February 2015

City of Palm Beach Gardens

10-Year Water Supply Facilities Work Plan

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LIST OF ACRONYMS

DRC – Development Review Committee
EAR – Evaluation and Appraisal Report
SUA – Seacoast Utility Authority (Seacoast)
SFWMD – South Florida Water Management District
LEC – Lower East Coast
MGD – Million Gallons per Day
CUP – Consumptive Use Permit
TAZ – Traffic Analysis Zone
WTP – Water Treatment Plant
GPCD – Gallons Per Capita Per Day
BEBR – Bureau of Economic and Business Research

1.0 INTRODUCTION

The purpose of the City of Palm Beach Gardens (City) Water Supply Facilities Work Plan (Work Plan) is to identify and plan for the water supply sources and facilities needed to serve existing and new development within the local government's jurisdiction. Chapter 163, Part II, Section 163.3177(6)(c)3, *Florida Statutes* (F.S.), requires local governments to prepare and adopt Water Plans into their comprehensive plans within18 months after the South Florida Water Management District (SFWMD or District) approves a regional water supply plan or its update. The Lower East Coast Water Supply Plan Update was approved by the District's Governing Board on September 12, 2013; therefore, the deadline for local governments within the Lower East Coast (LEC) region to amend their comprehensive plans to update the Work Plan is March 12, 2015.

Residents of the City obtain their water from the Seacoast Utility Authority (Seacoast). The City coordinates with Seacoast through the Development Review Committee (DRC) process to ensure that sufficient capacity is available, and Seacoast ensures that supporting infrastructure, such as water lines, are adequately planned for and maintained.

The Work Plan references Seacoast's water projections and the initiatives identified in the LEC Water Supply Plan Update to ensure adequate water supply for the City. According to state guidelines, the Work Plan and the City's comprehensive plan must address the development of traditional and alternative water supplies, service delivery, bulk sales agreements, and conservation and reuse programs that are necessary to serve existing and new development for at least a 10-year planning period. The City's Work Plan has a planning time schedule consistent with the comprehensive plan and LEC Water Supply Plan Update.

The City's Work Plan is divided into six sections:

- Section 1 - Introduction
- Section 2 - Background Information
- Section 3 - Data and Analysis
- Section 4 - Capital Improvements
- Section 5 - Comprehensive Plan Goals, Objectives, and Policies
- Section 6 - Regional Issues Identified in Regional Water Supply Plan

1.1 Statutory History

The Florida Legislature has enacted bills in the 2002, 2004, 2005, and 2011 sessions to address the state's water supply needs. These bills, in particular Senate Bills 360 and 444 (2005 legislative session), significantly changed Chapters 163 and 373, F.S., by

strengthening the statutory links between the regional water supply plans prepared by the water management districts and the comprehensive plans prepared by local governments. In addition, these bills established the basis for improving coordination between the local land use planning and water supply planning.

1.2 Statutory Requirements

The following summary highlights the statutory requirements the City has considered when updating the Work Plan:

1. Coordinate appropriate aspects of its comprehensive plan with the District's Regional Water Supply Plan [163.3177(4)(a), F.S.].

2. Ensure the future land use plan is based on availability of adequate water supplies and public facilities and services [s.163.3177(6)(a), F.S.]. Data and analysis demonstrating that adequate water supplies and associated public facilities will be available to meet projected growth demands must accompany all proposed Future Land Use Map amendments submitted for review. The submitted package must also include an amendment to the Capital Improvements Element, if necessary, to demonstrate that adequate public facilities will be available to serve the proposed Future Land Use Map modification.

3. Ensure that adequate water supplies and facilities are available to serve new development no later than the issuance by the local government of a certificate of occupancy, or its functional equivalent and consult with the applicable water supplier to determine whether adequate water supplies will be available to serve the development by the anticipated issuance date of the certificate of occupancy [s.163.3180(2)(a), F.S.].

4. For local government subject to a regional water supply plan, revise the General Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater Aquifer Recharge Element (the "Infrastructure Element") within 18 months after the District approves an update to the regional water supply plan to:

    a. Identify and incorporate the alternative water supply project(s) selected by the local government from projects identified in the updated District Regional Water Supply Plan or the alternative project(s) proposed by the local government under s. 373.709(8)(b), F.S. [s. 163.3177(6)(c), F.S.];

    b. Identify the traditional and alternative water supply projects, bulk sales agreements, and the conservation and reuse programs necessary to meet the water needs identified in the District Regional Water Supply Plan [s. 163.3177(6)(c)3, F.S.]; and

c. Update the Work Plan for a minimum 10-year planning period for constructing the public, private, and regional water supply facilities identified in the element as necessary to serve existing and new development [s.163.3177(6)(c)(3), F.S.].

5. Revise the Five-Year Schedule of Capital Improvements to include any water supply, reuse, and conservation projects and programs to be implemented during the five-year period [s. 163.3177(6)(a)(4), F.S.].

6. To the extent necessary to maintain internal consistency after making changes described in Paragraphs 1 through 5 above, revise the Conservation Element to assess projected water needs and sources for at least a 10-year planning period, considering the District Regional Water Supply Plan, as well as applicable consumptive use permit(s) [s.163.3177(6)(d), F.S.]. The plan must address the water supply sources necessary to meet and achieve the existing and projected water use demand for the established planning period, considering the applicable regional water supply plan [s.163.3167(9), F.S.].

7. To the extent necessary to maintain internal consistency after making changes described in Paragraphs 1 through 5 above, revise the Intergovernmental Coordination Element to ensure coordination of the comprehensive plan with the District Regional Water Supply Plan [s.163.3177(6)(h)1., F.S.].

8. An Evaluation and Appraisal Report (EAR) is not required; however, local governments are encouraged to comprehensively evaluate, and as necessary, update comprehensive plans to reflect changes in local conditions. The evaluation should address the extent to which the local government has implemented the need to update its Work Plan, including the development of alternative water supplies, and determine whether the identified alternative water supply projects, traditional water supply projects, bulk sales agreements, and conservation and reuse programs are meeting local water use demands [s.163.3191(3), F.S.].

2.0 BACKGROUND INFORMATION

2.1 Overview

On March 20, 1959, John D. MacArthur, multimillionaire insurance magnate and landowner, announced plans to develop approximately 4,200 acres and provide homes for 55,000 people in a new community bounded by Plat 4 (Garden Woods) to the north, Northlake Boulevard (Lake Park West Road) to the south, Prosperity Farms Road to the east, and the Florida Turnpike (Sunshine State Parkway) to the west in the north end of Palm Beach County, Florida. Subsequently, a City Charter was approved by the State of Florida on June 20, 1959, and the land was developed under his supervision until his death in 1978.

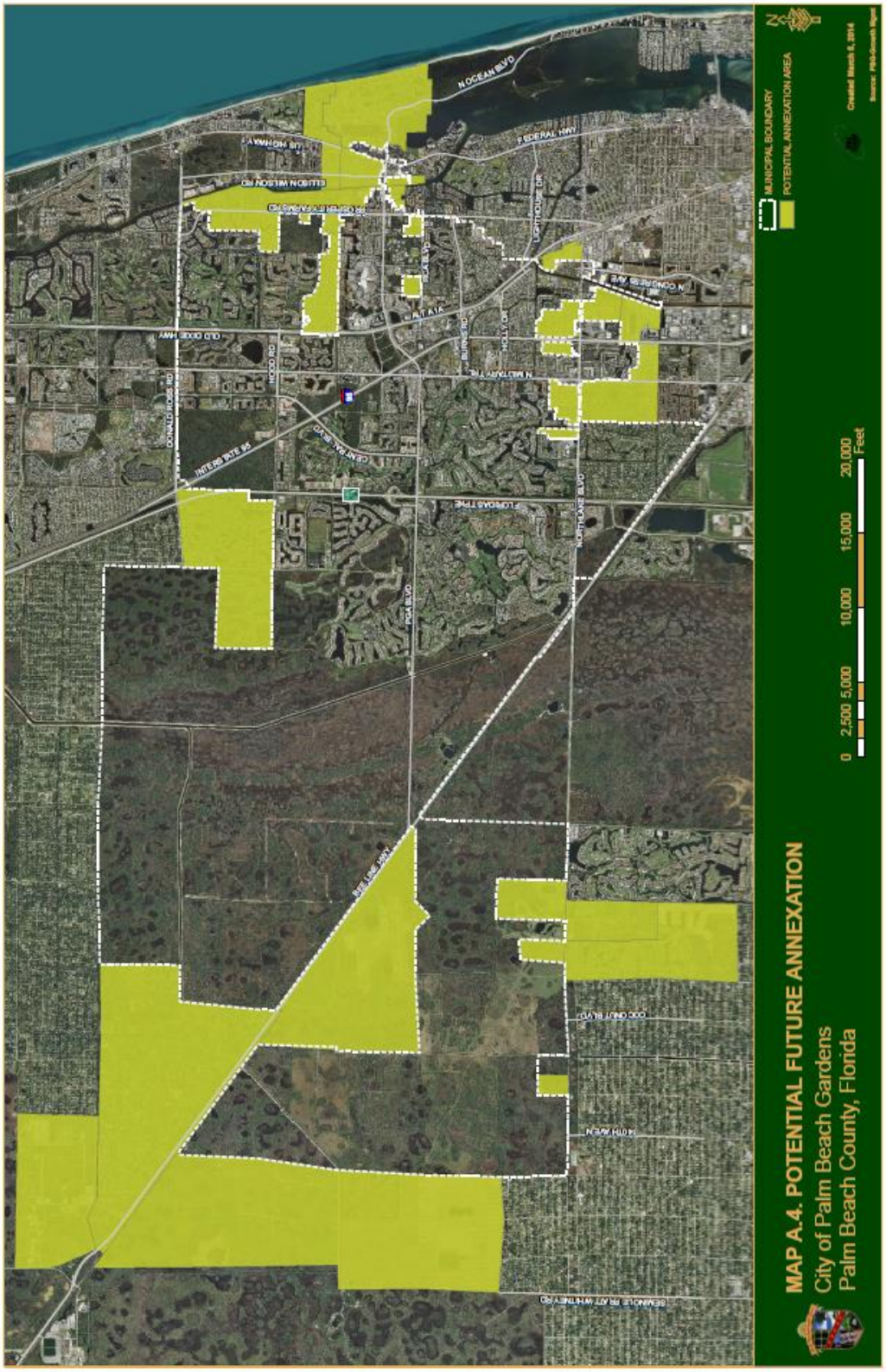
Mr. MacArthur's original name for the city was Palm Beach City. Permission to use that name, however, was denied; so MacArthur, in keeping with his "garden city" plan, decided to name the city Palm Beach Gardens. Mr. MacArthur wanted this new city to be a place to raise a family and earn a living – in essence, to realize the American dream. With this in mind, he set to work designing a garden city from miles of dairy cattle grazing and vacant land.

The City has grown steadily during its fifty-five years in existence. Between 1990 and 2000, the population grew from 22,990 to an estimated 35,058, an increase of approximately three percent annually. In 1999, the John D. and Catherine T. MacArthur Foundation sold approximately 14,000 acres of land in the area, including approximately 5,000 acres within the City. The City Council, entrusted with the responsibility of ensuring quality development, reached an agreement with the purchasers to manage the anticipated new growth. With the sudden land sale by the MacArthur Foundation, the City experienced an increased rate of growth in population from an estimated 35,058 in 2000 to an estimated 49,387 in 2007. Since that time, the City has blossomed to an estimated population of 50,067 in 2014 (Source: BEBR, 2014). Map 1, on Page 7, illustrates the current City boundaries and potential future annexation areas.

2.2 Relevant Regional Issues

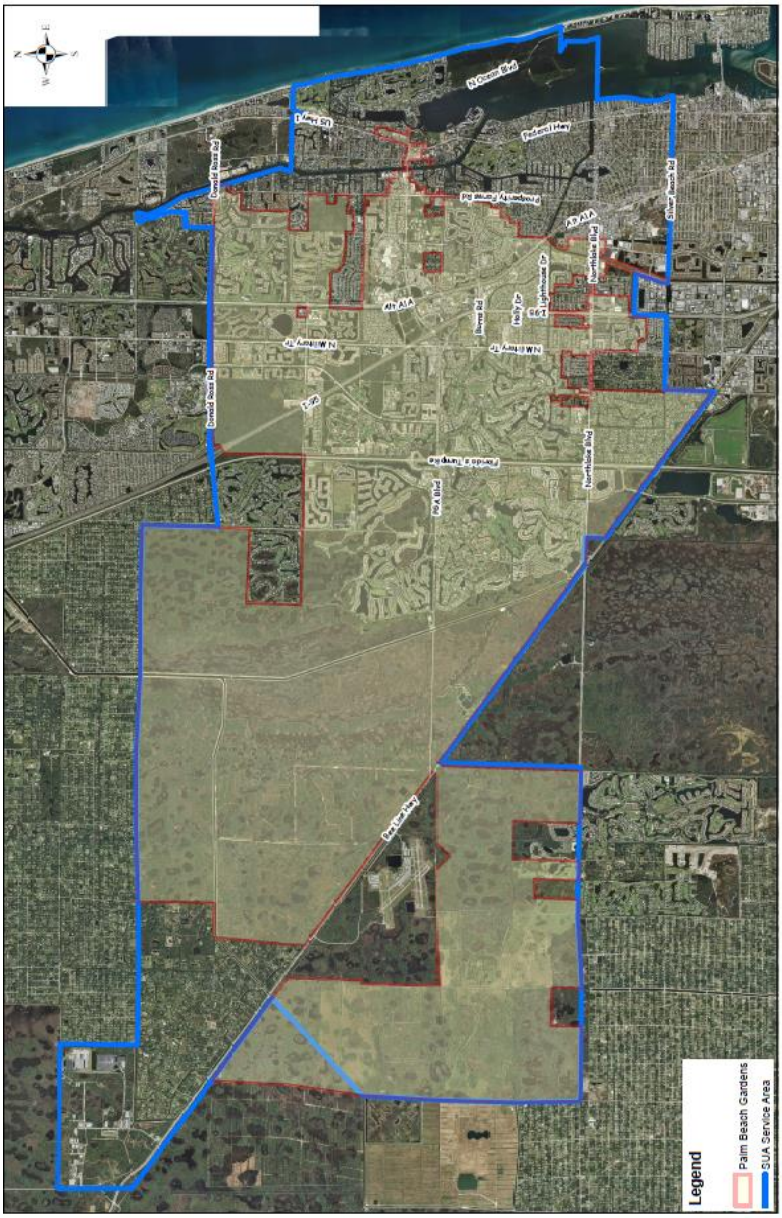
The regional issues and objectives identified for 2030 in the SFWMD Planning Region provide an overall framework for the planning process addressed by the Work Plan:

- Water supply – identify sufficient water resource and water supply development options to meet projected 2030 water demands during a 1-in-10 year drought environment.
- Water conservation and alternative source development – increase levels of conservation, the efficiency of water use, and the development of alternative water resources to meet projected demand.
- Natural systems – protect and enhance the environment, including the Everglades and other federal, state, and locally identified natural resource areas.
- Linkages with local governments – provide information to support local government comprehensive plans.
- Compatibility and linkage with other efforts – achieve compatibility and integration with the following:
  - Comprehensive Everglades Restoration Plan (CERP) and other environmental restoration projects
  - Modifications to operating schedules for the regional system, including Lake Okeechobee
  - Water use permitting processes, minimum flow and level criteria, and water reservations
  - Other regional and local water resource planning efforts (Source: SFWMD Planning Document, Lower East Coast Water Supply Plan Update, 2013).



Map 1. City Boundaries and Potential Future Annexation Areas

In addition to other regional and local water resource planning efforts, the SFWMD plays a pivotal role in resource protection through criteria used for consumptive use permitting. As pressure increased on the Everglades ecosystem resource, the Governing Board of the SFWMD initiated rulemaking to limit increased allocations dependent on the Everglades system. As a result, the Regional Water Availability Rule was adopted by the Governing Board on February 15, 2007, as part of the SFWMD Consumptive Use Permit (CUP) program. This reduced reliance on the regional system for future water supply needs, mandates the development of alternative water supplies and increased conservation and reuse in the Seacoast Utility Service Area (Map 2).



Map 2. Seacoast Utility Authority Service Area

3.0 DATA AND ANALYSIS

3.1 Overview

The City of Palm Beach Gardens does not own or operate its own potable water supply system. Rather, potable water facilities and services are provided by the Seacoast Utility Authority (Seacoast). Seacoast provides potable water to the City of Palm Beach Gardens, as well as unincorporated areas of Palm Beach County and the municipalities of Juno Beach, Lake Park, and North Palm Beach.

All five entities that receive water and services are members of the Seacoast Governing Board. All responsibilities for the withdrawal, treatment, and distribution of potable water to the residents and businesses of Palm Beach Gardens are assumed by Seacoast, including the direct billing of customers. Seacoast requires developers to upgrade the capacity of existing systems, and/or build new systems to meet their needs through the coordinated DRC process. In most cases, upon completion, Seacoast assumes ownership, operation, and maintenance responsibilities of all related systems.

Photo 1. Seacoast Water Tower - Hood Road Facility

Photo 2. Northwest View from Hood Road Elevated Storage Tank

3.2 Existing Conditions

On May 21, 2014, Seacoast placed a new 30.5 MGD membrane treatment facility in service. This will allow Seacoast to decommission and demolish its two lime-softening water treatment facilities on Richard Road (7.5 MGD capacity) and Hood Road (23.0 MGD) later in 2015. The photographs below illustrate the improvements undertaken by Seacoast to implement the LEC Water Supply Plan Update and to address applicable regional issues within the Seacoast Utility Service Area.

2009

Photos 3 & 4. Aerial Views of Richard Road and Hood Road Water Plants, 2009

2015

Photos 5 & 6. Aerial Views of Richard Road and Hood Road Water Plants, 2015

Photo 7. Existing Hood Road Lime-Softening Unit

3.3 Water Source

In 2013, Seacoast withdrew an average of 19.08 MGD of total raw water from the Surficial Aquifer System (SAS) for all customers, including Palm Beach Gardens. Current Seacoast plans will result in the use of both the Surficial and Floridan Aquifer Systems in the future.

Projections of raw water supply and finished water demand from Seacoast's 2012 SFWMD water use permit are presented in Table 1. Projections of finished water demand by expected supply component are presented in Table 2. Both tables include the proposed Scripps Florida Phase II/Briger DRI future water demand.

Table 1

Total Seacoast Current and Projected Water Supply and Demand*

Year	Raw Water Withdrawal (MGD)	Finished Water Demand (MGD)
2010	18.21	17.65
2015**	21.88	17.50
2020	23.33	18.62
2025	24.77	19.69
2030	26.30	20.69

* Demand under average conditions.
** Converted to membrane treatment May 21, 2014; resulted in increased raw water demand.
Source: Seacoast Utility Authority (12/14).

Table 2

Total Seacoast Current and Projected Water Supply by Source (MGD)

Year	Biscayne/Surficial Aquifer	Floridan Aquifer	Total
2010	18.21	0.00	18.21
2015	21.88	0.00	21.88
2020	22.30	1.03	23.33
2025	22.30	2.47	24.77
2030	22.30	3.53	25.83

Source: Seacoast Utility Authority (12/14).

The current 20-year duration Seacoast Public Water Supply consumptive use permit (CUP-50-00365-W) was renewed by the SFWMD in September 2012. This permit authorizes an average-day surficial aquifer allocation of 22.3 MGD, a Floridan aquifer allocation of 8.9 MGD, and expires in 2032.

Raw water is presently drawn from four surficial aquifer wellfields (Hood Road, North Palm Beach, Burma Road, Palm Beach Gardens) and three Floridan aquifer wells located on Seacoast's 40-acre Hood Road administration/water plant site, pursuant to the current CUP. Each of the wellfields has permitted average and maximum daily withdrawal rates established by CUP conditions.

Each wellfield also has protection zones mapped by the Palm Beach County Department of Environmental Resources Management and are protected by the Palm Beach County Wellfield Protection Ordinance. Zones of protection are developed and zone requirements enforced by the Palm Beach County Department of Environmental Resources Management.

The CUP further states that the potential for induced movement of contaminants from known sources of pollution to occur as a result of the withdrawal of the recommended allocation is considered minimal.

Photo 8. Surficial Aquifer Well

3.4 Population Information

As previously stated, between 1990 and 2000, the City's population grew steadily from 22,990 to an estimated 35,058. Between 2000 and 2007, there was a greater annual increase in population due to the sale of 5,000 acres of land by the MacArthur Foundation within the City boundaries and subsequent new development. The recent decline in development activity affected population growth in the City only slightly, and the City enjoys a robust reputation as a desirable place to live and work. Future population projections obtained from the Palm Beach County Planning Division indicate significant growth potential within the planning horizon as the City continues to attract new upscale development and residents within its corporate limits.

Water demand projections supplied by Seacoast include the proposed Scripps Florida Phase II/Briger DRI projects. Projections are based on the Palm Beach County 20-Year Water Supply Work Plan data prepared by the Palm Beach County Planning Division using traffic analysis zone (TAZ) data. Table 3 presents population projections for the City within the Seacoast Service Area.

Table 3

Population Projections

Year	Resident Population Projections		Palm Beach Gardens Share of Service Area
	Seacoast Service Area[1]	Palm Beach Gardens[2]	
2010	87,744	48,440[3]	55.2%
2015	90,853	50,221	55.3%
2020	96,764	55,276	57.1%
2025	100,816	58,354	57.9%
2030	103,271	59,722	57.8%

1. Source: Palm Beach County 20-Year Water Supply Work Plan Update, 2015. Table 5-1.
2. Source: Palm Beach County Planning Division, Population Allocation Model, 2015, unless otherwise noted. Retrieved from: http://www.co.palm-beach.fl.us/pzb/Planning/population/populationproj.htm
3. Source: BEBR, 2014 / U.S. Census.

For planning purposes, Seacoast's service area may be divided into two areas: those east of the east leg of the C-18 Canal and those areas west of the C-18 Canal. The east leg of the C-18 Canal runs north-south from the intersection of the Beeline Highway and Northlake Boulevard from the south, along the western boundaries of Mirasol (within Palm Beach Gardens) and Old Marsh (within unincorporated Palm Beach County) developments through the Loxahatchee Slough.

Most of the service area east of the C-18 Canal has been developed with the exception of the Briger parcel, which has a mixed-use future land-use category with a Bioscience Research Protection Overlay. The Scripps Florida Phase II/Briger DRI is a proposed mixed-use master plan community located on approximately 683 acres south of Donald Ross Road, north of Hood Road, east and west of Interstate 95, and east of the Florida Turnpike. The proposed development program includes 1,600,000 square feet of biotech research and development (Scripps Florida Phase II); 2,400,000 square feet of related biotech/biomedical, pharmaceutical, and ancillary office space and a hotel; 2,700 dwelling units; and 500,000 square feet of retail space.

The Scripps Florida Phase II/Briger DRI has a 30-year build-out timeframe. The phasing schedule and the projected potable water flow are shown in Tables 4 and 5. The Seacoast demand and water supply projections (Tables 1 and 2) consider the Briger DRI long-term water demand.

Included in the area east of the C-18 Canal are some residential units that are not presently served by Seacoast Utility Authority. There are 62 single family units located on North Mary Circle, South Mary Circle, and Dania Drive with private wells. Installation of water mains to serve these homes are not anticipated by the City within this planning horizon. There are 31 units located on Sunset Drive, 88 units located on 40th Trail North, and 6 units located on Brena Lane, where installation of water mains are currently underway. All of these units have been included within the population projections and projected finish water demands shown in Table 6.

Approximately 4,978 acres remain undeveloped in the western area of the City, of which approximately 3,384 acres has a Rural Residential RR-10 land-use designation (one dwelling unit per ten acres) and approximately 1,404 acres has a Rural Residential RR-20 designation (one dwelling unit per twenty acres). Based on this current data, the maximum density on the undeveloped acreage in the western area would be 338 units on the RR10 and 70 units on the RR20 land use, respectively. Seacoast's demand and water supply projections (Tables 1 and 2) consider the potential water demands for the western area at these land-use designations.

Future development west of the C-18 Canal includes potential development of the Vavrus property along the south side of the Beeline Highway, approximately 2.0 miles north of Northlake Boulevard. An application for a planned development has been submitted to the City on the property. The project, however, is in the planning stages, and the Work Plan presents projections considering the Future Land Use category and the total acreage of the remaining undeveloped areas at their current land-use designations. In the event additional future development is allowed in the western area of the City, it will be subject to the concurrency, LOS, and permitting requirements in the Work Plan and required by the City's comprehensive plan.

Table 4

Scripps Florida Phase II / Briger DRI Proposed Phasing Plan January 2015															
		Phase 2009-2013		Phase 2014-2018		Phase 2019-2023		Phase 2024-2028		Phase 2029-2033		Phase 2034-2039		Total	
Land Use	Gross Acres	Intensity	Density	Intensity	Density	Intensity	Density	Intensity	Density	Intensity	Density	Intensity	Density	Intensity	Density
Biotech R&D (Scripps	70	150,000		250,000		250,000		250,000		250,000		450,000		1,600,000	0
Biotech R&D and Ancillary Uses	100														
Biotech R&D		150,000		150,000		150,000		150,000		150,000		250,000		1,000,000	0
Office		100,000		200,000		200,000		200,000		200,000		300,000		1,200,000	0
Hotel		200,000	300											200,000	300
Residential	452		800		700		700		500					0	2,700
Retail Land Use	56	500,000												500,000	0
Utilities	5													0	0
Total	683	1,100,000	1,100	600,000	700	600,000	700	600,000	500	600,000	0	1,000,000	0	4,500,000	2,700

Table 5

Projected Potable Water Flow Calculations

Potable Water:							
Use	Gross Acreage	Units	x	Flow Rate	=	Total Flow	
Scripps - Biotech	70	1,600,000	S.F.	0.30	gpd/S.F. =	480000	gpd
Briger -Biotech/Ancillary:	100	2,400,000	S.F.				
Office		1,200,000	S.F.	0.15	gpd/S.F. =	180000	gpd
Biotech		1,000,000	S.F.	0.30	gpd/S.F. =	300000	gpd
Hotel		200,000	S.F.	0.15	gpd/S.F. =	30000	gpd
Apartment Site	30	700	Unit	250.00	gpd/Unit =	175000	gpd
FPL Site	3	3,000	S.F.	0.05	gpd/S.F. =	150	gpd
Commercial/Retail	50	500,000	S.F.	0.15	gpd/S.F. =	75000	gpd
Residential Multi-Family	150	1,400	Unit	250.00	gpd/Unit =	350000	gpd
Residential Single Family	100	600	Unit	300.00	gpd/Unit =	180000	gpd
Total Average Daily Flow					=	1770150	gpd
					=	1229.27	gpm
Peak Daily Flow (x 2.50)					=	4425375	gpd
					=	3073.18	gpm

3.5 Public Water Supply Demand Projections and Level of Service Standard

Palm Beach Gardens uses Seacoast's average day generation rate of 189 gallons per capita per day (gpcd) for planning purposes. Seacoast also uses this average day generation rate for planning purposes, which is consistent with the current system-wide usage (i.e., CUP 50-00365-W). Seacoast does not employ a non-residential generation rate; rather, all consumption for planning purposes is expressed on a per capita basis. For the purpose of the Work Plan, the Seacoast generation rate of 189 gpcd is used to project the City's water demands.

Projections of finished water demand for the City are presented in Table 6. Seasonal adjustments were not considered in the 2012 SFWMD Water Use Permit projections and are not included in the table. Current (2015) finished potable water demand is estimated at 9.49 MGD (i.e., resident population of 50,221 residents x 189 gallons per capita per day), representing approximately 55.3% of the total within the Seacoast service area.

It is projected that the City's potable water demand for 2030, using population projections obtained from the Palm Beach County Planning Division (i.e., resident population of 59,722 residents per Table 6) will attain a level of 11.29 MGD by 2030, or approximately 57.8% of the total demand within the Seacoast Service Area. The City will continue coordinating with Seacoast through the DRC process to estimate and project potable water use and needs throughout the entire service area.

Table 6

Palm Beach Gardens Projected Finished Water Demand

Year	Palm Beach Gardens Population Projections	Potable Water Demand (MGD)[3]
	Residents[1]	
2010	48,440[2]	9.16
2015	50,221	9.49
2020	55,276	10.45
2025	58,354	11.03
2030	59,722	11.29

1. Source: Palm Beach County Planning Division, Population Allocation Model, 2015, unless otherwise noted. Retrieved from: http://www.co.palm-beach.fl.us/pzb/Planning/population/populationproj.htm
2. Source: BEBR, 2014 / U.S. Census.
3. Residents x 189 gpcd.

3.6 Conservation and Reuse

Seacoast has included an extensive conservation program as part of its CUP, including the following components:

- Permanent Irrigation Ordinance - Palm Beach County adopted a Water and Irrigation Conservation Ordinance on January 19, 1993. This ordinance, which limits lawn irrigation to the hours of 5 p.m. to 9 a.m., is in effect countywide unless municipalities adopt an irrigation ordinance of their own.

- Xeriscape Ordinance – Section 7.3.1 of the Palm Beach County Unified Land Development Code requires that all new landscape plans promote water conservation by achieving a minimum score on a water conservation point scale.

- Ultra-Low Volume Plumbing Fixtures - All five participating governments within Seacoast have adopted the Standard Plumbing Code, 1994 Edition, as amended, which provides for maximum flow of volumes for various plumbing fixtures in all new construction.

- Water Conservation Rate Structure - on June 1, 1994, Seacoast implanted a rate structure that incorporated inclining block commodity rates. Seacoast has indicated that the rate structure has been successful in encouraging water conservation.

- Leak Detection - Seacoast field personnel area trained to identify leaks using leak detection equipment and techniques. In addition, all accounts are metered, and Seacoast has an active meter testing and change-out program that test all large meters annually for accuracy, and replaces smaller meters on either a “fixed service life” or “maximum mileage” basis.

- Rain Sensor Devices - Currently, all five member governments within Seacoast have code requirements for the installation of rain sensor overrides for new lawn irrigation systems.

- Water Conservation Education Program - Seacoast has an extensive public conservation education program and provides conservation-related pamphlets in its customer lobby.

- Reclaimed Water - Seacoast has been providing wastewater effluent for irrigation purposes since 1978. At present, Seacoast’s entire average daily wastewater flow is committed to active on-line reclaimed water consumers. An inventory of contracts for reclaimed water in the Seacoast service area is presented in Table 7.

Table 7

SEACOAST UTILITY AUTHORITY

RECLAIMED WATER COMMITMENTS
July 24, 2014

SITE	ALLOCATION (MGD)	(GPM)
ACTIVE SITES AS OF 12/18/13		
CLASS A GUARANTEED COMMITMENTS		
Country Club	0.300	208
Eastpointe Golf and Racquet	0.300	208
Eastpointe Homeowners (Briar Lake)	0.100	69
Frenchmans Creek	0.500	347
Mirasol	1.750	1,215
Mariners Cove	0.100	69
Oak Harbour	0.080	56
Old Port Cove	0.200	139
Frenchmans Reserve	0.800	556
The Isles	0.300	208
PGA Boulevard Streetscape	0.040	28
MacArthur (Regional) Center	0.700	486
Old Palm Golf Club (thru same meter as MacArthur allocation below, total 1.8 MGD)	0.800	556
Royale Harbour Condominium	0.040	28
North Palm Beach Country Club	0.300	208
Mirasol Walk	0.055	38
Governors Pointe	0.050	35
Paloma	0.300	208
Waterway Terrace Condominium	0.031	22
Gemini Condominium	0.034	24
Seasons 52 Restaurant	0.055	38
FPL Administrative Complex	0.055	38
FPL Monet Substation	0.004	3
Southampton	0.039	27
Subtotal, Class A Agreements	**6.933**	**4,815**
MACARTHUR SITES		
Abacoa (through ENCON interconnect)	1.000	694
BallenIsles East	0.750	521
BallenIsles West	0.750	521
The Bears Club (through ENCON interconnect)	0.500	347
Old Palm	1.000	694
Subtotal, MacArthur Sites	**4.000**	**2,778**
TOTAL, ACTIVE CLASS A GUARANTEED COMMITMENTS	**10.933**	**7,592**
CLASS A COMMITMENTS, CONTRACTED BUT NOT ON LINE		
Juno Bay Colony	0.080	56
Central Park	0.020	14
Bent Tree	0.060	42
Cimarron Cove	0.050	35

CONTINUED ON NEXT PAGE

TOTAL CLASS A COMMITMENTS, CONTRACTED BUT NOT ON LINE	**0.160**	**146**
ACTIVE CLASS B NON-GUARANTEED CONTRACTS		
Seamark Condominium	0.020	14
Subtotal, Active Class B Agreements	**0.020**	**14**
GRAND TOTAL, SEACOAST RECLAIMED WATER CONTRACTS	**11.113**	**7,752**

Seacoast's PGA Regional Water Reclamation Facility is located in Mirasol within the City limits. The facility has a 12.0 MGD capacity and has a current flow of 8.0 MGD. 100% of the daily flow is recycled to 33 large volume uses. The use of rain sensor devices is imposed through the City's DRC process. Additionally, reclaimed water use is strongly encouraged and is also often imposed as a condition of development approval. The City will continue its efforts to promote conservation and the use of reclaimed water as an alternative water supply.

Photo 9. PGA Regional Reclamation Facility

4.0 CAPITAL IMPROVEMENTS

4.1 Service Area Initiatives

In September 2006, Seacoast entered into a Service Area Agreement (R2005-1769) with Palm Beach County defining the service area boundary between the two providers. Delineation of the service area boundary was intended to eliminate or minimize duplication of facilities, and to provide for the orderly growth, expansion, and extension of respective water, wastewater, and reclaimed water utility systems. The Agreement benefited existing and future Seacoast customers by ensuring the most efficient delivery of public utility services.

The Seacoast Consumptive Use Permit issued by the SFWMD in September 2012 will ensure adequate water supply throughout the service area through 2032. Further, by having implemented the improvements identified in the Lower East Coast Water Supply Plan, 2005-2006 Update, Seacoast has ensured adequate water supply for its service area through 2030, provided that there are no unforeseen impacts on existing and planned supplies.

In addition, the Seacoast system is interconnected with the Town of Jupiter and City of Riviera Beach water utility systems in the event of an emergency shortage. Interconnections are detailed in Table 8 and shown in Map 3. Further, in June 2006, a Utility Bulk Service Agreement (R2006-0687) was executed with Palm Beach County to provide Seacoast with up to 5 MGD of bulk potable water and bulk wastewater service during an initial term of five years. Seacoast has the option to extend the Bulk Agreement for a period of 25 years at the same capacity level.

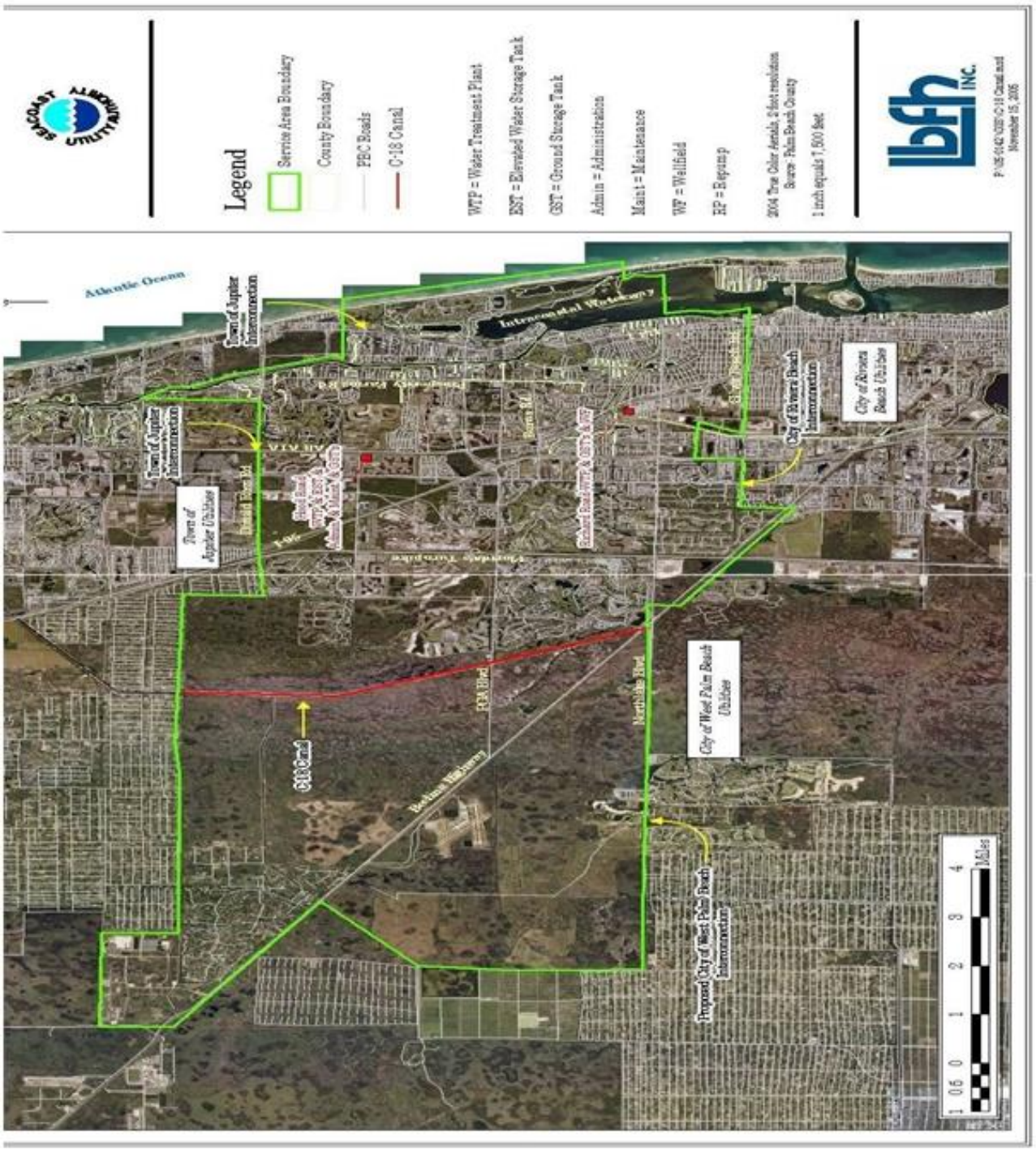
Table 8

Seacoast Interconnections

Entity	Size (inches)	Capacity (gpm)	Location
Jupiter	16	4,000	SR 811 and Donald Ross Road
Jupiter	10	2,500	US 1 and Ocean Drive
Jupiter	12	3,500	Jog Road and Donald Ross Road
Riviera Beach	12	3,500	Military Trail and Leo Lane

Source: Seacoast Utility Authority, 2014.

INTERCONNECTIONS



Map 3. Seacoast Utility Authority Interconnections

4.2 Work Plan Projects

The Lower East Coast (LEC) 2005-2006 water supply plan recommendeds two major capital improvement projects for the Seacoast water supply system:

- The Hood Road Water Treatment Plant (WTP) project for a 4.00 MGD Floridan reverse osmosis (RO) water treatment plant.

- Conversion of the 30.0 MGD lime-softening treatment capacity at the Hood Road WTP project to 26.0 MGD of nanofiltration treatment capacity. Losses in efficiency from the conversion to nanofiltration would be met by the expanded Floridan wells in the first project.

Both recommendations were placed in service by Seacoast in May 2014 and are fully operational. The LEC Water Supply Plan Update, 2013, recommends the following improvement project for the Seacoast water supply system, which also has been completed (see Table 10).

Reclaimed water development projects.

County	Utility/Entity	Project Count	Project	Completion Date	Total Capital Costs ($M)		Cumulative Distribution Capacity [b] (MGD)		Cumulative Treatment Capacity (MGD)	
					Distribution Project	Treatment Project	2020	2030	2020	2030
Palm Beach	Boca Raton, City of	1.	Recycling of Membrane Concentrate for Reuse Water	2013	$2.00	-	4.25	4.25	-	-
	Boynton Beach, City of	2.	Reclaimed Water Transmission Phase 2 (US 1 Corridor & Cypress Creek)	2014	$2.00	-	1.00	1.00	-	-
		3.	Leisureville Golf Course	2014	$2.00	-	0.65	0.65	-	-
		4.	Seacrest Boulevard Water Line	2013	$0.26	-	0.10	0.10	-	-
	Delray Beach Water & Sewer Department, City of	5.	Reclaimed Water (Area 12A Phase 1 – Barrier Island South, Atlantic Avenue to Casuarina Road, and Gleason Street trunk line)	2013	$1.70	-	0.25	0.25	-	-
		6.	Reclaimed Water (Area 12A Phase 2 and Area 12B Barrier Island South)	2014	$1.20	-	0.25	0.25	-	-
	Palm Beach County Water Utilities Department	7.	Morikami Reclaimed Pump Station	2013	$0.05	-	2.00	2.00	-	-
	Seacoast Utility Authority	8.	Nanofiltration Concentrate Blending for Reuse Water	2013	-	$4.50	-	-	3.00	3.00
	Wellington Public Utilities Department	9.	Phased Reclaimed System Expansions	2011-2030	$0.01	-	1.30	2.90	-	-

Source: Table F-4, LEC Update, 2013.

4.3 Capital Improvements Schedule

Current and projected water supply and recommended projects for consideration by Seacoast are summarized in Table 9. Since these projects are part of the Seacoast capital improvement plan, they are not included in the City's Five-Year Schedule of Improvements. Table 10 is a summary of recommended project improvements undertaken by Seacoast, which have also been completed.

Table 9

CURRENT AND PROJECTED WATER SUPPLY IN MGD*					
Item	Actual	Projected			
	2010	2015	2020	2025	2030
Population[1]	87,744	90,853	96,764	100,816	103,271
Per Capita (gallons per day finished water)	192	189	189	189	189
Potable Water Demands (daily average annual)	16.85	17.17	18.29	19.05	19.52
Water Source: Volume from Biscayne/Surficial	16.85	21.86[4]	22.30[5]	22.30	22.30
Volume from Floridan[2]	0.00	0.00	0.60	1.62	2.24
Volume from Other	0.00	0.00	0.00	0.00	0.00
Volume from Reclaimed[3]	0.00	0.00	0.00	0.00	0.00
Additional Potable Water Needed	0.00	0.00	0.00	0.00	0.00

* Total Seacoast Service Area, including Palm Beach Gardens.
1. Source: Palm Beach County 20-Year Water Supply Work Plan Update, 2015, Table 5.1.
2. Source: Seacoast Utility Authority, 2015. All potable volumes finished water. All water source volumes raw water.
3. Seacoast recycles 90% annual wastewater flow as irrigation water sold to customers in Table 7.
4. All water from Biscayne/Surficial aquifer in 2015; higher differential between finished and raw water (compared to 2010) because Seacoast converted to nanofiltration membrane treatment in May 2014.
5. Maximum daily allocation from Biscayne/Surficial aquifer allowed by SFWMD permit.

Table 10

PROJECT SUMMARY							
Project Description	Alt. Source	Total Capital Costs	Total Design Capacity (MGD)				
			2010	2015	2020	2025	2030
Hood Road WTP RO System – Four Floridan Wells and Two RO Reject Wells[1]	Brackish	$59,000,000	1.60	3.90	5.80	7.30	7.30
Seacoast 4.0 MGD Reclaimed Water Treatment Expansion – 2006 Funded Project[2]	Reclaim	$10,250,600	4.00	4.00	4.00	4.00	4.00

1. Project placed in service in 2014.
2. Project completed in 2006.
Source: Lower East Coast Water Supply Plan, 2005-2006 Update / Seacoast Utility Authority, 2015.

In addition to the LEC recommended capital improvements, a December 2005 engineering evaluation found the existing Hood Road and Richard Road WTPs nearing the end of their useful lives. Lime softening was found to be inefficient in meeting today's drinking water standards, requiring expensive and increasingly difficult to purchase chemicals. Additionally, lime softening cannot successfully treat brackish Floridan aquifer water. Membrane technology (nanofiltration/reverse osmosis) was found to be a more efficient alternative for the renewal and replacement of aging infrastructure. It also allows for the use of brackish Floridan aquifer water, if needed, to meet future water demands with a cleaner recyclable by-product.

In March 2006, the Seacoast Governing Board approved the proposed system improvement of constructing one 30.5 MGD nanofiltration/reverse osmosis plant at the Hood Road WTP and the demolition of the existing lime softening plants at both Richard Road and Hood Road WTPs. This work was completed by Seacoast in 2014.

In addition to the nanofiltration conversion, additional water supply, water storage, and transmission improvements were recommended. Water supply improvements include the addition of three Floridan Aquifer wells at 1500 feet; a raw water main connecting Richard Road, Lilac Street, and Hood Road facilities; and raw water booster pumping facilities at the Hood Road wellfield, Lilac Street, and Richard Road Water Plant sites.

Water storage and transmission improvements include four 2 million gallon ground storage tanks at the Hood Road WTP, one 2 million gallon ground storage tank at the Lilac Street WTP, a finished water main connecting Richard Road and Hood Road facilities, and the addition of miscellaneous pumping and control systems at Richard Road and Lilac Street facilities with an overall project cost of $88 Million. Most project elements are nearing completion or were placed in service by Seacoast in 2014.

Photo 10. Example of Membrane Treatment Facility

5.0 COMPREHENSIVE PLAN GOALS, OBJECTIVES, AND POLICIES

All of the comprehensive plan amendments related to the Work Plan Update are presented below in strikeout and underline.

5.1. Future Land Use

Policy 1.2.1.11.: The City shall coordinate ~~with Seacoast Utility Authority~~ the review of all land use change applications with Seacoast Utility Authority to ensure the availability of adequate water supplies.

Policy 1.2.1.12.: The City shall update the 10-Year Water Supply Facilities Work Plan at the time ~~of the Evaluation and Appraisal Report~~required by Chapter 163, Part II, Section 163.3177(6)(c)3, *Florida Statutes* (F.S.), as may be amended.

5.2. Infrastructure Element

Policy 4.D.1.1.1.: The City shall adopt an average annual daily potable water consumption level of service standard of ~~191~~ 189 gallons per ~~City Resident~~ capita per day (gpcd). This shall serve as the level of service standard for the urban area. The rural area shall utilize water wells, unless an alternative service provision is approved by the City Council consistent with Policy 9.1.4.2.(a)~~-(d)~~.

Policy 4.D.1.1.8.: The City shall coordinate with Seacoast Utility Authority and Palm Beach County in the preparation of their 10-Year Water Supply Facilities Work Plans, consistent with the directives of the Lower East Coast Water Supply Plan Update.

Policy 4.D.1.1.9.: At the time ~~of each required Evaluation and Appraisal Report~~required by the applicable statute, the City shall incorporate necessary 10-Year Water Supply Facilities Work Plan directives enacted by its water supplier and the regional water supply plan.

Policy 4.D.1.1.10.: The 10-Year Water Supply Facilities Work Plan Update is hereby adopted by reference in the City's Comprehensive Plan and implemented by Seacoast Utility Authority~~,~~ as the local water provider.

~~Policy 4.D.2.2.3.: The City shall adopt a 10-Year Water Supply Facilities Work Plan and related amendments within 18 months of the District's adoption of the Lower East Coast Water Supply Plan Update.~~

5.3. Conservation Element

Policy 6.1.1.9.: The City shall actively participate in the formulation and implementation of water supply conservation programs developed by Seacoast Utility Authority considering the most recently adopted SFWMD's Lower East Coast Regional Water Supply Plan.

Policy 6.1.1.10.: The City shall coordinate with Seacoast Utility Authority to implement potable water conservation programs established as part of its current 10-Year Water Supply Facilities Work Plan and Consumptive Use Permit.

Policy 6.1.1.11.: The City shall continue to cooperate with Seacoast Utility Authority in the development and implementation of water reuse programs, to the extent that they may apply to Palm Beach Gardens.

5.4. Intergovernmental Element

Policy 8.1.4.7.: The City shall update the 10-Year Water Supply Facilities Work Plan prepared by the City of Palm Beach Gardens, dated February 2015, and confirm the availability of water for existing development, new development, and redevelopment at the time ~~of the required Evaluation and Report~~required by the applicable statute; this should be consistent with the SFWMD's Lower East Coast Regional Water Supply Plan, and the 10-Year Water Supply Facility Plans of Seacoast Utility Authority and Palm Beach County.

~~Policy 8.1.4.8.: The City shall adopt a 10-Year Water Supply Facilities Work Plan and related amendments within 18 months after the South Florida Water Management District updates the Lower East Coast Water Supply Plan Update.~~

5.5. Capital Improvements Element

Policy 9.1.4.2.(a): The City hereby adopts the following Level of Service (LOS) standards and will use them in reviewing the impacts of new development upon facility provision. For public school facilities, the applicant for a Development Order or Development Permit which includes any residential component shall provide a determination of capacity by the School District of Palm Beach County that the proposed development will meet the public school facilities Levels of Service. A determination by the School District is not required for existing single family legal lots of record, in accordance with the Public School Facilities Policy 11.1.1.8. A Traffic Circulation concurrency determination shall not be required for existing single family legal lots of record. The Dual Level of Service standards shall be applied in the respective urban and rural areas, consistent with the Urban Growth Boundary philosophy established in the Future Land Use Element.

LEVEL OF SERVICE STANDARDS		
TRAFFIC CIRCULATION	**URBAN AREA**	**RURAL AREA**
Facility Type	**LOS for Peak Period in Peak Season**	
Neighborhood Collector	D	D
City Collector	D	D
County Minor Arterial	D	D
State Minor Arterial	E	E
State Principal Arterial	D	D
FIHS Roads	D	--
Beeline Highway	D	C
Excepted Links per Table 2A		

SEWAGE SERVICE	SANITARY SEWER 107 gallons per day per capita	SEPTIC TANKS Per DEP and Public Health Department Regulations
SOLID WASTE Generation per capita Collection	7.13 lbs per day Twice per week	7.13 lbs per day Once per week
DRAINAGE	3 day, 25 year event	3 day, 25 year event
WATER SERVICE	POTABLE WATER ~~191~~189 gallons per day per capita	WATER WELLS Per DEP and Public Health Department Regulations
RECREATION AND OPEN SPACE	5 acres of improved neighborhood and community park & other recreation and open space facilities per 1,000 residents	Park and recreation facilities will be located to serve the entire city population, and in most cases will be the urban area
PUBLIC SAFETY FIRE/EMS	6 minute 30 second response time to all calls on a district basis	Require well-based sprinklers for all structures; fire service with tanker trucks; 8 minute average response time
POLICE	1,000 service calls per officer per year; community policing philosophy	Zone patrol based on crime control strategies
PUBLIC SCHOOLS	110% utilization rate or up to 120%, per Policies 11.1.1.1.and 11.1.1.4. of the PSF Element	

6.0 REGIONAL ISSUES IDENTIFIED IN REGIONAL WATER SUPPLY PLANS

6.1 Lower East Coast Water Supply Plan

A summary of the issues identified in the SFWMD Regional Water Supply Plan can be found below. Briefly, the issues are:

1. Increased withdrawals from both the Surficial Aquifer System and surface water from Lake Okeechobee are limited.
2. Conservation continues to be relied upon to reduce per capita use and a means to potentially delay or perhaps avoid adding capacity.
3. Use of reclaimed water continues to be an important alternative source in the region and helps to meet requirements of the 2008 Leah G. Schad Ocean Outfall Program.

More detailed information on each regional issue can be found in Chapter 5, Evaluation of Water Source Options, Lower East Coast Water Supply Plan Update, 2013, which can be accessed at: http://www.sfwmd.gov/portal/page/portal/xweb%20-%20release%203%20water%20supply/lower%20east%20coast%20plan#wsp_docs. These issues, to the extent possible, are addressed in the Work Plan and supportive documents, such as the City's Comprehensive Plan and Land Development Regulations.