

# WATER SUPPLY PLAN

## POTABLE WATER SUB-ELEMENT



PREPARED BY  
THE CITY OF HOLLYWOOD  
DEPARTMENT OF PUBLIC UTILITIES  
AND HAZEN AND SAWYER

CITY OF HOLLYWOOD  
HOLLYWOOD, FLORIDA

**JANUARY** **JULY** 2020

# Table of Contents

---

<b>1. Introduction</b>	<b>1</b>
1.1 Statutory Overview	1
1.2 Objective	1
1.3 Project Overview	1
<b>2. Water Service Areas</b>	<b>4</b>
2.1 Potable Water Service Area	4
2.1.1 City of Hollywood Potable Water System Service Area	4
2.1.2 Broward County Water Districts 3A and 3B/3C	7
2.1.3 Port Everglades	7
2.1.4 Summary of Water Service Areas Supplying the City of Hollywood	7
2.2 Population Projections	8
2.3 Reuse Water System	9
<b>3. Water Suppliers</b>	<b>11</b>
3.1 City of Hollywood Potable Water System	11
3.1.1 Raw Water Supply	11
3.1.1.1 Biscayne Aquifer	14
3.1.1.2 Floridan Aquifer	14
3.1.1.3 Water Supply Allocation	14
3.1.2 Treatment Processes	15
3.1.2.1 Lime Softening System	16
3.1.2.2 Membrane Softening System	16
3.1.2.3 Reverse Osmosis System	17
3.1.2.4 Disinfection System	17
3.1.2.5 Degasifier System	17
3.1.3 Post-Treatment	18
3.1.4 Storage	18
3.1.5 High Service Pumps	19
3.1.6 Distribution System	19
3.2 Broward County Water System	20
3.3 City of Fort Lauderdale Water System	20
3.4 City of Hollywood Reclaimed Water System	20
3.5 Ocean Outfall Legislation	21
3.6 City of Hollywood Water Conservation Program	23
<b>4. Water Demand Forecast and Supply Adequacy</b>	<b>27</b>
<b>5. Regional Issues</b>	<b>39</b>
5.1 Regional Climate Action Plan	39

## Table of Contents

---

5.2	Climate Change .....	41
5.3	Sea Level Rise.....	41
5.4	Saltwater Intrusion .....	43
5.5	Extreme Weather Events .....	44
5.6	Infrastructure Development .....	46
5.7	Lake Okeechobee Surface Water Allocation Limitations.....	47
5.8	Lowering Lake Okeechobee Level .....	47
5.9	Infrastructure Planned to Attenuate Damaging Peak Flow Events from Lake Okeechobee.....	48
5.10	Use of brackish groundwater from the Floridan Aquifer .....	49
<b>6.</b>	<b>Water Supply Capital Improvements.....</b>	<b>50</b>
<b>7.</b>	<b>Water Supply Goals, Objectives, and Policies .....</b>	<b>52</b>
7.1	Land Use Element .....	52
7.2	Conservation Element.....	53
7.3	Utilities Element .....	55
7.3.1	Drainage Sub Element.....	55
7.3.2	Potable Water Sub Element .....	57
7.4	Capital Improvements Element.....	62
7.5	Intergovernmental Coordination Element .....	65

## Tables

---

Table 2-1.	Geographic Size of Water Utility Service Areas in Square Miles .....	8
Table 2-2.	City of Hollywood Water Service Area Historical Population.....	9
Table 2-3.	City of Hollywood Water Service Area Forecasted Population .....	9
Table 2-4.	City of Hollywood's Reuse System Capacity and FY 2018 Flow .....	10
Table 2-5.	Potential Expanded Reuse System Customers.....	10
Table 3-1.	City of Hollywood's Biscayne Aquifer and Floridan Aquifer Withdrawal Wells.....	12
Table 3-2.	City of Hollywood Permitted Groundwater Withdrawal Quantities and Contracted Groundwater Quantities from Broward County's SRW.....	15
Table 3-3.	Water Treatment Processes and Capacities .....	16
Table 3-4:	City of Hollywood Water Distribution System Pipe Diameters .....	20
Table 3-5.	City of Hollywood's FDEP OOL Compliance with respect to Reclaimed Water .....	23
Table 3-6.	City of Hollywood Historical Annual Average Per Capita Usage .....	24
Table 4-1.	Broward County Districts 3A and 3B/C Finished Water Demand Forecast .....	28
Table 4.2	City of Hollywood Historical Retail Population, Finished Water Production and Retail Per Capita Usage .....	28
Table 4.3	City of Hollywood Retail Finished Water Demand Forecast.....	29
Table 4.4	Finished Water Demand Forecast in the City of Hollywood Water Service Area .....	29
Table 4.5	City of Hollywood Maximum Day Water Demand Forecast.....	30
Table 4.6	City of Hollywood WTP Historical Raw Water Annual Average Withdrawals.....	30

## Table of Contents

---

Table 4.7 City of Hollywood WTP Annual Percent Treatment Loss Associated With All Treatment Processes .....	31
Table 4.8 City of Hollywood Forecasted Weighted Average Percent Treatment Loss.....	31
Table 4.9 City of Hollywood Forecasted Raw Water Withdrawals .....	32
Table 4.10 City of Hollywood Permitted Raw Water Withdrawal Quantities.....	32
Table 4.11 Calculation of Finished Water Quantity Limit based on Raw Water Permit Limit.....	35
Table 4-12. Historical Annual Average Daily Water Supplied.....	38
To Port Everglades from the City of Fort Lauderdale .....	38
Table 6-1. City of Hollywood Water Utility Five-Year Capital Improvement Program .....	51
Table 7-1. Water Conservation Measures .....	54
Table 7-2. Water Conservation Best Management Practices.....	55
Table 7-3. Potable Water Demand Rates .....	58
Table 7-4. Plumbing Standards Fixture Flow Rate .....	60
Table 7-5. Potable Water Demand Rates .....	64

## Figures

---

Figure 2-1: City of Hollywood Jurisdiction and Water Service Areas.....	5
Figure 4-1: Comparison of Raw Water Demand to Withdrawal Limit - City of Hollywood Service Area (Including Retail and BCWWS 3A and 3B/C).....	31
Figure 4-2: Comparison of Finished Water Demand Forecast with Treatment Limit - City of Hollywood Service Area (Including Retail and BCWWS 3A and 3B/C) .....	33
Figure 5-1 – Sea Level Rise Projection (2015) .....	38
Figure 5-2 – Sea Level Rise Projection (2019) .....	39
Figure 5-3 – 250 mg/L Isochlor Line in Broward County (SFWMD) .....	41

## Appendices

---

Appendix A: Broward County Water Supply Facilities Work Plan 2020	
Appendix B: City of Fort Lauderdale Water Supply Facilities Work Plan 2020 Update	

# 1. Introduction

---

*This section presents the statutory overview and the project objective, including a brief description of the content in this report.*

## 1.1 Statutory Overview

Chapter 163, Part II, Florida Statutes (F.S.), requires local governments to prepare and adopt 10-Year Water Supply Facilities Work Plans into their comprehensive plans within 18 months after the South Florida Water Management District (SFWMD) approves a regional water supply plan or its update. The 2018 Lower East Coast Water Supply Plan Update (2018 LECWSP Update) was adopted by the SFWMD's Governing Board on November 8, 2018. Therefore, local governments within the Lower East Coast Region are required to amend their comprehensive plans and include an updated 10-year Water Supply Facilities Work Plan and related planning elements by May 8, 2020.

The State of Florida requires that the 10-Year Water Supply Facilities Work Plan Update address the development of traditional and alternative water supplies and management strategies, including conservation and reuse. The data and analyses, including population projections and water demands, must span at least a 10-year planning period and be consistent with the 2018 LECWSP Update. The data presented herein are for the planning period through the year 2040.

## 1.2 Objective

The City of Hollywood's Water Supply Facilities Work Plan is incorporated into the Potable Water Sub-Element of its Comprehensive Plan. Hazen and Sawyer was contracted by the City of Hollywood Department of Public Utilities (HLWD-DPU) to update the City's 2015 Water Supply Facilities Work Plan to represent the year 2020 (WSFWP 2020 Update). The main objective of this update is to ensure that potable water service is available to concurrently support development over the next ten years.

## 1.3 Project Overview

This WSFWP 2020 Update identifies water utilities that serve the City of Hollywood (City) jurisdiction and presents the development of traditional and alternative water supplies, bulk sale agreements, and conservation and reuse programs that are necessary to serve existing and new development for a specific planning period while complying with regulatory requirements. Although this report is referred to as a 10-year work plan, the water demand forecast provided in this document extends to the year 2040, which is consistent with the SFWMD's LECWSP Update.

This City of Hollywood WSFWP 2020 Update builds upon or utilizes the following documents:

- City’s 2015 Water Supply Plan Potable Water Sub-Element;
- SFWMD’s 2018 LECWSP Update;
- Broward County’s Water Supply Facilities Work Plan 2020; and,
- City of Fort Lauderdale Water Supply Facilities Work Plan 2020 Update.

This WSFWP 2020 Update includes the following items:

- Five-year population and water demand projections through the year 2040 within the City’s jurisdiction and HLWD-DPU’s service area.
- Assessment of the City’s current water supply sources and treatment capacities.
- Identification of alternative water supply projects for implementation including cost and schedule.
- Recognition of the regional water supply planning issues that have the potential to impact the City.
- Identification of water conservation and reuse practices and regulations within the City’s service area.
- Identification of the HLWD-DPU capital improvement projects.
- Demonstration that the City of Hollywood has coordinated with other service providers supplying water within the City’s jurisdiction (i.e. Broward County Water and Wastewater Services and the City of Fort Lauderdale) to ensure that short- and long-term water supply needs will be met.
- Identification of Goals, Objectives, and Policies (GOP’s) required to implement the Work Plan and water supply concurrency requirements.

It should be noted that because the Seminole Tribe of Florida reservation maintains its own water supply system, it is required to prepare its own Water Supply Facilities Work Plan. Detailed water demand projections for its service area are not included in the City’s WSFWP 2020 Update.

This report is organized into the following sections.

Section 1 – *Introduction* – presents the statutory overview and the project objective, including a brief description of the content in this report.

Section 2 – *Water Service Area* – introduces the HLWD-DPU geographic service area and

population projections. This section also identifies the water utilities serving portions of the City and describes the City's reuse water system.

Section 3 – *Water Suppliers* – characterizes the water suppliers including consumptive use permit information, raw water sources, existing treatment facilities, and the City's conservation and reuse practices.

Section 4 – *Water Demand Forecast and Supply Adequacy* - presents the methods, data and results of the water demand forecasts within the HLWD-DPU water service area and provides a comparison of future water demand to available water supply. This section demonstrates that the existing water supply permitted quantities, coupled with the City's conservation and reuse practices, will meet projected demands through 2040.

Section 5 – *Regional Issues* – summarizes the regional water supply planning issues that have the potential to impact the City.

Section 6 – *Water Supply Capital Improvements* – identifies the capital improvements required to build public water supply facilities to serve the existing and new development within the City's jurisdiction.

Section 7 – *Water Supply Goals, Objectives, and Policies* – includes an assessment of current GOPs and identifies any new or revised GOPs, relative to the 2015 Water Supply Plan Potable Water Sub-Element, needed to implement the work plan.

## 2. Water Service Areas

---

*This section introduces the HLWD-DPU geographic service area and population projections. This section also identifies the water utilities serving portions of the City and describes the City's reuse water system.*

### 2.1 Potable Water Service Area

The City of Hollywood (City), located in Broward County Florida, covers approximately 29 square miles bound by the Atlantic Ocean to the east and surrounded by seven cities, one town, a Seminole Tribe of Florida reservation, and unincorporated areas. Figure 2-1 illustrates the City of Hollywood jurisdiction, the HLWD-DPU water service area, and the neighboring municipalities. Except for Port Everglades, the City's jurisdiction is supplied with finished water produced at the City of Hollywood Water Treatment Plant (City's WTP). Port Everglades is supplied by the City of Fort Lauderdale Public Works Department. The City has no plans to expand, contract, or change the geographic location of its water service area. There are no domestic self-supplied water systems within the City of Hollywood.

#### 2.1.1 City of Hollywood Potable Water System Service Area

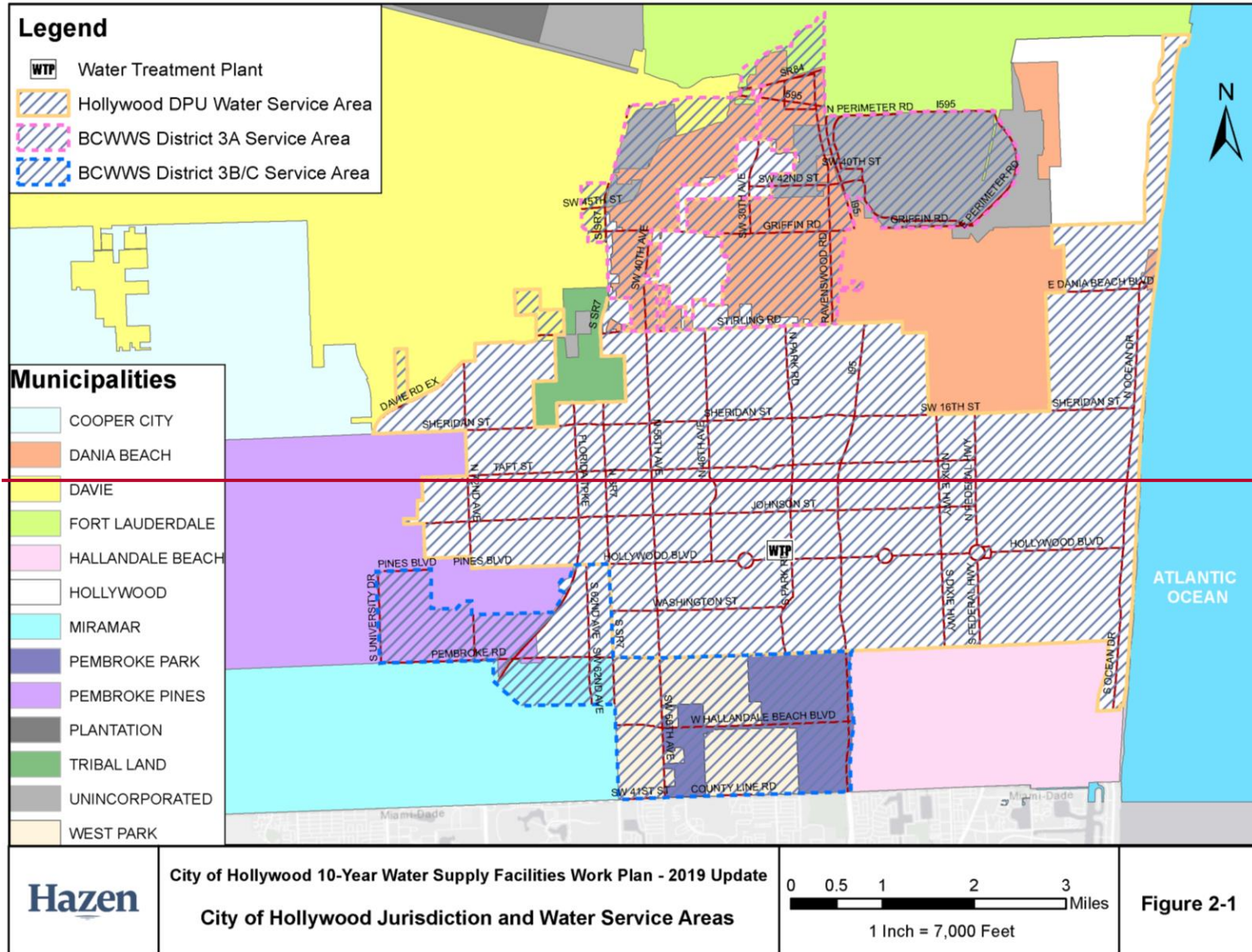
The City's WTP is operated by the HLWD-DPU. In 2018, the City's WTP produced approximately 21.9 million gallons per day (mgd) of potable water. The City's WTP supplies a retail service area, extending over most of the City's jurisdiction, and a wholesale service area covering Broward County Water and Wastewater Services (BCWWS) Districts 3A and 3B/C. In this report, these service areas are referred to as HLWD-DPU water retail area and HLWD-DPU water wholesale area. The BCWWS districts are served under an interlocal resale water agreement between the City and Broward County by which Broward County purchases potable water from HLWD-DPU for resale to its customers.

Beyond the City's jurisdiction, the HLWD-DPU water retail area includes approximately 300 acres in the Town of Davie, 50 acres in the City of Dania Beach, and 100 acres in the Seminole Tribe of Florida reservation.

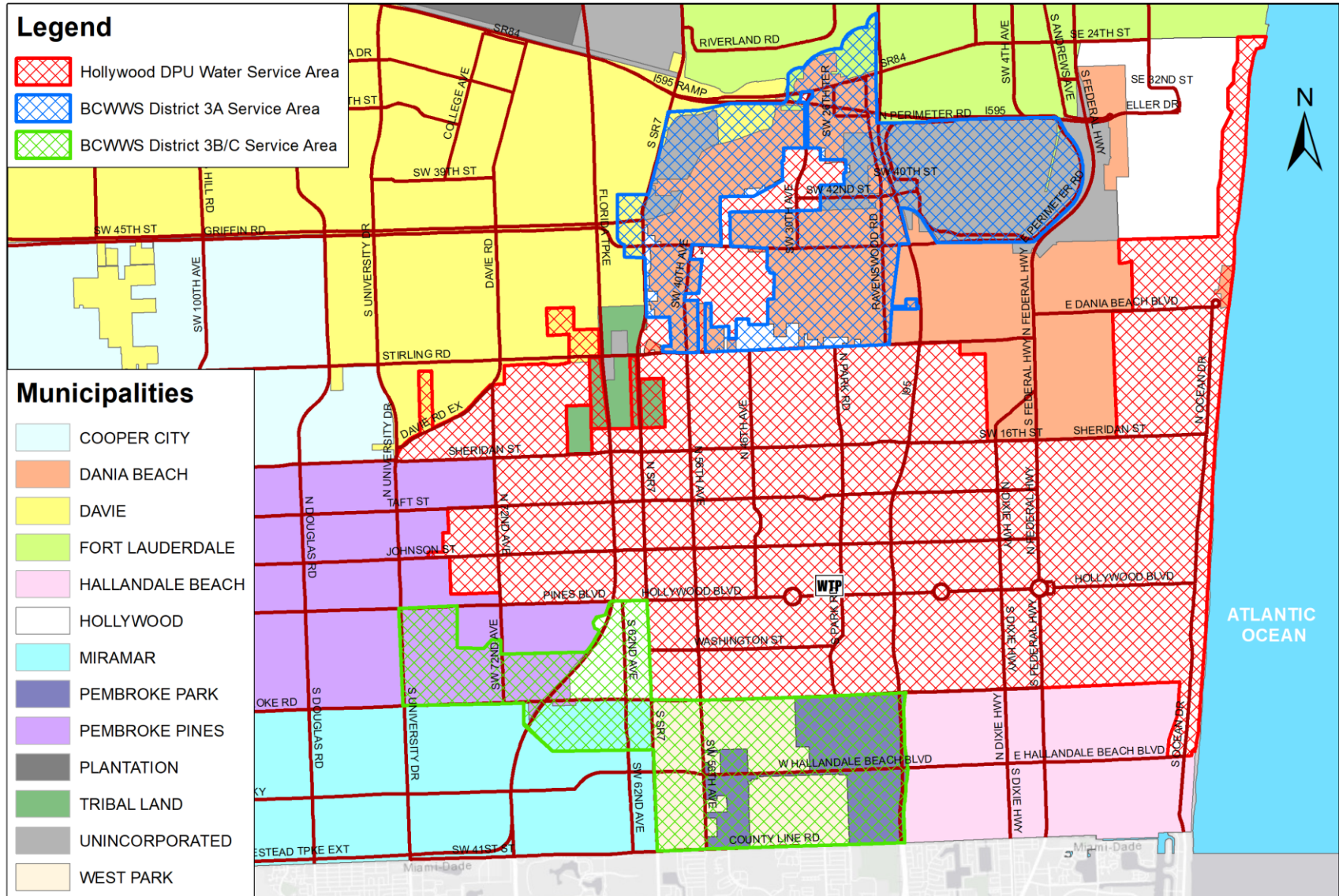
In addition to retail and wholesale water services, HLWD-DPU has an emergency connection with the City of Dania Beach, which withdraws water from the HLWD-DPU system to maintain its system pressure. In 2018, the City supplied only a nominal amount (less than 1,000 gallons per day) on a regular basis to the City of Dania Beach.



Section 2  
Water Service Areas



Section 2  
Water Service Areas



### **2.1.2 Broward County Water Districts 3A and 3B/3C**

BCWWS District 3A covers approximately eight square miles containing portions of the cities of Dania Beach and Fort Lauderdale, the Town of Davie, the Fort Lauderdale-Hollywood International Airport, and unincorporated Broward County. BCWWS District 3A has two wholesale interconnects with HLWD-DPU.

Districts 3B/C are interconnected and connect to HLWD-DPU via two wholesale interconnects each. Like District 3A, they are supplied solely by HLWD-DPU. BCWWS District 3B covers approximately four-square miles and includes the cities of West Park and Pembroke Park. BCWWS District 3C covers approximately two square miles containing portions of the cities of Hollywood, Miramar, and Pembroke Pines. This area of the City of Hollywood consumes about 2.5 percent of the City's water supply and its water demand is included in the water demand in District 3B/C.

These BCWWS districts fall mainly outside the City's jurisdiction except for the 400-acre southwest corner of the City of Hollywood located south of Hollywood Boulevard and west of State Road 7, which is served by BCWWS District 3C (See Figure 2-1). Small areas in the City's jurisdiction are served by BCWWS District 3A.

### **2.1.3 Port Everglades**

Port Everglades purchases potable water from the City of Fort Lauderdale through five metered connections at the following locations.

- 10-inch meter at Southeast 17<sup>th</sup> Street
- 12-inch meter at Southeast 20<sup>th</sup> Street
- 8-inch meter at Southeast 24<sup>th</sup> Street
- 16-inch meter at Southeast Eller Drive / Old South Federal Highway
- 10-inch meter at 900 Southeast 28<sup>th</sup> Street

Port Everglades distributes this potable water to various commercial and industrial users within its boundaries, such as passenger cruise ships, cargo container ships, and commercial businesses.

### **2.1.4 Summary of Water Service Areas Supplying the City of Hollywood**

In summary, three water utilities supply the City of Hollywood jurisdiction: (1) HLWD-DPU, (2) BCWWS, and (3) the City of Fort Lauderdale Public Works Department. The first two utilities are supplied by the City's WTP and deliver potable water to the entire City except for Port Everglades, which is supplied by the City of Fort Lauderdale Public Works Department. Table 2-1 tabulates the number of square miles covered by each potable water service area in

Section 2  
Water Service Areas

and out of the City’s jurisdiction. There are no anticipated changes in the size or coverage of these potable water service areas.

**Table 2-1. Geographic Size of Water Utility Service Areas in Square Miles**

Water Utility Serving the Geographic Area	In the City’s Jurisdiction	Out of City’s Jurisdiction and Served by City’s WTP	Total Served from City’s WTP by Water Service Area
HLWD-DPU (City WTP) to City of Hollywood Customers	26.70	0.60	27.30
HLWD-DPU (City WTP) to BCWWS District 3A Customers	0.00	7.70	7.70
HLWD-DPU (City WTP) to BCWWS District 3B Customers	0.00	3.80	3.80
HLWD-DPU (City WTP) to BCWWS District 3C Customers	0.60	1.80	2.40
Fort Lauderdale Public Works Department to Port Everglades	2.00	0.00	0.00
Total	29.30	13.90	41.20

Source: Water Supply Plan Potable Water Sub-Element, City of Hollywood, Florida, January 2015, based on GIS estimates.

## 2.2 Population Projections

Population in the City is expected to grow modestly throughout the forecast period. Less than one percent of the land area in the City is developable vacant land and most of these parcels are infill lots scattered throughout the City. Overall, the City is close to build-out and redevelopment is expected to accommodate the projected increases in population.

The City of Hollywood serves small areas in the Town of Davie, the Seminole Tribe of Florida, and the City of Dania Beach. The portions of the City’s water supply provided to these communities is about 0.5 percent, 0.4 percent and 0.1 percent, respectively. Given the small quantities of water demand and a lack of available historic data, the population and water demand data used in this evaluation represent, in aggregate, the City of Hollywood and these communities.

The historic population served by the HLWD-DPU from 2014 to 2018 is provided in Table 2-2. Population forecast for the period 2020 through 2040 is provided in Table 2-3. The historic population is based on population data provided in the City’s 2015 Water Supply Plan Potable Water Sub-Element and the Broward County Water Supply Facilities Work Plan 2020. The population forecast was also taken from the Broward County Water Supply Facilities Work Plan 2020. Historic and projected populations were based on the County’s allocation of population to Utility Analysis Zones (UAZs).

**Table 2-2. City of Hollywood Water Service Area Historical Population**

Year	City's Retail Customers	City's Wholesale Customers –		Total – Retail and Wholesale
		BCWWS District		
		3A	3B/C	
(1)	(2)	(3)	(4)	(5) = (2) + (3) + (4)
2014	141,179	16,143	35,623	192,945
2015	141,827	16,321	36,263	194,411
2016	142,698	16,438	36,508	195,644
2017	143,568	16,556	36,752	196,876
2018	144,439	16,673	36,997	198,109

Source: City of Hollywood 2015 Water Supply Plan Potable Water Sub-Element, January 2015, Table 2-3 and Broward County Water Supply Facilities Work Plan 2020, Table [WS4](#) and [Table WS7-WS12](#).

**Table 2-3. City of Hollywood Water Service Area Forecasted Population**

Year	City's Retail Service Area	City's Wholesale Customers –		Total – Retail and Wholesale
		BCWWS District		
		3A	3B/C	
(1)	(2)	(3)	(4)	(5) = (2) + (3) + (4)
2020	146,180	16,908	37,486	200,574
2025	150,380	18,083	38,889	207,352
2030	156,640	19,075	41,146	216,861
2035	161,270	19,686	42,639	223,595
2040	164,432	20,109	43,625	228,166

Source: Broward County Water Supply Facilities Work Plan 2020, Table [WS4](#) and [Table WS7-WS12](#).

## 2.3 Reuse Water System

HLWD-DPU has implemented a reuse system by making use of secondary treated effluent from its own wastewater service area, and from two of its wholesale wastewater customers, the City of Cooper City and the Town of Davie. HLWD-DPU delivers up to 4 mgd, on an annual average daily flow basis, of blended low-salinity reuse water for irrigation. The chloride levels of this reuse water are within the salt tolerance of local turf grasses and ornamentals. In addition, up to an annual average 4 mgd of high-salinity reuse water is used internally at the City's Southern Regional Wastewater Treatment Plant for non-potable process water and plant washdown. The City is implementing 10 mgd of feasible reuse capacity by 2025 through credit for existing on-site process reuse, additional reuse applications within the City, and contracted reuse with other utilities.

The existing reuse distribution system serves golf courses, public medians, private developments, athletic complexes and parks that have a relatively large irrigation demand.

These customers are the most cost-effective to serve. Table 2-4 summarizes the capacity and FY 2018 reclaimed water flows of the City’s reuse system by type of reuse application.

**Table 2-4. City of Hollywood's Reuse System Capacity and FY 2018 Flow**

Type of Reuse	Capacity in MGD	FY 2018 Flow in MGD	Acres Irrigated
Use at the Wastewater Treatment Plant	4.00	2.67	Not applicable
Golf Course Irrigation	2.82	2.00	752.8
Other Public Access Areas	0.51	0.20	121.0
Residential Irrigation	0.67	0.04	16.0
<b>Total</b>	<b>8.00</b>	<b>4.91</b>	<b>889.8</b>

Source: Florida Department of Environmental Protection, 2018 Reuse Inventory, August 2019, page 65 of 151.

The existing reuse system could be expanded to incorporate additional contract, residential and commercial customers. Table 2-5 identifies potential additional reuse customers (future committed and future non-committed) and their estimated water reuse demands. Expansion would be subject to the availability of suitable-quality water.

**Table 2-5. Potential Expanded Reuse System Customers**

Future Committed	mgd
T.Y. Park	0.272
<b>Total – Future Committed</b>	<b>0.272</b>
Future Non-Committed	mgd
Boggs Field	0.041
West of 441	0.250
<b>Total – Future Non-Committed</b>	<b>0.291</b>

Source: City of Hollywood Department of Public Utilities

## 3. Water Suppliers

---

*This section characterizes the water suppliers including consumptive use permit information, raw water sources, existing treatment facilities, and the City's conservation and reuse practices.*

As described in Section 2, the City of Hollywood is served, for the most part, by the City's own potable water system. The water suppliers of the City's residents and businesses include the following.

City of Hollywood Potable Water System: Serves most of the City's jurisdiction and several small areas outside of the City as illustrated in Figure 2-1.

City of Hollywood Reclaimed (Reuse) Water System: Provides irrigation water to customers and non-potable water for in-plant uses at the City's wastewater plant.

Broward County Water System: The County purchases finished water supplied by the City of Hollywood from the City's WTP and resells it to a small portion of the City's jurisdiction and to other retail customers in BCWWS District 3A and B/C service areas.

City of Fort Lauderdale Water System: Serves Port Everglades.

### 3.1 City of Hollywood Potable Water System

The HLWD-DPU operates the City's potable water system, which includes a raw water supply system, a water treatment plant, and a distribution system. They are described as follows.

#### 3.1.1 Raw Water Supply

The City's WTP treats water from the City's Biscayne Aquifer and Floridan Aquifer wellfields and water from Broward County's Biscayne Aquifer wells at the South Regional Wellfield (SRW). Raw water from the Biscayne Aquifer is of high quality and raw water from the deeper Floridan Aquifer is brackish and requires reverse osmosis treatment. Table 3-1 lists the City's Biscayne Aquifer and Floridan Aquifer withdrawal wells.

Section 3  
Water Suppliers

**Table 3-1. City of Hollywood's Biscayne Aquifer and Floridan Aquifer Withdrawal Wells**

Groundwater Source	Well Name	No. of Wells	Casing Diameter (inches)	Depth of Well (ft.)	Pumping Capacity (gpm)	Pumping Capacity (mgd)	Casing Depth (ft.)
<b>Existing Biscayne Wells</b>							
<b>Southern Wellfield</b>		<b>8</b>			<b>17,400</b>	<b>25</b>	
Biscayne	BW-28	1	10	75	2,400	3.5	60
Biscayne	BW-29	1	10	75	2,400	3.5	60
Biscayne	BW-30	1	24	95	2,100	3	60
Biscayne	BW-31	1	24	80	2,100	3	60
Biscayne	BW-32	1	24	80	2,100	3	55
Biscayne	BW-33	1	24	90	2,100	3	69
Biscayne	BW-34	1	24	86	2,100	3	70
Biscayne	BW-35	1	24	77	2,100	3	60
<b>Western Wellfield</b>		<b>6</b>			<b>12,600</b>	<b>18</b>	
Biscayne	BW-36	1	32	112	2,100	3	90
Biscayne	BW-37	1	32	144	2,100	3	125
Biscayne	BW-38	1	32	150	2,100	3	128
Biscayne	BW-39	1	32	155	2,100	3	135
Biscayne	BW-40	1	32	145	2,100	3	125
Biscayne	BW-41	1	32	150	2,100	3	139
<b>Total Biscayne Wellfield</b>		<b>14</b>			<b>30,000</b>	<b>43</b>	
<b>Existing Floridan Wells</b>							
Floridan	FW-F2	1	12	1,314	1,000	1.4	926
Floridan	FW-F3	1	12	1,185	1,000	1.4	950
Floridan	FW-F4	1	12	1,185	800	1.2	960
Floridan	FW-F5	1	12	1,185	1,100	1.6	920
Floridan	FW-F6	1	16	1,200	1,000	1.4	1,005
Floridan	FW-F7	1	16	1,200	1,000	1.4	1,005
Floridan	FW-F10	1	16	1,300	1,000	1.4	900
Floridan	FW-F13	1	17	1,300	1,000	1.4	1,000
<b>Total Floridan Existing</b>		<b>8</b>			<b>7,900</b>	<b>11.2</b>	
<b>Proposed Future Floridan Wells (Beyond 2019)</b>							
Floridan	FW- F8	1	16	1,300	1,000	1.4	900
Floridan	FW-F9	1	16	1,300	1,000	1.4	900
Floridan	FW-F11	1	16	1,300	1,000	1.4	900
Floridan	FW-F12	1	16	1,300	1,000	1.4	900
Floridan	FW-F14	1	16	1,300	1,000	1.4	900



Section 3  
Water Suppliers

**Table 3-1. City of Hollywood's Biscayne Aquifer and Floridan Aquifer  
Withdrawal Wells**

Groundwater Source	Well Name	No. of Wells	Casing Diameter (inches)	Depth of Well (ft.)	Pumping Capacity (gpm)	Pumping Capacity (mgd)	Casing Depth (ft.)
Floridan	FW-F15	1	16	1,300	1,000	1.4	900
Floridan	FW-F16	1	16	1,300	1,000	1.4	900
Floridan	FW-F17	1	16	1,300	1,000	1.4	900
Floridan	FW-F18	1	16	1300	1,000	1.4	900
Floridan	FW-F19	1	16	1300	1,000	1.4	900
Floridan	FW-F20	1	16	1300	1,000	1.4	900
Floridan	FW-F21	1	16	1300	1,000	1.4	900
Floridan	FW-F22	1	16	1300	1,000	1.4	900
Floridan	FW-F23	1	16	1300	1,000	1.4	900
Floridan	FW-F24	1	16	1300	1,000	1.4	900
<b>Total Floridan Proposed</b>		<b>15</b>			<b>15,000</b>	<b>21</b>	

Source: City of Hollywood Public Utilities Department and South Florida Water Management District, Staff Report for Application No. 070518-17 - Hollywood Water Treatment Plant, April 9, 2008, Table A - Description of Wells

### **3.1.1.1. Biscayne Aquifer**

Fresh groundwater from the Biscayne Aquifer is accessed via the City's wellfields and Broward County's SRW. The City has two Biscayne Aquifer wellfields called the South and Western (a.k.a. Chaminade) wellfields. Biscayne wells No. 20 and 21 (BW-20 and BW-21), referred to as the North wellfield, were abandoned and plugged in 2009.

The Southern and Western wellfields are comprised of 14 shallow wells with depths ranging from 75 to 155 feet. The total raw water pumping capacity of the Biscayne wells is currently 30,000 gpm (or 43.0 mgd). The total production capacity available from the Biscayne wells significantly exceeds the amount of water that can be withdrawn under the City's water use permit, which limits maximum-month withdrawals to an average daily withdrawal of 27.03 mgd.

Broward County provides raw water to the City from the SRW under a four-year raw water large user agreement dated 1994 that is automatically renewed every four years unless terminated by either party. An annual average daily quantity not to exceed 5.78 mgd is available to the City under this agreement and the City is required to take or pay for 4.0 mgd. The SRW is comprised of eight wells, each with a capacity of 4.0 mgd, providing a total design capacity of 32 mgd. The firm capacity is about 28 mgd with one well out of service. The SRW is in the western part of the County at Brian Piccolo Park.

### **3.1.1.2. Floridan Aquifer**

Raw water from the Floridan Aquifer, which is a brackish water supply, is accessed via the City's Floridan wellfield. The Floridan wellfield is comprised of eight wells that extend about 1,185 to 1,314 feet below ground. The total raw water pumping capacity of the active Floridan wells is 7,900 gpm (or 11.2 mgd).

### **3.1.1.3. Water Supply Allocation**

The City's Water Use Permit No. 06-00038-W, issued on April 10, 2008, provides limits to the annual and monthly withdrawals from the City's two Biscayne Aquifer wellfields and the City's Floridan Aquifer wellfield. These limitations are summarized in Table 3-2 and were established under the requirements of the District's Regional Water Availability (RWA) Rule. This Rule limits groundwater withdrawals from the Biscayne Aquifer to the maximum quantity during any consecutive five years preceding April 2006 and requires that alternative water supplies be used to meet additional demands. The City of Hollywood's alternative water supply is the Floridan Aquifer.

The total annual average daily withdrawal limit is 24.80 mgd from the City's two Biscayne Aquifer wellfields and 8.68 mgd from the Floridan Aquifer. The total allowable withdrawal from these sources is 33.48 mgd. In addition, the City has an agreement with Broward County to purchase 5.78 mgd of Biscayne Aquifer raw water from the County's SRW. This purchase agreement increases the City's available raw water supply to 39.26 mgd.

**Table 3-2. City of Hollywood Permitted Groundwater Withdrawal Quantities and Contracted Groundwater Quantities from Broward County’s SRW**

Water Supply Source	Annual Withdrawal Limit		Maximum Monthly Withdrawal	
	MG	Average Daily mgd	MG	Average Daily mgd
(1)	(2)	(3) = (2) / 365	(4)	(5) = (4) / (365/12)
Biscayne Aquifer:				
Western (Chaminade) Wellfield	5,475	15.00	497.30	16.35
South Wellfield	3,577	9.80	324.90	10.68
<b>Subtotal - Biscayne Aquifer</b>	<b>9,052</b>	<b>24.80</b>	<b>822</b>	<b>27.03</b>
Floridan Aquifer	3,168	8.68	259.00	8.52
<b>Subtotal – City Permitted</b>	<b>12,220</b>	<b>33.48</b>	<b>1,081.00</b>	<b>35.55</b>
Contracted from Broward County SRW	2,110	5.78	197.00	6.47
<b>Total – All Sources</b>	<b>14,330</b>	<b>39.26</b>	<b>1,278.20</b>	<b>42.02</b>

Source: SFWMD Water Use Permit No. 06-00038-W (expires on April 10, 2028) and Letter from Broward County to the City of Hollywood dated April 27, 2018, Subject: Hollywood Flow Limitations.

The City has established and expanded its Floridan Aquifer water supply and treatment capacity to meet forecasted increases in water demand and to incorporate a more drought-resistant water source that improves water supply reliability.

### 3.1.2 Treatment Processes

The City’s WTP has been in continuous operation for almost 85 years and consists of the following treatment processes:

- Lime Softening (LS)
- Membrane Softening (MS)
- Reverse Osmosis (RO)

Raw water from the City’s Biscayne Aquifer wellfields is treated using LS and MS treatment processes. In addition, some Biscayne Aquifer raw water is blended with the softened water from the LS and MS systems to help balance water quality and efficiently use the available Biscayne Aquifer allocation. Although raw water piping from both Biscayne Aquifer wellfields and the SRW is interconnected at the plant, the MS units reportedly treat a higher percentage of SRW water, which tends to be more highly colored (MS is more effective at reducing color). Raw water from the Floridan Aquifer is treated using the RO treatment process.

Table 3-3 summarizes the existing firm and nominal water treatment capacities of each treatment system. As shown in the table, the existing total firm and nominal water treatment capacities of the City’s water treatment facilities are 40.5 mgd and 46.0 mgd, respectively.

Section 3  
Water Suppliers

The average treatment losses of the LS, MS, and RO treatments are 2, 13, and 20 percent, respectively. Treatment losses for the LS facility were estimated based on data from water plant Monthly Operating Reports (MORs). Treatment losses for the MS and RO facilities are based on design and operational criteria.

**Table 3-3. Water Treatment Processes and Capacities**

Treatment System	Units in Service Assumed For Firm Capacity	Existing Firm and Nominal Finished Water Treatment Capacities (mgd)	Treatment Losses
Lime Softening (LS)	Nine units in service out of twelve total	Firm: 22.5 mgd Nominal: 24.0 mgd	2 percent
Membrane Softening (MS)	Six trains in service out of seven total	Firm: 12.0 mgd Nominal: 14.0 mgd	13 percent
Reverse Osmosis (RO)	Three trains in service out of four total	Firm: 6.0 mgd Nominal: 8.0 mgd	20 percent
Total (all three systems)	Described above	Firm: 40.5 mgd Nominal: 46.0 mgd	N/A

Source: City of Hollywood Public Utilities Department and 2007 Water Master Plan

**3.1.2.1 Lime Softening System**

The primary water treatment for the LS system is achieved by a process known as fluidized bed crystallization. The City’s LS system consists of 12 fluidized bed crystallization units (Spiractors) followed by 18 dual media filters. Each Spiractor has a conservatively estimated capacity of approximately 2.5 mgd, producing a total capacity of 30 mgd and a firm capacity of 22.5 mgd with three Spiractors offline. Lime is stored in silos and is constantly fed to the Spiractors at an approximate rate of 200 mg/L. There are a total of six lime silos at the City’s WTP (four 50 ton and two 100 ton). The 18 multimedia filters following the Spiractors have a maximum surface loading rate of 2.0 gpm/ft<sup>2</sup>, but the plant prefers to conservatively operate its six larger filters at 1.5 gpm/ft<sup>2</sup>.

Using these loading rates, the LS system has a total nominal capacity of 24 mgd and a firm capacity of 22.5 mgd, with the maximum production capacity being limited by the filters. Since the current loading rates are relatively conservative, up-rating the filters may be feasible in the future, if the City has an opportunity to expand its Biscayne Aquifer supply. The capacities of the Spiractors and membrane system (described below) together are adequate to be able to fully utilize the City’s Biscayne Aquifer allocation.

**3.1.2.2 Membrane Softening System**

The City’s MS system consists of seven operational treatment trains and three available slots for future installation of additional MS trains. Raw water from the Biscayne Aquifer is treated with sulfuric acid and a proprietary anti-scalant to protect the membranes from scaling. The raw water is filtered through 5 µm cartridge filters prior to entering the membrane to protect against particulate fouling or damage. Each MS skid has a production capacity of 2.0 mgd,

and there are seven skids currently in operation. Therefore, the firm capacity of the MS system is 12 mgd and the nominal capacity is 14 mgd.

Each train consists of a feed pump and 54 pressure vessels arranged into a three-stage configuration. Each pressure vessel holds seven membrane elements. Each MS train is designed to operate at 87 percent recovery, which means that approximately 2.3 mgd of feed water is required to produce 2.0 mgd of permeate. Since future capacity expansion is expected to use water from the Floridan Aquifer, the MS system will likely remain at its current capacity in the long term.

#### **3.1.2.3 Reverse Osmosis System**

The City's RO system consists of four RO skids and four available slots to facilitate the installation of additional RO treatment trains. Raw water from the Floridan Aquifer is treated with sulfuric acid and a proprietary anti-scalant to protect the membranes from scaling. The raw water is filtered through 5 µm cartridge filters prior to entering the membrane to protect against particulate fouling or damage. The four RO skids that are currently in place have finished water production capacities of 2.0 mgd and each operate at 80 percent recovery. At this recovery rate, 2.5 mgd of raw water is needed to produce 2.0 mgd of finished water. Therefore, the total finished water capacity of the RO system is 8.0 mgd and the firm capacity is 6.0 mgd.

#### **3.1.2.4 Disinfection System**

The City currently uses chloramines to provide primary disinfection and a secondary residual for the distribution system. Sodium Hypochlorite 12% solution is added to the water, and a brief sodium hypochlorite contact time is provided prior to the addition of ammonia to form chloramines. The City's Sodium Hypochlorite 12% solution is stored in nine (seven 10,000 gallons and two 7,000 gallons) fiberglass storage tanks.

The City's ammonia system consists of two 1,000-gallon ammonia gas storage tanks and four rotameters (three 100 lb./day units and one 250 lb./day unit). To maintain a residual of 4.0 mg/L chloramines, 0.85 mg/L ammonia must be added to maintain a ratio of chlorine to ammonia within a recommended range of 4.5:1 to 5.0:1, with a target of 4.7:1. At this dosage, the ammoniators have the capability to treat 77.6 mgd with all four units in service, and 42.3 mgd with the largest (250 lb./day) rotameter offline.

#### **3.1.2.5 Degasifier System**

The City's degasifier system reduces the carbon dioxide (CO<sub>2</sub>) levels in both the MS-treated water and RO-treated water and the hydrogen sulfide (H<sub>2</sub>S) levels in RO-treated water, via air stripping. Sulfuric acid is added to lower the pH of the Floridan Aquifer water to aid in H<sub>2</sub>S removal prior to countercurrent air stripping through a packed tower. The MS-treated Biscayne Aquifer water does not require additional pretreatment prior to stripping. The WTP has four forced-draft, packed-tower degasifiers. Each degasifier unit includes an 18,000-cfm fan, a 13.5 feet diameter by 24 feet overall height tower, and 12 feet of packing. Two

degasifiers are designed to remove CO<sub>2</sub> from the MS permeate with discharge of the tower exhaust to the atmosphere. One degasifier is designed to remove H<sub>2</sub>S from the RO permeate with discharge of the tower exhaust to an odor control scrubber. The fourth degasifier is a standby unit for both systems, which can discharge exhaust gas either to the atmosphere or to the odor control scrubber. The degasification system is adequate to treat the MS and RO flows that the plant currently produces. The upgrades to the odor scrubber system allow the plant to run all four of its RO skids without generating nuisance odors.

### **3.1.3 Post-Treatment**

Degasified permeate from the MS and RO systems drains to a 250,000-gallon blend tank where it mixes with LS water. The secondary treatment in the blend tank includes addition of sodium hypochlorite, caustic soda, and fluoride. Water from the blend tank is pumped into the onsite ground storage tanks.

### **3.1.4 Storage**

The City has 18 million gallons of total finished water storage capacity including 2 MG stored in two separate 1 MG elevated storage tanks within the distribution system, 11 MG of ground storage on-site at the WTP, and 5 MG of ground storage located at the West Hollywood Storage and Pumping Facility located near Sheridan St. and 68<sup>th</sup> Avenue. The tankage present at each location is detailed below.

At the plant, a total of five ground storage tanks are available. Water from the blend tank flows into parallel lines that feed two 3.5 MG tanks. Water from these two tanks is discharged into a manifold that feeds three parallel 1.0 MG storage tanks. These three storage tanks then combine into another manifold that feeds a 1 MG high service pumping clearwell. Inclusive of the clearwell, the combined finished water storage inventory (on-site) is 11 MG. The breakdown of the 11 MG on-site finished water storage capacity is indicated below.

- Clearwell: 1 MG
- Tank # 2: 1 MG
- Tank # 3: 1 MG
- Tank # 4: 1 MG
- Tank # 5: 3.5 MG
- Tank # 6: 3.5 MG

The on-site finished water storage tanks provide operational storage required to equalize diurnal demands and provide for emergency storage (fire flows). According to the most recent Water Master Plan, they hold approximately six hours flow when all treatment systems are operating at designed capacity. The water levels in the tanks are typically maintained between

low (50 percent) and high (85 percent) operating limits to accommodate short-term system changes in the system demand. The tanks are all interconnected and are maintained at the same level.

### **3.1.5 High Service Pumps**

The City's WTP has two High Service Pump (HSP) stations that pump finished water from on-site storage tanks at the WTP to the City's distribution system.

The main HSP station, referred to as the high service pump room, houses six split-case horizontal centrifugal pumps and their respective motor control centers. The six pumps, aligned in parallel, draw water from clear wells and pump into a common 42-inch discharge header.

The secondary HSP station, referred to as the aeration building pump station, is primarily used to complement the required constant operation of the main pumping station. The facility houses four split-case horizontal pumps with their respective motor control centers. The pumps and motors located in this facility are paired up and are arranged in series. These pumps draw water from a 1.0 MG storage tank and pump into a common 20-inch discharge header.

### **3.1.6 Distribution System**

The City's WTP has three discharge mains that supply water into the distribution system transmission lines as follows:

- 24-inch water main (South header);
- 30-inch water main (West header); and
- 20-inch water main (Bypass header).

The City's water distribution system consists of:

- Approximately 700 miles of water main pipe ranging from 2-inch to 36-inch diameter;
- Two elevated 1.0 MG storage tanks;
- The West Hollywood Pumping and Storage Facility which includes four 1,700 gpm vertical turbine pumps to boost system pressure, chemical dosing to boost system disinfection residual, and two 2.5 mgd aboveground storage tanks; and,
- Approximately 40,000 connections, over 2,500 fire hydrants, and over 7,500 valves.

The piping diameter ranges and lengths are presented in Table 3-4. The distribution system piping is comprised of a variety of materials, including cast iron, galvanized iron, polyvinyl chloride, ductile iron, and asbestos cement.

**Table 3-4: City of Hollywood Water Distribution System Pipe Diameters**

Diameter (inches)	Approximate Length (miles)
16 to 30	30
6 to 14	480
< 4	200

### **3.2 Broward County Water System**

Finished water from the City’s WTP is supplied to the BCWWS Districts 3A and 3B/3C. The water customers in these Districts are Broward County’s retail water customers and a small area, less than one square mile, is within the City’s jurisdiction. The raw water sources and treatment plant facilities supplying these areas were described previously in this section.

### **3.3 City of Fort Lauderdale Water System**

According to its Water Supply Facilities Work Plan 2020 Update, the City of Fort Lauderdale provides potable water service to a population of approximately 239,000 residents and six wholesale customers in central Broward County. Port Everglades is one of Fort Lauderdale’s wholesale water customers. Fort Lauderdale’s Water Supply Facilities Work Plan 2020 Update accounts for Port Everglades’ water demand as part of its overall aggregate demand projection.

The City of Fort Lauderdale supplies its retail and wholesale customers with treated raw water from the Prospect wellfield at the Fiveash Water Treatment Plant and from the Dixie wellfield at the Peele-Dixie Water Treatment Plant. Both the Prospect and Dixie wellfields are permitted by the SFWMD under Consumptive Use Permit (CUP) No. 06-00123-W. Both wellfields withdraw raw water from the Biscayne Aquifer.

The Peele-Dixie system supplies Port Everglades. The Dixie wellfield is comprised of eight 2.5 mgd rated wells and has an installed capacity of approximately 20 mgd. The existing CUP limits the maximum-day withdrawal of this wellfield to 15 mgd. The existing Peele-Dixie Water Treatment Plant is a nanofiltration treatment plant placed into service in 2008. The plant has a maximum installed finished water treatment capacity of 12 mgd with all units in service.

### **3.4 City of Hollywood Reclaimed Water System**

Reclaimed water is a critical component in effectively managing water resources. Effective water management employs diverse water resources to strike an appropriate balance among resource conservation, development cost, and sustainability. Reclaimed water, when of suitable quality, may be used for many purposes including, but not limited to:



## Section 3 Water Suppliers

---

- Irrigation of golf courses, parks, medians, residential lots, school landscaping, and other green space;
- Cooling water and process water;
- Decorative lakes, ponds, and fountains;
- Car washing, toilet flushing, and dust control;
- Agricultural irrigation and irrigation at nurseries;
- Wetlands creation, restoration, and enhancement; and,
- Recharging groundwater aquifers.

The HLWD-DPU operates a reclaimed (reuse) water system at the City-owned Southern Regional Wastewater Treatment Plant (SRWWTP). The SRWWTP collects, treats, and discharges approximately 42 mgd of secondary-treated wastewater into the Atlantic Ocean and to the underground Boulder Zone via deep injection wells. Since chloride and TDS levels prevent the City from reusing SRWWTP effluent without desalination (RO) treatment, the City has implemented its existing reuse system using the low-salinity effluent from the Town of Davie and City of Cooper City, which pump their effluent to the SRWWTP.

The City's existing water reuse system has a rated capacity of 8.0 mgd of which 4.0 mgd is available to irrigate landscaping and 4.0 mgd is available for non-potable in-plant uses such as foam control, washdown water, and process make-up water.

### **3.5 Ocean Outfall Legislation**

In 2008, the State Legislature promulgated Ocean Outfall Legislation (OOL) which requires that all utilities in the State of Florida eliminate wastewater effluent discharges from their ocean outfalls by 2025, except during peak flow events. The rule also requires that utilities provide technically, economically, and environmentally feasible reuse of 60 percent of a base condition annual average flow by December 31, 2025. The legislation also requires this facility to reduce the mass loading of nitrogen and phosphorus from the outfall by 2018. The City has elected to comply with this requirement by shifting outfall flows to its deep injection well system, thereby reducing the mass loading of nitrogen and phosphorus being discharged through the outfall.

The OOL provides that alternative water supply capacity allocated to meet the utility's water supply needs prior to July 2011 may not be displaced and "stranded". The City of Hollywood has been investing in its Floridan Aquifer supply and treatment system since the mid-1990s and has developed and installed 6.00 mgd of firm RO treatment capacity and 8.68 mgd of Florida Aquifer water supply withdrawal capacity. Consequently, it is not anticipated that reuse may be feasibly utilized to meet anticipated water demand growth through the planning

### Section 3 Water Suppliers

---

horizon, as that will be fully supplied by its existing Biscayne Aquifer and Floridan Aquifer supply and treatment infrastructure. Also, as explained above, the salinity of the City's wastewater effluent precludes direct reuse without extensive treatment (RO) beyond what is typical for providing irrigation-quality reuse water.

Shortly after the OOL was passed, the City assessed effluent disposal alternatives to meet the OOL requirement for the elimination of all effluent disposals through the outfall (Southern Regional Wastewater Treatment Plant Ocean Outfall Compliance Report, December 2009). As the plan was being developed, the City explored reuse options that included implementation of a dual irrigation system at an estimated cost of \$1 billion. The City invested \$3 million in a pilot study that evaluated the technology requirements to implement recharge of the Floridan Aquifer. These alternatives faced significant challenges that limited their feasibility.

In a status report (mandated by the OOL) to the Governor and State Legislature, the FDEP acknowledged that Hollywood faced unique challenges in its development of a feasible reuse program. The FDEP indicated that it will work with the City to ensure that the most feasible reuse options are implemented by December 31, 2025. The City developed a refined functional reuse compliance plan and closely coordinated with the FDEP to solicit its input at various stages during the development phase.

In a letter dated January 13th, 2016, the FDEP documented the results of its evaluation and identified the elements of the City's plan that constitute feasible reuse. The FDEP findings were based on reviewing documents and studies furnished by the City and the outcomes of meetings between the FDEP and the City. Key elements of the City's compliance plan were determined to constitute feasible reuse and meet the OOL legislative requirements including the following items.

- Credit for Existing Onsite Process Reuse – 4 mgd (filtered brackish effluent)
- Additional Reuse within the City – 1.5 mgd (committed customer capacity)
- Contracted Reuse – 4.5 mgd

These efforts correspond to a total of 10 mgd of feasible reuse to be accomplished by the December 2025 deadline.

**Credit for Existing Onsite Reuse** - The existing 4 mgd brackish effluent filtration capacity is being fully utilized based on recent operating history (since 2012). Consequently, no further action or capital investment is required to receive the 4 mgd credit for process water reuse applications.

**Use of Reclaimed Water for Irrigation** – The City of Hollywood has contracts with 10 customers and commitments with 11 additional customers to use up to 3.4 mgd of reclaimed water from the City. Additional customers have been identified that may be served in the future.

**Contracted Reuse** – The City of Hollywood is in the process of entering into an interlocal agreement with the City of Miramar by which Miramar will provide a minimum 2.0 mgd AADF of contract reuse water by December 31, 2025 which will be credited to Hollywood for the purpose of satisfying 2.0 mgd of Hollywood’s reuse water requirement under the OOL for a 30-year agreement term.

The status of the City of Hollywood’s OOL compliance is provided in Table 3-5. The total installed or contracted reclaimed water capacity is 9.4 mgd of the required 10.0 mgd.

**Table 3-5. Status of City of Hollywood’s FDEP OOL Compliance with respect to Reclaimed Water**

Requirement	Installed Reclaimed Water Capacity in mgd
Onsite reuse at Southern Regional Wastewater Treatment Plant	4.0
Irrigation use by customers	3.4
Miramar contract reuse	2.0
<b>Total</b>	<b>9.4</b>

### 3.6 City of Hollywood Water Conservation Program

The average gallons per capita per day (gpcd) over all customers served by the HLWD-DPU, including retail and wholesale customers, fell from a five-year average of 127 gpcd in 2008 to 114 gpcd in 2013. The five-year average in 2018 remained steady at 113 gpcd. The historic gpcd from 2004 to 2018 is provided in Table 3-6.

The reduction in gpcd is due to a variety of conservation efforts that include a plumbing fixture replacement program, public education, year-round irrigation restrictions, replacement of aging (leaky) water mains, and other measures. The impact of the City’s efforts appears to be permanent because gpcd did not rebound during the recent economic recovery. Florida Statute 373.250(1) recognizes the importance of conservation and gives it equal consideration with reuse in promoting the public interest. Conservation programs are effective in producing the same water use impact as using reclaimed water at a fraction of the cost.

**Table 3-6. City of Hollywood Historical Annual Average Per Capita Usage**

Year	Finished Water (mgd)	Population – Retail and Wholesale	Annual Average Usage (gpcd)	Five-Year Average Usage (gpcd)
(1)	(2)	(3)	(4) = [(2) x 1,000,000] / (3)	(5)
2004	26.1	186,648	140	
2005	24.5	188,287	130	
2006	24.6	190,595	129	
2007	23.0	189,716	121	
2008	22.1	188,837	117	<b>127</b>
2009	22.6	187,958	120	
2010	20.8	187,078	111	
2011	21.7	188,108	115	
2012	21.0	189,138	111	
2013	21.0	190,168	110	<b>114</b>
2014	21.4	192,944	111	
2015	22.3	194,411	115	
2016	22.8	195,644	116	
2017	22.5	196,876	114	
2018	21.9	198,109	111	<b>113</b>

Sources: 2004 to 2013 finished water and population data from are from the City's 2015 Water Supply Plan – Potable Water Sub-Element, Table 4-3.

2014 to 2018 population data are from the City of Hollywood 2015 WSP Update, page 2-5, Table 2-3 and Broward County Water Supply Facilities Work Plan 2020, Table WS7 where values between the 5-year increments provided were interpolated.

Finished water production data from 2013 to 2018 are from the City WTP Monthly Operating Reports.

The City's Water Conservation Plan was developed with the goal of maximizing the City's water use efficiency and reducing overall potable water demand. The City's water conservation plan includes recommendations on water conservation measures and best management practices (BMPs) that the City has elected to implement to reduce its per-capita potable water consumption over time and "free up" available water resources to support future growth. The City has implemented the following water conservation BMPs.

1. Private Irrigation System Audit and Rebate Program: [The City of Hollywood, in coordination with Broward County NatureScape Division, has performed annual irrigation system evaluations since 2006. Launched in 2005, the NatureScape Irrigation Services \(NIS\) is implemented by the Broward County's Environmental Protection and Community Resilience Division with cost-share funding provided by Broward County Water and Wastewater Services and local municipalities. The NIS conducts irrigation evaluations of, mostly, large-scale irrigation systems. At each site, the NIS assesses irrigation system design, functional integrity, scheduling, and maintenance issues related](#)

### Section 3 Water Suppliers

---

to water use efficiency, and landscape best management practices. Following each assessment, efficiency improvement recommendations are provided to the site owner or manager. Water consumption is documented before and after improvements are implemented to calculate water savings. The program targets large water users including government facilities, parks, schools, and homeowner associations where the greatest potential exists for significant water savings. Best Management Practices that encourage the ‘right plant in the right place’, irrigation water use efficiency, and smart irrigation technology help to secure outdoor water use reductions and long-term water savings.

The City of Hollywood has provided financial support for Broward’s NIS Program to conduct irrigation evaluations throughout the Hollywood service area since 2006. From 2008 to 2017, a total of 131 irrigation system evaluations were completed within Hollywood resulting in a total water savings of 26,318,934 gallons. In April 2020, the City renewed its agreement with Broward County to share the cost of the NatureScape Irrigation Service and Residential Irrigation Rebate Program for the next 5 years. In June 2020, the Residential Irrigation Rebate Program was launched and will provide irrigation system inspections and water conservation education to residents. It will also offer rebates to offset initial costs incurred in upgrading specified water-efficient irrigation system components.

2. City promotion of Florida-friendly landscape practices and use of native plants to reduce irrigation water use. (This BMP resulted in the City becoming a National Wildlife Federation (NWF) Community Habitat in 2018. The City uses the NWF and Broward County “naturescapes” to help promote better landscape BMPs.)
3. Expansion of Reuse Projects
4. Water-Efficient Landscape and Irrigation Evaluations
5. High Efficiency Toilet (HET) Rebates
6. Retrofit Kit Giveaways
7. Water Use Evaluations
8. Restaurant Rinse Valve Replacement
9. City-adopted landscape irrigation limited to twice per week year-round: The City is currently working with the SFWMD to review and update Section 51.116 “Permanent Restrictions on Lawn and Landscaping Irrigation” of the City’s Code of Ordinances to include Mandatory Year-Round Landscape Irrigation Conservation Measures and Variances in accordance with Rule 40E-24.301, F.A.C.

The City is a committed member of the Broward Water Partnership Conservation Program that has a goal of saving 30 mgd county-wide. This program was launched in 2011 and consists of 19 municipalities and water utilities that collaborate on water conservation implementation. In 2019, the US Environmental Protection Agency recognized the Broward Water Partnership with a WaterSense® Promotional Partner of the Year Award

for “its heroic efforts to defeat water waste and promote WaterSense® in 2018”. The Broward Water Partnership was one of 25 recipients.

### **3.7 Intergovernmental Coordination**

The HLWD-DPU maintains formal agreements with its raw water providers and bulk water customers and communicates and coordinates with them on a regular basis through a variety of methods. In 1994, the City signed a “Large User Raw Water Agreement” with Broward County to purchase raw water from the County’s South Regional (Brian Piccolo) Wellfield. This agreement was amended in 2004 and is still current. The City also has a current “Finished Water for Resale Agreement” with Broward County to provide finished water to the County’s 3B/3C and 3A distribution systems. The City of Dania Beach purchases finish water from the City on an emergency basis through an “Interlocal Agreement for Emergency Water Interconnection”.

The City ensures that adequate water supply is available to fulfill its obligations to its large water users by planning and projecting future demand in the area (See Section 4) and by maintaining an open line of communication with the involved municipalities. The City conducts individual meetings with Broward County and the City of Dania Beach as issues arise which may be hosted by either party. Consultants and various agency representatives may be added to the aforementioned meetings and communications as warranted. Formal meetings are augmented by emails and phone contacts.

Additionally, the HLWD-DPU has a designated large user coordinator to facilitate communication between multiple interested parties. Primary operational, budgetary, and field contacts are frequently updated and distributed to each large user to further facilitate planning and coordination activities. At this time, the current coordination activities between the City and its large water users/ raw water supplier are sufficient and additional activities will be scheduled as deemed necessary by either party.

## 4. Water Demand Forecast and Supply Adequacy

---

*This section presents the methods, data and results of the water demand forecasts within the HLWD-DPU water service area and provides a comparison of future water demand to available water supply. This section also documents the inclusion of Port Everglades in the City of Fort Lauderdale WSP 2020 Update. This section demonstrates that the existing water supply permitted quantities, coupled with the City's conservation and reuse practices, will meet projected demands through 2040.*

The City provides retail water service to residents of the City of Hollywood and small portions of the Town of Davie, the City of Dania Beach, and the Seminole Tribe of Florida reservation. The City provides wholesale potable water service to Broward County through pipelines that serve the County's retail water customers located in its Districts 3A and 3B/C. District 3A serves residents and businesses in portions of the Town of Davie, the City of Dania Beach, the City of Hollywood, the City of Fort Lauderdale and unincorporated Broward County. District 3B/C serves residents and businesses in the City of West Park, the Town of Pembroke Park, and portions of the City of Hollywood, the City of Pembroke Pines, and the City of Miramar. The City's WTP is the sole source of treated water to these customers. Port Everglades is in the City of Hollywood but receives water service from the City of Fort Lauderdale. The City of Hollywood has no plans to provide raw or finished water to any retail or wholesale customer outside of its existing water service area.

According to the interlocal resale agreement between the City and Broward County, the County will annually review and project its future needs for potable water demand in terms of annual average daily flow and annual maximum daily flow. In turn, the City will use these annual projections as reasonable estimates for planning, expansion, construction, modification, or alteration of the City's facilities. Therefore, the water demand forecast provided in this Section uses the most recent projections for Districts 3A and 3B/C provided in Table WS13 of the Broward County Water Facilities Work Plan 2020. The County's Districts 3A and 3B/C forecasts of water demand in annual average daily mgd are provided in Table 4-1.

**Table 4-1. Broward County Districts 3A and 3B/C Finished Water Demand Forecast**

Year	Average Daily Demand (mgd)
2017 (Actual)	6.52
2020	6.91
2025	7.24
2030	7.65
2035	7.92
2040	8.10

Source: Broward County Water Supply Facilities Work Plan 2020, Table [WS13](#)[WS20](#)

Table 4.2 presents the recent historical data regarding the City’s population served by the retail system, the annual average daily flow from the WTP, and the average daily flow from the WTP to BCWWS District’s 3A and 3B/C and to the City’s retail customers. The table provides the calculation of the average daily amount of water used by the City’s retail customers measured as gallons per person (or per capita) per day. Also provided is the maximum day flow during the year at the WTP and the maximum day factor which is the ratio of maximum day flow and annual average daily flow.

**Table 4.2 City of Hollywood Historical Retail Population, Finished Water Production and Retail Per Capita Usage**

Year	Population - Retail Customers (a)	Finished Water Production					
		Annual Average Daily Flow (mgd)			Retail gpcd	Maximum Day at WTP (mgd) (b)	Max Day Factor at WTP
		WTP (b)	To BCWWS District 3A and B/C (c)	To Retail			
(1)	(2)	(3)	(4)	(5) = (3) - (4)	(6) = (5) x 10 <sup>6</sup> / (2)	(7)	(8) = (7) / (3)
2014	141,179	21.4	6.5	14.9	105.4	24.5	1.15
2015	141,827	22.3	6.8	15.5	109.4	26.2	1.17
2016	142,698	22.8	6.8	16.0	111.8	27.6	1.21
2017	143,568	22.5	6.5	15.9	110.9	24.9	1.11
2018	144,439	21.9	6.7	15.3	105.6	26.2	1.20
<b>Average</b>					<b>108.6</b>		<b>1.17</b>

(a) City of Hollywood 2015 Water Supply Plan Potable Water Sub-Element, page 2-5, Table 2-3 and Broward County Water Supply Facilities Work Plan 2020, Table [WS4](#) and [Table WS7](#), [WS12](#).

(b) City of Hollywood WTP Monthly Operating Reports

(c) Broward County Water Supply Facilities Work Plan 2020, Table WS13. The 2018 metered finished water flow to BCWWS Districts 3A and 3B/C was not provided in this document. Therefore, the average metered flow from 2014 to 2017 was used for the 2018 value.

The annual average water use of the City’s retail customers measured as gallons per capita per day over the five-year period from 2014 to 2018 is 108.6. This value was used to forecast



Section 4  
Water Demand Forecast and Supply Adequacy

annual average daily water demand by the City’s retail customers. The average maximum day factor over the same period is 1.17. This value was used to forecast maximum day demand that needs to be supplied by the City’s WTP.

The population projection for the City of Hollywood’s retail water service area in 2020, 2025, 2030, 2035 and 2040 was obtained from Table WS7 of the Broward County Water Supply Facilities Work Plan 2020. The 108.6 gpcd was multiplied by the City’s retail population forecast to obtain the daily water demand in gallons. The resulting retail water demand forecast is provided in Table 4.3.

**Table 4.3 City of Hollywood Retail Finished Water Demand Forecast**

Year	Population - City Retail Customers (a)	Retail Finished Water Demand	
		GPCD	Annual Average Day (mgd)
(1)	(2)	(3)	(4) = (3) x (2) / 10 <sup>6</sup>
2018 - Actual	144,439	105.6	15.3
2020	146,180	108.6	15.9
2025	150,380	108.6	16.3
2030	156,640	108.6	17.0
2035	161,270	108.6	17.5
2040	164,432	108.6	17.9

(a) Broward County Water Supply Facilities Work Plan 2020, Table ~~WS4 and Table WS7~~WS12

To obtain the water demand that needs to be supplied by the City’s WTP, the retail water demand forecast in Table 4.3 was added to the wholesale water demand forecast in Table 4-1. The resulting forecast of the City’s water demand is provided in Table 4.4.

**Table 4.4 Finished Water Demand Forecast in the City of Hollywood Water Service Area**

Year	Annual Average Daily Demand in mgd		
	Retail	Districts 3A and 3B/C	Total
(1)	(2)	(3)	(4) = (2) + (3)
2018 – Actual (a)	15.26	6.67	21.93
2020	15.88	6.91	22.79
2025	16.34	7.24	23.57
2030	17.02	7.65	24.67
2035	17.52	7.92	25.44
2040	17.86	8.10	25.96

(a) The 2018 demand value used for Districts 3A and 3B/C is from Table 4.2.

Section 4  
Water Demand Forecast and Supply Adequacy

---

The forecasted maximum day water demand that needs to be supplied by the City’s WTP is provided in Table 4.5.

**Table 4.5 City of Hollywood Maximum Day Water Demand Forecast**

Year	Annual Average Daily Water Demand from WTP, mgd	Max Day Factor	Max Day Demand, mgd
(1)	(2)	(3)	(4) = (2) x (3)
2018 - Actual	21.9	1.20	26.2
2020	22.8	1.17	26.6
2025	23.6	1.17	27.5
2030	24.7	1.17	28.8
2035	25.4	1.17	29.7
2040	26.0	1.17	30.3

The annual average daily water demand forecast was used to estimate the amount of raw water that would be needed from the Biscayne and Floridan aquifers including water lost due to treatment. The average treatment losses of the LS, MS, and RO treatments are 2, 13, and 20 percent, respectively. The weighted average treatment loss over all the water produced was estimated based on historical raw water withdrawals and corresponding finished water production as follows.

The historical annual average withdrawals from the Biscayne and Floridan aquifers are provided in Table 4.6.

**Table 4.6 City of Hollywood WTP Historical Raw Water Annual Average Withdrawals**

Year	Biscayne Aquifer (mgd)	Floridan Aquifer (mgd)	Total (mgd)
(1)	(2)	(3)	(4) = (2) + (3)
2014	21.42	1.90	23.3
2015	20.76	3.70	24.5
2016	21.03	3.91	24.9
2017	21.37	2.71	24.1
2018	20.34	4.84	25.2

Source: City of Hollywood WTP Monthly Operating Reports

The annual percent treatment loss considering all treatment processes over the period 2014 through 2018 is provided in Table 4.7. The historic average annual treatment loss over the period is approximately nine percent.

**Table 4.7 City of Hollywood WTP Annual Percent Treatment Loss Associated With All Treatment Processes**

Year	Annual Average (mgd)		Percent Treatment Loss (%)
	Raw Water Withdrawal	Finished Water Production	
(1)	(2)	(3)	(4) = $\{[(2) - (3)] / (2)\} / 100$
2014	23.32	21.37	8.4%
2015	24.46	22.34	8.7%
2016	24.95	22.78	8.7%
2017	24.07	22.46	6.7%
2018	25.18	21.93	12.9%
<b>Average</b>			<b>9.1%</b>

Table 4.7 shows that the overall treatment loss increased in 2018. This increase is largely a result of increased use of Floridan Aquifer source water in 2018. Floridan Aquifer source water is treated exclusively through RO treatment which has a treatment loss of 20%, significantly higher than LS and MS treatment processes (2% and 13% respectively).

For the purpose of determining the amount of raw water needed to supply the forecasted finished water demand, the weighted average treatment loss when a combined 30 mgd of raw water is pumped from both aquifer sources was calculated. Table 4.8 presents the treatment methods considered.

**Table 4.8 City of Hollywood Forecasted Weighted Average Percent Treatment Loss**

Treatment Technology	Raw Water Withdrawal, Annual Average mgd	% of Raw Water	% Treatment Loss
(1)	(2)	(3)	(4)
Lime Softening	12	40%	2%
Membrane Softening	12	40%	13%
Reverse Osmosis	6	20%	20%
<b>Total / Weighted Average</b>	<b>30</b>	<b>100%</b>	<b>10%</b>

If 40 percent of the raw water is treated using LS, 40 percent is treated using MS, and 20 percent is treated using RO, the weighted average percent treatment loss is 10 percent. This value was used to convert the finished water demand forecast to the total annual raw water withdrawal needed from the City’s Biscayne and Floridan aquifer wellfields and the County’s SRW.

The raw water forecast is calculated in Table 4.9. Total raw water withdrawal will need to be 25.3 mgd in 2020 and will need to increase each year to 28.8 mgd by 2040. If the overall treatment loss is 13 percent, instead of 10 percent, as was the case in 2018, then the total raw water withdrawal will need to be about 1.0 mgd higher each year.

**Table 4.9 City of Hollywood Forecasted Raw Water Withdrawals**

Year	Finished Water Demand (mgd)	Annual Average Raw Water Withdrawal (mgd)		
		At 10% Treatment Loss	At 13% Treatment Loss	Difference
(1)	(2)	(3) = (2) / [1 - 0.10]	(4) = (2) / [1 - 0.13]	(5) = (4) - (3)
2018 - Actual	21.9	25.2		
2020	22.8	25.3	26.2	0.9
2025	23.6	26.2	27.1	0.9
2030	24.7	27.4	28.4	0.9
2035	25.4	28.3	29.2	1.0
2040	26.0	28.8	29.8	1.0

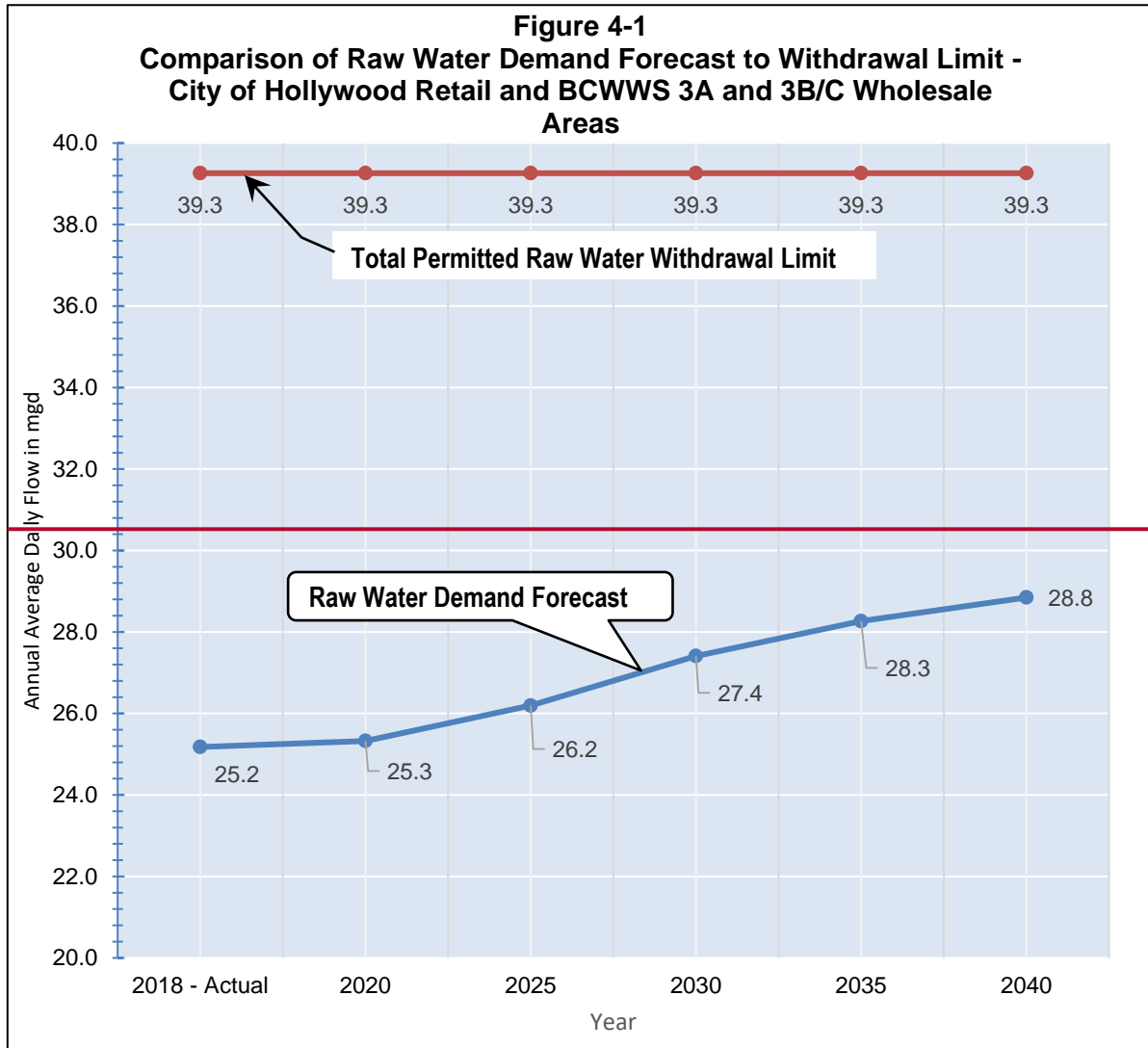
The City’s combined permitted raw water withdrawal quantities total 39.3 mgd on an annual average day basis and 42.0 mgd on a maximum month basis as summarized in Table 4.10. The comparison of forecasted raw water withdrawal to the permitted quantity is provided in Figure 4-1.

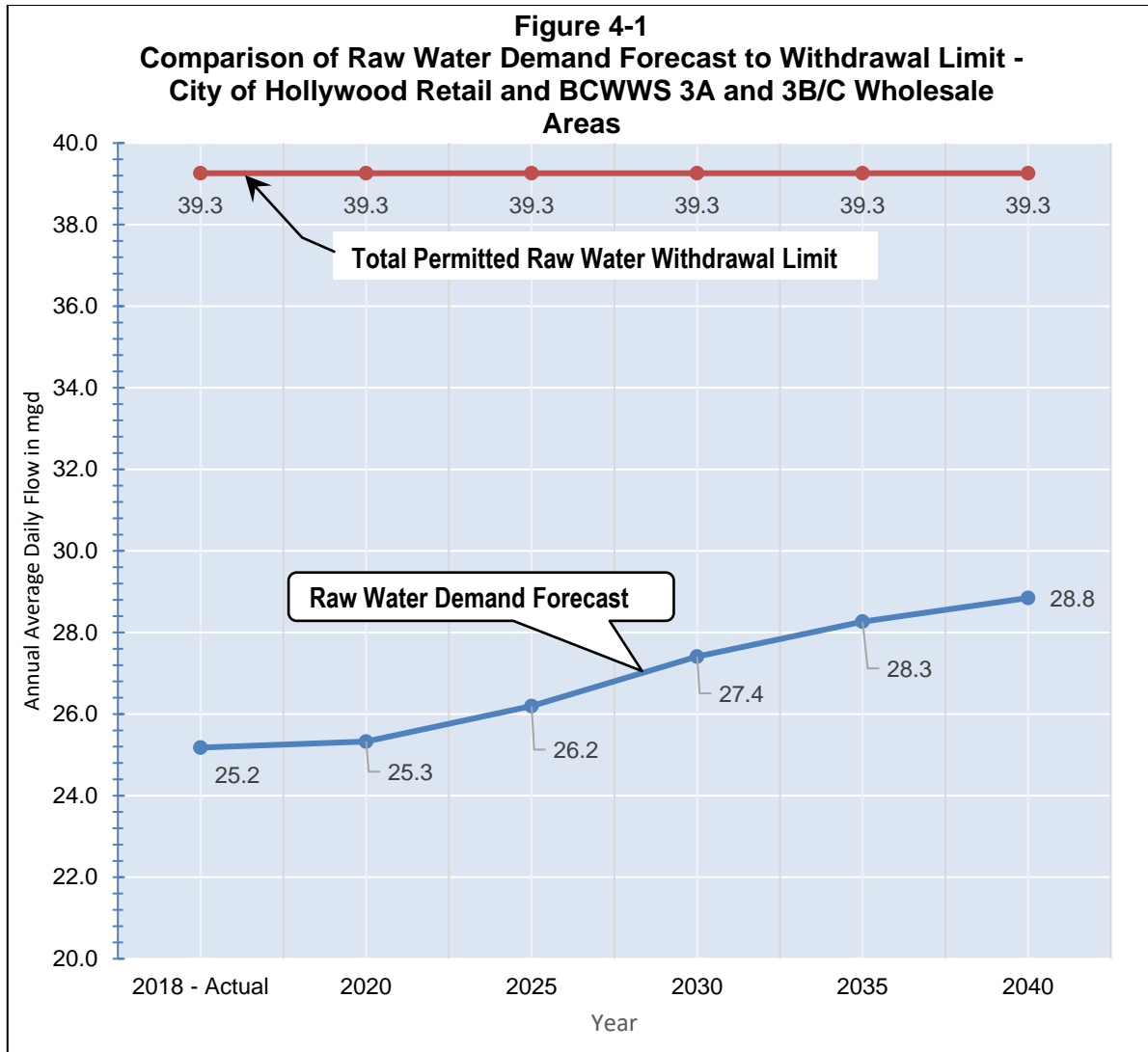
**Table 4.10 City of Hollywood Permitted Raw Water Withdrawal Quantities**

Water Supply Source	Annual Average Day (mgd)	Maximum Monthly Withdrawal (mgd)
(1)	(2)	(3)
Biscayne Aquifer:		
Chaminade (Western) Wellfield	15.00	16.35
South Wellfield	9.80	10.68
BCWWS - Piccolo Wellfield (contractual)	5.78	6.47
Subtotal - Biscayne Aquifer	30.58	33.50
Floridan Aquifer	8.68	8.52
<b>Total</b>	<b>39.26</b>	<b>42.02</b>

Section 4  
Water Demand Forecast and Supply Adequacy

During the period 2020 through 2040, the forecast of raw water withdrawals from the City’s Biscayne and Floridan aquifers are significantly lower than the total permitted raw water quantity, even when the forecasts are increased by one mgd to account for a conservative overall treatment loss of 13% (described previously). Thus, no additional water supply is expected to be needed through 2040.





The limit on the amount of finished water that can be produced was based on the firm raw water treatment capacity of the City’s LS process, the permitted quantities from the Biscayne and Floridan aquifers and the historical percent treatment loss of each treatment process. The calculation of the finished water treatment limit is provided in Table 4.11. The limit is 36.1 mgd.

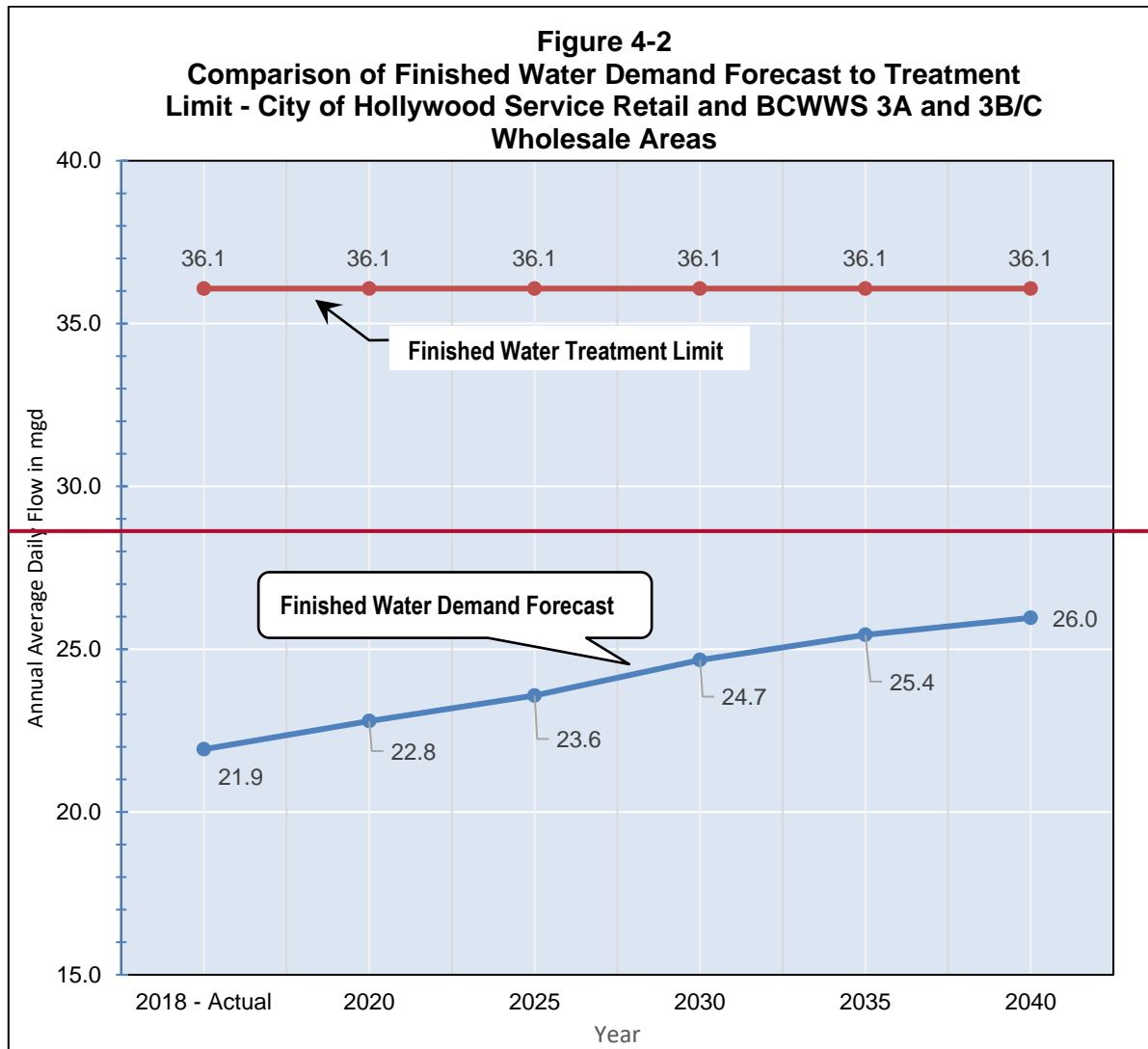
Section 4  
Water Demand Forecast and Supply Adequacy

**Table 4.11 Calculation of Finished Water Quantity Limit based on Raw Water Permit Limit**

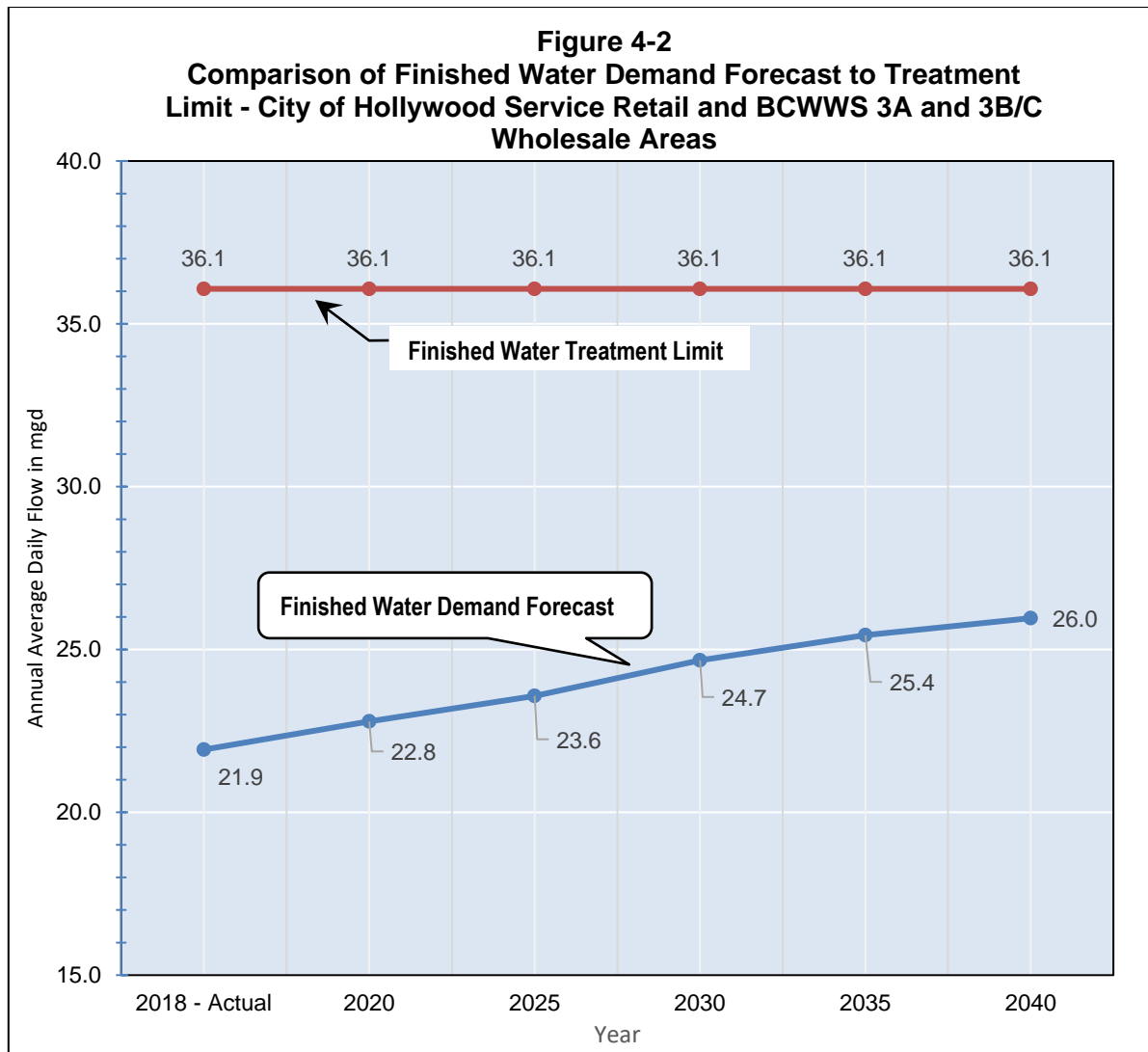
Treatment Process	Treatment - Firm Capacity (mgd)	Treatment Loss (%)	Raw Water Treatment Capacity (mgd)	- LIMIT - Raw Water Treatment Allocation (mgd) (a)	- LIMIT - Finished Water Treatment (mgd)
(1)	(2)	(3)	(4) = (2) / [1 - (3)]	(5)	(6) = (5) x [1 - (3)]
Lime Softening - Biscayne Aquifer	22.50	2%	22.96	22.96	22.50
Membrane Softening - Biscayne Aquifer	12.00	13%	13.79	7.62	6.63
<b>Total Permitted Quantity from Biscayne Aquifer</b>	<b>34.50</b>		<b>36.75</b>	<b>30.58</b>	<b>29.13</b>
Reverse Osmosis (Floridan Aquifer)	6.00	20%	7.50	8.68	6.94
<b>Total</b>	<b>40.50</b>		<b>44.25</b>	<b>39.26</b>	<b>36.07</b>

(a) The LS value is equal to the LS raw water treatment capacity of 22.96 mgd of raw water. The MS value is the permitted quantity of raw water from the Biscayne Aquifer (30.58 mgd) minus the amount of raw water treated using LS (22.96 mgd). The RO value is equal to the permitted quantity from the Floridan Aquifer (8.68 mgd). While RO treatment firm capacity is less than the permitted quantity from the Floridan Aquifer, it is assumed that the City would be able to increase treatment capacity to treat 8.68 mgd, when needed.

Comparison of the finished water demand forecast (from Table 4.4) to the finished water treatment limit (from Table 4.11) is provided in Figure 4-2. During the period 2020 through 2040, the forecast of finished water demand is significantly lower than the finished water treatment limit.







Section 4  
Water Demand Forecast and Supply Adequacy

---

Port Everglades purchases water from the City of Fort Lauderdale. The historical metered water to Port Everglades is provided in Table 4-12. Water flow varied within a narrow range of 1.04 mgd to 1.06 mgd from 2015 to 2017. In 2018, water flow increased to 1.20 mgd. The annual average daily flow over the five-year period from 2014 to 2018 was 1.04 mgd.

**Table 4-12. Historical Annual Average Daily Water Supplied To Port Everglades from the City of Fort Lauderdale**

<b>Calendar Year</b>	<b>Annual Average Daily Flow (mgd)</b>
2014	0.86
2015	1.04
2016	1.06
2017	1.06
2018	1.20
<b>Annual Average</b>	<b>1.04</b>

The adequacy of the City of Fort Lauderdale water system to supply Port Everglades is implicitly ensured in the City of Fort Lauderdale Water Supply Facility Work Plan 2020 Update. Within Fort Lauderdale’s Plan, the forecasted water flow to Port Everglades is included within the forecast for “Unincorporated Broward Plus Port Everglades” and this category is projected to increase from 2.94 mgd in 2015 to 4.32 mgd in 2040.

## 5. Regional Issues

---

*This section summarizes the regional water supply planning issues that have the potential to impact the City.*

The City and the HLWD-DPU are cognizant of the regional issues that are impacting or have the potential to impact water supply, water demand, and utility infrastructure. The City works with other local governments and utilities to address the challenges and opportunities created. This section summarizes the regional issues being followed by the City including:

- Regional Climate Action Plan;
- Climate Change;
- Sea Level Rise;
- Saltwater Intrusion;
- Extreme Weather Events;
- Infrastructure Development;
- Lake Okeechobee Surface Water Allocation Limitations;
- Lowering Lake Okeechobee Level;
- Infrastructure Planned to Attenuate Damaging Peak Flow Events from Lake Okeechobee; and,
- Use of brackish groundwater from the Floridan Aquifer.

Each is discussed in turn.

### 4.1 Regional Climate Action Plan

Southeast Florida is one of the most vulnerable regions to be impacted by climate change and sea level rise. This is largely the result of several unique geographic characteristics which include low land elevations, flat topography, a porous geology, and dense coastal development. In combination, climate change and sea level rise are expected to present significant challenges relating to water resource planning, management and infrastructure for communities throughout the region, which includes Palm Beach, Broward, Miami-Dade and Monroe counties. These communities have agreed to partner in regionally-coordinated climate mitigation and adaptation strategies as part of the Southeast Florida Regional Climate Change Compact (Compact) and have jointly developed and adopted a Regional Climate Action Plan (RCAP) including 21 recommendations that address “Water Supply, Management, and Infrastructure”.

Section 5  
Regional Issues

---

Table 5-1 summarizes the water supply-related recommendations from the Regional Climate Action Plan 2.0.<sup>1</sup> These recommendations are intended to meet the goals of advancing water management strategies and infrastructure improvements needed to mitigate for adverse impacts of climate change and sea level rise on water supplies, water and wastewater infrastructure, and water management systems and have been incorporated throughout this Water Supply Facilities Work Plan Update and related comprehensive planning element updates.

**Table 5.1 - Water Supply Recommendations of the  
2019 Regional Climate Change Action Plan**

<b>Item</b>	<b>Recommendations</b>
WS-1	Foster innovation, development, and exchange of ideas for managing water.
WS-2	Ensure consistency in water resource scenarios used for planning.
WS-3	Plan for future water supply conditions.
WS-4	Coordinate saltwater intrusion mapping across Southeast Florida.
WS-5	Maintain regional inventories of water and wastewater infrastructure.
WS-6	Develop a spatial database of resilience projects for water infrastructure.
WS-7	Modernize infrastructure development standards in the region.
WS-8	Address the resilience of the regional flood control system.
WS-9	Update the regional stormwater rule.
WS-10	Integrate combined surface and groundwater impacts into the evaluation of at-risk infrastructure and the prioritization of adaptation improvements.
WS-11	Encourage green infrastructure and alternative strategies.
WS-12	Integrate hydrologic and hydraulic models.
WS-13	Practice integrated water management and planning.
WS-14	Advance comprehensive improvements to regional and local stormwater management practices.
WS-15	Foster scientific research for improved water resource management.
WS-16	Expand partnerships and resources to further innovation in water resource management.
WS-17	Advance capital projects to achieve resilience in water infrastructure.
WS-18	Coordinate innovation and regional funding.
WS-19	Recognize adaptable infrastructure.
WS-20	Support the Comprehensive Everglades Restoration Plan (CERP).
WS-21	Expand regional surface water storage.

---

<sup>1</sup> <http://southeastfloridaclimatecompact.org/regional-climate-action-plan/>

## 4.2 Climate Change

Investigations and evaluations conducted at the national, regional, and local levels have reinforced the need to plan for the predicted impacts of more frequent and severe drought and increases in tidal and storm-related flooding. To protect the City’s water supply infrastructure, ongoing planning efforts should be flexible to adapt to these climate changes.

The City of Hollywood, together with its municipal and regional partners, understands that local governments and water utilities must integrate water supply and climate change considerations through coordinated planning efforts. The City works to provide relevant updates to the 10-year Water Supply Facilities Work Plan and to enhance the Goals, Objectives and Policies (GOPs) of its comprehensive plan.

The City is a leader in developing planning tools and identifying achievable and cost-effective goals that meet the needs of its community. In 2013, the City signed a resolution endorsing the Mayor’s Climate Action Pledge in support of the Southeast Florida Regional Climate Change Compact and the Regional Climate Action Plan.

The City is a participant in the Southeast Florida Regional Climate Change Compact. The Compact outlines an ongoing collaborative effort among the Compact participants to foster sustainability and climate resilience on a regional scale. The Compact participants include local communities, regulatory agencies, and the counties of Broward, Miami-Dade, Monroe and Palm Beach.

In June 2017, Hollywood Mayor Josh Levy joined Climate Mayors (a.k.a. the Mayors’ National Climate Action Agenda) which is a Mayor-to-Mayor network collaborating on climate. There are no binding commitments except for the pursuit of actions to achieve an emissions reduction target through:

- Developing a community Greenhouse Gas (GHG) inventory;
- Setting near- and long-term targets to reduce emissions; and,
- Developing a Climate Action Plan aligned with the City's targets.

The City’s Sustainability Action Plan was approved on March 15, 2017. The Plan contains 99 actions to achieve 32 goals within seven focus areas. Progress towards the goals will be measured by a set of 22 metrics. The focus areas are: (1) Leadership by Example; (2) Resiliency (Climate Action Plan); (3) Built Environment; (4) Environmental Quality; (5) Resource Stewardship; (6) Mobility; and (7) Community Engagement.

## 4.3 Sea Level Rise

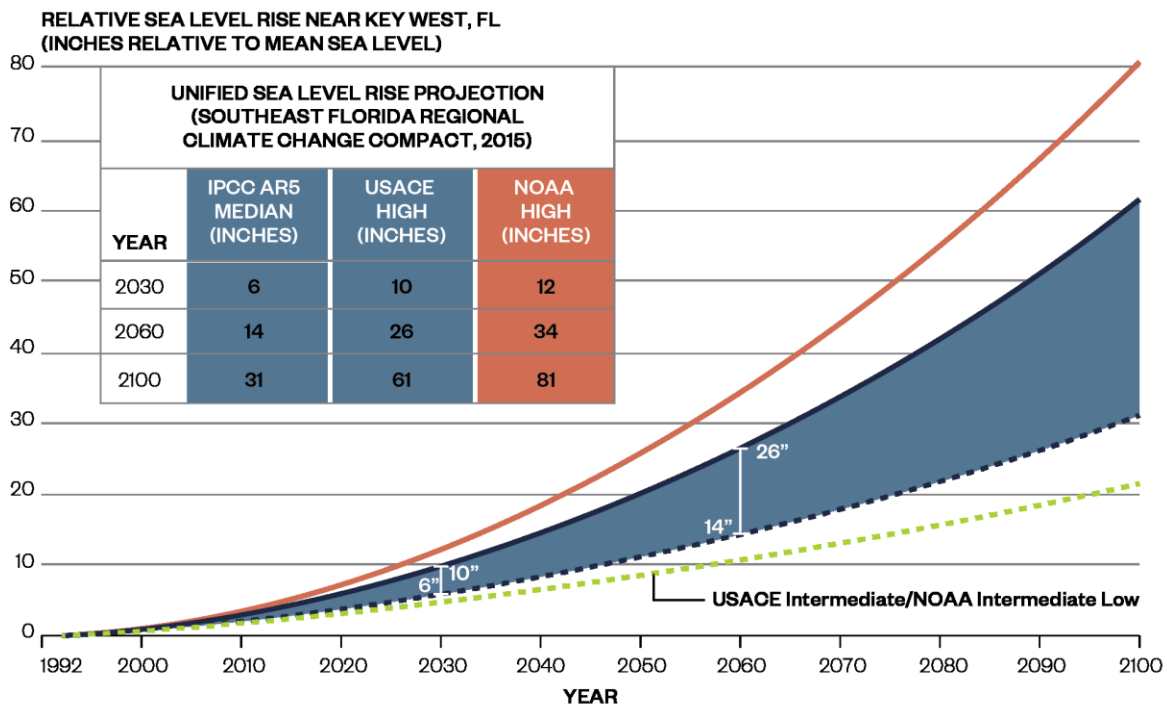
The sea level is rising as reflected in the City’s sunny day flooding events. The flooding frequency has been on average less than eight days per year. With an expected sea level rise above two feet, measured to the North American Vertical Datum (NAVD), by the year 2060, the frequency is estimated to increase to 226 days per year. The US Army Corps of Engineers

Section 5  
Regional Issues

and Broward County conducted a study of flood risk management in Hollywood Lakes and Las Olas Isles in the City of Fort Lauderdale. They modeled different seawall heights to determine how well the walls would protect property from flooding caused by king tides and storms of varying strength.

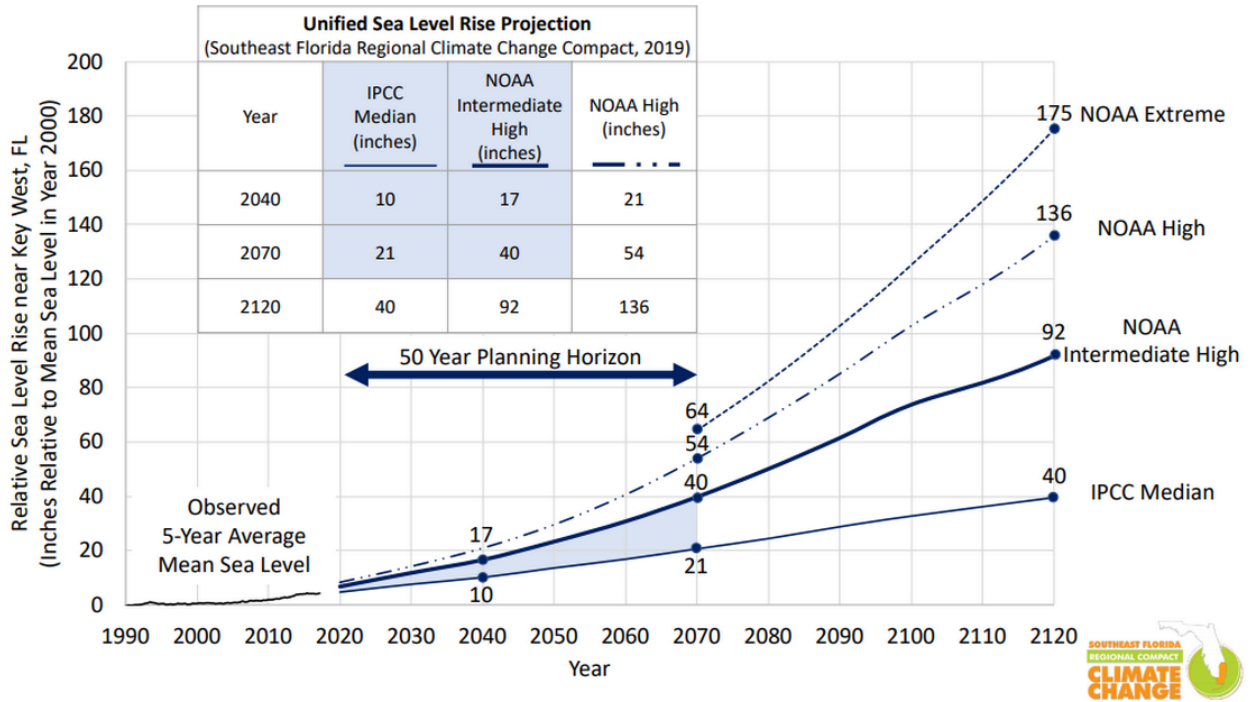
Based on these findings, the Broward County Commission is considering new regulations for seawall heights. These regulations would be an integral part of a holistic approach the County is developing to address tidal flooding and surge protection. Broward County is proposing seawalls that are four feet NAVD by 2035 and five feet NAVD by 2050, allowing two years for municipal implementation. Resilience features like this will help prevent large increases in national flood insurance rates.

Development of cost-effective sea level rise adaptation strategies to ensure the sustainability of the City’s water supply is critical to all ongoing planning efforts. A unified projection by the Southeast Florida Regional Climate Change Compact developed in 2015, which the City formally accepted in its 2016 Resolution R-2016-015, is illustrated in Figure 5-1. It shows a 6- to 10-inch increase in sea level in the near term, and a 14- to 26-inch rise by mid-century.



**Figure 5-1 – Sea Level Rise Projection (2015)**

The sea level rise projection was recently updated by the Compact (in December 2019) that increases the projected magnitude of sea level rise. The revised projection is provided in Figure 5-2. This update is now being used as the basis for planning throughout the region.



**Figure 5-2 – Sea Level Rise Projection (2019)**

In terms of infrastructure, every aspect that is underground or touches the ground will need to be assessed for its vulnerability and, if necessary, protected. This includes basic services, such as provision of drinking water, sewage treatment, electricity and waste disposal.

#### 4.4 Saltwater Intrusion

The Biscayne Aquifer is the City’s primary water supply. It is a shallow, surficial, highly transmissive aquifer. Coastal saltwater intrusion of the aquifer has occurred in eastern parts of Broward County. The extent of saltwater intrusion is measured by the depth and location of the 250 mg/L chloride concentration toe. The mapping of this saltwater intrusion front is supported by local governments throughout the region, the United States Geologic Survey (USGS), and the SFWMD. The SFWMD’s 250 mg/L Isochlor Line in Broward County is illustrated in Figure 5-3.

At the toe of the saltwater front, chloride concentrations exceed drinking water standards of 250 mg/L and thus restrict and/or require abandonment of wellheads located east of the saltwater intrusion line. It has been concluded that movement of the saltwater front is primarily caused by the historic lowering of the water table in western Broward County for the construction of regional drainage canals. While the City’s Biscayne Aquifer wellfields are located sufficiently west of the 250 mg/L Isochlor, the City continues to monitor its movement and the potential impact on the City’s water supply.

## **4.5 Extreme Weather Events**

An increase in frequency and severity of extreme weather events may be an impact of climate change. Comprehensive planning should consider impacts and risks associated with drought, water shortages and reduced groundwater tables, all of which can hasten saltwater intrusion and exacerbate water supply deficits. Conversely, more intense rainfall will cause flooding, increased runoff, impacts to the natural systems and provide more recharge potential for wellfields. Integrated water resource management strategies will help to mitigate for these impacts, particularly those projects that can serve to provide additional long-term storage of stormwater runoff and redistribution of excess rainfall during dry periods and drought. Regional surface water reservoirs and below ground aquifer storage and recovery systems (ASR) are potentially viable alternative water supply projects and climate adaptation strategies.



Section 5  
Regional Issues

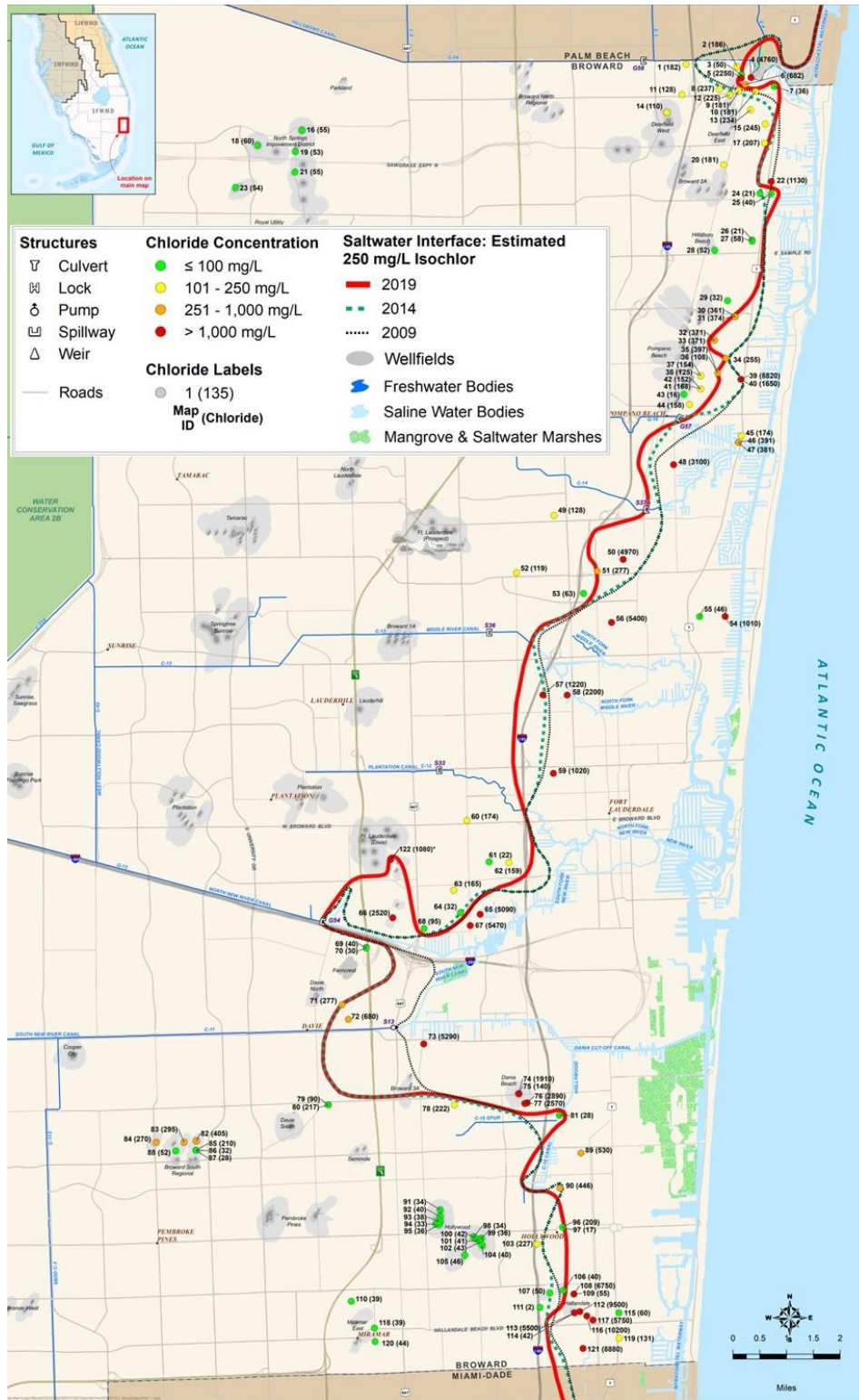


Figure 5-3 – 250 mg/L Isochlor Line in Broward County (SFWMDC)

## 4.6 Infrastructure Development

To ensure the long-term sustainability of key facilities in the face of climate change, sea level rise and extreme weather events, it becomes critical to diversify water supply sources, improve treatment technologies, and develop adaptive stormwater and wastewater infrastructure design criteria. Strategic infrastructure planning should incorporate these opportunities and work within the GOPs of the Comprehensive Planning process and 10-year Water Supply Facilities Work Plans to provide for long-term sustainability and a balanced approach to future development.

Increases in groundwater elevations, as a direct and indirect response to sea level, will challenge the function of drainage systems and is expected to exacerbate future flooding for even mild storm events. Future conditions will be more severe with extreme rainfall events increasing damage to low-lying utility infrastructure and contributing to prolonged surface water flooding. Planning for the combined influences of storm events, high tides and sea level rise on drainage system functions and other public infrastructure is a critical need as is the assessment of viable water supplies and impacts to the natural systems from prolonged droughts.

Options that provide for a diversification of water projects and protection of resources will be fundamental and may include changing treatment technologies; developing regional water storage such as the C-51 Reservoir; improving (or relocating) infrastructure in low lying areas; and enhancing operational flexibility. The City's planning effort regarding water supply infrastructure includes use of the Floridan Aquifer as an alternative water supply source and considerations of issues impacting water supply and demand including the RWA Rule, the C-51 Reservoir Project, the Ocean Outfall Program, and the Regional Climate Change Action Plan.

The Regional Water Availability (RWA) Rule was adopted by the SFWMD on February 16, 2007. The RWA limits raw water withdrawals from the Biscayne Aquifer to the maximum quantity withdrawn during any consecutive five years preceding April 2006. Cities needing additional water supplies are required to seek sources that are not dependent upon the Everglades for recharge. These alternative water supply solutions include recycling water, using reclaimed water to recharge the Biscayne Aquifer, or drawing water from the deeper Floridan Aquifer.

The RWA Rule limited the City's Biscayne Aquifer withdrawal from its two wellfields to 24.80 mgd on an annual average day basis. Currently, the City is limited to a 5.78 mgd total allocation from the County's SRW. The Floridan Aquifer, as the City's alternative water source, will provide the additional water needed to serve future increases in demand.

## **4.7 Lake Okeechobee Surface Water Allocation Limitations**

Surface water allocations from Lake Okeechobee and the Water Conservation Areas are limited in accordance with the Lake Okeechobee Service Area Restricted Allocation Area (RAA) criteria. In 2008, the SFWMD adopted RAA criteria for the Lake Okeechobee Service Area as part of the Minimum Flow and Minimum Water Level (MFL) recovery strategy for Lake Okeechobee. The criteria limit allocations from Lake Okeechobee and integrated conveyance systems hydraulically connected to the lake to base condition water uses that occurred from April 1, 2001 to January 1, 2008. After adoption of the RAA, all irrigation users in the Lake Okeechobee Service Area were required to renew their water use permits.

In 2007, the SFWMD adopted the LEC Regional Water Availability criteria to prohibit increases in surface water and groundwater withdrawn from the North Palm Beach County/Loxahatchee River Watershed Waterbodies and Lower East Coast Everglades Waterbodies above base condition water uses permitted as of April 1, 2006. This also includes canals that are connected to and receive water from these water bodies. New direct surface water withdrawals are prohibited from the Everglades and Loxahatchee River watersheds and from the integrated conveyance systems. These criteria are components of the MFL recovery strategies for the Everglades and the Northwest Fork of the Loxahatchee River.

While the City is not directly impacted by the Lake Okeechobee surface water allocation limitations, the City is directly impacted by the LEC Regional Water Availability criteria as it applies to the Lower East Coast Everglades Waterbodies. These criteria impact the amount of permitted water quantities available to the City from the Biscayne Aquifer.

## **4.8 Lowering Lake Okeechobee Level**

In January 2019, Florida's Governor announced his promotion of a plan to lower the minimum level of the Lake Okeechobee Regulation Schedule to 10.5 feet. The current Lake Okeechobee Regulation Schedule (LORS) ranges from a minimum level of 12.5 feet to a maximum of 15.5 feet.

While lowering Lake levels could provide environmental benefits to the Lake and the coastal estuaries, dropping the minimum level to 10.5 feet would reduce the amount of water stored in Lake Okeechobee, potentially reducing the amount of water available to recharge the Biscayne Aquifer. Should this happen, the risk of water shortages in the LEC, including the City of Hollywood, would increase. The City continues to monitor this issue and, when appropriate, will develop a policy to address any potential impacts to its water utility.

## **4.9 Infrastructure Planned to Attenuate Damaging Peak Flow Events from Lake Okeechobee**

Construction of additional storage systems (e.g., reservoirs, aquifer storage and recovery systems) to capture wet season flow volumes may be needed to increase water availability during dry conditions and attenuate damaging peak flow events from Lake Okeechobee. The C-51 Reservoir project located in southwestern Palm Beach County is one such project.

The infrastructure planned to attenuate damaging peak flows to surface water bodies and coastal ecosystems located near the City are those underway in Broward County by the SFWMD and the US Army Corps of Engineers under the Comprehensive Everglades Restoration Project (CERP).

The Broward County Water Preserve Areas project is part of the CERP and was designed to perform three primary functions:

1. Reduce seepage loss from WCA-3A/3B to developed areas (i.e., the C-11 and C-9 basins);
2. Capture, store, and distribute surface water runoff from the western C-11 Basin; and,
3. Restore wetlands, recharge groundwater, improve hydroperiods in WCA-3A/3B, and maintain flood protection.

The following major infrastructure features will be constructed as part of the project.

- C-11 Impoundment – A 1,168-acre impoundment to capture and store runoff from the C-11 Basin, reduce pumping of surface water into the WCAs, and provide releases for other regional uses.
- WCA-3A/3B Seepage Management Area – A 4,353-acre seepage management area that would establish a buffer to reduce seepage from WCA-3A/3B, connect the C-11 and C-9 impoundments via conveyance canal, and maintain flood protection.
- C-9 Impoundment – A 1,641-acre impoundment to capture and store surface runoff from the C-9 Basin, store C-11 Impoundment overflow, manage seepage, and provide releases for regional benefit.

These infrastructure features will provide various functions such as reducing seepage from WCA-3A, reducing phosphorus loading to WCA-3A, capturing stormwater otherwise lost to tide, and providing conveyance features for urban and natural system water deliveries. The preserve areas will benefit federally listed threatened and endangered species and many wading birds. This project provides water supplies identified in the Everglades MFL recovery strategy. The project received congressional authorization in 2014. Design efforts are under way for the C-11 Impoundment, and construction began in October 2017 on a portion of the mitigation area. Construction of the C-11 Impoundment is expected to be completed in 2027.

The WCA-3A/3B Seepage Management Area is anticipated to begin construction in 2027. Construction of the C-9 Impoundment is expected to begin in 2030.

The City continues to monitor the status of environment restoration projects in the LEC.

#### **4.10 Use of brackish groundwater from the Floridan Aquifer**

The City of Hollywood was the first south Florida utility to develop water supply from the Floridan Aquifer. Currently, the City is permitted to withdraw an annual average quantity of 8.68 mgd. The City has existing RO treatment capacity and the ability to expand this capacity as needed.

## 6. Water Supply Capital Improvements

---

*This section identifies the capital improvements required to build public water supply facilities to serve the existing and new development within the City of Hollywood jurisdiction.*

The City's overall FY 2020 – 2024 Capital Improvement Program (CIP) identifies capital improvement projects for the HLWD-DPU that are related to repair and replacement work needed to proactively maintain the level of service for the City's water distribution system. Because the City has sufficient existing water supply and treatment infrastructure in place, no anticipated capital expenditures are required to meet the City's water supply needs over the planning horizon.

The City of Hollywood has historically supplemented its revenues from the following funding sources: alternative water supply grants, low-interest state revolving funds (SRFs), water impact fees, and bond proceeds (debt financing). The City anticipates continuing the use of these revenue and funding sources over the next five years to implement the Capital Improvement Projects for repair, replacement, and upgrades of existing infrastructure. No additional funding is needed for water supply or treatment expansion.

Table 6-1 presents the ~~public utilities~~ City's funding priorities for upgrade, repair and replacement projects benefitting the City's water utility system over the next five years. There are no Broward County capital projects benefitting the City of Hollywood scheduled within the next five years. It should be noted that water supply rates can be increased by City Commission action, without third party concurrence, to support the issuance of revenue bonds for any projects not funded by other means. In FY 2019, the City of Hollywood approved the recommended rate study findings to support the Capital Improvement Program for FY 2020 to FY 2024.

Section 6  
Water Supply Capital Improvements

**Table 6-1. City of Hollywood Water Utility Five-Year Capital Improvement Program**

Project Title	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Total
Water Main Replacement - Small Scope	\$0	\$0	\$0	\$0	\$50,000	\$50,000
Consulting Services	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$500,000
Permitting Activities	\$0	\$0	\$25,000	\$0	\$0	\$25,000
Water Conservation PIII	\$0	\$0	\$200,000	\$0	\$0	\$200,000
Switchgear Clean, Re-calibrate & Test at Plant	\$0	\$75,000	\$0	\$0	\$75,000	\$150,000
Water Treatment Small Maint. - Emergency, Small Project Repairs	\$150,000	\$150,000	\$225,000	\$150,000	\$150,000	\$825,000
Rehabilitation of Lime Softening Plant	\$1,300,000	\$0	\$0	\$0	\$0	\$1,300,000
Membrane Softening Replace Skids, Upgrade Feed Pumps to VFD	\$2,000,000	\$0	\$2,000,000	\$0	\$2,000,000	\$6,000,000
Elevated West Tank Maintenance	\$0	\$750,000	\$0	\$0	\$0	\$750,000
Elevated East Tank Maintenance	\$0	\$0	\$0	\$750,000	\$0	\$750,000
Treatment Improvements - 4 Log Compliance	\$500,000	\$0	\$0	\$0	\$0	\$500,000
Water Main Replacement Program (WMRP) - Citywide	\$851,359	\$3,667,125	\$0	\$5,092,500	\$0	\$9,610,984
WMRP – Hlwd Blvd to US 1 to Pembroke Rd to S 21 Ave	\$10,185,000	\$0	\$0	\$0	\$0	\$10,185,000
WMRP – Johnson St to FL Turnpike to Hlwd Blvd to N 72 Ave	\$0	\$11,617,900	\$0	\$0	\$0	\$11,617,900
WMRP - Sheridan St to 26 Ave to Taft St to I-95	\$0	\$0	\$7,035,000	\$0	\$0	\$7,035,000
WMRP - Sheridan St. to N. 31 Ave to Hlwd Blvd to N. 35 Ave	\$0	\$0	\$8,268,750	\$0	\$0	\$8,268,750
WMRP – Sheridan St. to N. 31 Ave to Hlwd Blvd to N. 35 Ave	\$0	\$0	\$0	\$0	\$8,925,000	\$8,925,000
<b>Total</b>	<b>\$15,086,359</b>	<b>\$16,360,025</b>	<b>\$17,853,750</b>	<b>\$6,092,500</b>	<b>\$11,300,000</b>	<b>\$66,692,634</b>

## 7. Water Supply Goals, Objectives, and Policies

---

*This section includes an assessment of current Goals, Objectives, Policies (GOPs) and identifies any new or revised GOPs, relative to the 2015 Water Supply Plan Potable Water Sub-Element, needed to implement the work plan. For ease of identification, edits are ~~provided~~ tracked in ~~track changes~~: red with ~~strikeout~~ (text deleted) and underline (text added).*

### 7.1 Land Use Element

Goal: Promote a distribution of land uses that will enhance and improve the residential, business, resort, and natural communities while allowing landowners to maximize the use of their property.

Objective 7.0: Achieve consistency with the Broward County Land Use Plan by adopting the following goals, objectives, and policies into the City's Land Use Element, by reference, from other elements of the City's Comprehensive Plan. ~~See Exhibit A at the end of the Land Use Element.~~

- Policy 7.14: Continue to provide enough potable water for a year-round water supply including the increased utilization of the Floridan Aquifer in addition to the Biscayne Aquifer, thus discouraging an increase in saltwater intrusion.
- Policy 7.15: Coordinate with the South Florida Water Management District (SFWMD) on any measures they take to decrease the possibility of further salt-water intrusion through their canals.
- Policy 7.16: Cooperate with the SFWMD in enforcing their emergency water conservation measures during droughts.
- Policy 7.20: Continue to address the protection of the functions of natural groundwater recharge areas and natural drainage features.
- Policy 7.21: The City will adopt the minimum design criteria for water management as its level of service per the Drainage sub element of the Utilities element.
- Policy 7.22: The City will continue to adhere to its ongoing annual maintenance program for drainage systems; and will establish priorities for correcting existing deficiencies through its drainage complaint system. Priorities for future facility needs will be based on the City's adopted level of service standards and will be enforced through its concurrency management system.



- Policy 7.23: The City will protect the functions of the natural drainage features by regulating land use to ensure that uses permitted are compatible with adjacent drainage features.
- Policy 7.24: To ensure through coordination with the ~~South Florida Water Management District (SFWMD)~~, the Broward County Water Management Division (BCWMD), and the Broward County Environmental Protection and Growth Management Department (BCEPGMD) in the development review process that new development is required to provide adequate drainage measures to service itself and to neutralize any deficiencies which would be created by such new development.
- Policy 7.25: Maintain the existing land development regulations requiring new development to provide adequate drainage measures to service itself and to neutralize any deficiencies created by proposed projects.
- Policy 7.26: To continue to address the protection of natural groundwater recharge areas and natural drainage features.
- Policy 7.27: The City will prohibit the use of land which conflicts with the functions of the natural drainage and natural groundwater aquifer recharge areas, and will not permit development in conservation areas.

## 7.2 Conservation Element

Goal: To maintain, and if possible, encourage better natural environmental quality.

Objective 1.0: Continue to provide enough potable water for a year-round water supply including the increased utilization of the Floridan Aquifer in addition to the Biscayne Aquifer thus discouraging an increase in saltwater intrusion.

- Policy 1.1: Coordinate with the SFWMD on any measures they take to decrease the possibility of further saltwater intrusion through their canals.
- Policy 1.2: Cooperate with the SFWMD in enforcing their emergency water conservation measures during droughts.
- Policy 1.3: Require City parks to use reclaimed water instead of potable water for irrigation. Maintain City golf courses using reclaimed water instead of potable water for irrigation.
- Policy 1.4: Investigate the potential for ~~whether or not~~ industrial, office, and commercial property owners uses can also to use reclaimed water for ~~watering landscaping irrigation~~.

Section 7  
Water Supply Goals, Policies and Objectives

---

- Policy 1.5: Investigate ~~the potential for whether or not some~~ industries and businesses ~~can to~~ reuse water in their service or manufacturing processes.
- Policy 1.6: Encourage the use of native instead of exotic plants in landscaping.
- Policy 1.7: The City shall participate in the development of the Regional Water Supply Plan in conjunction with the SFWMD and shall adopt the ~~2018~~ *Lower East Coast Water Supply Plan Update*, which was approved by the District’s Governing Board on ~~November 8, 2018, September 12, 2013~~ into the Utilities Element of this Plan as required by Florida Statute.

Effectiveness Measures:

Number of meetings with the ~~South Florida Water Management District~~ SFWMD.

- (a) Ground-water monitoring for saltwater showing no further intrusion.
- (b) Increase in number of water reuse systems.
- (c) Decrease in percent of water being used for non-potable uses.
- (d) Adoption of Regional Water Supply Plan in the Utilities Element.

Objective 2.0: Continue to encourage the public to participate in the City’s Water Conservation Program.

- Policy 2.1: The City shall encourage public participation in the water conservation measures and best management practices presented in the Water Conservation Plan dated January 2008. These are provided in the tables below.

**Table 7-1. Water Conservation Measures**

Conserve Florida Water Conservation Measure
Source-Water Metering
Service-Connection Metering
Fixed-Interval Meter Maintenance Program
System Audit
Leak Detection and Repair
Landscape/Irrigation Ordinance
Conservation Rate Structures
Customer Leak Notification
Informative Billing
Water Bill Inserts
Retrofit Kit Giveaway
Public Information/Education
Workshops
Advisory Committee(s)
Reuse Feasibility Study
Customer Surveys
Water Waste Prohibition

**Table 7-2. Water Conservation Best Management Practices**

BMP
Reuse Projects
Water-Efficient Landscape and Irrigation Evaluations
<del>Ultra Low Flush (ULF)</del> <u>High Efficiency Toilet (HET)</u> Rebates
Retrofit Kit Giveaways <u>and Rebates</u>
Water Use Evaluations
Restaurant Rinse Valve Replacement

Objective 3.0: Maintain and, if possible, increase the level of ground and surface water quality.

- Policy 3.1: Review ordinances and procedures to ensure that the restrictions dictated by Broward County wellfield protection ordinance are being met and enforced.
- Policy 3.9: Determine the greatest impact on water supply (ground and surface waters) whether point or non-point source pollution, and work to eliminate cause(s). (CWMP Policy CW. 130)

Objective 17: Promote public awareness of natural resources, wildlife habitats, conservation measures, and environmental hazards.

- Policy 17.1: Maintain an information counter in the lobby near the City Commission Chambers and at all Community Centers.
- Policy 17.2: Obtain information on conservation issues such as water conservation, endangered species and West Lake and distribute the information from the Water Department Counter, the Zoning Counter, and the Information Counter.
- Policy 17.9: Disseminate conservation and water quality information through community newsletters, public access Channel 78, social media, and proclamations and presentations during televised City Commission meetings.

## 7.3 Utilities Element

### 7.3.1 Drainage Sub Element

Goal: To optimize the utilization of water resources through provision of stormwater management for the City of Hollywood, which reduces damage and inconvenience from flooding, promotes recharge to the Biscayne Aquifer, minimizes degradation of water quality in surface and ground waters, and protects the functions of wetlands in urban areas.

Objective 3.0: Stormwater management facilities shall be designed, constructed and operated in such a manner that conserves potable water resources.

Section 7  
Water Supply Goals, Policies and Objectives

---

- Policy 3.1: The City shall coordinate with the ~~South Florida Water Management District~~ (SFWMD) to implement applicable portions of the Lower East Coast Regional Water Supply Plan intended to reduce losses of excess stormwater to tide, recharge the surficial aquifer and Water Preserve Areas, or provide additional storage of surface waters.
- Policy 3.3: The City shall address stormwater issues on a watershed (basin) basis as a means of providing cost-effective water quality and water quantity solutions to specific watershed problems.
- Policy 3.4: The City shall develop a basin-wide water management protocol that optimizes flood protection, water quality, stormwater storage, wetlands sustainability, and ground water recharge functions. By assessing the existing surface water management system, wellfield characteristics, groundwater levels, flows, and canal stages, a model will be developed to better utilize the water resource.
- Policy 3.5: The City shall work with Independent Drainage Districts and the SFWMD, ~~and shall~~to investigate application of the basin-wide protocols throughout the City where appropriate.

Objective 4.0: Maintain and protect groundwater recharge of the surficial aquifer system so as to maintain all of the functions of the Biscayne Aquifer, including the reduction of saltwater intrusion.

- Policy 4.1: The City shall encourage the use of BMPs in accordance with its regulations and those of the ~~South Florida Water Management District~~ SFWMD.
- Policy 4.2: The City shall develop an integrated geographic information system inventory of public water supply wellfields to facilitate local and regional planning efforts.
- Policy 4.3: The City of Hollywood in cooperation with the United States Geological Survey (USGS) and SFWMD shall install additional monitoring wells and rehabilitate existing wells to continue monitoring the extent of saltwater intrusion into the Biscayne Aquifer.
- Policy 4.4: The City shall work cooperatively with Broward County, the SFWMD, and the independent drainage districts to implement plans for additional surface water storage such as water preserve areas, the Lower East Coast Regional Water Supply Plan and any other plans and operating procedures to increase recharge water to the Biscayne Aquifer.
- Policy 4.5: In order to protect and conserve the Biscayne Aquifer, the City shall continue to utilize the Floridan Aquifer and investigate utilization of other alternate potable water resources to supplement and broaden the future water supplies as

addressed in the Lower East Coast Regional Water Supply Plan of the SFWMD.

- Policy 4.6: To utilize, preserve, restore, and enhance natural water bodies and functions by encouraging non-structural and structural erosion control devices and discourage the channelization, installation of seawalls or other alteration of natural rivers, streams and lakes.
- Policy 4.7: Protect the water storage and water quality enhancement functions of wetlands, floodplains, and aquifer recharge areas through acquisition, enforcement of rules, and the application of land and water management practices, which provide for compatible uses.
- Policy 4.8: The City will coordinate with Broward County and the SFWMD to protect aquifers from depletion through water conservation and preservation of the functions of high recharge areas including, but not limited to, the water conservation areas and water preserve areas.

### **7.3.2 Potable Water Sub Element**

Goal: Provide residents of the City of Hollywood, and large users a cost-effective and equitable potable water supply system, which provides an adequate supply of water meeting all applicable federal, state and local water quality standards and does not compromise the sustainability of the county's water resources to supply water in the future.

Objective 1.0: The City of Hollywood shall identify and, where feasible, correct existing potable water facilities deficiencies as necessary.

- Policy 1.1: In the absence of legal constraints on the use of revenues, the City of Hollywood should maintain funding for system improvements identified in the Capital Improvements Element to alleviate potable water deficiencies.
- Policy 1.2: The City of Hollywood shall develop and maintain an inventory of all its potable water facility serving residents, customers, and large users.
- Policy 1.3: Maintain public facilities and areas utilizing preventive measures to avoid deterioration of the public infrastructure. (CWMP Policy CW.31)

Objective 2.0: Potable water facilities shall be provided to meet the City's short-term and long-term future needs.

- Policy 2.1: The level of service (LOS) standard for potable water facilities shall be the Florida Department of Environmental Protection (FDEP) Permitted Capacity of the facility. The LOS standard for water treatment plants shall be measured by maximum daily flow.

Section 7  
Water Supply Goals, Policies and Objectives

- Policy 2.2: The City of Hollywood shall use the information contained [in Table 7-3](#) to access adequacy of service and concurrency for potential retail customers. For a bulk purchaser of potable water, the City will use the flow information contained in the FDEP permit application to access adequacy of service and concurrency.

**Table 7-3. Potable Water Demand Rates**

Facility Type	Water Use in Gallons per Day
<u>Residential</u> Per capita per day (annual avg. gpcd)	<u>109-114</u> <sup>(a)</sup>
Per single family unit	350 <sup>(b)</sup>
Retail per square foot	<u>0.1</u> <sup>(b)</sup>
Office space per square foot	<u>0.2</u> <sup>(b)</sup>
Other non-residential per capita	20 <sup>(b)</sup>

Source: (a) [2014 City of Hollywood Water Supply Facilities Work Plan 2020 Update](#). [Includes residential and commercial water uses.](#)

(b) Broward County [Comprehensive Plan, Potable Water Element, Volume 4 Support Documents, page 4-32](#). [Health Department, Florida Department of Health.](#)

Note: In the case where the facility type is not listed, then the most suitable one is to be used.

- Policy 2.3: The City shall continue to utilize the development review process of the Broward County Land Development Code to require applicants for development permits to utilize existing potable water facilities if lines are “available” as defined by Chapters 62-550, 62-555, and 62-560, Florida Administrative Code (FAC).
- Policy 2.4: Planning for additional capacity and/or a reduction in per capita demand shall be included in the 10-Year Water Supply Facilities Work Plan as required in Chapter 163 of Florida Statutes to increase the coordination of local land use and future water supply planning.
- Policy 2.5: An assessment of the impacts of the construction and operation of water treatment plants and support services on adjacent natural resources shall be prepared during site review when considering the siting of new water treatment plants and the expansion of, or increase in capacity of, water treatment plants.
- Policy 2.6: Within twelve (12) months after the adoption of the Retail Service Water and Wastewater Master Plan Update, the City of Hollywood shall re-examine the feasibility of amending the potable water facilities LOS standard. The LOS standards that may be considered include treatment plant peak demand capacity, water storage capacity, and water pressure for distribution facilities.

Section 7  
Water Supply Goals, Policies and Objectives

---

- Policy 2.7: In order to protect and conserve the Biscayne Aquifer, the City of Hollywood shall continue to utilize the Floridan Aquifer and investigate the utilization of alternate water sources to supplement and broaden the City's future water supply sources as described in the 10-Year Water Supply Facilities Work Plan. These potential sources could include the increased use of reclaimed water, improved methods of conservation, Aquifer Storage and Recovery (ASR), improved operations to increase stormwater reuse and aquifer recharge by improvements to the secondary canal infrastructure, and other technologies, which may be addressed in the Lower East Coast Regional Water Supply Plan of the South Florida Water Management District (SFWMD).
- Policy 2.8: The City shall encourage maximizing the use of existing potable water facilities and reducing redundant facilities.
- Policy 2.9: The City shall promote the implementation of an integrated geographic information system in order to make available standardized land use and potable water supply facilities information for local and regional planning.
- Policy 2.10: The City shall ensure adequate water supplies are available to serve the new development no later than the anticipated date of issuance of a certificate of occupancy or its functional equivalent.
- Policy 2.11: Prior to approval of a building permit, the City shall consult with the appropriate water supplier(s) to determine whether adequate water supplies to serve the new development will be available no later than the anticipated date of issuance of a certificate of occupancy.

Objective 3.0: Maximize the use of existing potable water facilities and encourage compact urban growth patterns.

- Policy 3.1: The City of Hollywood shall continue to coordinate the provision of potable water through agreements with the municipalities serviced by the City of Hollywood.
- Policy 3.2: The City of Hollywood shall recommend the denial of future land use map amendments where densities or intensities are increased if:
  1. Potable water facilities are not available and a consumptive use permit for the FDEP Permitted Capacity from the SFWMD has not been issued; and

Plans to extend potable water facilities so that they become available are not included within a financially feasible capital improvements program and/or there is not a reasonable expectation that the consumptive use permit will be issued.

- Policy 3.3: As an alternative to new potable water facility construction, the City of

Section 7  
 Water Supply Goals, Policies and Objectives

---

Hollywood shall identify opportunities to increase the efficiency and optimize the use of existing facilities.

- Policy 3.4: The City of Hollywood shall encourage the use of coordinated regulatory and programmatic approaches and financial incentives to promote compact, efficient urban growth patterns.

Objective 4.0: Conserve and protect potable water resources with primary focus on the Biscayne Aquifer by optimizing the utilization of water resources through effective water management practices.

~~• Policy 4.1: The City of Hollywood shall develop a basin-wide water management protocol that optimizes flood protection, water quality, stormwater storage, wetlands sustainability, and groundwater recharge functions while protecting groundwater from saltwater intrusion. By assessing the existing surface water management system, wellfield characteristics, groundwater levels, saltwater intrusion limits, flows and canal stages a model will be developed to better utilize the water resource.~~

- Policy 4.21: The City of Hollywood shall continue to coordinate with the independent Drainage Districts and the SFWMD to investigate application of the basin-wide protocols throughout the county where appropriate.

- Policy 4.32: The City of Hollywood will cooperate with Broward County to develop a plan to maintain the Centralized Wellfield System to protect and maximize the raw water supply while protecting the Biscayne Aquifer from further saltwater intrusion.

- Policy 4.43: The City of Hollywood and Broward County shall continue to maintain Chapter 36, “Water Resources and Management,” Article II, “Water Emergencies,” Section 35-55, “Restrictions on Landscape Irrigation,” Broward County Code of Ordinances, which imposes year-round, county-wide landscape irrigation restrictions.

~~• Policy 4.5: The City shall enforce the landscape regulations, which include zoning, functional landscaping, and xeriscaping ordinances. The City will also address the SFWMD’s xeriscaping guidelines.~~

The Broward County Board of Rules and Appeals has approved the standards for ultra-low plumbing fixtures at 80 psi.

**Table 7-4. Plumbing Standards Fixture Flow Rate**

Fixture	Flow Rate
Toilet	1.6 gal/flush
Shower Heads	2.5 gal/minute
Faucets	2.0 gal/minute



Section 7  
Water Supply Goals, Policies and Objectives

---

- Policy 4.6: The City shall continue to implement its conservation-oriented rate structure within its utility systems.
- Policy 4.7: The City shall continue to implement a leak detection program to reduce the amount of non-revenue water within its utility systems.
- Policy 4.8: The City of Hollywood shall continue to implement a year-round public information and education program promoting water conservation.
- Policy 4.9: ~~The City of Hollywood will gather a comprehensive water use profile for service area customers including demographic data, customer class, land use, rate profiles, usage patterns and seasonal variations to increase the effectiveness of conservation efforts by focusing methods on those elements with the greatest water saving potential. Using the data generated, the City of Hollywood will expand and/or implement those programs that promote conservation of water resources. In addition,~~ ¶The City shall expand and continue to implement programs that promote conservation of water resources through efforts such as plumbing retrofit, toilet rebates, water use audits, installation of rain sensors, promotion of [xeriscape Florida friendly](#) and landscape Best Management Practices (BMPs), and education as applicable.
- Policy 4.10: The City shall reduce the potential groundwater pollution sources by continuing to implement the Water and Sewer Connection Ordinances.
- Policy 4.11: The City shall continue to eliminate causes of pollution to water supply (CWMP Policy CW.130)
- Policy 4.12: The City of Hollywood shall continue to protect the groundwater supply from potential sources of contamination pursuant “Water and Sewers” along with Water and Septic Tank Ordinance.
- Policy 4.13: The City of Hollywood shall protect groundwater quality by continuing to implement Wellfield Protection Ordinance, which regulates the storage, handling, usage, disposal, or production of hazardous materials and solid waste within designated zones of influence as identified in the Code.

Objective 5.0: Potable water facilities shall be designed, constructed, maintained and operated in such a manner as to protect the functions of natural groundwater recharge areas and natural drainage features and not exacerbate saltwater intrusion.

- Policy 5.1: The design for the construction, operation, and maintenance, of new or expanded potable water facilities shall consider the short-term and long-term impacts to natural groundwater recharge areas, wetlands, surface and groundwater levels, and exacerbation of saltwater intrusion. The design shall also consider ~~whether or not~~ the potential for the construction, operation, and maintenance will to significantly

Section 7  
Water Supply Goals, Policies and Objectives

---

harm the aquifer system. Adverse impacts of construction, operation, and maintenance shall be avoided or at least minimized.

Objective 6: Provide the customers and large users of the City of Hollywood cost effective, equitable and adequate potable water system meeting all applicable federal, state and local standards.

- Policy 6.1: The City of Hollywood shall endeavor to provide service to residents, customers, as well as those municipalities having agreements with the City of Hollywood, when service is not anticipated to be provided by others.
- Policy 6.2: The City of Hollywood shall continue to coordinate the provision of potable water services through agreements with municipalities and other service providers in Broward County.
- Policy 6.3: In order to protect and conserve the Biscayne Aquifer, the City of Hollywood shall continue to utilize the Floridan Aquifer and investigate utilization of other alternate potable water supply sources to supplement and broaden future water supply sources. These other potential sources could include ASR, desalination, capture and storage of excess storm water currently lost to tide and other technologies, which may be addressed in the SFWMD's Lower East Coast Regional Water Supply Plan.
- Policy 6.4: Consistent with bonding requirements, the City of Hollywood will take no action by which the rights and benefits of its customers might be impaired or diminished.

Objective 7: With the treatment capacity serviceable by the Reclaimed Water System, expand the reclaimed water system to replace current systems using potable water for irrigation in the public right-of-way and other public facilities. Investigate possible expansion of treatment capacity of the reclaimed water system.

- Policy 7.1: Design large private projects to include reclaimed water. (CWMP Policy CW.34).
- ~~Policy 7.2: Investigate the feasibility of installing reclaimed water for the irrigation system on US 441/SR7 project. (CWMP Policy 1.19)~~

## 7.4 Capital Improvements Element

Goal: To undertake actions necessary to adequately provide needed public facilities to all residents within the jurisdiction of the City of Hollywood in a manner which protects investments in existing facilities, and promotes orderly compact urban growth.

Objective 1: Create a 5-year schedule of Capital Improvements, which will be coordinated

Section 7  
Water Supply Goals, Policies and Objectives

---

with land use decisions, and which will ensure that the adopted level of service standards will be maintained through the correction of deficiencies and the provision of capital facilities to meet the needs of future growth.

- Policy 1.6: Proposed capital improvement projects shall be evaluated and ranked in order of priority according to the following guidelines:
  - a) Whether the project is needed to protect public health and safety, to fulfill the City's legal commitment to provide facilities and services, or to preserve or achieve full use of existing facilities.
  - b) Whether the project increases efficiency of use of existing facilities, prevents or reduces future improvement cost, provides service to developed areas lacking full service, or promotes infill development.
  - c) The City Manager shall coordinate the evaluating and ranking in order of priority projections proposed for inclusion in the Schedule of Improvements based on demand anticipated for future growth, facility life expectancy, elimination of blight, correction of deficiencies in service.
  - d) Whether the project implements the policies of the Comprehensive Plan.
- Policy 1.7: The Schedule of Capital Improvements shall be updated on an annual basis.

Objective 4: The City will manage its fiscal resources to ensure the provision of needed capital improvements for previously issued development orders and for future development and redevelopment.

- Policy 4.1: Prior to the issuance of Certificates of Occupancy, the City shall require the provision of all needed public facilities.
- Policy 4.2: In providing capital improvements, the City shall limit the maximum ratio of outstanding general obligation indebtedness to no greater than 15% of the property tax base.
- Policy 4.3: The City shall continue to adopt a capital improvements program and annual capital budget as part of its budgeting process.
- Policy 4.4: Efforts shall be made to secure grants or private funds whenever available to finance the provision of capital improvements.

Objective 5: The City will implement a Concurrence Management System so that decisions regarding the issuance of development orders and permits will be based upon coordination of the development requirements included in this plan, the land development regulations, and the availability of necessary public facilities to support such development at the time needed.

- ~~Policy 5.1: Water Service: The level of service (LOS) standard for potable water facilities shall be the Florida Department of Environmental Protection Permitted Capacity of the facility. The LOS standard for water treatment plants shall be measured by maximum daily flow.~~

~~The City of Hollywood shall use the information contained to access adequacy of service and concurrency for potential retail customers. For a bulk purchaser of potable water, the City will use the flow information contained in the FDEP permit application to access adequacy of rates and concurrency.~~

**Table 7-5. Potable Water Demand Rates**

Facility Type	Water Use in Gallons per Day
Residential	109-114 <sup>(a)</sup>
Per capita per day (ann. avg. gpcd)	
Per single family unit	350 <sup>(b)</sup>
Retail per square foot	0.1 <sup>(b)</sup>
Office space per square foot	0.2 <sup>(b)</sup>
Other non-residential per capita	20 <sup>(b)</sup>

~~(a) Developed in the City's 2014 City of Hollywood Water Supply Facilities Work Plan 2020 Update.~~

~~(b) Broward County Comprehensive Plan, Potable Water Element, Volume 4 Support Documents, page 4-32, Health Department, Florida Department of Health.~~

~~Note: In the case where the facility type is not listed, then the most suitable one is to be used.~~

- Policy 5.21: The City shall require that, at the time a development permit is issued, adequate facility capacity is available or will be available when needed to serve the development.

The City shall follow the timing requirements to ensure that adequate public facilities are available to meet level of service standards with the impact of development.

- Sanitary sewer, solid waste, drainage, adequate water supplies, and potable water facilities shall be in place and available to serve new development no later than the issuance by the local government of a certificate of occupancy or its functional equivalent. Prior to approval of a building permit or its functional equivalent, the City shall determine whether adequate water supplies to serve the new development will be available no later than the anticipated date of issuance by the City of a certificate of occupancy or its functional equivalent.

- Policy 5.32: Proposed plan amendments and requests for new development or

redevelopment shall be evaluated according to the following guidelines to whether the proposed action would:

- a) Be consistent with the Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater Recharge Element; and Coastal Management Element and not contribute to a condition of public hazard.
- b) Be consistent with the Transportation Element; Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater Recharge Element; and Recreation and Open Space Element and not exacerbate any existing condition of public facility capacity deficits.
- c) Generate public facility demands that may be accommodated by planned capacity increases.
- d) Conform with future land uses as shown on the future land use map of the Future Land Use Element; and service areas as described in the Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater Recharge Element.
- e) Accommodate public facility demands based upon LOS standards by provision of facilities by the developer or by the City consistent with this element.
- f) Be consistent with state agencies' and water management districts' facilities plans.

## **7.5 Intergovernmental Coordination Element**

Goal: To enhance existing intergovernmental coordination mechanisms, and to create new opportunities for cooperation among state, regional, and local government entities in the provision of services and the management of future development.

Objective 3: To coordinate level of service standards with state, regional, and local government entities having responsibility for the operation and maintenance of those facilities.

- Policy 3.10: The City will coordinate its Capital Improvements Schedule with the schedules of adjacent municipalities and other providers of public facilities within or adjacent to the City in order to establish a potential coordination of efforts relating to the maintenance and extension of existing and location of new public facilities subject to concurrency.
- Policy 3.11: The City will annually review the five-year Capital Improvements Plan for consistency with the Comprehensive Plan to address potential impacts or conflicts.
- Policy 3.12: The City will pursue joint funding opportunities with the SFWMD, ~~FDPEP~~, Broward County, FDOT, and surrounding municipalities to insure utilization of joint processes and collaborative planning efforts, when feasible to complete capital improvements.

## Section 7

### Water Supply Goals, Policies and Objectives

---

- Policy 3.18 The City shall coordinate with the ~~SFWMD South Florida Water Management District~~ and the Lower East Coast Water Supply Plan on alternate water supply planning.
- Policy 3.20 The City in cooperation with the appropriate federal, state, county, and other local governmental agencies, shall encourage the appropriate coordinated level of service facilities and services.
  - Monitoring and Evaluation: The City shall annually review the level of service (LOS) standards utilized by public agencies in their planning activities to ensure consistency.
- Policy 3.21 The City shall ensure and identify the consistency of local level of service standards by annually contacting all local governments in which water service is provided to obtain current information, including populations, level of services, service areas, and water supply facilities, and evaluate if future modification to either the service agreement or level of service standards should be included in subsequent Comprehensive Plan Amendments.
- Policy 3.22 The City shall negotiate or renew interlocal agreements with local governments in which water is supplied, ensuring contractual agreement of the adopted level of service standards, service area, populations and time periods for services provided.
- Policy 3.23 The City shall review the level of service standards adopted or amended by all adjacent local governments that receive water from the City.

#### Objective 4:

**Public Agency Coordination:** The City shall coordinate the Comprehensive Plan and its implementation with the State, the South Florida Regional Planning Council, Broward County and adjacent cities, as well as the Broward County School District, the South Florida Water Management District, and the special districts, through the duration of this plan.

**Monitoring and Evaluation:** The City shall maintain a record of City staff attendance and participation in appropriate intergovernmental and/or multi-jurisdictional coordination efforts (i.e. meetings, workshops, committees, agreements, etc.). This objective shall also be made measurable by its implementing policies.

- Policy 4.1 The City shall provide immediate and ongoing coordination with the SFWMD to ensure that the City's plans, requirements, and related actions contained in the 10-Year Water Supply Facilities Work Plan are consistent with the Lower East Coast Water Supply Plan.
- Policy 4.2 The City shall provide the SFWMD with annual reports on the status of the development of all alternative water supply projects in accordance with limiting

Section 7  
Water Supply Goals, Policies and Objectives

---

- condition #30 of Water Use Permit 06-00038-W and the provisions of Section 373.0361(7)(b) F.S. The annual report shall include work completed to date, expenditures, capacities, and any changes in timelines. Where appropriate and feasible, the annual reports shall include ongoing collaborative approaches with other local governments for long term alternative water supply source use and water treatment technology.
- Policy 4.3 The City shall submit Water Use Compliance reports to the SFWMD for review and approval by the SFWMD ~~District~~ Staff every five years from April 10, 2008 (date of permit issuance) in accordance with Limiting condition #23 of Water Use Permit 06-00038-W.
  - Policy 4.4 The City shall submit unaccounted-for water loss reports to the SFWMD every year from April 10, 2008 (date of permit issuance) in accordance with Limiting condition #20 of Water Use Permit 06-00038-W.
  - Policy 4.5 The City shall notify the SFWMD within 30 days of any change in service area boundary in accordance with Limiting condition #19 of Water Use Permit 06-00038-W.
  - Policy 4.6 The City will hold annual meetings with local governments in the City's Water Service Area and the SFWMD to discuss forecasted populations, service area expansions, review land use changes that increase water ~~supply~~ demand, and review the implementation of all alternative water supplies.
  - Policy 4.7 The City shall continue to provide utility services to governments with which the City has executed agreements and will continue to exchange information with surrounding local governments regarding relative items that affect the standing for such service agreements.
  - Policy 4.8: The City shall participate in the development of the Lower East Coast Water Supply Plan Update. The City shall adopt a 10-year water supply facility work plan into their comprehensive plan within 18 months after the South Florida Water Management District approves the Lower East Coast Water Supply Plan Update in accordance with Chapter 163.3177(6)(c), F.S.
  - Policy 4.9: The City shall continue coordinating with Broward County and the City of Fort Lauderdale on water service that is provided to a portion of the City, and as such, hereby adopts by reference and incorporates herein, the 2020 Broward County 10-Year Water Supply Facilities Work Plan, adopted on April 21, 2020 and the City of Fort Lauderdale 10-Year Water Supply Facilities Work Plan 2020 Update, adopted on June 16, 2020, as reviewed and updated at least every 5 years, within 18 months after the SFWMD approves an update to the LECWSP.

Section 7  
Water Supply Goals, Policies and Objectives

---

- ~~● Policy 4.9: Since Broward County supplies water to parts of Hollywood and the City of Fort Lauderdale also supplies water to parts of Hollywood, the Broward County Water Supply Facilities Work Plan 2020 dated November 24, 2014, and the City of Fort Lauderdale 10-Year Water Supply Facilities Work Plan 2020 Update dated October 6, 2014 are hereby included in the City of Hollywood Water Supply Facilities Work Plan 20205 Update by reference and as respectively included in Appendix A and Appendix B.~~