
<b>Monroe County Total</b>		<b>23.97</b>	<b>17.79</b>	<b>9.70</b>		<b>29.80</b>
Hendry County						
Seminole Tribe of Florida – Big Cypress <sup>c</sup>	N/A <sup>c</sup>	2.00	2.00	0.00	N/A <sup>c</sup>	N/A <sup>c</sup>
<b>Hendry County Total</b>		<b>2.00</b>	<b>2.00</b>	<b>0.00</b>		
<b>LEC Planning Area Total</b>		<b>1,165.70</b>	<b>993.19</b>	<b>185.82</b>		<b>1,494.63</b>

FAS = Floridan aquifer system; FDEP = Florida Department of Environmental Protection; mgd = million gallons per day; N/A = not applicable; PWS ID = Public Water Supply identification number; SAS = surficial aquifer system; SFWMD = South Florida Water Management District; WWS = Water and Wastewater Services.

<sup>a</sup> Withdrawal source is surface water from Clear Lake.

<sup>b</sup> Does not treat water, provides raw water to City of Hollywood for treatment before delivery to Broward County District 3, which serves a population but does not have a wellfield or water treatment plant and thus does not have a permit or FDEP water treatment ID.

<sup>c</sup> Allocation was established in the Water Rights Compact not through an SFWMD water use permit, and there is no FDEP water treatment ID for the Seminole Tribe of Florida.

<sup>d</sup> This system has two FDEP PWS IDs: 4061408 and 4061410.

<sup>e</sup> This system has two permit numbers: 4130871 and 4131202.

<sup>f</sup> Withdrawals located in Miami-Dade County.

# SAMPLE UTILITY COMPANY

**Service Area:** Sample city and portions of unincorporated county

**Description:** This description includes water sources, type of WTPs, and other issues of concern to the utility.

Population and Finished Water Demand							
				Existing	Projected		
				2016	2020	2030	2040
Population				100,000	110,000	120,000	130,000
Average 2012-2016 Per Capita (gallons per day finished water)				100			
<b>Potable Water Demands (daily average annual finished water in mgd)</b>				<b>10.00</b>	<b>11.00</b>	<b>12.00</b>	<b>13.00</b>
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 12-34567-W (expires 2040)			
SAS				14.00			
FAS				2.00			
<b>Total Allocation</b>				<b>16.00</b>			
FDEP Potable Water Treatment Capacity (mgd) (PWS ID# 1234567)							
Permitted Capacity by Source				Existing	Projected		
				2016	2020	2030	2040
SAS				18.00	18.00	18.00	18.00
FAS				0.00	2.00	3.00	3.00
<b>Total Potable Capacity</b>				<b>18.00</b>	<b>20.00</b>	<b>21.00</b>	<b>21.00</b>
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				1.00	1.00	4.00	4.00
ASR				2.00	2.00	3.00	3.00
<b>Total Nonpotable Capacity</b>				<b>3.00</b>	<b>3.00</b>	<b>7.00</b>	<b>7.00</b>
Projects Summary							
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2020	2030	2040	
Potable Water							
2.00-mgd expansion of FAS RO treatment plant	FAS	2019	\$14.00	2.00	2.00	2.00	
FAS wells and expansion of RO treatment plant	FAS	2029	\$4.00	0.00	1.00	1.00	
<b>Total Potable Water</b>			<b>\$18.00</b>	<b>2.00</b>	<b>3.00</b>	<b>3.00</b>	
Nonpotable Water							
3.00-mgd reclaimed water facility	Reclaimed Water	2021	\$5.00	0.00	3.00	3.00	
ASR and irrigation supply	ASR	2022	\$2.00	0.00	1.00	1.00	
<b>Total Nonpotable Water</b>			<b>\$7.00</b>	<b>0.00</b>	<b>4.00</b>	<b>4.00</b>	
<b>Total New Water</b>			<b>\$25.00</b>	<b>2.00</b>	<b>7.00</b>	<b>7.00</b>	

9

10

11

**1 Population** – The 2016 populations were determined by assigning 2010 United States Census block data and permanent resident population data published in 2017 by the Bureau of Economic and Business Research to 2016 PWS utility service areas. The 2020 and 2030 population projections were linear interpolations from the 2016 data. To project 2040 populations, the relative growth rates for PWS utility service areas were developed using county population projections (see **Appendix B** for more information).

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**2 Average 2012-2016 Per Capita** (gallons per day finished water) – A PWS utility’s per capita was calculated by dividing total net (finished) water produced each year (from monthly operating reports submitted by utilities to FDEP) by the utility’s permanent population for that year. Each utility’s per capita was calculated for 2012 to 2016, then averaged for the 5 years.

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**3 Potable Water Demands** (daily average annual finished water in mgd) – The current (2016) and projected (2020 to 2040) demands were calculated by multiplying the PWS utility’s average 2012-2016 per capita by the estimated service area populations for the respective years.

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**4 Allocation from the Water Use Permit** – The gross (raw) surface water and groundwater (from the SAS and FAS) allocations as described in the permit. The 2016 allocation is assumed to continue through 2040 unless noted otherwise. If a utility sells bulk net (finished) water to another utility, the amount of raw water needed to provide the finished water is listed in parenthesis but does not count toward the allocation; it is for reference only.

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**5 Total Allocation** – The total gross (raw) water allocation in the water use permit. For utilities withdrawing from multiple sources, the total allocation may be less than the sum of the individual source allocations due to limits on the sources; this is indicated in the appropriate profiles.

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**6 FDEP Permitted Capacity** – The existing net (finished) water capacity of the WTPs owned/operated by the utility, as provided by the FDEP (2016), split into the capacity available to process water from the SAS and the FAS. The projected net (finished) water capacity includes the capacity created by future planned projects (Item 9). Project capacity to be completed by 2020 is shown in the 2020 column, capacity to be completed between 2021 and 2030 is in the 2030 column, and capacity to be completed between 2031 and 2040 is in the 2040 column.

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**7 Nonpotable Alternative Water Source Capacity** – The capacity of the nonpotable alternative water sources, including reclaimed water, ASR, and surface water/stormwater. Reclaimed water is the wastewater treatment facility capacity to produce reclaimed water as provided by the FDEP (2017). ASR and surface water/stormwater capacity is the storage capacity of the project as listed in the water use permit or provided by the PWS utility. Additional capacity is from projects planned by the utility (Item 10). Project capacity to be completed by 2020 is shown in the 2020 column, capacity to be completed between 2021 and 2030 is in the 2030 column, and capacity to be completed between 2031 and 2040 is in the 2040 column.

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**8 Projects Summary** – The potable and nonpotable water supply projects the utility is proposing to construct. All proposed projects have been screened by SFWMD water supply planning and water use permitting staff to determine if a project could be permitted.

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**9 Potable Projects Summary** – A description of the potable water supply projects the utility is proposing to construct, including the project water source, completion date, total capital cost, and design capacity. Only projects that produce additional potable water (e.g., wells, WTPs) are included; maintenance or replacement projects are not included. Projects to be completed by 2020 have the projected design capacity shown in the 2020 column, projects to be completed between 2021 and 2030 have the projected design capacity in the 2030 column, and projects to be completed between 2031 and 2040 have the projected design capacity in the 2040 column. The projected capacity totals are added to the appropriate columns in Item 6.

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**10 Nonpotable Projects Summary** – A description of the nonpotable water supply projects the utility is proposing to construct, including the project water source, completion date, total capital cost, and design capacity. Only projects that produce additional nonpotable water or water storage are included; maintenance or replacement projects are not included. Projects to be completed by 2020 have the projected design capacity shown in the 2020 column, projects to be completed between 2021 and 2030 have the projected design capacity in the 2030 column, and projects to be completed between 2031 and 2040 have the projected design capacity in the 2040 column. The projected capacity totals are added to the appropriate columns in Item 7.

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**11 Total Projected Cumulative Design Capacity for New Water 2020, 2030, or 2040** – The total projected cost and capacity of potable and nonpotable water supply projects the utility is proposing to construct between 2016 and 2040.

# PALM BEACH COUNTY

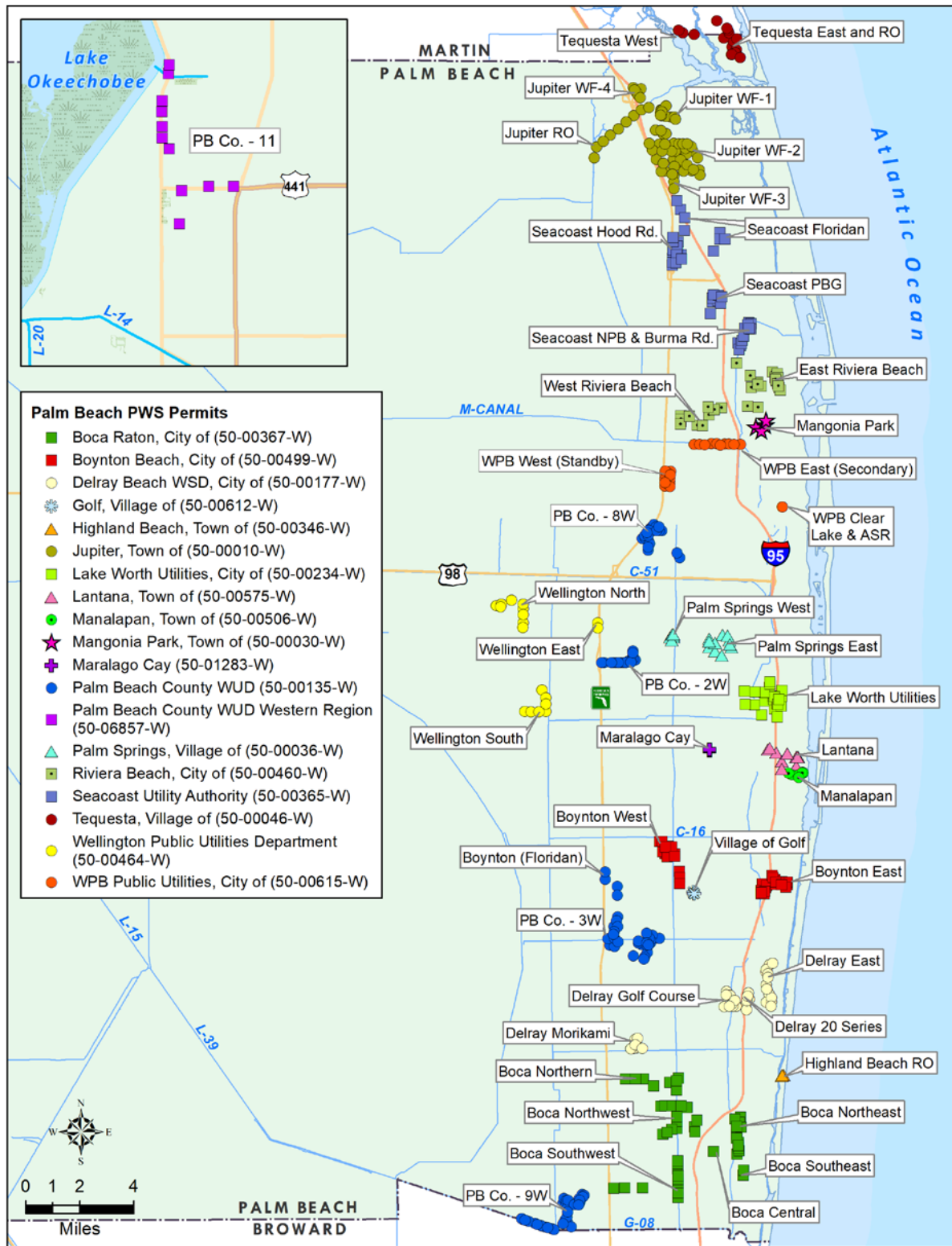


Figure E-1. Existing Public Water Supply wellfields in Palm Beach County.

## CITY OF BOCA RATON

**Service Area:** City of Boca Raton and unincorporated areas of Palm Beach County

**Description:** Potable water supplies are obtained from six SAS wellfields, and water is treated at two WTPs using lime softening and nanofiltration at the same location. In 2016, the City was designated a 100 percent reuse (capacity) facility by FDEP and was deemed to have met the reuse requirements of the Ocean Outfall Law. The City maintains interconnections with the City of Deerfield Beach, City of Delray Beach Water and Sewer Department, Town of Highland Beach, and PBCWUD.

Population and Finished Water Demand						
		Existing	Projected			
		2016	2020	2030	2040	
Population		113,040	117,109	124,630	129,336	
Average 2012-2016 Per Capita (gallons per day finished water)		299				
<b>Potable Water Demands</b> (daily average annual finished water in mgd)		<b>33.80</b>	<b>35.02</b>	<b>37.26</b>	<b>38.67</b>	
SFWMD Water Use Permitted Allocation (mgd)						
Potable Water Source		Permit Number 50-00367-W (expires 2028)				
SAS		51.54				
FAS		0.00				
<b>Total Allocation</b>		<b>51.54</b>				
FDEP Potable Water Treatment Capacity (PWS ID # 4500130)						
Permitted Capacity by Source		Cumulative Facility & Project Capacity (mgd)				
		Existing	Projected			
		2016	2020	2030	2040	
SAS		70.00	70.00	70.00	70.00	
FAS		0.00	0.00	0.00	0.00	
<b>Total Potable Capacity</b>		<b>70.00</b>	<b>70.00</b>	<b>70.00</b>	<b>70.00</b>	
Nonpotable Alternative Water Source Capacity (mgd)						
Reclaimed Water		17.50	17.50	17.50	17.50	
<b>Total Nonpotable Capacity</b>		<b>17.50</b>	<b>17.50</b>	<b>17.50</b>	<b>17.50</b>	
Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Nonpotable Water						
No Projects						
<b>Total Nonpotable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Total New Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

PALM BEACH

# CITY OF BOYNTON BEACH

**Service Area:** City of Boynton Beach; towns of Briny Breezes, Hypoluxo, and Ocean Ridge; and unincorporated areas of Palm Beach County

**Description:** Potable water supplies are obtained from two SAS wellfields, and water is treated at two WTPs that use lime softening and nanofiltration. The water supply system is augmented by two ASR wells that provide water and reduce pumping of the eastern wellfield during the dry season. The city maintains interconnections with the City of Delray Beach, Town of Lantana, Village of Golf, and PBCWUD.

PALM BEACH

Population and Finished Water Demand						
		Existing	Projected			
		2016	2020	2030	2040	
Population		107,646	113,090 <sup>a</sup>	126,509	134,809	
Average 2012-2016 Per Capita (gallons per day finished water)		119				
<b>Potable Water Demands</b> (daily average annual finished water in mgd)		<b>12.81</b>	<b>13.46</b>	<b>15.05</b>	<b>16.04</b>	
SFWMD Water Use Permitted Allocation (mgd)						
Potable Water Source		Permit Number 50-00499-W (expires 2029)				
SAS		16.58 <sup>b</sup>				
FAS		6.42 <sup>c</sup>				
<b>Total Allocation</b>		<b>20.86<sup>d</sup></b>				
FDEP Potable Water Treatment Capacity (PWS ID # 4500145)						
Permitted Capacity by Source		Cumulative Facility & Project Capacity (mgd)				
		Existing	Projected			
		2016	2020	2030	2040	
SAS		29.64	29.64	29.64	29.64	
FAS		0.00	0.00	0.00	0.00	
<b>Total Potable Capacity</b>		<b>29.64</b>	<b>29.64</b>	<b>29.64</b>	<b>29.64</b>	
Nonpotable Alternative Water Source Capacity (mgd)						
Reclaimed Water		8.00	8.00	11.00 <sup>e</sup>	11.00 <sup>e</sup>	
ASR		4.00	4.00	4.00	4.00	
<b>Total Nonpotable Capacity</b>		<b>12.00</b>	<b>12.00</b>	<b>15.00</b>	<b>15.00</b>	
Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Nonpotable Water						
No Projects						
<b>Total Nonpotable Water</b>			<b>\$0.00</b>	0.00	0.00	0.00
<b>Total New Water</b>			<b>\$0.00</b>	0.00	0.00	0.00

- <sup>a</sup> In October 2018, the City Commission approved an agreement with the Town of Hypoluxo to provide the Town with finished water beginning in 2020. The additional population and demand are included in the City's data starting in 2020.
- <sup>b</sup> The City's baseline SAS allocation is 16.58 mgd. The current water use permit states the City may apply for an increased SAS allocation of up to 4.23 mgd if the City can document increased demand and completes a reuse implementation plan that includes the termination of existing permits by future reuse customers.
- <sup>c</sup> Includes 1.42 mgd for proposed FAS withdrawals. The remaining 5.00 mgd are from ASR during the dry season. The ASR volumes are equal to reductions in the eastern wellfield pumpage such that the City does not exceed its annual allocation.
- <sup>d</sup> The water use permit limits the total annual withdrawals from all sources to 7,615 million gallons, an average of 20.86 mgd.
- <sup>e</sup> Projection to meet Ocean Outfall Law requirements. To meet this capacity, the City has suggested several potential end users; see **Appendix F** for more information.

# CITY OF DELRAY BEACH WATER AND SEWER DEPARTMENT

**Service Area:** City of Delray Beach, Town of Gulf Stream, and unincorporated areas of Palm Beach County

**Description:** Potable water supplies are obtained from four SAS and FAS wellfields, and water is treated at one lime softening WTP near the Eastern wellfield. The water use permit contains limits on the Eastern, Morikami, 20-Series, and Golf Course wellfields. The City has converted an ASR well to an FAS well for backup supply of brackish water for blending with fresh groundwater, but withdrawals may not exceed 1.50 mgd. The City is committed to replacing permitted SAS irrigation withdrawals with reclaimed water. The city maintains interconnections with the Town of Highland Beach.

Population and Finished Water Demand						
		Existing	Projected			
		2016	2020	2030	2040	
Population		67,272	70,520	77,079	81,874	
Average 2012-2016 Per Capita (gallons per day finished water)		229				
<b>Potable Water Demands</b> (daily average annual finished water in mgd)		<b>15.41</b>	<b>16.15</b>	<b>17.65</b>	<b>18.75</b>	
SFWMD Water Use Permitted Allocation (mgd)						
Potable Water Source		Permit Number 50-00177-W (expires 2030)				
SAS		19.10				
FAS		1.50 <sup>a</sup>				
<b>Total Allocation</b>		<b>19.10</b>				
FDEP Potable Water Treatment Capacity (PWS ID # 4500351)						
Permitted Capacity by Source		Cumulative Facility & Project Capacity (mgd)				
		Existing	Projected			
		2016	2020	2030	2040	
SAS		26.00	26.00	26.00	26.00	
FAS		0.00	0.00	0.00	0.00	
<b>Total Potable Capacity</b>		<b>26.00</b>	<b>26.00</b>	<b>26.00</b>	<b>26.00</b>	
Nonpotable Alternative Water Source Capacity (mgd)						
Reclaimed Water		5.00	5.00	8.00 <sup>b</sup>	8.00 <sup>b</sup>	
<b>Total Nonpotable Capacity</b>		<b>5.00</b>	<b>5.00</b>	<b>8.00</b>	<b>8.00</b>	
Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Nonpotable Water						
No Projects						
<b>Total Nonpotable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Total New Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

<sup>a</sup> The City's FAS well is a backup source for blending limited to 1.50 mgd.

<sup>b</sup> Projection to meet Ocean Outfall Law requirements. To meet this capacity, the City has suggested several potential end users; see **Appendix F** for more information.

PALM BEACH

## VILLAGE OF GOLF

**Service Area:** Village of Golf and unincorporated areas of Palm Beach County

**Description:** Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening and ultrafiltration. The Village maintains an interconnection with the City of Boynton Beach.

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Population and Finished Water Demand						
		Existing	Projected			
		2016	2020	2030	2040	
Population		2,904	2,967	3,056	3,077	
Average 2012-2016 Per Capita (gallons per day finished water)		151				
<b>Potable Water Demands</b> (daily average annual finished water in mgd)		<b>0.44</b>	<b>0.45</b>	<b>0.46</b>	<b>0.46</b>	
SFWMD Water Use Permitted Allocation (mgd)						
Potable Water Source		Permit Number 50-00612-W (expires 2033)				
SAS		0.69				
FAS		0.00				
<b>Total Allocation</b>		<b>0.69</b>				
FDEP Potable Water Treatment Capacity (PWS ID # 4501528)						
Permitted Capacity by Source		Cumulative Facility & Project Capacity (mgd)				
		Existing	Projected			
		2016	2020	2030	2040	
SAS		0.86	0.86	0.86	0.86	
FAS		0.00	0.00	0.00	0.00	
<b>Total Potable Capacity</b>		<b>0.86</b>	<b>0.86</b>	<b>0.86</b>	<b>0.86</b>	<b>0.86</b>
Nonpotable Alternative Water Source Capacity (mgd)						
<b>Total Nonpotable Capacity</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Nonpotable Water						
No Projects						
<b>Total Nonpotable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Total New Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>



# TOWN OF HIGHLAND BEACH

**Service Area:** Town of Highland Beach

**Description:** Potable water supplies are obtained from one FAS wellfield, and water is treated at one WTP using RO. The Town maintains interconnections with the City of Delray Beach.

Population and Finished Water Demand							
				Existing	Projected		
				2016	2020	2030	2040
Population				3,828	3,911	4,030	4,058
Average 2012-2016 Per Capita (gallons per day finished water)				334			
<b>Potable Water Demands</b> (daily average annual finished water in mgd)				<b>1.28</b>	<b>1.31</b>	<b>1.35</b>	<b>1.36</b>
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 50-00346-W (expires 2026)			
SAS				0.00			
FAS				3.15			
<b>Total Allocation</b>				<b>3.15</b>			
FDEP Potable Water Treatment Capacity (PWS ID # 4500609)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2016	2020	2030	2040
SAS				0.00	0.00	0.00	0.00
FAS				3.00	3.00	3.00	3.00
<b>Total Potable Capacity</b>				<b>3.00</b>	<b>3.00</b>	<b>3.00</b>	<b>3.00</b>
Nonpotable Alternative Water Source Capacity (mgd)							
<b>Total Nonpotable Capacity</b>				0.00	0.00	0.00	0.00
Project Summary							
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2020	2030	2040	
Potable Water							
No Projects							
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Nonpotable Water							
No Projects							
<b>Total Nonpotable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Total New Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

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## TOWN OF JUPITER

**Service Area:** Towns of Jupiter and Juno Beach, and unincorporated areas of Martin and Palm Beach counties

**Description:** Potable water supplies are obtained from four SAS and FAS wellfields. FAS water is treated at an RO WTP and SAS water is treated at a nanofiltration WTP at the same location. The water use permit includes an overlap in allocations from SAS and FAS sources to provide operational flexibility on a seasonal basis, but the permit has a maximum annual allocation from the two sources combined along with specific wellfield withdrawal limitations. The Town maintains interconnections with the Seacoast Utility Authority and Village of Tequesta.

PALM BEACH

Population and Finished Water Demand						
		Existing	Projected			
		2016	2020	2030	2040	
Population		72,984	75,871	81,381	85,047	
Average 2012-2016 Per Capita (gallons per day finished water)		215				
<b>Potable Water Demands</b> (daily average annual finished water in mgd)		<b>15.69</b>	<b>16.31</b>	<b>17.50</b>	<b>18.29</b>	
SFWMD Water Use Permitted Allocation (mgd)						
Potable Water Source		Permit Number 50-00010-W (expires 2030)				
SAS		18.80				
FAS		11.71				
<b>Total Allocation</b>		<b>24.41</b>				
FDEP Potable Water Treatment Capacity (PWS ID # 4501491)						
Permitted Capacity by Source		Cumulative Facility & Project Capacity (mgd)				
		Existing	Projected			
		2016	2020	2030	2040	
SAS		16.30	16.30	16.30	16.30	
FAS		13.70	13.70	13.70	13.70	
<b>Total Potable Capacity</b>		<b>30.00</b>	<b>30.00</b>	<b>30.00</b>	<b>30.00</b>	
Nonpotable Alternative Water Source Capacity (mgd)						
Stormwater		0.00	16.16	16.16	16.16	
<b>Total Nonpotable Capacity</b>		<b>0.00</b>	<b>16.16</b>	<b>16.16</b>	<b>16.16</b>	
Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Nonpotable Water						
Surface water recharge system	Stormwater	2019	\$1.76	16.16	16.16	16.16
<b>Total Nonpotable Water</b>			<b>\$1.76</b>	<b>16.16</b>	<b>16.16</b>	<b>16.16</b>
<b>Total New Water</b>			<b>\$1.76</b>	<b>16.16</b>	<b>16.16</b>	<b>16.16</b>

## CITY OF LAKE WORTH UTILITIES

**Service Area:** City of Lake Worth, portion of the Town of Lake Clarke Shores, and unincorporated areas of Palm Beach County

**Description:** Potable water supplies are obtained from two SAS and FAS wellfields. FAS water is treated at an RO WTP and SAS water is treated at a lime softening WTP at the same location. In 2011, the FAS wellfield was put into production to reduce the vulnerability of the Eastern wellfield to saltwater intrusion. The City maintains interconnections with the Town of Lantana, PBCWUD, and City of West Palm Beach Public Utilities.

Population and Finished Water Demand						
		Existing	Projected			
		2016	2020	2030	2040	
Population		47,397	49,608	54,033	57,225	
Average 2014-2016 Per Capita (gallons per day finished water)		107 <sup>a</sup>				
<b>Potable Water Demands</b> (daily average annual finished water in mgd)		<b>5.07</b>	<b>5.31</b>	<b>5.78</b>	<b>6.12</b>	
SFWMD Water Use Permitted Allocation (mgd)						
Potable Water Source		Permit Number 50-00234-W (expires 2032)				
SAS		5.25				
FAS		6.00				
<b>Total Allocation</b>		<b>11.25</b>				
FDEP Potable Water Treatment Capacity (PWS ID # 4500773)						
Permitted Capacity by Source		Cumulative Facility & Project Capacity (mgd)				
		Existing	Projected			
		2016	2020	2030	2040	
SAS		12.90	12.90	12.90	12.90	
FAS		4.50	4.50	4.50	4.50	
<b>Total Potable Capacity</b>		<b>17.40</b>	<b>17.40</b>	<b>17.40</b>	<b>17.40</b>	
Nonpotable Alternative Water Source Capacity (mgd)						
<b>Total Nonpotable Capacity</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Nonpotable Water						
No Projects						
<b>Total Nonpotable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Total New Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

<sup>a</sup> The average per capita was calculated using 2014-2016 finished water data because of significant SAS restrictions in earlier years due to saltwater intrusion issues.

# TOWN OF LANTANA

**Service Area:** Town of Lantana

**Description:** Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using nanofiltration. The water supply is vulnerable to saltwater intrusion; therefore, the Town constructed two additional wells farther from the coast to provide additional wellfield operational flexibility. The Town maintains interconnections with the City of Boynton Beach, City of Lake Worth, and Town of Manalapan.

PALM BEACH

Population and Finished Water Demand						
		Existing	Projected			
		2016	2020	2030	2040	
Population		10,943	11,215	11,634	11,795	
Average 2012-2016 Per Capita (gallons per day finished water)		175				
<b>Potable Water Demands</b> (daily average annual finished water in mgd)		<b>1.92</b>	<b>1.96</b>	<b>2.04</b>	<b>2.06</b>	
SFWMD Water Use Permitted Allocation (mgd)						
Potable Water Source		Permit Number 50-00575-W (expires 2028)				
SAS		2.48				
FAS		0.00				
<b>Total Allocation</b>		<b>2.48</b>				
FDEP Potable Water Treatment Capacity (PWS ID # 4500784)						
Permitted Capacity by Source		Cumulative Facility & Project Capacity (mgd)				
		Existing	Projected			
		2016	2020	2030	2040	
SAS		3.84	3.84	3.84	3.84	
FAS		0.00	0.00	0.00	0.00	
<b>Total Potable Capacity</b>		<b>3.84</b>	<b>3.84</b>	<b>3.84</b>	<b>3.84</b>	
Nonpotable Alternative Water Source Capacity (mgd)						
<b>Total Nonpotable Capacity</b>		0.00	0.00	0.00	0.00	
Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Nonpotable Water						
No Projects						
<b>Total Nonpotable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Total New Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

# TOWN OF MANALAPAN

**Service Area:** Towns of Manalapan and Hypoluxo

**Description:** Potable water supplies are obtained from one SAS and FAS wellfield, and water is treated at one WTP using RO. The Town maintains multiple interconnections with the Town of Lantana.

Population and Finished Water Demand						
		Existing	Projected			
		2016	2020	2030	2040	
Population		2,552	2,626 <sup>a</sup>	446	478	
Average 2012-2016 Per Capita (gallons per day finished water)		442				
<b>Potable Water Demands</b> (daily average annual finished water in mgd)		<b>1.13</b>	<b>1.16</b>	<b>0.91</b>	<b>0.98</b>	
SFWMD Water Use Permitted Allocation (mgd)						
Potable Water Source		Permit Number 50-00506-W (expires 2023)				
SAS		0.58				
FAS		1.34				
<b>Total Allocation</b>		<b>1.92</b>				
FDEP Potable Water Treatment Capacity (PWS ID # 4500840)						
Permitted Capacity by Source		Cumulative Facility & Project Capacity (mgd)				
		Existing	Projected			
		2016	2020	2030	2040	
SAS		0.65	0.65	0.65	0.65	
FAS		1.70	1.70	1.70	1.70	
<b>Total Potable Capacity</b>		<b>2.35</b>	<b>2.35</b>	<b>2.35</b>	<b>2.35</b>	
Nonpotable Alternative Water Source Capacity (mgd)						
<b>Total Nonpotable Capacity</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Nonpotable Water						
No Projects						
<b>Total Nonpotable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Total New Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

<sup>a</sup> The Town of Hypoluxo has terminated its current water services agreement with the Town of Manalapan, effective 2020. The Hypoluxo population and demands are not included in Manalapan's data starting in 2021.

PALM BEACH

# TOWN OF MANGONIA PARK

**Service Area:** Town of Mangonia Park

**Description:** Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening.

PALMBEACH

Population and Finished Water Demand							
				Existing	Projected		
				2016	2020	2030	2040
Population				1,990	2,156	2,527	2,837
Average 2012-2016 Per Capita (gallons per day finished water)				176			
<b>Potable Water Demands</b> (daily average annual finished water in mgd)				<b>0.35</b>	<b>0.38</b>	<b>0.44</b>	<b>0.50</b>
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 50-00030-W (expires 2027)			
SAS				0.58			
FAS				0.00			
<b>Total Allocation</b>				<b>0.58</b>			
FDEP Potable Water Treatment Capacity (PWS ID # 4500841)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2016	2020	2030	2040
SAS				1.08	1.08	1.08	1.08
FAS				0.00	0.00	0.00	0.00
<b>Total Potable Capacity</b>				<b>1.08</b>	<b>1.08</b>	<b>1.08</b>	<b>1.08</b>
Nonpotable Alternative Water Source Capacity (mgd)							
<b>Total Nonpotable Capacity</b>				<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Project Summary							
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2020	2030	2040	
Potable Water							
No Projects							
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
Nonpotable Water							
No Projects							
<b>Total Nonpotable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>Total New Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	

## MARALAGO CAY

**Service Area:** Unincorporated area of Palm Beach County

**Description:** Potable water supplies are obtained from one SAS wellfield, and water is treated at one WTP using lime softening.

Population and Finished Water Demand							
				Existing	Projected		
				2016	2020	2030	2040
Population				1,063	1,093	1,142	1,167
Average 2012-2016 Per Capita (gallons per day finished water)				225			
<b>Potable Water Demands</b> (daily average annual finished water in mgd)				<b>0.24</b>	<b>0.25</b>	<b>0.26</b>	<b>0.26</b>
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 50-01283-W (expires 2035)			
SAS				0.27			
FAS				0.00			
<b>Total Allocation</b>				<b>0.27</b>			
FDEP Potable Water Treatment Capacity (PWS ID # 4500062)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2016	2020	2030	2040
SAS				0.42	0.42	0.42	0.42
FAS				0.00	0.00	0.00	0.00
<b>Total Potable Capacity</b>				<b>0.42</b>	<b>0.42</b>	<b>0.42</b>	<b>0.42</b>
Nonpotable Alternative Water Source Capacity (mgd)							
<b>Total Nonpotable Capacity</b>				<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Project Summary							
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2020	2030	2040	
Potable Water							
No Projects							
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Nonpotable Water							
No Projects							
<b>Total Nonpotable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Total New Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

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# PALM BEACH COUNTY WATER UTILITIES DEPARTMENT

**Service Area:** Cities of Atlantis, Boynton Beach, Greenacres, Lake Worth, Parkland, West Lake, and West Palm Beach; towns of Cloud Lake, Glen Ridge, Haverhill, Lake Clarke Shores, and Loxahatchee Groves; villages of Palm Springs, Royal Palm Beach, and Wellington; and unincorporated areas of Palm Beach County

**Description:** Potable water supplies are obtained from four SAS wellfields, and water is treated at two lime softening and two nanofiltration WTPs in the Eastern Region. The wellfields are interconnected with 42-inch water mains, allowing PBCWUD to operate a unified distribution system. The PBCWUD's bulk sales in 2016 were 2.36 mgd, which were distributed to the cities of Boca Raton, Boynton Beach, Atlantis, and Lake Worth, West Palm Beach; Seminole Improvement District, Seacoast Utility Authority; and Town of Lake Clark Shores.

PALM BEACH

Population and Finished Water Demand						
		Existing	Projected			
		2016	2020	2030	2040	
Population		498,848	534,857	613,513	677,834	
Average 2012-2016 Per Capita (gallons per day finished water)		111				
<b>Potable Water Demands</b> (daily average annual finished water in mgd)		<b>55.37</b>	<b>59.37</b>	<b>68.10</b>	<b>75.24</b>	
SFWMD Water Use Permitted Allocation (mgd)						
Potable Water Source		Permit Number 50-00135-W (expires 2023)				
SAS		79.99				
FAS (ASR wells for blending with SAS)		7.00				
Bulk Raw Water (finished water sale to multiple municipalities in 2016)		(2.61) <sup>a</sup>				
<b>Total Allocation</b>		<b>86.99</b>				
FDEP Potable Water Treatment Capacity (PWS ID # 4504393)						
Permitted Capacity by Source		Cumulative Facility & Project Capacity (mgd)				
		Existing	Projected			
		2016	2020	2030	2040	
SAS		103.28	103.28	103.28	103.28	
FAS		0.00	0.00	0.00	0.00	
<b>Total Potable Capacity</b>		<b>103.28</b>	<b>103.28</b>	<b>103.28</b>	<b>103.28</b>	
Nonpotable Alternative Water Source Capacity (mgd)						
Reclaimed Water		25.00 <sup>b</sup>	25.00 <sup>b</sup>	35.50 <sup>b</sup>	35.50 <sup>b</sup>	
<b>Total Nonpotable Capacity</b>		<b>25.00</b>	<b>25.00</b>	<b>35.50</b>	<b>35.50</b>	
Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Nonpotable Water						
South County Reclaimed Phase I <sup>c</sup>	Reclaimed Water	2021	\$22.00	0.00	10.50	10.50
<b>Total Nonpotable Water</b>			<b>\$22.00</b>	<b>0.00</b>	<b>10.50</b>	<b>10.50</b>
<b>Total New Water</b>			<b>\$22.00</b>	<b>0.00</b>	<b>10.50</b>	<b>10.50</b>

- <sup>a</sup> The amount of raw water needed to produce 2.36 mgd of finished water, which is the amount of bulk water the PBCWUD provided to municipalities in 2016.
- <sup>b</sup> The PBCWUD is contracted to provide FPL with up to 22.00 mgd of reclaimed water for cooling purposes at the West County Energy Center. FPL currently uses approximately 14.00 mgd of that amount. This is in addition to the reclaimed capacity listed (25.00 mgd).
- <sup>c</sup> The PBCWUD is contracted to receive up to 10.50 mgd of reclaimed water from BCWWS.



# PALM BEACH COUNTY WATER UTILITIES DEPARTMENT WESTERN REGION

**Service Area:** Cities of Belle Glade, Pahokee, and South Bay

**Description:** Potable water supplies are obtained from one FAS wellfield, and water is treated at one WTP using RO. PBCWUD Western Region, formerly known as the Glades Utility Authority, became part of PBCWUD in April 2013.

Population and Finished Water Demand						
		Existing	Projected			
		2016	2020	2030	2040	
Population		34,886	36,137	38,446	39,888	
Average 2012-2016 Per Capita (gallons per day finished water)		157				
<b>Potable Water Demands</b> (daily average annual finished water in mgd)		<b>5.48</b>	<b>5.67</b>	<b>6.04</b>	<b>6.26</b>	
SFWMD Water Use Permitted Allocation (mgd)						
Potable Water Source		Permit Number 50-06857-W (expires 2025)				
SAS		0.00				
FAS		9.43				
<b>Total Allocation</b>		<b>9.43</b>				
FDEP Potable Water Treatment Capacity (PWS ID # 4505005)						
Permitted Capacity by Source		Cumulative Facility & Project Capacity (mgd)				
		Existing	Projected			
		2016	2020	2030	2040	
SAS		0.00	0.00	0.00	0.00	
FAS		10.00	10.00	10.00	10.00	
<b>Total Potable Capacity</b>		<b>10.00</b>	<b>10.00</b>	<b>10.00</b>	<b>10.00</b>	
Nonpotable Alternative Water Source Capacity (mgd)						
<b>Total Nonpotable Capacity</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	
Nonpotable Water						
No Projects						
<b>Total Nonpotable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>Total New Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	

PALM BEACH

## VILLAGE OF PALM SPRINGS

**Service Area:** Village of Palm Springs, Town of Lake Clarke Shores, and unincorporated areas of Palm Beach County

**Description:** Potable water supplies are obtained from two SAS wellfields, and water is treated at two interconnected WTPs utilizing ion exchange, followed by lime softening. The Town of Lake Clarke Shores purchases and distributes finished water from the Village of Palm Springs; in 2016, the Town purchased 0.16 mgd.

PALM BEACH

Population and Finished Water Demand							
				Existing	Projected		
				2016	2020	2030	2040
Population				47,899	50,206	54,860	58,260
Average 2012-2016 Per Capita (gallons per day finished water)				81			
<b>Potable Water Demands</b> (daily average annual finished water in mgd)				<b>3.88</b>	<b>4.07</b>	<b>4.44</b>	<b>4.72</b>
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 50-00036-W (expires 2029)			
SAS				4.62			
FAS				0.00			
<b>Total Allocation</b>				<b>4.62</b>			
FDEP Potable Water Treatment Capacity (PWS ID # 4501058)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2016	2020	2030	2040
SAS				10.00	10.00	10.00	10.00
FAS				0.00	0.00	0.00	0.00
<b>Total Potable Capacity</b>				<b>10.00</b>	<b>10.00</b>	<b>10.00</b>	<b>10.00</b>
Nonpotable Alternative Water Source Capacity (mgd)							
<b>Total Nonpotable Capacity</b>				0.00	0.00	0.00	0.00
Project Summary							
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2020	2030	2040	
Potable Water							
R.L. Pratt Washwater Recovery Basin	SAS	2020	\$1.75	0.00	0.20	0.20	
Purchase bulk water from PBCWUD <sup>a</sup>	SAS	2030	NA	0.00	0.30 <sup>a</sup>	0.30 <sup>a</sup>	
<b>Total Potable Water</b>			<b>\$1.75</b>	<b>0.00</b>	<b>0.50<sup>a</sup></b>	<b>0.50<sup>a</sup></b>	
Nonpotable Water							
No Projects							
<b>Total Nonpotable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>Total New Water</b>			<b>\$1.75</b>	<b>0.00</b>	<b>0.50<sup>a</sup></b>	<b>0.50<sup>a</sup></b>	

<sup>a</sup> This project is suggested by the SFWMD in order for the Village of Palm Springs to have adequate water supply to meet 2030 to 2040 demands. The Village of Palm Springs can choose to implement this project or determine an alternative source to meet the 2030 to 2040 demands.

## CITY OF RIVIERA BEACH

**Service Area:** City of Riviera Beach and Town of Palm Beach Shores

**Description:** Potable water supplies are obtained from the SAS in an eastern and western wellfield, and water is treated at one WTP using lime softening. The City maintains interconnections with the Town of Mangonia Park, Seacoast Utility Authority, and City of West Palm Beach Public Utilities Department. The City is developing strategies to reduce water loss, by upgrading water meters, and the amount of system flushing to lower the per capita use rate and decrease future demands. The City maintains interconnections with the Seacoast Utility Authority and City of West Palm Beach.

Population and Finished Water Demand						
		Existing	Projected			
		2016	2020	2030	2040	
Population		39,805	42,467	48,212	52,835	
Average 2012-2016 Per Capita (gallons per day finished water)		184				
<b>Potable Water Demands</b> (daily average annual finished water in mgd)		<b>7.32</b>	<b>7.81</b>	<b>8.87</b>	<b>9.72</b>	
SFWMD Water Use Permitted Allocation (mgd)						
Potable Water Source		Permit Number 50-00460-W (expires 2032)				
SAS		9.08				
FAS		0.00				
<b>Total Allocation</b>		<b>9.08</b>				
FDEP Potable Water Treatment Capacity (PWS ID # 4501229)						
Permitted Capacity by Source		Cumulative Facility & Project Capacity (mgd)				
		Existing	Projected			
		2016	2020	2030	2040	
SAS		17.50	17.50	17.50	17.50	
FAS		0.00	0.00	0.00	0.00	
<b>Total Potable Capacity</b>		<b>17.50</b>	<b>17.50</b>	<b>17.50</b>	<b>17.50</b>	
Nonpotable Alternative Water Source Capacity (mgd)						
<b>Total Nonpotable Capacity</b>		0.00	0.00	0.00	0.00	
Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
Purchase bulk water from PBCWUD or City of West Palm Beach <sup>a</sup>	SAS	2030	N/A	0.00	1.00 <sup>a</sup>	1.00 <sup>a</sup>
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>1.00<sup>a</sup></b>	<b>1.00<sup>a</sup></b>
Nonpotable Water						
No Projects						
<b>Total Nonpotable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Total New Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>1.00<sup>a</sup></b>	<b>1.00<sup>a</sup></b>

<sup>a</sup> This project is suggested by the SFWMD in order for the City of Riviera Beach to have adequate water supply to meet 2030 to 2040 demands. The City of Riviera Beach can choose to implement this project or determine an alternative source to meet the 2030 to 2040 demands.

PALM BEACH

## SEACOAST UTILITY AUTHORITY

**Service Area:** Towns of Juno Beach and Lake Park, Village of North Palm Beach, City of Palm Beach Gardens, and unincorporated areas of Palm Beach County

**Description:** Potable water supplies are obtained from four SAS wellfields and one FAS wellfield, and water is treated at an RO WTP that began operating in 2013 and at a nanofiltration WTP that replaced the lime softening WTP in 2013. The water use permit includes an overlap in allocations from SAS and FAS sources to provide operational flexibility on a seasonal basis, but the permit has a maximum annual allocation from the two sources combined along with specific wellfield withdrawal limitations. The utility maintains interconnections with the Town of Jupiter and City of Riviera Beach.

PALMBEACH

Population and Finished Water Demand							
				Existing	Projected		
				2016	2020	2030	2040
Population				90,703	94,330	101,276	105,926
Average 2012-2016 Per Capita (gallons per day finished water)				191			
<b>Potable Water Demands</b> (daily average annual finished water in mgd)				<b>17.32</b>	<b>18.02</b>	<b>19.34</b>	<b>20.23</b>
SFWMD Water Use Permitted Allocation (mgd)							
Potable Water Source				Permit Number 50-00365-W (expires 2032)			
SAS				22.30			
FAS				8.90			
<b>Total Allocation</b>				<b>26.92</b>			
FDEP Potable Water Treatment Capacity (PWS ID # 4501124)							
Permitted Capacity by Source				Cumulative Facility & Project Capacity (mgd)			
				Existing	Projected		
				2016	2020	2030	2040
SAS				27.50	27.50	27.50	27.50
FAS				3.00	3.00	3.00	3.00
<b>Total Potable Capacity</b>				<b>30.50</b>	<b>30.50</b>	<b>30.50</b>	<b>30.50</b>
Nonpotable Alternative Water Source Capacity (mgd)							
Reclaimed Water				15.00	15.00	15.00	15.00
<b>Total Nonpotable Capacity</b>				<b>15.00</b>	<b>15.00</b>	<b>15.00</b>	<b>15.00</b>
Project Summary							
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)			
				2020	2030	2040	
Potable Water							
FAS well F-6	FAS	2018	\$4.00	2.00	2.00	2.00	
FAS well F-9	FAS	2020	\$4.00	0.00	2.00	2.00	
<b>Total Potable Water</b>			<b>\$8.00</b>	<b>2.00</b>	<b>4.00</b>	<b>4.00</b>	
Nonpotable Water							
No Projects							
<b>Total Nonpotable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
<b>Total New Water</b>			<b>\$8.00</b>	<b>2.00</b>	<b>4.00</b>	<b>4.00</b>	

## VILLAGE OF TEQUESTA

**Service Area:** Village of Tequesta, towns of Jupiter Inlet Colony and Jupiter Island, and unincorporated Palm Beach and Martin counties

**Description:** Potable water supplies are obtained from three SAS and FAS wellfields, and SAS water is treated at one WTP using sand filtration, and FAS water is treated at an RO WTP. The water use permit includes an overlap in allocations from SAS and FAS sources to provide operational flexibility; however, the permit has a maximum total annual allocation from the two sources. In 1996, the Village began to reduce its dependence on the SAS and use the FAS as its primary supply source. The Village maintains an interconnection with the Town of Jupiter.

Population and Finished Water Demand						
		Existing	Projected			
		2016	2020	2030	2040	
Population		8,668	8,866	9,155	9,241	
Average 2012-2016 Per Capita (gallons per day finished water)		309				
<b>Potable Water Demands</b> (daily average annual finished water in mgd)		<b>2.68</b>	<b>2.74</b>	<b>2.83</b>	<b>2.86</b>	
SFWMD Water Use Permitted Allocation (mgd)						
Potable Water Source		Permit Number 50-00046-W (expires 2031)				
SAS		1.10				
FAS		3.43				
<b>Total Allocation</b>		<b>4.37</b>				
FDEP Potable Water Treatment Capacity (PWS ID # 4501438)						
Permitted Capacity by Source		Cumulative Facility & Project Capacity (mgd)				
		Existing	Projected			
		2016	2020	2030	2040	
SAS		2.73	2.73	2.73	2.73	
FAS		3.60	3.60	3.60	3.60	
<b>Total Potable Capacity</b>		<b>6.33</b>	<b>6.33</b>	<b>6.33</b>	<b>6.33</b>	
Nonpotable Alternative Water Source Capacity (mgd)						
<b>Total Nonpotable Capacity</b>		0.00	0.00	0.00	0.00	
Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Nonpotable Water						
No Projects						
<b>Total Nonpotable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Total New Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>

PALM BEACH

## WELLINGTON PUBLIC UTILITIES DEPARTMENT

**Service Area:** Villages of Wellington and Royal Palm Beach, and unincorporated areas of Palm Beach County

**Description:** Potable water supplies are obtained from three SAS wellfields. Water from the northern wellfield is slightly brackish and treated at a membrane filtration WTP. Water from the southern and eastern wellfields is fresher and treated at a lime softening WTP at the same location. The utility maintains an interconnection with the PBCWUD.

PALMBEACH

Population and Finished Water Demand						
		Existing	Projected			
		2016	2020	2030	2040	
Population		55,587	57,640	61,468	63,908	
Average 2012-2016 Per Capita (gallons per day finished water)		107				
<b>Potable Water Demands</b> (daily average annual finished water in mgd)		<b>5.95</b>	<b>6.17</b>	<b>6.58</b>	<b>6.84</b>	
SFWMD Water Use Permitted Allocation (mgd)						
Potable Water Source		Permit Number 50-00464-W (expires 2031)				
SAS		8.02				
FAS		0.00				
<b>Total Allocation</b>		<b>8.02</b>				
FDEP Potable Water Treatment Capacity (PWS ID # 4500014)						
Permitted Capacity by Source		Existing	Projected			
		2016	2020	2030	2040	
SAS		12.80	12.80	12.80	12.80	
FAS		0.00	0.00	0.00	0.00	
<b>Total Potable Capacity</b>		<b>12.80</b>	<b>12.80</b>	<b>12.80</b>	<b>12.80</b>	
Nonpotable Alternative Water Source Capacity (mgd)						
Reclaimed Water		1.00	2.30	3.90	7.50	
<b>Total Nonpotable Capacity</b>		<b>1.00</b>	<b>2.30</b>	<b>3.90</b>	<b>7.50</b>	
Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Nonpotable Water						
Phased reclaimed system expansions	Reclaimed Water	2016-2040	\$4.00	1.30	2.90	6.50
<b>Total Nonpotable Water</b>			<b>\$4.00</b>	<b>1.30</b>	<b>2.90</b>	<b>6.50</b>
<b>Total New Water</b>			<b>\$4.00</b>	<b>1.30</b>	<b>2.90</b>	<b>6.50</b>

## CITY OF WEST PALM BEACH PUBLIC UTILITIES

**Service Area:** City of West Palm Beach, and towns of Palm Beach, South Palm Beach, and unincorporated areas of Palm Beach County

**Description:** Potable water supplies are obtained from surface water and the SAS, and water is treated at one WTP using lime softening. Surface water is stored in Grassy Waters Preserve, Lake Mangonia, and Clear Lake. When used, the SAS wells discharge to the M Canal, typically during very dry conditions. The City is authorized to capture water from the C-17 and C-51 canals when they are discharging to tide. The City provides 0.50 mgd of finished bulk water to the Solid Waste Authority of Palm Beach County (SWAPBC) (0.15 mgd) and PBCWUD (0.35 mgd).

Population and Finished Water Demand						
		Existing	Projected			
		2016	2020	2030	2040	
Population		115,088	121,366	134,399	144,341	
Average 2012-2016 Per Capita (gallons per day finished water)		243				
<b>Potable Water Demands</b> (daily average annual finished water in mgd)		<b>27.97</b>	<b>29.49</b>	<b>32.66</b>	<b>35.07</b>	
SFWMD Water Use Permitted Allocation (mgd)						
Potable Water Source		Permit Number 50-00615-W (expires 2033)				
SAS		6.39 <sup>a</sup>				
FAS		0.00				
Surface Water (Clear Lake)		41.20 <sup>b</sup>				
Surface Water (SFWMD L-8 Canal, M Canal, and Grassy Waters Preserve)		66.98 <sup>c</sup>				
Bulk Raw Water (finished water sale to SWAPBC and PBCWUD)		(0.50)				
<b>Total Allocation</b>		<b>41.20</b>				
FDEP Potable Water Treatment Capacity (PWS ID # 4501559)						
Permitted Capacity by Source		Cumulative Facility & Project Capacity (mgd)				
		Existing	Projected			
		2016	2020	2030	2040	
SAS		47.00	47.00	47.00	47.00	
FAS		0.00	0.00	0.00	0.00	
<b>Total Potable Capacity</b>		<b>47.00</b>	<b>47.00</b>	<b>47.00</b>	<b>47.00</b>	
Nonpotable Alternative Water Source Capacity (mgd)						
ASR		8.00	14.00	14.00	14.00	
Reclaimed Water		0.70	0.70	0.70	0.70	
Stormwater		0.00	13.00	13.00	13.00	
<b>Total Nonpotable Capacity</b>		<b>8.70</b>	<b>27.70</b>	<b>27.70</b>	<b>27.70</b>	
Project Summary						
Water Supply Projects	Source	Completion Date	Total Capital Cost (\$ million)	Projected Cumulative Design Capacity (mgd)		
				2020	2030	2040
Potable Water						
No Projects						
<b>Total Potable Water</b>			<b>\$0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Nonpotable Water						
C-17 Pump Station	Stormwater	2017	\$1.50	10.00	10.00	10.00
ASR Well Expansion Program	ASR	ND	\$9.00	6.00	6.00	6.00
Grassy Waters Preserve Water Quality, Diversion, and Storage Improvements	Stormwater	ND	\$6.00	3.00	3.00	3.00
<b>Total Nonpotable Water</b>			<b>\$16.50</b>	<b>19.00</b>	<b>19.00</b>	<b>19.00</b>
<b>Total New Water</b>			<b>\$16.50</b>	<b>19.00</b>	<b>19.00</b>	<b>19.00</b>

- <sup>a</sup> Withdrawals from the Eastern and Western (SAS) wellfields are limited to 60 days per year on a rolling 12-month basis.
- <sup>b</sup> Public Water Supply portion of permit; surface water is withdrawn from Clear Lake.
- <sup>c</sup> Diversion and Impoundment portion of permit; surface water from L-8 Canal is conveyed via M-Canal into Grassy Waters and/or Clear Lake.

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