

## UTILITIES ELEMENT

### POTABLE WATER SUBELEMENT GOALS, OBJECTIVES AND POLICIES

**GOAL 1:** PROVIDE CITY RESIDENTS AND OTHER LOCAL GOVERNMENTS THAT RECEIVE POTABLE WATER WITH RELIABLE SERVICE.

**Objective 1.1:** New development within the City's Potable Water Service Area shall be approved only when adequate water supply, treatment and distribution capacity is available to provide, or provisions are included (as identified in Capital Improvement Element Policies), for the needed potable water or when the developer obligates funds to provide that development's share of capital improvements to any of these systems, as well as the distribution systems within the development.

**Policy 1.1.1:** The City shall coordinate closely with local governments that receives potable water from the City to ensure they provide the City with an annual report including 5-year and 10-year projections of population, land use and water usage information.

**Policy 1.1.2:** Applicants seeking development approvals shall obtain a written water availability statement from the City indicating an adequate water supply consistent with the established level of service (LOS) standards is available to serve the development. At a minimum, the water availability statement shall indicate an adequate water supply will be available and all required delivery infrastructure shall be fully constructed and operable prior to the issuance of the Certificate of Occupancy.

**Policy 1.1.3:** The following level of service standards shall serve as the basis for determining the demand and future capacity needs to be generated by a development:

<u>Average Water Consumption Rate</u> (gpcpd)
West Palm Beach Service Area                      269

**Objective 1.2:** The City shall continue to annually evaluate programs and construction projects to identify necessary repairs and add to the potable water delivery system to correct existing facilities and distribution deficiencies.

**Policy 1.2.1:** The City shall continue to implement an on-going program of inspection and replacement of water lines which are determined to be in a deteriorated condition. Priorities for this work shall be established within a Potable Water Quality Master Plan that additionally includes identification of appropriate measures to safeguard the quality of the City's potable water.

**Policy 1.2.2:** The City shall identify areas within the water distribution system, which are not provided with looped service and schedule construction, as funding permits, to correct this problem by 2016.

**Objective 1.3:** Pursuant to the South Florida Water Management District Consumptive Use Permit, per capita use of potable water within the West Palm Beach Service Area shall be

decreased to 262 gallons per capita per day by 2011, and further to 257 gallons per capita per day by 2016.

**Policy 1.3.1:** The City shall continue to educate water users of the importance of water conservation and coordinate with the South Florida Water Management District in the implementation of water conservation programs such as but not limited to:

- a) Encourage the use of water saving plumbing devices in new and existing structures.
- b) Reduce water line loss through regular repair and replacement.
- c) Aggressively pursue the use of wastewater reuse for landscaping within rights-of-way, golf courses and parks.
- d) Promote xeriscape practices when considering all proposals for development and/or redevelopment.

**Policy 1.3.2:** The City shall continue to implement a water conservation program aimed at the consumer and monitor water usage to study the results of the program.

**Policy 1.3.4:** The City shall continue to employ structured water rates as an incentive that supports this objective of potable water conservation.

**Objective 1.4:** In order to discourage urban sprawl, the City shall concentrate new development around existing or planned infrastructure, including potable water facilities.

**Policy 1.4.1:** The City shall discourage urban sprawl by adhering to the concurrency requirements and level of service standards outlined within this comprehensive plan, including those for potable water facilities.

**Policy 1.4.2:** The City shall construct additional infrastructure and/or facilities for potable water delivery as it deems necessary to accommodate projected needs.

**Policy 1.4.3:** The City shall complete, by 2010, a capacity need and water delivery analysis for potable water that includes the identification and work program for improvements for the replacement, expansion, and/or increase in capacity of facilities within the West Palm Beach Service Area. Future improvements shall be implemented so that there is no disruption in meeting levels of service and shall be compatible with adopted level of service standards for facility design as required by federal and state regulations. [9J-5.011(2)(c)I,F.A.C.]

**Objective 1.5:** The City shall plan for future water supplies and assure future water demands will be met through the implementation and updates of the 10 Year Water Supply Facility Work Plan (incorporated into this Element as the 10 Year Water Supply Facility Work Plan SubElement) and incorporate alternative water supply projects identified in the South Florida Water Management District's regional water supply plan pursuant to s. 373.0361(2)(a) or proposed by the County under s. 373.0361 (7)(b).

**Policy 1.5.1:** The City shall continue to coordinate with the South Florida Water Management District regarding water supply efforts and shall incorporate into the 10 Year Water Supply Facility Work Plan, as appropriate, any updates to the 2005-2006 South Florida Water Management District Lower East Coast Regional Water Supply Plan.

**Policy 1.5.2:** The City shall continue to coordinate population projections and future annexation areas with local governments within the City's potable water service area through the following actions:

- An ongoing review, through the IPARC notification system, of all future land use amendments to properties located within the City's potable water service area;
- Once-a-year written notification, requiring local governments within the City's potable water service area to provide the City with (i) major development plans affecting the service/future annexation area; and (ii) population projections, if different from those provided by Palm Beach County; and
- Yearly written notification, requesting Palm Beach County to provide current population projections.

**Policy 1.5.3:** The City shall coordinate its level of service (LOS) standards for potable water with local governments within the City's service area, through the following actions:

- The City shall contact local governments within the City's potable water service area to provide them with information on any changes regarding current LOS standards or any changes of future LOS standards to be included in the Comprehensive Plan and the renewal of local service agreements; and;
- The City shall provide local governments within the City's potable water service area with its potable water conservation measures, including reuse.

**Policy 1.5.4:** The City shall provide local governments within the City's potable water service area with a copy of its annual update of the Capital Improvements Schedule (CIS) for all capacity-related water supply facility projects to be included in the respective updates of their CIS.

## **SANITARY SEWER SUBELEMENT GOALS, OBJECTIVES AND POLICIES**

**GOAL 1:** THE CITY SHALL CONTINUE TO MEET ITS SANITARY SEWER NEEDS AND SHALL COORDINATE WITH LOCAL GOVERNMENTS THAT IT SERVES IN ORDER TO MEET THEIR FUTURE PLANNING NEEDS.

**Objective 1.1:** The City shall continually ensure that future demands for sanitary sewer can be met for at least a 10-year planning horizon.

**Policy 1.1.1:** The City shall coordinate closely with local governments that receive treatment service to ensure they provide the City with 5-year and 10-year projections of future wastewater needs and flows based on population projections, development activity, and wastewater generation estimates.

**Policy 1.1.2:** The City shall treat wastewater from the service area to meet current and future State and Federal standards.

**Policy 1.1.3:** The City shall coordinate with the communities holding large user agreements to ensure their comprehensive plans and development permit procedures are compatible with the City of West Palm Beach policies with regard to waste water generation, collection, transport, treatment and disposal.

**Objective 1.2:** In order to discourage urban sprawl, the City shall maximize the use of existing facilities by concentrating new development activity around existing or planned infrastructure, including sanitary sewer facilities.

**Policy 1.2.1:** The City shall discourage urban sprawl by adhering to the concurrency requirements and level of service standards for sanitary sewer.

**Policy 1.2.2:** The City shall construct additional infrastructure and/or facilities for sanitary sewer delivery as it deems necessary to accommodate projected needs.

**Objective 1.3:** The City shall ensure that development permits are issued only if adequate capacity is available concurrent with the impacts of development.

**Policy 1.3.1:** The City shall continue to prepare annual summaries of built and approved development within its service area:

**Policy 1.3.2:** The following level of service standards shall serve as the basis for determining current or future capacity requirements:

## WASTE WATER COLLECTION

DEVELOPMENT TYPE	AVG. DAILY WASTE WATER FLOW
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Single Family	350 gpd/DU
Multifamily	250 gpd/DU
Commercial	0.20 gpd/SF
Industrial	0.15 gpd/SF
Hotel	100 gpd/room

DU = dwelling unit

SF = square feet

gpd = gallons per day

AC = acre

## PUMP STATION PEAKING FACTORS

PEAKING FACTOR	AVG DAILY FLOW (MGD)
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3.5	0.01 to 0.05
3.0	0.05 to 0.25
2.5	0.25 to 2.0
2.0	> 2.0

Peaking factors for other facilities shall be determined using historical flow records.

**Policy 1.3.3:** All improvements shall be consistent with the Environmental Control Rules (ECR) or with Palm Beach County Standards, where applicable.

**Policy 1.3.4:** Permits for future development shall not be issued if flow from the development will cause overloaded conditions within the sewage treatment facilities until improvements can be completed to bring treatment/transmission systems up to capacity and up to adopted standards.

**Policy 1.3.5:** Sanitary sewer lines shall be installed, either by the City, or through City-approved agreements to meet sanitary sewer level of service requirements.

**Policy 1.3.6:** The City shall prepare a capacity analysis for the wastewater treatment plant in accordance with State and Federal regulations. The analysis shall be updated annually when a capacity increase is necessary within the next 10 years. Design for additional capacity in the City service area shall begin before a facility is 3 years away from the need for on-line capacity expansion determined by the capacity analysis.

**Objective 2.1:** The City shall develop a list of capital improvement projects, to be updated annually, identifying needs in 5-year planning increments.

**Policy 2.1.1:** The capital improvement projects list shall be comprehensive and include projects from all departments of the City government.

**Policy 2.1.2:** The City shall evaluate and rank the list of capital improvement projects in order to logically distribute funding for the various projects.

**Policy 2.1.3:** Projects which correct existing deficiencies to an adopted level of service, shall be ranked ahead of those required for projected shortfalls.

**Objective 2.2:** The City shall ensure the maximum use of existing facilities and discourage urban sprawl while expanding the City tax base sufficiently to provide adequate services to all within its service area.

**Policy 2.2.1:** New capital projects shall be constructed in a compact loop design around the Water Catchment Area in order to maximize the use of new facilities and minimize the cost to the City.

## **SOLID WASTE SUBELEMENT GOALS, OBJECTIVES AND POLICIES**

**GOAL 1:** THE CITY SHALL CONTINUE TO PROVIDE COLLECTION AND TRANSPORT OF GARBAGE, VEGETATIVE WASTE, BULK TRASH AND RECYCLABLES TO MEET THE CITY'S EXISTING AND 10-YEAR PROJECTED DEMANDS.

**Objective 1.1:** The City shall continue to implement procedures to discourage urban sprawl and ensure that at the time a development permit is issued, adequate solid waste disposal capacity is available or will be available when needed to serve the development.

**Policy 1.1.1:** The following collection and disposal level-of-service standards are hereby adopted for determining the availability of facility capacity and the demand generated by development:

### Collection

The City shall adhere to the Franchise Agreement of the Solid Waste Authority by providing a minimum level of service for residential garbage collection of twice per week, bulk trash collection of once per week, vegetation collection of once per week, and recyclable collection of once per week.

### Disposal

The City shall ensure delivery of solid waste material collected to the Solid Waste Authority (SWA) North County Landfill and shall continue to seek annual certification from the SWA that it has sufficient disposal capacity to accommodate the solid waste generated for both the five (5) year and ten (10) year planning periods. The SWA certification letter shall constitute compliance with the City's Solid Waste LOS standard.

**Objective 1.2:** The City shall continue to coordinate with the Palm Beach County Solid Waste Authority regarding the management of existing landfill sites, the selection of future landfill sites, and in developing alternative methods of disposing of solid and hazardous wastes.

**Policy 1.2.1:** The City shall continue operating its recycling program on a Citywide basis in order to increase the amount of recyclable material, to reduce solid waste going to landfills by 30 percent between 2008-2018, and to conserve valuable natural resources through reuse of materials.

**Policy 1.2.2:** The City of West Palm Beach shall coordinate with Palm Beach County to ensure that the City is assisting the County with a countywide solid waste collection system to discourage littering and the illegal dumping of solid waste.

**Policy 1.2.3:** The City shall ensure proper notification to its residents and businesses of its collection schedule before and after a major storm event in order to provide appropriate and safe disposal practices.

**Policy 1.2.4:** The City shall control urban sprawl by adhering to the concurrency requirements and level of service standards outlined within this comprehensive plan, including those for solid waste facilities.

**Policy 1.2.5:** The City shall provide additional infrastructure and/or facilities for solid waste collection and transport as it deems necessary to accommodate projected needs.

## **STORMWATER MANAGEMENT SUBELEMENT GOALS, OBJECTIVES AND POLICIES**

**GOAL 1:** THE CITY SHALL PROVIDE ADEQUATE STORMWATER MANAGEMENT FOR PROTECTION AGAINST FLOODING AND TO PREVENT DEGRADATION OF THE QUALITY OF RECEIVING WATERS.

**OBJECTIVE 1.1:** The City shall continue to implement adopted stormwater management regulations which will help to discourage urban sprawl and provide guidelines to prevent the degradation of the water quality of receiving waters. The City shall ensure that future development meets level of service standards and utilizes stormwater management systems compatible with the City's Stormwater Management Plan.

**POLICY 1.1.1:** The City shall continue to fully implement the stormwater requirements set forth in the Zoning and Land Development Regulations and as specified by the South Florida Water Management District. The City shall continue to implement these regulations in order to meet the following:

- a. Maintain and expand the storm management system as needed to maintain level of service design standards of a 3-year, 1-hour storm for the storm-sewer system and a 25-year, 24-hour storm for the canal system.
- b. Require erosion and sedimentation controls during construction to avoid contamination of receiving waters.

- c. Utilize retention/detention facilities where practical to provide water-quality treatment of stormwater runoff.
- d. Install sedimentation basins and/or baffle systems to prevent pollutants from entering receiving water bodies.
- e. Maintain the use of a continuous levee around Clear Lake and Lake Mangonia in order to prevent stormwater runoff from entering this potable water source.
- f. Require future development to limit post-development runoff rates to pre-development discharge rates.
- g. Provide routine maintenance to the stormwater management facilities to ensure they are functioning properly and to prolong their service life.
- h. Continue the City's vigorous street sweeping program that includes the daily sweeping of downtown streets and twice weekly sweeping of all streets outside of the downtown.

**GOAL 2: THE CITY SHALL ENCOURAGE COMPACT GROWTH IN THE WESTERN AREAS OF THE CITY AND PROVIDE ADEQUATE STORMWATER MANAGEMENT SYSTEMS WITHOUT DEPLETING THE SOURCE OF IRRIGATION AND RECHARGE WATER.**

**Objective 2.1:** The City shall continue to coordinate with the South Florida Water Management District and the local improvement districts to design and implement future stormwater management systems, to conserve wetlands acreage, to foster protection of natural wildlife habitats, to protect natural resources, and to protect water quality.

**Policy 2.1.1:** The City shall maintain the water levels in the City's discharge canals at beneficial elevations during dry periods to conserve valuable water resources.

**Objective 3.1:** The City shall continue to implement recommendations from the 2000 Stormwater Management Plan, which addresses correcting existing deficiencies and the increasing of capacity to meet future needs.

**Policy 3.1.1:** The City shall address deficiencies and future demand through the Implementation of the of the 2000 Stormwater Management Plan recommendations and by the implementation of the 1993 Stormwater Utility Ordinance and the Utility Fee to fund designated projects on an ongoing basis.

## **NATURAL GROUNDWATER AQUIFER RECHARGE SUBELEMENT GOALS, OBJECTIVES AND POLICIES**

**GOAL 1: PRESERVATION AND ENHANCEMENT OF THE AQUIFER IN THE CITY'S WATER CATCHMENT AREA.**

**Objective 1.1:** The City shall maintain Comprehensive Plan policies and land development regulations that restrict the encroachment of incompatible land uses upon the water catchment area.

**Policy 1.1.1:** Written objections will be submitted to the City regarding restrictions upon encroachment of potentially-detrimental land uses near the water catchment area. The Water Catchment Area Advisory Committee will analyze and report concerns directly to the City Commission.

**Policy 1.1.2:** Continue monitoring water quality in an effort to identify possible deterioration in water supply quality. Cooperate and participate with other agencies to develop water quality models to more accurately assess the impacts of proposed land use activities.

**Objective 1.2:** The City shall actively pursue acquisition of lands adjacent to the Water Catchment Area and the voluntary dedication of preserves areas in adjacent developed land to maximize natural buffer areas around the perimeter of the Water Catchment Area.

**Policy 1.2.1:** The City shall protect this vital groundwater recharge area and closely regulate development surrounding the Water Catchment Area by allowing only those land uses, site designs, and on-site stormwater drainage systems that are of a benign or beneficial influence to the recharge area.

**Objective 1.3:** The City shall continue to implement a program of public education and information to promote understanding of the Water Catchment Area and the importance of environmental preservation to the quality of the City's water supply.

**Policy 1.3.1:** The City shall continue to develop and utilize the Nature Center facilities and relationships with environmental groups and educational centers to provide an educational program that allows acceptable, passive recreational use of the Water Catchment Area to promote an appreciation of the fragile and unique environment that is the source of the City's water.

**Objective 1.4:** The City shall continue to implement existing and identify additional programs to augment and enhance groundwater recharge.

**Policy 1.4.1:** The City shall continue to implement an aquifer storage and recovery program that will allow the storage of excess water underground which could then be released during low-flow or drought periods to augment surface waters and water supply requirements.

**Policy 1.4.2:** The City shall continue to implement a water reuse program utilizing reclaimed waste water to recharge surficial wetlands and shallow aquifer systems.

# 10 YEAR WATER SUPPLY FACILITY WORK PLAN SUBELEMENT

## 1.0 INTRODUCTION

### 1.1 Purpose and Objectives

The purpose of the City of West Palm Beach Water Supply Facility Work Plan (hereinafter the 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, F.S., requires local governments to prepare and adopt Work Plans into their comprehensive plans within 18 months after the water management district approves a regional water supply plan or its update. The Lower East Coast Water Supply Plan (LECWSP) Update was approved by the South Florida Water Management District on February 15, 2007.

Residents of the City buy their water directly from the City of West Palm Beach Public Utilities Department (PUD). Under this arrangement, the City's PUD ensures that enough capacity is available for existing and future customers and that supporting infrastructure, such as the water lines, are adequately maintained.

According to state guidelines, the Work Plan and the comprehensive plan amendment must address the development of traditional and alternative water supplies, 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 is divided into the following four sections:

Section 1 – Introduction

Section 2 – Background Information

Section 3 – Data and Analysis

Section 4 – Work Plan Projects/Capital Improvement Element/Schedule

### 1.2 Statutory History

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

### 1.3 Statutory Requirements

The following highlights the statutory requirements:

1. Coordinate appropriate aspects of its comprehensive plan with the appropriate water management district's regional water supply plan, [163.3177(4)(a), F.S.]
2. Ensure that its future land use plan is based upon availability of adequate water supplies and public facilities and services, [s.163.3177(6)(a), F.S., effective July 1, 2005.] 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 to the Department 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 date on which the local government anticipates issuing a certificate of occupancy and consult with the applicable water supplier prior to approving building permit, 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., effective July 1, 2005.] This “water supply concurrency” is now in effect, and local governments should be complying with the requirement for all new development proposals. In addition, local governments should update their comprehensive plans and land development regulations as soon as possible to address these statutory requirements. The latest point at which the comprehensive plan must be revised to reflect the concurrency requirements is at the time the local government adopts plan amendments to implement the recommendations of the Evaluation and Appraisal Report (EAR).
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 water management district approves an updated 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 regional water supply plan, or the alternative project proposed by the local government under s. 373.0361(7), 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 current and future water use demands within the local government’s jurisdiction [s. 163.3177(6)(c), F.S.]; and
  - c. Include a water supply facility work plan for at least a 10-year planning period for constructing the public, private, and regional water supply facility identified in the Element as necessary to serve existing and new development. [s. 163.3177(6)(c), F.S.] Amendments to incorporate the water supply facility work plan into the comprehensive plan are exempt from the twice-a-year amendment limitation. [s. 163.3177(6)(c), 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.
6. To the extent necessary to maintain internal consistency after making changes described in Paragraph 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 appropriate regional water supply plan, the applicable District Water Management Plan, as well as applicable consumptive use permit(s). [s.163.3177(6)(d), F.S.]

If the established planning period of a comprehensive plan is greater than ten years, the plan must address the water supply sources necessary to meet and achieve the existing and projected water use demand for established planning period, considering the appropriate regional water supply plan. [s.163.3167(13), 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 applicable regional water supply plans and regional water supply authorities' plans. [s.163.3177(6)(h)1., F.S.]
8. Address in the EAR, the extent to which the local government has implemented the 10-year water supply facility 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(2)(1), F.S.]

## **2.0 BACKGROUND INFORMATION**

### **2.1 Overview of the City of West Palm Beach**

The City, established in 1894, is the largest municipality within Palm Beach County and serves as the County seat. The City boundaries encompass approximately fifty-eight (58) square miles and are bounded by the Intracoastal Waterway to the east, the South Florida Water Management District C-51 canal to the south, the City's 19.3 square mile Water Catchment Area (WCA) to the west, and the Beeline Highway and 59<sup>th</sup> Street to the north. Located adjacent to the City are several municipalities including, the Town of Palm Beach, City of Lake Worth, Town of Mangonia Park, and City of Riviera Beach.

Although the City is substantially built-out, approximately 98%, between 1990 and 2000, the City population grew from 67,764 to 82,103, an increase of approximately twenty-one percent. This population growth is reflective of the fact that the City continues to experience infill and redevelopment within its limits.

In 2007, an evaluation of existing gross acreage by land uses revealed that 28.2% of the total gross acreage in the City is dedicated to residential use. The remaining gross acreages are allocated to non-residential such as recreation/open space (50%); commercial (5.4%); industrial (2.9%); and undeveloped (2%). The City does not anticipate substantial increases in land area in the near future, however the population projection indicates a continued modest growth for the City of approximately 3% for the next 10 years.

### **2.2 Relevant Regional Issues**

As the state agency responsible for water supply in the Lower East Coast planning area, the South Florida Water Management District (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 initiated rule making 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's Consumptive Use Permit Program. This reduced reliance on the regional system for future water supply needs, mandates the development of alternative water supplies, and increasing conservation and reuse.

The intent of the City's Water Supply Facilities Work Plan is to meet the statutory requirements mentioned in subsection 1.2 of this plan and to coordinate the City's water supply initiatives with the Lower East Coast Water Supply Plan (LECWSP) Update, prepared by the South Florida Water Management District.

This Water Supply Facilities Work Plan details the facilities and proposed alternative water supply (AWS) projects that are planned and included in the LECSWP in order to assist the City in meeting the service area water demands through 20178. These projects are expected to be completed in increments consistent with the projected growth set forth in the Plan. The AWS projects are included in the City's Capital Improvement Element.

### **3.0 DATA AND ANALYSIS**

#### **3.1 Service Area - Population Information**

The City of West Palm Beach Potable Water Supply Service Area (Utility Service Area) includes the City of West Palm Beach, Town of Palm Beach and Town of South Palm Beach. The existing and future population figures for the Utility Service Area are derived from Palm Beach County Planning, Zoning and Building Department and the University of Florida Bureau of Economic and Business Research (BEBR). Between 1990 and 2000, the Utility Service Area grew from 78,937 to 93,310, an increase of approximately eighteen (18%) percent. In 20078 the City's Utility Service Area population was estimated at 114,241. By 2012, the City's Utility Service Area population is anticipated to increase to 125,049; and in 2018 to 145,670; representing an increase of twenty (27.5 %) percent over the 2008 population. This population growth is reflective of the fact that the City continues to experience redevelopment and infill projects within its limits.

#### **3.2 Service Area Map**

The City Utility Service Area includes the City of West Palm Beach, Town of Palm Beach and Town of South Palm Beach. A copy of the City's Potable Water Supply Service Area map is provided in the Comprehensive Plan Map Series.

#### **3.3 Population and Potable Water Supply Demand Projections**

This section provides historical population projections from 2002 to 2007 and projected population projections from 2008 through 20178 for the City Utility Service Area. Population projections for the City and its Utility Service Area are provided by the Palm Beach County Planning Division. The Palm Beach County Planning Division establishes municipal projection figures by disaggregating county-level forecasts produced by the Bureau of Economic and Business Research analysis of the University of Florida.

##### **3.3.1 Historical Population Projections for the Service Area**

Historical populations for the City Utility Service Area are as shown below in Table 1.

**Table 1 – Historical Population for City of West Palm Beach Water Utility Service Area**

<b>Year</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
<i>City of West Palm Beach Population</i>	90,721	95,628	101,111	107,617	105,068
<i>Town of Palm Beach Population</i>	9,682	9,685	9,700	9,706	9,744
<i>Town of South Palm Beach Population</i>	1,533	1,532	1,532	1,526	1,528
<i>Unincorporated Palm Beach County</i>	270	270	270	270	273
<b>Total Service Area Population</b>	<b>102,206</b>	<b>107,115</b>	<b>112,613</b>	<b>119,119</b>	<b>116,613</b>

**3.3.2 Future Population Projections for the Service Area**

Future population projections for the City Water Utility Service Area are as shown below in Table 2.

**Table 2– Future Population Projections for City of West Palm Beach Water Utility Service Area**

<b>Year</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
<i>City of West Palm Beach Population</i>	102,453	104,762	107,109	110,131	113,224	116,387	119,623	122,933	126,015	129,157	132,363
<i>Town of Palm Beach Population</i>	9,969	9,943	9,916	9,916	10,010	10,074	10,250	10,369	10,635	10,937	11,298
<i>Town of South Palm Beach Population</i>	1,546	1,540	1,534	1,533	1,545	1,553	1,579	1,596	1,636	1,681	1,736
<i>Unincorporated Palm Beach County</i>	273	273	272	272	270	271	270	271	270	272	273
<b>Total Service Area Population</b>	<b>114,241</b>	<b>116,518</b>	<b>118,831</b>	<b>121,852</b>	<b>125,049</b>	<b>128,285</b>	<b>131,722</b>	<b>135,169</b>	<b>138,556</b>	<b>142,047</b>	<b>145,670</b>

### 3.3.3 Historical Water Use

The City’s Water Treatment Plant historic water production figures are provided below in Table 3 for year 2003 through 2007. As seen from the values in the Table, the City’s water production, i.e., demand, significantly dropped in year 2007 due to the significant drought that affected the region and the effective implementation of water restrictions.

**Table 3–Service Area Past Water Production and Demand**

Year	Annual Finished Water Produced at WPB WTP (MGY)	Daily Finished Water Produced at WPB WTP (MGD)	Service Area Population	Per Capita Demand (GPCPD)
2003	10,171.37	27.87	102,206	272.65
2004	10,849.90	29.73	107,115	277.51
2005	10,924.60	29.93	112,613	265.78
2006	11,526.23	31.58	119,119	265.10
2007	9,670.89	26.50	116,613	227.21

### 3.3.4 Future Water Demand Projections

Future water demand projections were calculated using the City’s service area population projections multiplied by its projected per capita demands. The projected per capita demands are listed as identified in the City’s Water Use Permit. Table 4 below provides the projected finished water demand for the year 2008 through 2018 and the permitted allocation from the SFWMD. The City’s permitted allocation of 14,346 million gallons per year includes 4,055 million gallons per year of water produced from alternative water supply sources.

**Table 4–Utility Service Area Water Demand Projections**

Year	Projected Population	Per Capita Demand (GPCPD)	Projected Annual Demand (MGY)	Permitted Annual Allocation (MGY)
2008	114,241	269	11,216.75	14,346.00
2009	116,518	269	11,440.32	14,346.00
2010	118,831	269	11,667.42	14,346.00
2011	121,852	262	11,652.71	14,346.00
2012	125,049	262	11,958.44	14,346.00
2013	128,285	262	12,267.89	14,346.00
2014	131,722	262	12,596.57	14,346.00
2015	135,169	262	12,926.21	14,346.00
2016	138,556	257	12,997.25	14,346.00
2017	142,047	257	13,324.72	14,346.00
2018	145,670	257	13,664.57	14,346.00

The City’s projected annual demand ranges from 11,216 million gallons per year in 2008 to 13,664 million gallons per year in 2018.

Table 5 below summarizes the City’s Bulk Service Agreements with local service providers and municipalities. The City has an additional bulk service agreement with Seacoast Utility Authority that provides for up to 3.0 mgd of water to Seacoast provided the City has the water available within in its permitted capacity. This agreement along with the emergency interconnect agreements with Palm Beach County, Indian Trail Improvement District and Riviera Beach are not included as a capacity reservation as they are, by definition, on an emergency basis or subject to system capacity capability at the time of request.

**Table 5 – Bulk Service Agreements Capacity Reservation**

<b>Bulk Sale Agreements - City of West Palm Beach</b>											
Utility/Agency Served	Quantity of Water (mgd)										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Solid Waste Authority	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
<b>Total</b>	<b>0.350</b>	<b>0.350</b>	<b>0.350</b>	<b>0.350</b>	<b>0.350</b>	<b>0.350</b>	<b>0.350</b>	<b>0.350</b>	<b>0.350</b>	<b>0.350</b>	<b>0.350</b>

The total quantity of water allocated through the bulk service agreements is combined with the City’s projected annual demand and compared to the City’s permitted annual allocation below in Table 6.

**Table 6 – Total Service Area and Bulk Service Agreement Demand Projection**

Year	Bulk Service Agreements (MGY)	Projected Service Area Annual Demand (MGY)	Total Service Area Demand with Bulk Service (MGY)	Permitted Maximum Allocation (MGY)	Surplus or (Deficit) of Permitted Allocation (MGY)
2008	127.75	11,216.75	11,344.50	14,346.00	3,001.50
2009	127.75	11,440.32	11,568.07	14,346.00	2,777.93
2010	127.75	11,667.42	11,795.17	14,346.00	2,550.83
2011	127.75	11,652.71	11,780.46	14,346.00	2,565.54
2012	127.75	11,958.44	12,086.19	14,346.00	2,259.81
2013	127.75	12,267.89	12,395.64	14,346.00	1,950.36
2014	127.75	12,596.57	12,724.32	14,346.00	1,621.68
2015	127.75	12,926.21	13,053.96	14,346.00	1,292.04
2016	127.75	12,997.25	13,125.00	14,346.00	1,221.00
2017	127.75	13,324.72	13,452.47	14,346.00	893.53
2018	127.75	13,664.57	13,792.32	14,346.00	553.68

Table 7 below identifies the Alternative Water Supply Sources that are utilized to meet the City’s projected annual service area demand and bulk service agreement reservation.

**Table 7–Service Area Water Demand Projections and Alternative Water Supply Sources**

Year	Clear Lake Allocation (MGY)	Renaissance AWS (MGY)	Wetlands Based Water Reclamation AWS (MGY)	Total Service Area Demand with Bulk Service (MGY)	Permitted Maximum Allocation (MGY)	Surplus or (Deficit) of Permitted Allocation (MGY)
2008	10,291.00	365.00	688.50	11,344.50	14,346.00	3,001.50
2009	10,291.00	365.00	912.07	11,568.07	14,346.00	2,777.93
2010	10,291.00	365.00	1,139.17	11,795.17	14,346.00	2,550.83
2011	10,291.00	365.00	1,124.46	11,780.46	14,346.00	2,565.54
2012	10,291.00	365.00	1,430.19	12,086.19	14,346.00	2,259.81
2013	10,291.00	365.00	1,739.64	12,395.64	14,346.00	1,950.36
2014	10,291.00	365.00	2,068.32	12,724.32	14,346.00	1,621.68
2015	10,291.00	365.00	2,397.96	13,053.96	14,346.00	1,292.04
2016	10,291.00	365.00	2,469.00	13,125.00	14,346.00	1,221.00
2017	10,291.00	365.00	2,796.47	13,452.47	14,346.00	893.53
2018	10,291.00	365.00	3,136.32	13,792.32	14,346.00	553.68

### **3.4 Potable Water Supply System**

#### **3.4.1 SFWMD Water Use Permit**

The City received a twenty year water use permit from the South Florida Water Management District on October 12, 2006. Permit information is as follows:

- WUP Number: 50-00615-W
- Raw Water Source:
  - Ground Water from: Floridan Aquifer System and Surficial Aquifer System
  - Surface Water from: Clear Lake
- Raw Water Allocation Information:
  - Annual Allocation: 14,346 Million Gallons (MG)
  - Maximum Monthly Allocation: 1,339 Million Gallons (MG)
- Annual allocation includes 10,291 Million Gallons (MG) existing surface water withdrawal and 4,055 Million Gallons (MG), Alternative Water Supply which is made up of 365 MGY from the Renaissance Project and 3690 MGY from the Wetland Based Reclamation Project.
- Average to Maximum Monthly Pumping Ratio: 1:1.12
- Specific Source Limitation:
  - Clear Lake Annual = 14,346 MG; Monthly = 1,339 MG
- Permit Expiration: October 11, 2026.

#### **3.4.2 Existing Withdrawal Facility**

Source: Floridan Aquifer System

1-24" x 1200' x 4861 GPM Well Cased to 985 feet

Source: Surficial Aquifer System

1-18" x 152.5' x 2,790 GPM Well Cased to 82.5 feet

1-18" x 153.5' x 2,790 GPM Well Cased to 83.5 feet

1-18" x 154' x 2,780 GPM Well Cased to 84 feet

1-18" x 163' x 2,780 GPM Well Cased to 93.5 feet

1-18" x 166' x 2,780 GPM Well Cased to 96 feet

1-18" x 170' x 2,780 GPM Well Cased to 100 feet

1-18" x 150 x 2,780 GPM Well Cased to 80 feet

4-18" x 150' x 2,780 GPM Well Cased to 80 feet

Source: Clear Lake

4-14" x 100 HP x 8,400 GPM turbine pumps

1-16" x 100 HP x 5,250 GPM centrifugal pumps

2-18" x 125 HP x 10,500 GPM centrifugal pumps

1-30" x 150 HP x 17,500 GPM turbine pump

### **3.4.3 Alternative Water Supplies**

The City's Water Use Permit requires the City to "use alternative water supplies to account for all increased demands from Clear Lake above the City's historic use in the 12-month period prior to April 2006 which equates to 10, 291 million gallons per year (MGY)". The City has approved alternatives, urban stormwater treatment via the Renaissance Project and wetland rehydration and aquifer recharge through the Wetlands Based Water Reclamation Project. Table 7 identifies the required alternative water supply demand needed to meet the projected water service area demand for year 2008 through 2018. A discussion of the City's alternative water supply projects can be found in Section 3.6 of this report.

### **3.4.4 Interconnects**

The City maintains interconnections with other public water suppliers as follows:

- 1) An emergency interconnection with Indian Trail Improvement District, for delivery of up to 0.15 MGD of finished water;
- 2) One emergency interconnection with the Village of Royal Palm Beach near State Road 7 and Okeechobee Boulevard for delivery of up to 2.0 MGD of finished water;
- 3) One interconnection with the Solid Waste Authority for delivery of up to 0.35 MGD of finished water;-
- 4) One interconnection with Seacoast Utilities located at Northlake Boulevard, for delivery of up to 3.0 MGD of finished water as available within the capacity of the City's water system;
- 5) Three emergency interconnections with Palm Beach County at Bridgeman Road, Ernest Street and Jog Road; and
- 6) Two emergency interconnections with the City of Riviera Beach with one at Military Trail and one at Broadway Avenue.

### **3.5 Conservation**

The City developed and adopted a Water Conservation Plan in July 2005. The Water Conservation Plan elements include an aggressive approach to the development and implementation of several alternative water supply projects, water conservation based water rate structures, leak detection programs, an irrigation limitation ordinance, native vegetation landscaping requirements, ultra-low volume plumbing fixture construction code, rain sensor override requirement ordinance, and extensive public education programs. The City will coordinate future water conservation efforts with SFWMD to ensure that proper techniques are applied. In addition, the City will continue to support and expand existing goals, objectives and policies in the comprehensive plan that promote water conservation in a cost-effective and environmentally sensitive manner. The City will continue to actively support the SFWMD in the implementation of new regulations or programs that are design to conserve water during the dry season.

### **3.6 Alternative Water Supply Projects/Reuse**

The City is committed to developing and implementing alternative water supply projects involving reuse. In 2002, the City completed the construction of the Renaissance Project, an innovative stormwater collection and reuse system that collects and treats stormwater normally discharged to tide, for reuse by the City in its potable water supply system. The Renaissance

Project, a \$17,600,000 project was completed with financial support from the Environmental Protection Agency, South Florida Water Management District, and Palm Beach County. The Renaissance Project became operational in September 2002 and it is estimated that between September 2003 and January 2004, over 340 million gallons of stormwater were pumped and treated through the Renaissance Pump Station. The Renaissance Project captures, treat and stores approximately 365 million gallons per year, (MGY) or one (1) million gallons per day (MGD). The Renaissance Project is intended to capture, treat and store stormwater that would normally be lost to tide and reduce the City's dependency on the regional water supply system.

In 2006, the City completed construction on the Wetlands Based Water Reclamation Project (WBWRP). The WBWRP is another innovative water reuse project involving the discharge of highly treated effluent to an adjacent wetland area to restore and recharge the wetland and surficial aquifer. The City's wellfield ultimately pulls water from this recharged aquifer and discharges the water to the City's potable water supply system. The reclaimed water, at up to 10 million gallons per day (MGD), is available to augment the City's water supply and again reduces the need to withdraw additional water from the regional water supply system.

The City has also completed construction of an 8 mgd aquifer storage and recovery (ASR) well at its Water Treatment Plant. The City's ASR well is designed to store excess treated surface water during period of heavy rainfall. The excess water is pumped into the upper Floridan Aquifer System and is recovered when the water is withdrawn to meet increased demands during dry weather. The City's ASR well is not operational at this time but it is being evaluated for potential use in the future.

#### **4.0 WORK PLAN PROJECTS/CAPITAL IMPROVEMENT ELEMENT/SCHEDULE**

##### **4.1 Existing Water Treatment Plant Process**

The City's Water Treatment Plant (WTP) was originally constructed in 1921. In 1989, the WTP was expanded to increase the facility design capacity to 47 million gallons per day (mgd) and in 1999, the City modified their treatment processes to include a ferric sulfate-enhanced lime softening treatment methodology. Currently, the City is evaluating several alternatives regarding future water treatment methods, future sources of water and location of future plant facility. The existing plant as it operates today is described herein, future modifications to the plant will be included in future amendments to this plan as these decisions are made, approved and implemented.

The primary source of the City's water supply is surface water. Surface water travels through the City's M-Canal to the City's water supply lakes, Lake Mangonia and Clear Lake, from the City's Grassy Waters Preserve, a 19.3 square mile aquatic preserve located in western West Palm Beach. Alternative sources of water that feed into this above-ground water supply system include the City's Renaissance Project and the City's Wetlands Based Water Reclamation Project (WBWRP). Ultimately, the combined contribution of source water from Grassy Waters Preserve, the Renaissance Project, and the WBWRP is pumped from Clear Lake into the WTP for treatment.

First, powdered activated carbon is added to control taste and odor. Next, the water enters two parallel rapid mix coagulation-flocculation-sedimentation treatment trains. Each treatment train

operates independently of the other utilizing two different chemical treatment methods. The east train utilizes ferric-sulfate-enhanced lime softening (LS) and the west train utilizes enhanced coagulation using ferric sulfate (EC). Following chemical addition, both trains enter flocculation basins and then sedimentation basins where particles settle and are removed from the water. Water is collected at the end of the sedimentation basins and both trains are combined in a combined effluent channel. After re-combining, caustic soda is added to raise the pH prior to filtration. The pH adjusted water is then filtered to remove any remaining particulates before the final process step of chlorination. After chlorination, the water is pumped through three major transmission mains that pump to the east, south and north.

#### **4.2 Capital Improvements Element/Schedule**

The City's financially feasible Capital Improvements Schedule, adopted annually, includes capital improvement projects necessary to maintain levels of service and provide for improved operational facility over the next 5 years. (See the Capital Improvements Element) The City is currently engaged in a comprehensive water supply planning effort to evaluate future water treatment methods, sources of water and location of water treatment plant facility. Upon completion of this planning effort, the City will incorporate any necessary capital improvement projects into the annual capital improvement schedule updates.

Upon reviewing the City's projected water demands, permitted allocation and alternative water supply projects, the City does not anticipate the necessity of additional capacity within the 10 year planning horizon. The City will continue to increase its operation of the WBWRP to meet increased demands through 2018. A permit modification to the City's WBWRP will be necessary in 2014 to increase the quantity of water discharged to the Wetlands reuse site above the current average daily flow of 6.0 MGD to 10.0 MGD. No modifications to the WBWRP advanced wastewater treatment plant are required as the WBWRP has a rated capacity of 10.0 MGD.