

EXHIBIT B

WATER SUPPLY PLAN POTABLE WATER SUB-ELEMENT



PREPARED BY
THE UTILITIES-CITY OF HOLLYWOOD
DEPARTMENT OF PUBLIC UTILITIES
AND BROWNHAZEN AND
CALDWELLSAWYER

Style Definition: Heading 2 new: Indent: Left: 0.38", Hanging: 0.5"

Style Definition: Heading 3 new: Indent: Left: 0.19", Hanging: 0.5"

Style Definition: Bullet 1: Indent: Left: 0.35"

Style Definition: Body Numbering: No bullets or numbering

Style Definition: Body Letters: No bullets or numbering

Formatted: Centered

Formatted: Right: 1.39"

Table of Contents

CITY OF HOLLYWOOD
HOLLYWOOD, FLORIDA

JANUARY 2015

JUNE 2020

Table of Contents

1.1 Statutory Overview 1-1

1.2 Objective 1-1

1.3 Project Overview 1-1

2. Water Service Areas 2-1

2.1 Potable Water Service Areas 2-1

2.1.1 City of Hollywood Potable Water System Service Area 2-1

2.1.2 Broward County Water Districts 3A and 3B/3C 2-5

2.1.3 Port Everglades 2-5

2.2 Population Projections 2-6

2.3 Reuse Water Service Areas 2-10

3. Water Suppliers 3-14

3.1 City of Hollywood Potable Water System 3-14

3.1.1 Raw Water Supply 3-14

3.1.1.1 Biscayne Aquifer 3-1

3.1.1.2 Floridan Aquifer 3-2

3.1.1.3 Water Supply Allocation 3-2

3.1.2 Treatment Processes 3-8

3.1.2.1 Lime Softening System 3-9

3.1.2.2 Membrane Softening System 3-9

3.1.2.3 Reverse Osmosis System 3-10

3.1.2.4 Disinfection System 3-10

3.1.2.5 Degasifier System 3-10

3.1.3 Post-Treatment 3-11

3.1.4 Storage 3-11

3.1.5 High Service Pumps 3-12

3.1.6 Distribution System 3-12

3.2 City of Hollywood Reclaimed Water System 3-16

3.2.1 Ocean Outfall Legislation 3-17

3.3 City of Hollywood Water Conservation Program 3-20

3.4 Broward County Water System 3-24

3.5 City of Fort Lauderdale Water System 3-24

4. Water Demand Characterization 4-26

4.1 Finished Water Wholesale Agreement 4-1

4.2 Water Demand Characterization 4-3

4.2.1 Finished Water Maximum Day Demands, Maximum Month Demands, and Peaking Factors 4-4

4.2.2 Maximum Month Raw Water Production and Peaking Factors for Supply Allocation 4-7

4.2.3 Fire Flow 4-7

4.2.4 Average Per Capita Daily Demand 4-7

4.2.1 Non-Revenue Water (NRW) 4-11

4.3 Port Everglades Water Demand 4-12

5. Water Demand Forecast and Water Supply Adequacy 5-1

City of Hollywood Public Utilities Potable Water Sub-Element – Water Supply Plan 1

Formatted: Different first page header

Formatted: Space Before: 12 pt, Tab stops: 6", Left + Not at 6.5"

Formatted: Font: 10 pt

5.1	Projected Finished Water Demands	5-1
5.1.1	Projected Maximum-Day Finished Water Demands	5-5
5.2	Raw Water Supply Adequacy Projections	5-6
5.2.1	Water Supply Capacity Summary	5-2
5.3	Water Treatment Capacity Evaluation	5-2
5.4	Projected Peak Hour Demands and Storage Needs	5-11
5.4.1	Finished Water Storage Capacity Evaluation	5-12
6	Water Supply Capital Improvements	6-1
6.1	Financial Feasibility	6-1
7	Goals, Objectives, and Policies	7-1
7.1	Land Use Element	7-1
7.2	Conservation Element	7-2
7.3	Utilities Element	7-4
7.3.1	Drainage Sub Element	7-4
7.3.2	Potable Water Sub Element	7-6
7.4	Capital Improvements Element	7-11
7.5	Intergovernmental Coordination Element	7-14
1	Introduction	1
1.1	Statutory Overview	1
1.2	Objective	1
1.3	Project Overview	1
2	Water Service Areas	1
2.1	Potable Water Service Area	1
2.1.1	City of Hollywood Potable Water System Service Area	1
2.1.2	Broward County Water Districts 3A and 3B/3C	5
2.1.3	Port Everglades	5
2.1.4	Summary of Water Service Areas Supplying the City of Hollywood	5
2.2	Population Projections	6
2.3	Reuse Water System	10
3	Water Suppliers	14
3.1	City of Hollywood Potable Water System	14
3.1.1	Raw Water Supply	14
3.1.1.1	Biscayne Aquifer	1
3.1.1.2	Floridan Aquifer	2
3.1.1.3	Water Supply Allocation	2
3.1.2	Treatment Processes	8
3.1.2.1	Lime Softening System	9
3.1.2.2	Membrane Softening System	9
3.1.2.3	Reverse Osmosis System	10
3.1.2.4	Disinfection System	10
3.1.2.5	Degasifier System	10

Formatted: Left, Tab stops: 6.13", Left + Not at 5.94"

Table of Contents

3.1.3 Post-Treatment 11

3.1.4 Storage 11

3.1.5 High Service Pumps 12

3.1.6 Distribution System 12

3.2 Broward County Water System 13

3.3 City of Fort Lauderdale Water System 13

3.4 City of Hollywood Reclaimed Water System 16

3.5 Ocean Outfall Legislation 17

3.6 City of Hollywood Water Conservation Program 20

4. Water Demand Forecast and Supply Adequacy 1

5. Regional Issues 2

5.1 Regional Climate Action Plan 2

5.2 Climate Change 3

5.3 Sea Level Rise 4

5.4 Saltwater Intrusion 6

5.5 Extreme Weather Events 7

5.6 Infrastructure Development 2

5.7 Lake Okeechobee Surface Water Allocation Limitations 3

5.8 Lowering Lake Okeechobee Level 3

5.9 Infrastructure Planned to Attenuate Damaging Peak Flow Events from Lake Okeechobee 4

5.10 Use of brackish groundwater from the Floridan Aquifer 5

6. Water Supply Capital Improvements 1

7. Water Supply Goals, Objectives, and Policies 1

7.1 Land Use Element 1

7.2 Conservation Element 2

7.3 Utilities Element 4

7.3.1 Drainage Sub Element 4

7.3.2 Potable Water Sub Element 6

7.4 Capital Improvements Element 11

7.5 Intergovernmental Coordination Element 14

Tables

Table 2-1. Potable Water Service Areas 2-6

Table 2-2. City's 2010 Water Service Area Population Estimated Based on the 2010 Census 2-7

Table 2-3. City's Water Service Area Estimated Population 2010-2030 2-9

Table 2-4. Existing Reuse System Customers 2-11

Table 2-5. Expanded Reuse System Customers 2-12

Table 3-1. Biscayne Aquifer and Floridan Aquifer Withdrawal Wells 3-3

Table 3-2. Water Treatment Processes and Capacities 3-9

Formatted: Left

Formatted: Left, Tab stops: 6.06", Left + Not at 5.94"

Table 4-1. Historical Finished Water Production	4-5
Table 4-2. Historical Raw Water Withdrawals	4-8
Table 4-3. Historical Per Capita Demands	4-10
Table 4-4. Port Everglades Water Demand Forecast	4-12
Table 5-1a. Forecasted Average-Day Finished Water Demand Projections, 114 gpcd Retail Per-Capita	5-2
Table 5-1b. Forecasted Average-Day Finished Water Demand Projections, 140 gpcd Retail Per-Capita	5-5
Table 5-2. Forecasted Average-Day and Maximum-Day Demands	5-5
Table 5-3. Water Supply Permitted Withdrawals and Firm Wellfield Production Capacities	5-6
Table 5-4. Water Supply Capacity Usage, Low Per-Capita Demand	5-8
Table 5-5. Water Supply Capacity Usage, High Per-Capita Demand	5-9
Table 5-6. Peak Hour Demand and Finished Water Storage Needs	5-12
Table 6-1. Public Utilities Funding over the Next Five Years	6-2
Table 7-1. Water Conservation Measures	6-3
Table 7-2. Water Conservation Best Management Practices	6-4
Table 7-3. Potable Water Demand Rates	6-7
Table 7-4. Plumbing Standards Fixture Flow Rate	6-9
Table 7-5. Potable Water Demand Rates	6-13
Table 2-1. Geographic Size of Water Utility Service Areas in Square Miles	6
Table 2-2. City of Hollywood Water Service Area Historical Population	8
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	11
Table 2-5. Potential Expanded Reuse System Customers	12
Table 3-1. City of Hollywood's Biscayne Aquifer and Floridan Aquifer Withdrawal Wells	15
Table 3-2. City of Hollywood Permitted Groundwater Withdrawal Quantities and Contracted Groundwater Quantities from Broward County's SRW	3
Table 3-3. Water Treatment Processes and Capacities	9
Table 3-4. City of Hollywood Water Distribution System Pipe Diameters	13
Table 3-5. City of Hollywood's FDEP OOL Compliance with respect to Reclaimed Water	20
Table 3-6. City of Hollywood Historical Annual Average Per Capita Usage	22
Table 4-1. Broward County Districts 3A and 3B/C Finished Water Demand Forecast	2
Table 4.2 City of Hollywood Historical Retail Population, Finished Water Production and Retail Per Capita Usage	8
Table 4.3 City of Hollywood Retail Finished Water Demand Forecast	11
Table 4.4 Finished Water Demand Forecast in the City of Hollywood Water Service Area	12
Table 4.5 City of Hollywood Maximum Day Water Demand Forecast	14
Table 4.6 City of Hollywood WTP Historical Raw Water Annual Average Withdrawals	14
Table 4.7 City of Hollywood WTP Annual Percent Treatment Loss Associated With All Treatment Processes	15
Table 4.8 City of Hollywood Forecasted Weighted Average Percent Treatment Loss	15
Table 4.9 City of Hollywood Forecasted Raw Water Withdrawals	16
Table 4.10 City of Hollywood Permitted Raw Water Withdrawal Quantities	16
Table 4.11 Calculation of Finished Water Quantity Limit based on Raw Water Permit Limit	18
Table 4-12. Historical Annual Average Daily Water Supplied	20
To Port Everglades from the City of Fort Lauderdale	20

Formatted: Left, Tab stops: 6.13", Left + Not at 5.94"

Table of Contents

Table 6-1. City of Hollywood Water Utility Five-Year Capital Improvement Program.....2

Table 7-1. Water Conservation Measures3

Table 7-2. Water Conservation Best Management Practices.....4

Table 7-3. Potable Water Demand Rates7

Table 7-4. Plumbing Standards Fixture Flow Rate9

Table 7-5. Potable Water Demand Rates13

Figures

Figure 2-1: City of Hollywood Jurisdiction and Water Service Areas.....2-25

Figure 2-2-4-1: Comparison of Raw Water Demand to Withdrawal Limit - City of Hollywood Water Service Areas (Including Retail and Traffic Analysis Zones).....2-8 BCWWS 3A and 3B/C)31

Figure 3-1: Biscayne Aquifer and Floridan Aquifer Wells (Existing and Future).....3-4

Figure 3-2: Retail Comparison of Finished Water Demand Forecast with Treatment Limit - City of Hollywood Service Area Distribution System (Including Retail and BCWWS 3A and 3B/C)33

Figure 5-1: Water Supply Capacity Usage, Annual Average Basis...5-7 – Sea Level Rise Projection (2015)38

Figure 5-2: Water Supply Capacity Usage, Maximum-Month Basis...5-8 – Sea Level Rise Projection (2019)39

Figure 5-3: Finished Water Capacity Needs Projections, Maximum-Day Basis5-10

Figure 5-4: Finished Water Storage Needs Forecast5-13

Figure 5-3 – 250 mg/L Isochlor Line in Broward County (SFWMD)41

Appendices

Appendix A: Broward County 2014 Water Supply Facilities Work Plan 2020

Appendix B: City of Fort Lauderdale 2014 Water Supply Facilities Work Plan 2020 Update

Formatted: Left

Formatted: Indent: Left: 0", Hanging: 0.8", Space Before: 6 pt, Line spacing: single

Formatted: Indent: Left: 0", Hanging: 0.8", Space Before: 12 pt, Line spacing: single

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

Formatted: Highlight

Formatted: Not Expanded by / Condensed by

Formatted: Indent: Left: 0", Hanging: 0.8", Space Before: 4 pt, Line spacing: Exactly 14 pt

Formatted: Not Expanded by / Condensed by

Formatted: Highlight

Formatted: Indent: Left: 0", Hanging: 0.8", Space Before: 4 pt

Formatted: Not Expanded by / Condensed by

Formatted: Indent: Left: 0", Hanging: 0.8", Space Before: 4 pt, Line spacing: single

Formatted: Not Expanded by / Condensed by

Formatted: Highlight

Formatted: Space Before: 3 pt, After: 3 pt, Line spacing: Exactly 14 pt

Formatted: Left, Tab stops: 6.06", Left + Not at 5.94"

1. Introduction

Formatted: Heading 1 new

Formatted: Font: 10 pt

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

Formatted: Font: 12 pt, Not Bold

Formatted: Opening Paragraph Italic, Space Before: 0 pt

1.1 Statutory Overview

To address the increasing water demands of a growing population, the portions of the Florida Statutes (F.S.) that cover local government comprehensive planning (Chapter 163, Part II, F.S.) and regional water supply planning (Chapter 373, F.S.) require that planned growth be coordinated with available water supply and treatment capacity. This legislation required Florida Statutes (F.S.) requires local governments to prepare and adopt 10-Year Water Supply Facilities Work Plans that demonstrate that sufficient capacity is either available or will be provided over a minimum 10-year planning horizon. For utilities where traditional water sources (in the case of Hollywood, Biscayne Aquifer groundwater) are not sufficient to meet demand, alternative water supplies must be provided. Alternative water supply projects must be reflected both in the municipality's comprehensive plan and CIP, as well as the regional water supply plan.

Formatted: Not Expanded by / Condensed by

Water Supply Facilities Work Plans must be amended into their comprehensive plans within 18 months of adoption of an updated water supply plan prepared by the governing Water Management District. The City of Hollywood falls under after the South Florida Water Management District's District (SFWMD) approves a regional water supply plan or its update. The 2018 Lower East Coast Water Supply Plan ("LEC Plan"). The most recent update of this plan Update (2018 LECWSP Update) was adopted by the SFWMD's Governing Board on September 12, 2013. Prior to this, the City had prepared a Water Facilities Plan Update Amendment (WFPUA) based on the previous LEC plan update. Now, the City must prepare a new WFPUA that takes into account the most recent LEC plan update. These WFPUAs are comprehensive plan updates, as required by Subsection 163.3177(6)(c)3., F.S. This update will be the 2014 10-Year WFPUA. It should be noted that since the adoption of the previous WFPUA, the SFWMD has developed a revised set of guidelines that should be reflected in the 2014 WFPUA. November 8, 2018. Therefore, the 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. 2014 WFPUA focuses on updating the following:

Formatted: Widow/Orphan control

- Planning timeframes
- Population estimates and projections
- Projections of future water demand

- ~~Identification of viable water sources and development efforts~~
- ~~Conservation efforts~~
- ~~Coordination with applicable Regional Water Supply Plan~~

Formatted: Left, Tab stops: 6.13", Left + Not at 5.94"

~~As a comprehensive plan amendment, the WFPUA must be reviewed and adopted by the Florida Department of Economic Opportunity (DEO) pursuant to Chapter 163, Florida Statutes. This can be done under the expedited review process defined under 163.3184, Florida Statutes.~~

Formatted: Different first page header

~~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

~~Brown~~The City of Hollywood's Water Supply Facilities Work Plan is incorporated into the Potable Water Sub-Element of its Comprehensive Plan. Hazen and Caldwell ~~has been~~ Sawyer ~~was~~ contracted by the City of Hollywood Department of Public Utilities (HLWD-DPU) to ~~prepare this 2014 WFPUA, update the City's 2015 Water Supply Facilities Work Plan to represent the year 2020 (WSFWP 2020 Update).~~ The main objective of ~~the 2014 WFPUA, this update~~ is to ensure that potable water service is available to concurrently support development ~~throughover the 10-year planning horizonnext ten years.~~

1.3 Project Overview

~~This 2014 WFPUA provides the characterization of~~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. ~~Note that the term "water supply facilities" includes raw water supply infrastructure, treatment facilities, distribution system, and associated storage.~~ Although this report is referred to as ~~being over a 10-year periodwork plan,~~ the water demand ~~forecasts and projects identified cover up~~forecast provided in this document extends to the year ~~20402030,~~ which is consistent with ~~SFMWD's LEC Planthe SFWMD's LECWSP Update.~~

~~This 2014 WFPUA~~City of Hollywood WSFWP 2020 Update builds upon ~~the or utilizes the following documents:~~

- ~~• City's previous WFPUA, the 2015 Water Supply Plan Potable Water Sub-Element;~~
- ~~• SFWMD's LEC Plan, the 10-Year-2018 LECWSP Update;~~
- ~~• Broward CountyCounty's Water Supply Facilities Work Plan (dated November 2014), the 10-Year-2020; and,~~

Formatted: Space Before: 12 pt, Tab stops: 6", Left + Not at 6.5"

Formatted: Font: 10 pt

Section 1
Introduction

- ~~City of Fort Lauderdale Water Supply Facilities Work Plan, and data provided by the City on recent developments regarding its reuse system and water conservation 2020 Update.~~

~~Generally, this 2014 WFPUA~~This WSFWP 2020 Update includes the following items:

- ~~Population~~Five-year population and water ~~supply~~demand projections ~~up to~~through the year ~~2030~~2040 within the ~~City of Hollywood's~~City's jurisdiction and HLWD-DPU's service area; ~~these will be aggregate population projections with the service area as a whole that are consistent with the approach used in the most recent SFWMD LEC Plan; water demand projections will be based on aggregate demands over the service area, which includes an implicit assumption that customer makeup will not change significantly over the planning horizon;.~~
- Assessment of ~~the City's~~ current water supply sources and ~~facilities for each water utility serving the City's jurisdiction and their adequacy for projected demands;~~treatment capacities.
- Identification of alternative water supply projects for implementation including cost and schedule ~~for each water utility;.~~
- 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~~including demonstration of financial feasibility for the first five years of the plan for HLWD-DPU;~~
- Demonstration that the City of Hollywood has coordinated with other service providers supplying water within the City's jurisdiction (i.e. BCWWS 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; ~~and.~~
- Identification of ~~goals, objectives~~Goals, Objectives, and ~~policies~~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 ~~WFPUA~~Water Supply Facilities Work Plan. Detailed water demand projections for its service area ~~will therefore~~are not ~~be~~ included in ~~Hollywood's 2014 WFPUA~~the City's WSFWP 2020 Update.

This report is organized into the following ~~seven~~ sections;.

Formatted: Left

Formatted: Bulleted + Level: 1 + Aligned at: 0.25" + Indent at: 0.5", Widow/Orphan control

Formatted: Indent: Left: 0.5", Tab stops: 0.5", Left

Formatted: Indent: Left: 0.5", Tab stops: 0.5", Left

Formatted: Widow/Orphan control

Formatted: Left, Tab stops: 6", Left + Not at 5.94"

Section 1
Introduction

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 Areas* – introduces the HLWD-DPU geographic service areas for potable water and reuse water service providers of the City of Hollywood jurisdiction. This section also presents the population projections by water service area. 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, storage facilities, distribution and interconnects, and the City's conservation and reuse practices in place.

Section 4 – *Water Demand Characterization* – characterizes HLWD-DPU's retail water customers and describes the existing HLWD wholesale agreement with Broward County. Based on HLWD-DPU's historical finished water production, this section also determines the average per capita daily demand, as well as maximum day and maximum month peaking factors. Fire flow requirements were taken from the City's Water Master Plan. This section ends with a brief review of Port Everglades' water demand characterization, water demand forecast, and water supplier adequacy.

Section 5 – *Water Demand Forecast and Water Supply Adequacy* – evaluates the 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 facilities adequacy relative to the water demand forecast and shows. This section demonstrates that the existing water supply facilities and permitted quantities, coupled with the City's conservation and reuse practices, will meet projected demands. Based on the projections developed herein, it appears that the City's existing water supply and treatment capacity is adequate to satisfy demand through the planning horizon of through 2040/2030.

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 all-public water supply facilities to serve the existing and new development within the City of Hollywood/City's jurisdiction. No capital improvements were required to meet water supply needs over the planning horizon. The City continues to invest in repairing and replacing distribution system infrastructure to maintain and enhance its overall level of service.

Section 7 – *Water Supply Goals, Objectives, and Policies* – includes a statement 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

City of Hollywood Public Utilities Element-Potable Water Sub-Element – Water Supply Plan – WS 1-
3

Formatted: Header, Space Before: 0 pt

Formatted: Font: Not Italic

Formatted: Left, Tab stops: 6", Left + Not at 5.94"

Section 1
Introduction

plan.

Formatted: Left

Formatted: Left, Tab stops: 6", Left + Not at 5.94"

2. Water Service Areas

This section introduces the HLWD-DPU geographic service areas for potable area and reuse water service providers of the City of Hollywood jurisdiction. This section also presents the population projections by water service area. 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 AreasArea

The City of Hollywood, (City), located in southeast 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 itsthe neighboring municipalities. Except for Port Everglades, the City of HollywoodCity'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 of Hollywood Water Treatment Plant (City's WTP) is operated by the City of Hollywood Department of Public Utilities (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 both a retail service area, extending over most of the City of HollywoodCity's jurisdiction, and a wholesale service area, covering Broward County Water and Wastewater Services (BCWWS) Districts 3A, 3B, and 3C/3B/C. In this report, these service areas are referred to as HLWD-DPU water retail area and HLWD-DPU water wholesale area. In 2013, the City's WTP produced approximately 21.0 million gallons per day (mgd) of potable water, of which 14.7 mgd were served to nearly 40,000 connections in the retail area and the remaining 6.3 mgd were sold to the wholesale service area. All threeThe 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 of HollywoodCity's jurisdiction, the HLWD-DPU water retail area servesincludes 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. These areas are billed as retail customers. It should be noted that the Hard Rock Hotel and Casino is served by the Town of Davie.

Formatted: Space Before: 0.3 pt

Formatted: No bullets or numbering

Formatted: No bullets or numbering

Formatted: Left, Tab stops: 6", Left + 9.25", Left + Not at 5.94"

In addition to ~~the~~ 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 ~~2013~~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.

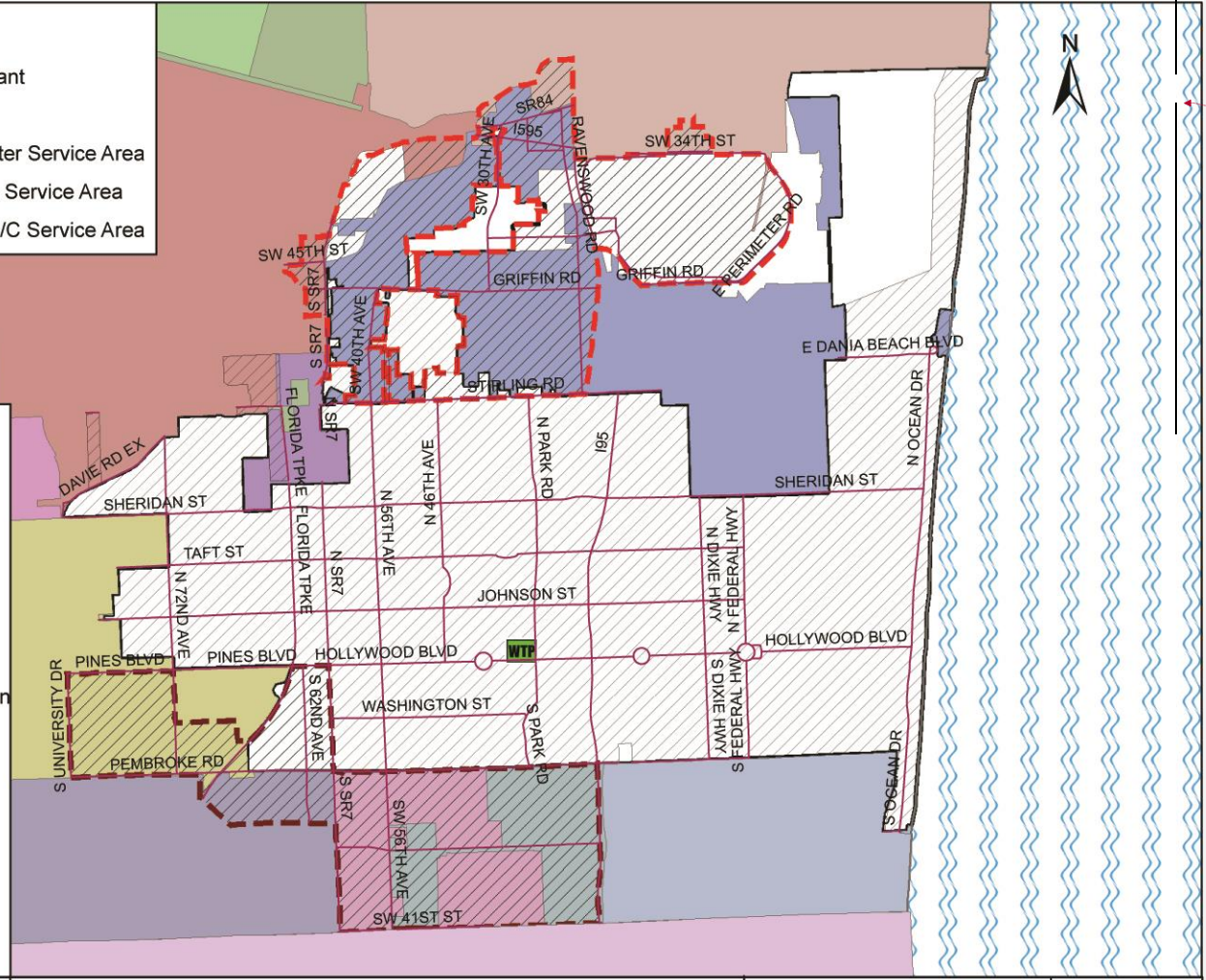
Formatted: Left, Tab stops: 6", Left + Not at 5.94"

Legend

- Water Treatment Plant
- Atlantic Ocean
- Hollywood DPU Water Service Area
- BCWWS District 3A Service Area
- BCWWS District 3B/C Service Area

Municipalities

- Cooper City
- Dania Beach
- Davie
- Fort Lauderdale
- Hallandale Beach
- Hollywood
- Seminole Reservation
- Miramar
- Pembroke Park
- Pembroke Pines
- Plantation
- Unincorporated
- West Park
- Miami-Dade



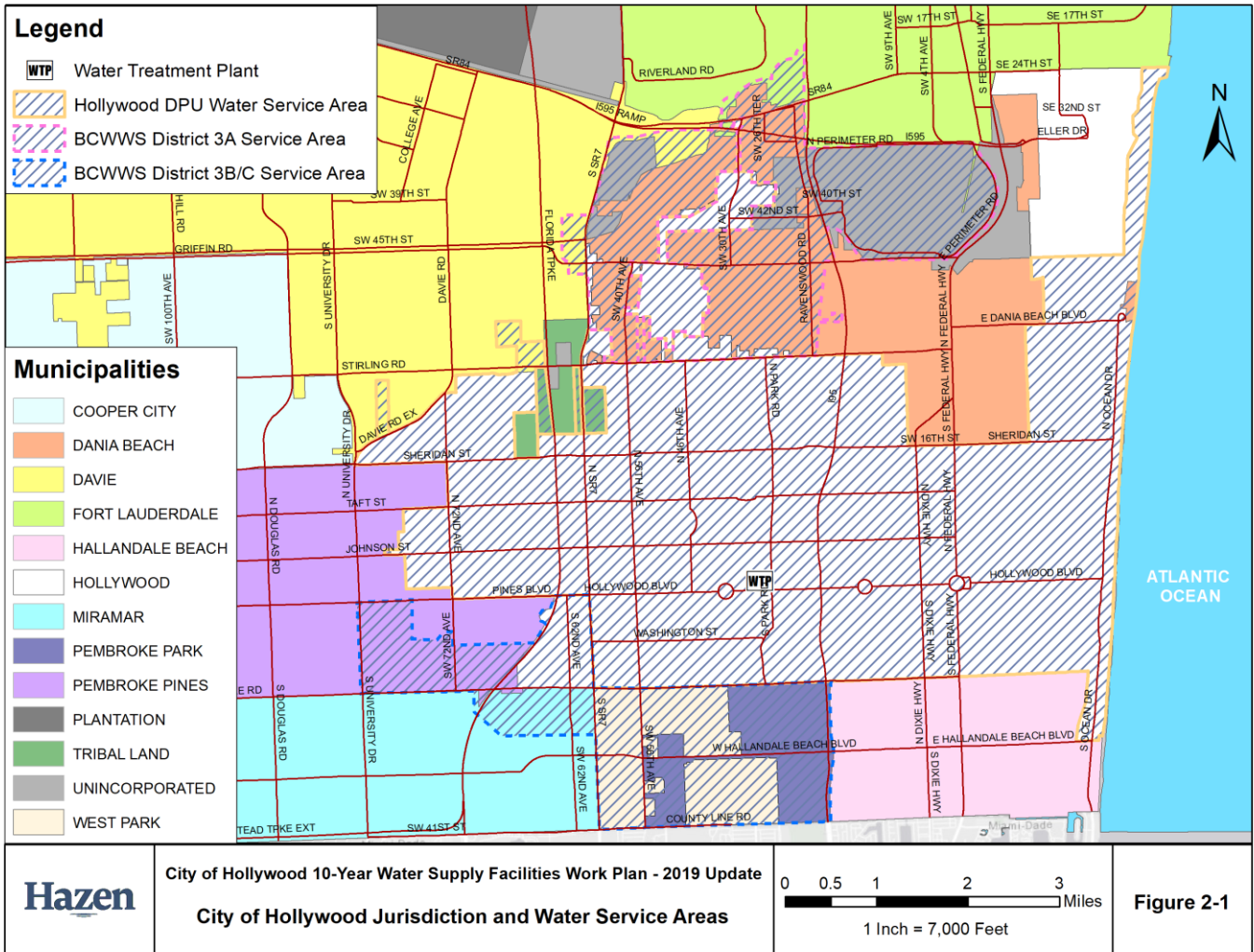
Formatted: Left: 0.8", Right: 0.8", Top: 0.5", Bottom: 0.5"



City of Hollywood 10-Year Water Supply Facilities Work Plan - 2014 Update
 City of Hollywood Jurisdiction and Water Service Areas



Figure 2-1



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

Formatted: No bullets or numbering

BCWWS District 3A covers approximately eight square miles containing portions of the ~~Cities~~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 ~~and 3C~~ are interconnected and ~~are connected~~connect to HLWD-DPU via two wholesale interconnects each. Like District 3A, they are ~~also~~ supplied solely by HLWD-DPU. BCWWS District 3B covers approximately four ~~square miles~~ ~~containing and includes~~ the ~~Cities~~cities of West Park and Pembroke Park. BCWWS District 3C covers approximately two square miles containing portions of the ~~Cities~~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.

~~All three~~These BCWWS districts fall mainly outside the ~~City of Hollywood~~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 2-1-7).~~ Small areas in the ~~City of Hollywood~~City's jurisdiction are served by BCWWS District 3A.

2.1.3 Port Everglades

Formatted: No bullets or numbering

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

- 10-inch meter at Southeast 17th Street
- 12-inch meter at Southeast 20th Street
- 8-inch meter at Southeast 24th Street
- 16-inch meter at Southeast Eller Drive / Old South Federal Highway
- 10-inch meter at 900 Southeast ~~26th~~28th 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 ~~space~~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 ~~same water treatment plant~~(City's WTP) and deliver potable water to the entire ~~jurisdiction~~City except for Port Everglades, which is supplied by the City of Fort

Section 2
Water Service Areas

~~percent, respectively. Given the small quantities of water demand and a lack of available historic data, the population of census blocks that were totally or partially within the City's service area. A summary of the 2010 estimated 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's 2010 Water Service Area Population
Estimated Based on the 2010 Census**~~

Section 2
Water Service Areas

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

Year	City's Retail Water Service Area Customers	City's Wholesale Customers –		2010 Estimated Population
		Broward County District 3A Large User Service Area	Broward County District 3B/3C Large User Service Area	Total – Retail and Wholesale
(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

Total City Water Service Area 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 WS12. **187,078**

*Table 5.1 of the 2012 Update to the 2007 Water Master Plan

The basis of the population projections for the City's water service area were estimated for 2015-2030 based on population projections published by the Bureau of Economic and Business Research (BEBR) in June 2013 in the "Detailed Projections by Age, Sex, Race, and Hispanic Origin for Florida and Its Counties 2015-2040, With Estimates for 2013".

The Broward County Planning and Redevelopment Division (BCPRD) further refined these projections for each municipality using TAZ level population projection data and aerial photography data to allocate population to the various municipalities and unincorporated areas within the County. The most recent versions of these projections, which are summarized in the "Traffic Analysis Zones and Municipal Forecasts Update, 2014" published by BCPRD, were used as the basis for estimating the City's retail populations for this report. The population projections for the Broward County 3A and 3B/C service areas were calculated by Broward County based on a Utility Analysis Zone (UAZ) level analysis of BEBR population data. A detailed description of their methodology can be found in the Broward County Water

Deleted Cells

Formatted: Table Title new, Space Before: 6 pt, Page break before

Formatted Table

Merged Cells

Formatted: Table Heading Center

Inserted Cells

Formatted: Font color: Black

Inserted Cells

Formatted: Font color: Black

Formatted: Table Heading Center

Merged Cells

Formatted: Font color: Black

Inserted Cells

Formatted: Font color: Black

Formatted: Table Heading Center

Inserted Cells

Formatted: Font color: Black

Formatted: Font color: Black

Deleted Cells

Formatted: Normal, Space Before: 3 pt

Formatted Table

Formatted: Font: Not Bold, Font color: Black

Section 2
Water Service Areas

facilities Work Plan located in Appendix A of this report. Table 2-3 presents the water service area population projections for the City's retail, wholesale, and overall service areas.

Table 2-3. City's Water Service Area Estimated Population 2010-2030

Table 2-3. City of Hollywood Water Service Area Forecasted Population					2010	2015	2020	2025	2030
Year	City's Water Service Area	City's Retail Customers - BCWWS District	City's Wholesale Customers - District	Total Retail and Wholesale					
(1)	(2)	(3)	(4)	(5) = (2) + (3) + (4)					
Base Year	15,431	16,384	138,585	144,554					
2010	146,180	18,384	16,960	179,524	17,962				
2015	150,380	18,083	38,889	207,352					
2030	156,640	19,075	41,146	216,861					

- Formatted: Table Title new, Space After: 6 pt
- Formatted Table
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Merged Cells
- Deleted Cells
- Deleted Cells
- Merged Cells
- Formatted: Table Heading Center
- Inserted Cells
- Formatted: Table Heading Center
- Deleted Cells
- Formatted: Centered

0				
2				
10	161,270	19,686	42,639	223,595
20				
40	164,432	20,109	43,625	228,166

Source: Broward County District 3B/3C Service Area Water Supply Facilities Work Plan 2020, Table WS12.

City's Water Service Area	187,078	193,840	200,193	202,246	208,664
---------------------------	---------	---------	---------	---------	---------

2.3 Reuse Water Service Areas 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. Up to 4 mgd of high salinity reuse water is available for internal use at the City's South Regional Wastewater Treatment Plant for non-potable process water and plant washdown. In addition to this, HLWD-DPU delivers up to 4 mgd, on an annual average daily flow basis, of blended low-salinity reuse water for irrigation with. 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 primarily golf courses, public medians, private developments, athletic complexes and parks that have a relatively large irrigation demand. These customers, classified as contract customers, are the most cost-effective to serve. Table 2-4 lists these contract customers. Figure 2-2 illustrates summarizes the coverage capacity and FY 2018 reclaimed water flows of the existing City's reuse water service areas system by type of reuse application.

- Deleted Cells
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Formatted: Normal, Space Before: 4 pt
- Formatted Table
- Formatted: Font: 9 pt, Font color: Black
- Formatted: Font color: Black
- Formatted: Indent: Left: 0.88", Space Before: 12 pt, No bullets or numbering

Section 2
Water Service Areas

Table 2-4. Existing Reuse System Customers

<u>Diplomat Country Club</u>	<u>Type of Reuse</u>	<u>Capacity in MGD</u>	<u>Actual- (mgd)- 2013- 2014</u>	<u>Acres Irrigated</u>
<u>Emerald Hills Country Club</u>	<u>Use at the Wastewater Treatment Plant</u>	<u>0.6714</u>	<u>0.9082</u>	<u>Not applicable</u>
<u>ECO Grande</u>	<u>Golf Course Irrigation</u>	<u>0.4092</u>	<u>0.0432</u>	<u>752.8</u>
<u>Orangebrook Country Club</u>	<u>Other Public Access Areas</u>	<u>0.8885</u>	<u>0.5262</u>	<u>121.0</u>
<u>Hollywood Country Club</u>	<u>Residential Irrigation</u>	<u>0.2136</u>	<u>0.0650</u>	<u>16.0</u>
<u>Hillcrest Country Club</u>		<u>0.582</u>	<u>0.675</u>	
Total		2.9098	2.4844	889.8
<u>Other Current Users</u> <small>Source: Florida Department of Environmental Protection, 2018 Reuse Inventory, August 2019, page 65 of 151.</small>				
<u>Park Road Medians</u>		<u>0.025</u>	<u>0.040</u>	
<u>Dowdy Field</u>		<u>0.014</u>	<u>0.012</u>	
<u>Memorial Hospital</u>		<u>0.026</u>	<u>0.004</u>	
<u>City Nursery</u>		<u>0.005</u>	<u>0.004</u>	
<u>Rotary Park</u>		<u>0.023</u>	<u>0.015</u>	
<u>David Park</u>		<u>0.002</u>	<u>0.004</u>	
<u>Lincoln Park/School</u>		<u>0.028</u>	<u>0.020</u>	
<u>West Lake Village</u>		<u>0.040</u>	<u>0.003</u>	
<u>McKinley Street</u>		<u>0.004</u>	<u>0.004</u>	
<u>Park Road & Lincoln</u>		<u>0.003</u>	<u>0.004</u>	
<u>HWD Blvd/U.S. 1 Median</u>		<u>0.004</u>	<u>0.004</u>	
Total		0.168	0.069	

Source: 2007 Reuse System Master Plan and COH Department of Public Utilities

~~Expansion of the~~The existing reuse system could be expanded to incorporate additional contract customers as well as residential and commercial customers ~~and likely be done in phases.~~ Table 2-5 identifies potential additional reuse customers (future committed and future non-committed) and their ~~associated~~ estimated water reuse demands. Expansion ~~will~~ would be subject to the availability of suitable-quality water. ~~Other potential reuse customers are~~

Deleted Cells

Deleted Cells

Formatted: Table Title new, Indent: Left: 0", Space Before: 6 pt, After: 6 pt

Formatted Table

Formatted: Font: 10 pt, Not Bold

Inserted Cells

Formatted: Table Heading Center

Formatted: Table Text Center

Formatted: Table Text Center

Formatted: Table Text Center

Formatted: Table Text Center

Formatted: Table Text Center, Indent: Left: 0", Space Before: 0 pt, Line spacing: single

Inserted Cells

Deleted Cells

Deleted Cells

Formatted: Normal, Indent: Left: 0"

Formatted Table

Formatted: Font: Not Bold, Font color: Black

identified in the Reuse Master Plan that may serve as alternatives to the ones identified in the table below or as additional future customers, if future studies indicate that further expansion is feasible.

Table 2-5. Potential Expanded Reuse System Customers

Future Committed	mgd
Sheridan Station	0.060
T.Y. Park	0.272
Hallandale (Joe Scavo Park)	0.250
Total – Future Committed	0.582272
Future Non-Committed	mgd
Boggs Field	0.041
West of 441	0.250
Other Medians	0.002
Total – Future Non-Committed	0.293291

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

Formatted: Font: 8 pt

Formatted: Indent: Left: 0", Right: 0", Space Before: 6 pt, After: 6 pt, No page break before

Formatted: Centered

Formatted Table

Formatted Table

Formatted Table

Formatted: Font: Bold

Formatted: Font: Bold

Formatted: Centered

Formatted Table

Formatted Table

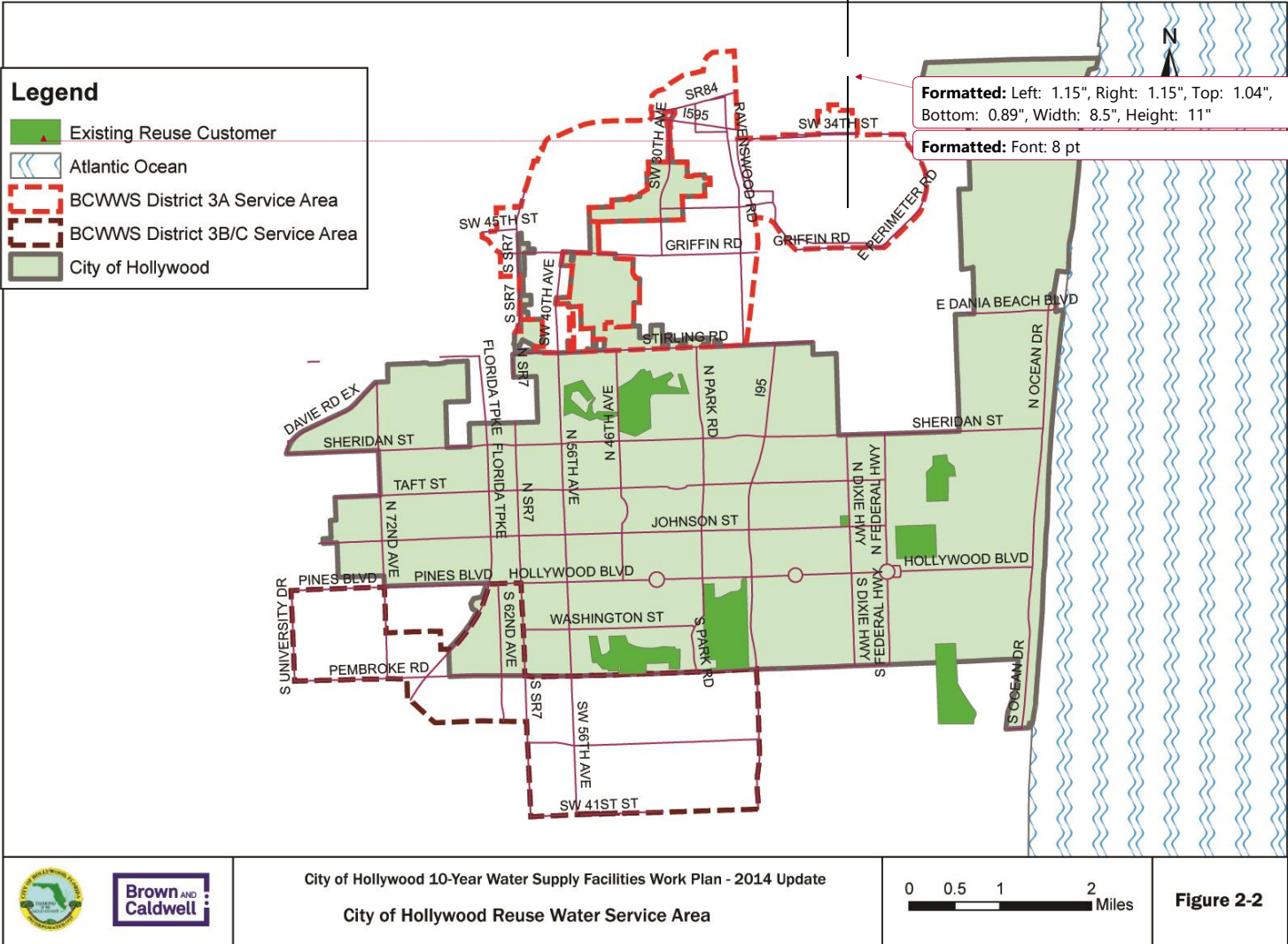
Formatted: Font: Bold

Formatted: Font: Bold

Formatted: Font: Arial Narrow, 9 pt

Formatted: Font: Arial Narrow, 9 pt

Formatted: Space Before: 6 pt



3. Water Suppliers

This section characterizes the water suppliers including consumptive use permit information, raw water sources, existing treatment facilities, ~~storage facilities, distribution and interconnects, and the City's~~ conservation and reuse practices ~~in place~~.

As ~~indicated~~ 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 ~~jurisdiction~~ 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: ~~Currently, serves seven contract~~ Provides irrigation water to customers ~~in the City and non-potable water for irrigation~~ in-plant uses at the City's wastewater plant.

Broward County Water System: ~~Purchases~~ The County purchases finished water ~~from~~ supplied by the City of Hollywood from the City's WTP and resells it to a small portion of the City's jurisdiction ~~that is mostly served by Broward County Service Area 3B~~ 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 ~~its~~ the City's potable water system, which ~~consists of~~ 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 ~~own~~ Biscayne Aquifer and Floridan Aquifer wellfields, ~~as well as bulk purchased raw Biscayne Aquifer and~~ water from Broward County's Biscayne Aquifer wells at the South Regional Wellfield (SRW) ~~located at Brian Piccolo Park. The~~. Raw water from the Biscayne Aquifer is ~~a raw water supply~~ of high quality, ~~while and raw water from the deeper~~ Floridan Aquifer, ~~a much deeper source of water,~~ is brackish and requires reverse osmosis treatment. Table 3-1 lists the City's Biscayne Aquifer and Floridan Aquifer withdrawal wells. ~~Figure 3-1 maps these wellfield locations.~~

Formatted: Not Expanded by / Condensed by

Formatted: Indent: Left: 0.5", Right: 0.5"

Formatted: Indent: Left: 0", Hanging: 0.63", No bullets or numbering

Formatted: Space Before: 12 pt, Tab stops: 6", Left + Not at 6.5"

Formatted: Font: 10 pt

Section 3
Water Suppliers

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

<u>Groundwater Source</u>	<u>Well Name</u>	<u>No. of Wells</u>	<u>Casing Diameter (inches)</u>	<u>Depth of Well (ft.)</u>	<u>Pumping Capacity (gpm)</u>	<u>Pumping Capacity (mgd)</u>	<u>Casing Depth (ft.)</u>
-	Existing Biscayne Wells						
Southern Wellfield		8	-	-	17,400	25	-
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
Western Wellfield		6	-	-	12,600	18	-
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
Total Biscayne Wellfield		14	-	-	30,000	43	-
-	Existing Floridan Wells						
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
Total Floridan Existing		8	-	-	7,900	11.2	-
-	Proposed Future Floridan Wells (Beyond 2019)						
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

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

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

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

Formatted: Space Before: 12 pt, Tab stops: 6", Left + Not at 6.5"

Formatted: Font: 10 pt

3.1.1.1. Biscayne Aquifer

~~Groundwater~~Fresh groundwater from the Biscayne Aquifer is ~~fresh and~~ accessed via the ~~Hollywood Biscayne wellfield~~City's wellfields and Broward County's SRW. The ~~Hollywood Biscayne wellfield includes~~City has two Biscayne Aquifer wellfields: called the ~~Southern~~South and Western (~~aka~~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.

Section 3
Water Suppliers

The Southern and Western wellfields ~~have a total~~are comprised of 14 shallow wells with ~~total~~ 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 34.9~~an average daily withdrawal of 27.03 mgd.

~~The SRW-Broward County~~ provides raw water to the City ~~from the SRW~~ under a ~~four-year~~ raw water large user agreement ~~dated 1994 that has a four year period of time with an automatic renewal for another~~is automatically renewed every four years. ~~Up unless terminated by either party. An annual average daily quantity not to exceed 5.9 MGD~~78 mgd is ~~provided~~available to the City under this agreement. ~~The and the City is required to take or pay for 4.0 mgd. The SRW includes 10~~is comprised of eight wells, ~~of which eight have each with a capacity of 4.0 mgd and two have a capacity of 2.0 mgd. The SRW has, providing a total design capacity of approximately 3632 mgd and a. The firm capacity of is about 3228 mgd with the largest one well out of service. This wellfield-The SRW is in the western part of the County at Brian Piccolo Park~~which is located on the northeast corner of Palm Avenue and Sheridan Street.

3.1.1.2. Floridan Aquifer

Raw water from the Floridan Aquifer, which is a brackish water supply, is accessed via ~~Hollywood's~~the City's Floridan wellfield. The Floridan wellfield ~~has is~~ comprised of eight ~~existing withdrawal~~ wells that extend about ~~9261,185~~ to 1,300314 feet below ground. ~~The last expansions to the Floridan Aquifer wellfield, which included wells FW 6, FW 7, FW 10, and FW 13, occurred between 2008 and 2010.~~The total raw water pumping capacity of the active Floridan wells is ~~8,5007,900~~ gpm (or ~~1211.2~~ mgd).

~~It should be noted that for planning purposes the rated capacities of the oldest Floridan wells (F2, F3, and F5) were assumed to be 800 gpm each which is the lowest operational pumping rate indicated by HLWD DPU's records, in order to conservatively account for the reduction in efficiency that these wells have experienced over time.~~

3.1.1.3. Water Supply Allocation

~~According to the~~The City's ~~WU~~Water Use Permit No. 06-00038-W, issued on April 10, 2008, ~~the maximum annual average raw water withdrawal allowed from the Biscayne Aquifer is 11,205 MG (or 30.7 mgd) provides limits to the annual and from the Floridan Aquifer is 3,168 MG (8.7 mgd). The water use permit also defines allowable maximum month~~monthly withdrawals: ~~The maximum month withdrawal from the City's two Biscayne Aquifer is limited to 1,062.20 MG, wellfields and the maximum month withdrawal from the City's Floridan Aquifer is limited to wellfield. These limitations are summarized in Table 3-2 and were 259.00 MG. The existing allocation was established under the requirements of the District's Regional Water Availability (RWA) Rule, which limited the maximum day and~~

Formatted: Line spacing: Multiple 1.09 li

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

Formatted: Not Expanded by / Condensed by

Formatted: Line spacing: Multiple 1.09 li,
Widow/Orphan control

~~maximum month. This Rule limits groundwater withdrawals to a base condition that was established based on raw water usage from 2002 from the Biscayne Aquifer to the maximum quantity during any consecutive five years preceding April 2006, and required-requires that alternative water supplies to-be used to meet any-additional demands. In the caseThe City of Hollywood, the-Hollywood's alternative water supply used-is the Floridan Aquifer.~~

~~In subsequent sections of this report, the City's water production records will be used to establish annual average and projected maximum month demands, which will be compared to the respective allocations to determine the overall adequacy of the water supply over the planning horizon.~~

Table 3-1. Biscayne Aquifer and Floridan Aquifer Withdrawal Wells

~~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.~~

Groundwater Source	Well ID	No. of Wells	Casing Diameter (inches)	Depth of Well (ft.)	Pumping Capacity (gpm)	Pumping Capacity (mgd)	Casing Depth (ft.)
--------------------	---------	--------------	--------------------------	---------------------	------------------------	------------------------	--------------------

Water Supply Source	Existing Biscayne Wells Annual Withdrawal Limit	Maximum Monthly Withdrawal	
		Average Daily	17,400 Average Daily
Southern Wellfield	8MG	MG	25.0
Biscayne BW-28	(2,400)	(3,600)	(5) = (4) / (365/12)

- Deleted Cells
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Formatted: Table Title new
- Formatted Table
- Inserted Cells
- Merged Cells
- Formatted: Table Heading Center
- Formatted: Font: Arial
- Deleted Cells
- Deleted Cells
- Formatted: Table Heading Center
- Formatted: Table Heading Center, Left, Indent: Left: 0", Right: 0", Space Before: 0 pt
- Formatted: Table Heading Center, Left, Indent: Left: 0", Space Before: 0 pt
- Formatted: Font: Arial
- Formatted: Font: Arial
- Formatted: Table Heading Center, Indent: Left: 0", Space Before: 0 pt
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Formatted: Table Heading Center, Indent: Left: 0", Space Before: 0 pt
- Formatted: Table Heading Center, Left, Indent: Left: 0", Right: 0", Space Before: 0 pt
- Formatted: Table Heading Center, Left, Indent: Left: 0", Right: 0", Space Before: 0 pt
- Formatted: Table Heading Center, Left, Indent: Left: 0", Space Before: 0 pt
- Inserted Cells

Section 3
Water Suppliers

Biscayne

Biscayne Aquifer:

Biscayne	BW-30	1	24	9 6	2	3.0	6 0
Biscayne	BW-31	1	24	8 6	2	3.0	6 0
Biscayne	BW-32	1	24	8 6	2	3.0	5 5
Biscayne	BW-33	1	24	9 6	2	3.0	6 9
Biscayne	BW-34	1	24	8 6	2	3.0	7 0
Biscayne	BW-35	1	24	7 7	2	3.0	6 0
			6	1	4	12	18.0
			5	1	4	6	
			14	5	7	16	
			7	0	3	13	
			5	0	0	5	
Western (Chaminade) Wellfield							
Biscayne South Wellfield	BW-36	1	3	3	3		
		2	3	3	2		
		5	9	4	9		
		7	8	0	0		
		7	0			10.68	
Biscayne	BW-37	1	32	4 4 4	2	3.0	4 2 5
Biscayne	BW-38	1	32	4 5 6	2	3.0	4 2 8

- Formatted: Table Text Left, Indent: Left: 0", Space Before: 0 pt
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Formatted: Table Text Left, Left, Indent: Left: 0", Right: 0", Space Before: 0 pt
- Formatted: Table Text Left, Left, Indent: Left: 0", Right: 0", Space Before: 0 pt
- Formatted Table
- Formatted: Table Text Left, Left, Indent: Left: 0", Space Before: 0 pt
- Deleted Cells
- Deleted Cells
- Formatted: Table Text Left, Right, Indent: Left: 0", Right: 0", Space Before: 0 pt
- Formatted: Table Text Left, Right, Indent: Left: 0", Space Before: 0 pt
- Formatted: Table Text Left, Right
- Formatted: Font: Arial
- Formatted: Table Text Left, Indent: Left: 0", Space Before: 0 pt
- Formatted: Font: Not Bold
- Formatted: Font: Not Bold
- Formatted: Font: Not Bold
- Formatted: Font: Not Bold
- Formatted: Font: Arial
- Formatted: Font: Not Bold
- Formatted: Table Text Left, Left, Indent: Left: 0", Right: 0", Space Before: 0 pt
- Formatted: Table Text Left, Right, Indent: Left: 0", Space Before: 0 pt
- Formatted: Table Text Left, Right, Indent: Left: 0", Right: 0", Space Before: 0 pt
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Inserted Cells
- Inserted Cells

Section 3
Water Suppliers

						0		
Biscayne	BW-39	4	32	4	2	3.0		
Biscayne	BW-40	4	32	4	2	3.0		
Biscayne	BW-41	4	32	4	2	3.0		
Total Subtotal - Biscayne Wellfield Aquifer				4	2	30	43.0	
			19	2	8	99		
			0	4	27			
			2	0	0			
			3	8	10			
Existing Floridan Wells Aquifer			18	10	10	8.52		
	FW-F2	1		1		1.2		
Floridan Subtotal - City Permitted			1	1	0			
			2	3	0			
			2	4	1	0		
			0	8	0	55		
Floridan Contracted from Broward County SRW								
	FW-F4	4	12	4	2	1.2		
	FW-F5	1	12	2	1	1.2		
	FW-F6	4	16	4	1	1.8		

- Deleted Cells
- Deleted Cells
- Formatted: Table Text Left, Right, Indent: Left: 0", Right: 0", Space Before: 0 pt
- Formatted: Table Text Left, Right, Indent: Left: 0", Right: 0", Space Before: 0 pt
- Formatted: Table Text Left, Right
- Formatted: Font: Arial, Bold
- Formatted: Font: Arial, Bold
- Formatted: Table Text Left, Indent: Left: 0", Space Before: 0 pt
- Deleted Cells
- Inserted Cells
- Inserted Cells
- Inserted Cells
- Formatted: Table Text Left
- Inserted Cells
- Formatted: Font: Bold
- Formatted: Table Text Left, Right, Indent: Left: 0", Right: 0", Space Before: 0 pt
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Formatted: Font: Bold
- Formatted: Table Text Left, Right, Indent: Left: 0", Right: 0", Space Before: 0 pt
- Formatted: Table Text Left, Left, Indent: Left: 0", Right: 0", Space Before: 0 pt
- Formatted: Font: Bold
- Formatted: Font: Bold
- Formatted: Font: Bold
- Formatted: Font: Bold
- Formatted: Table Text Left, Right, Indent: Left: 0", Space Before: 0 pt
- Deleted Cells
- Formatted: Table Text Left, Right, Indent: Left: 0", Right: 0", Space Before: 0 pt
- Formatted
- Formatted Table

Section 3
Water Suppliers

Floridan	FW-F7	4	16	4	4	1.8	950
Floridan	FW-F10	4	17	4	4	2.0	4000
Floridan	FW-F13	4	17	4	4	2.0	4000

Total Floridan Existing- All Sources			8430	1293	8702	12.2	
---	--	--	------	------	------	------	--

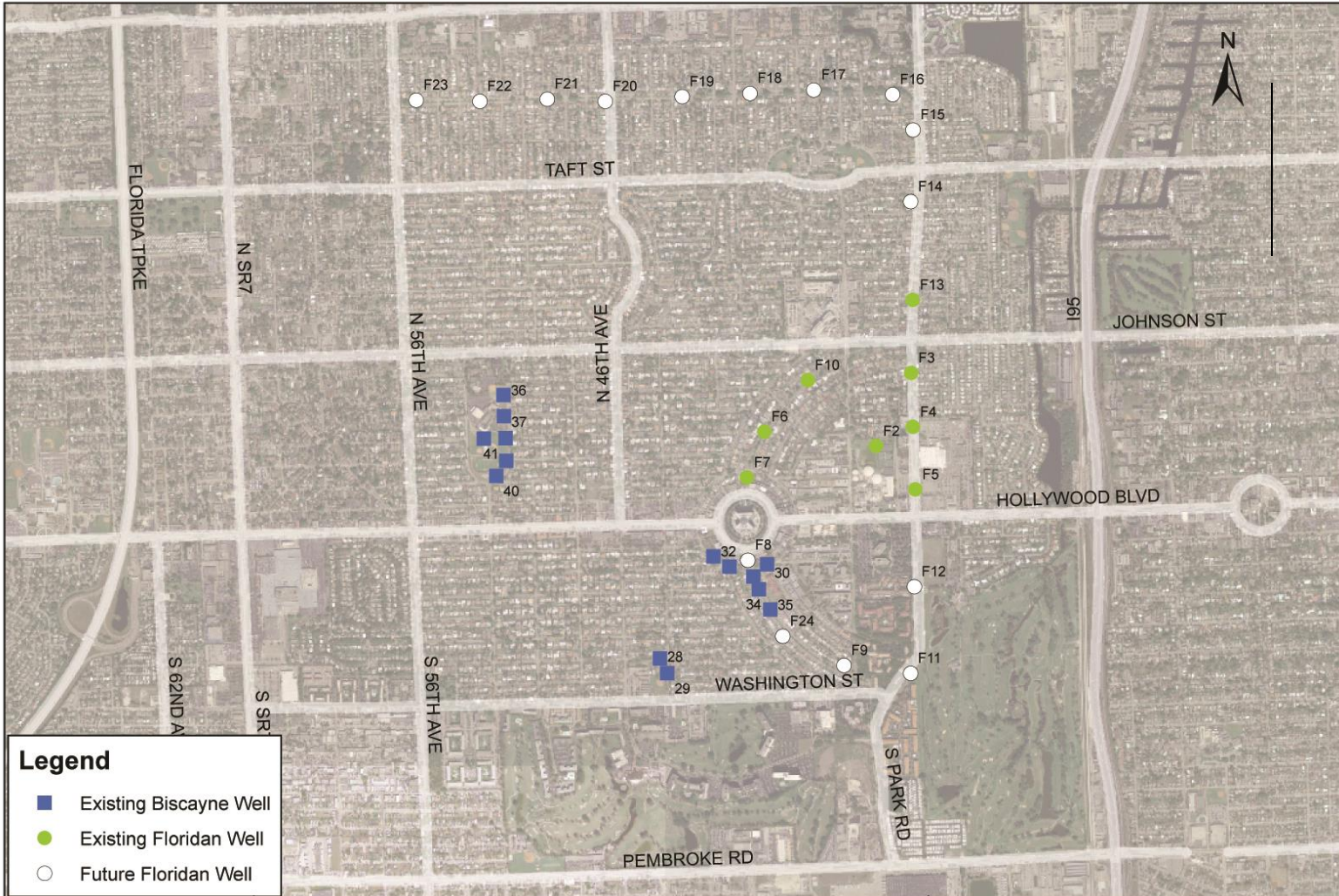
Source: SFWMD Water Use Permit No. 06-00038-W (expires on April 10, 2028) and Letter from Broward County to the City of Hollywood dated April 27, 2018, Subject: Hollywood Flow Limitations.

Proposed Future Floridan Wells (Beyond 2030)

Floridan	FW-F8, F9, F11, F12, F14 through F24	45	TBD		45	21.6	TBD
Total Floridan Proposed		45			45	21.6	

Source: Well ID and capacities table from the City of Hollywood Water and Sewer Revenue Bonds, Series 2014 document provided on November 17, 2014.

- Deleted Cells
- Deleted Cells
- Formatted: Table Text Left, Right, Indent: Left: 0", Space Before: 0 pt
- Formatted: Table Text Left, Right, Indent: Left: 0", Right: 0", Space Before: 0 pt
- Formatted: Table Text Left, Right
- Formatted: Font: Arial, Bold
- Formatted: Table Text Left, Indent: Left: 0", Space Before: 0 pt
- Formatted: Font: Arial, Bold
- Deleted Cells
- Formatted: Normal, Space Before: 3 pt
- Formatted Table
- Formatted: Font: Arial, Font color: Black



City of Hollywood 10-Year Water Supply Facilities Work Plan - 2014 Update
 Biscayne and Floridan Aquifer Wells (Existing and Future)

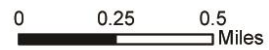


Figure 3-1

The City has been proactive in establishing and expanding its Floridan Aquifer supply and treatment capacity as its alternative water supply source. This serves two purposes: to meet projected water demands and to provide increased water supply reliability by including a more drought resistant source in its overall water supply mix. As part of its overall water supply planning process, the City had received allocation in both its 2000 and 2008 WUPs for new Floridan wells, rated at approximately 1,000 gallons per minute (gpm) each, in addition to the four existing Floridan wells. Between 2008 and 2012, the City constructed four of the planned new wells (F-6, F-7, F-10, and F-13). Because of the supply, transmission, and treatment facility infrastructure already in place, these wells can be installed on a “just in time” basis if needed to meet increasing water demands in the future. At this time, it does not appear that these new wells will be needed within the current planning horizon. Figure 3-1 illustrates the locations of existing and proposed future Floridan wells.

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

Formatted: No bullets or numbering

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 ~~Hollywood~~City’s Biscayne ~~wellfield~~Aquifer wellfields is treated ~~by both~~ theusing LS and MS treatment ~~systems~~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 ~~at 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 by using the RO treatment ~~system exclusively~~process.

Table 3-~~23~~ summarizes the existing firm and nominal water treatment capacities of each treatment system. As shown in ~~Table 3-2~~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. 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 ~~2003-2013~~ water plant Monthly Operating Reports (MORs). Treatment losses for the MS and RO facilities are based on design and operational criteria.

Table 3-23. 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)	All described/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/sq. ft., but the plant prefers to conservatively operate its six larger filters at 1.5 gpm/sq. ft. Using these loading rates, the LS system has a total capacity of 24 mgd and a firm capacity of 22.5 mgd.

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 ~~systems~~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 ~~antisealant~~anti-scalant to protect the membranes from scaling, ~~and~~. 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.

~~2.0 mgd, and there are seven skids currently in operation. Therefore, the MS system is able to~~

Formatted: No page break before

Formatted: Table Text Center

Formatted Table

Formatted: Table Text Center

Formatted: Table Text Center

Formatted Table

Formatted: Table Text Center

Formatted: Font: 9 pt

Formatted: Font: 9 pt

~~produce a total of 14 mgd and with one skid out of service; the system has a firm capacity of 12 mgd.~~

Each train consists of a feed pump and 54 pressure vessels arranged into a three-stage ~~32-16-6~~ configuration. Each pressure vessel holds seven membrane elements. Each ~~membrane softening~~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 ~~antiscalant~~anti-scalant to protect the membranes from scaling, ~~and~~. ~~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 ~~operating~~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 ~~with one train out of service.~~

3.1.2.4 Disinfection System

The City currently uses chloramines to provide primary disinfection and a secondary residual for the distribution system. ~~Free chlorine generated by an on-site generation 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.

~~This system consists of two electrolytic cells, each with a capacity of 1,500 lb./day. Adequate chlorination capacity exists when both chlorinators are online and the average dose is being applied. Currently, 0.8 percent hypochlorite solution is generated by the cells and is stored in a total of~~ 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-~~gallons-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

Section 3
Water Suppliers

The City's degasifier system reduces ~~the carbon dioxide (CO₂)~~ levels in ~~both the MS-~~treated water and ~~CO₂-RO-treated water~~ and ~~the hydrogen sulfide (H₂S)~~ levels in RO-treated water, via air stripping. Sulfuric acid is added to lower ~~the~~ pH of ~~the~~ Floridan ~~Aquifer~~ water to aid in H₂S removal prior to countercurrent air stripping through a packed tower, ~~but the~~ ~~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 ~~carbon dioxide~~CO₂ from the MS permeate with discharge of the tower exhaust to the atmosphere. One degasifier is designed to remove ~~hydrogen sulfide (H₂S)~~ 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 recent~~ upgrades to the odor scrubber system allow the plant to run all four of its RO skids without generating nuisance odors.

Formatted: Subscript

Formatted: Subscript

3.1.3 Post-Treatment

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

Formatted: No bullets or numbering

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 ~~in~~within the distribution system, 11 MG of ground storage on-site at the WTP, and 5 MG of ground storage located at ~~a new (installed 2014)~~the West Hollywood Storage and Pumping Facility located near Sheridan St. and 68th Avenue. The tankage present at each location is detailed below.

Formatted: Indent: Left: 0.69", No bullets or numbering

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 ~~that are~~ 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, ~~a 24-inch water main (South header), a 30-inch water main (West header), and a 20-inch water main (bypass header)~~ 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 ~~service area~~ water distribution system (~~Figure 3-2~~) consists of ~~over~~:

- Approximately 700 miles of water main pipe with diameters ranging from 2-inch to 36-inch, two diameter;
- Two elevated 1.0 MG storage tanks, two 2.5 MG ground;
- The West Hollywood Pumping and Storage Facility which includes four 1,700 gpm

Formatted: No bullets or numbering

Formatted: Body Text, No bullets or numbering

Formatted: Body Text

Formatted: Not Expanded by / Condensed by

Formatted: No bullets or numbering

Section 3
Water Suppliers

vertical turbine pumps to boost system pressure, chemical dosing to boost system disinfection residual, and two 2.5 mgd aboveground storage tanks located at a common storage and pumping facility, approximately ; and.

- Approximately 40,000 connections, over 2,500 fire hydrants, and over 7,500 valves. The vast majority of these facilities are over 35 years old. There are currently 30 miles of transmission mains of 16 to 30 inches in diameter, approximately 480 miles of distribution mains of 6 to 14 inches in

The piping diameter, and approximately 200 miles of distribution pipe of ranges and lengths are presented in Table 3-4 inches and less in diameter. The distribution system piping is constructed comprised of different a variety of materials such as, including cast iron (CI), galvanized iron (GI), polyvinyl chloride (PVC), ductile iron (DI), and asbestos cement (AC).

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

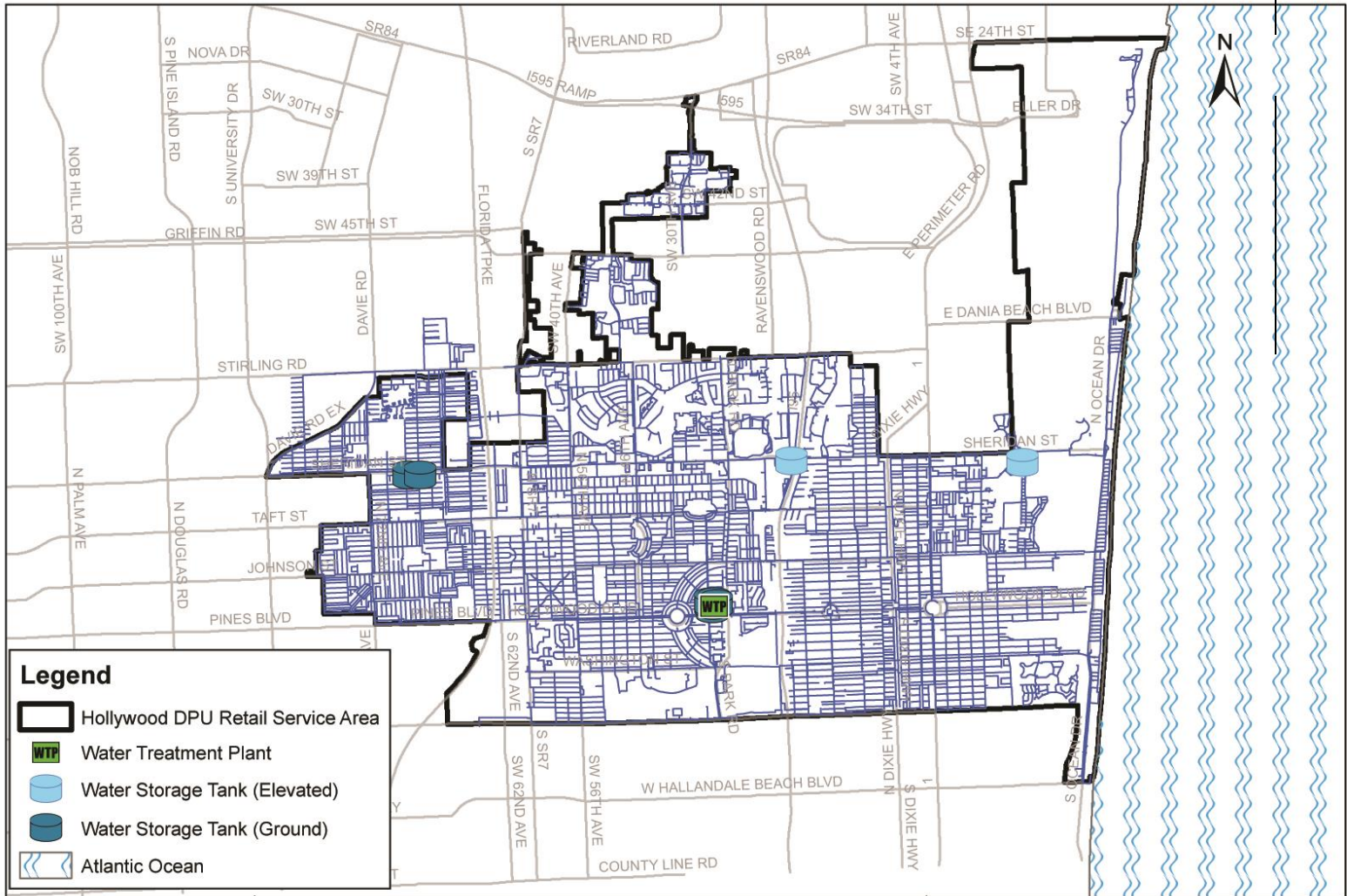
Formatted: No bullets or numbering

Formatted: No bullets or numbering

Section 3
Water Suppliers

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.



Legend

- Hollywood DPU Retail Service Area
- Water Treatment Plant
- Water Storage Tank (Elevated)
- Water Storage Tank (Ground)
- Atlantic Ocean



City of Hollywood 10-Year Water Supply Facilities Work Plan - 2014 Update
 City of Hollywood Retail Service Area Distribution System

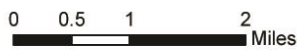


Figure 3-2

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.

3.23.4 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:

- Irrigation of golf courses, parks, medians, residential lots, ~~schools~~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.

~~Use of reclaimed water for the above purposes reduces the reliance on potable water for these uses. Within the state of Florida, over 600 MG of reclaimed water are used on a daily basis; over 200 mgd of this is from the 16 counties covered by the SFWMD.~~

~~The City's DPU is committed to managing its water supplies and, as such, has an existing reuse (or reclaimed) water system. This reuse water system is~~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 ~~by importing lower~~using the low-salinity effluent from the Town of Davie and City of Cooper City, which pump their effluent (~~approximately 3.7 mgd on an annual average basis~~) to the SRWWTP.

The City's existing water reuse ~~water~~ system has a rated capacity of 8.0 mgd, ~~4.0~~ of which 4.0 mgd is usedavailable to provide irrigation quality reuseirrigate landscaping and ~~the other~~

Formatted: No bullets or numbering

Formatted: Indent: Left: 0.6"

Section 3
Water Suppliers

4.0 mgd ~~of which is used~~ available for non-potable in-plant uses such as foam control, washdown water, and process make-up water. ~~The irrigation reuse portion of the facility has an annual average daily flow of 2.6 mgd, according to recent operating report data provided by the City. Flows from this facility are used primarily for irrigation of a few contract customers, previously listed in Table 2-3. The existing reuse system consists of dedicated reuse mains ranging from 4 inches to 24 inches in diameter, sized to serve the identified contract customers. Secondary effluent is filtered and treated to the FDEP's High Level Disinfection (HLD) standards as required to facilitate public access reuse.~~

3.2.13.5 Ocean Outfall Legislation

In 2008, the State Legislature promulgated Ocean Outfall Legislation (OOL) which requires that all utilities in the State of Florida ~~to~~ eliminate wastewater effluent discharges from their ocean outfalls by 2025, except ~~for~~ 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~~ the utility's water supply needs prior to July 2011 may not ~~displace~~ displaced and "~~strand~~" the alternative water supply capacity stranded". The City of Hollywood has been investing in its Floridan Aquifer supply and treatment ~~structures~~ system since the mid-1990s, and has developed and installed 86.00 mgd of firm RO treatment capacity and ~~the corresponding firm~~ 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 horizon, as that will be fully supplied by its existing Biscayne Aquifer and Floridan Aquifer supply and treatment infrastructure. Also, as ~~described~~ 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.

~~The City evaluated alternatives for reuse and their associated costs. Based on the preliminary evaluation, an expanded treatment and dual distribution irrigation system was estimated to cost approximately \$1,000,000,000. Floridan Aquifer recharge through direct injection was identified as a potentially more viable method of compliance. However, because local regulatory standards outlined in the Broward County Code are substantially more stringent than those of the State of Florida, the advanced treatment technology required (i.e. MF/RO/UV AOP) was not only overly costly, it was also accompanied by substantial carbon emissions. In an attempt to reduce both the cost and environmental impacts, the City piloted, at a cost of approximately \$3,000,000, an alternate treatment strategy specific to recharge of the brackish Floridan Aquifer. However, while results from the alternate treatment strategy~~

Formatted: Heading 2 new, No bullets or numbering

~~seem promising for the removal of emerging contaminants, the stringent requirements of the Broward County regulations still leave it economically infeasible to remove or significantly lower the levels of other regulated parameters.~~

~~The City formulated a revised compliance initiative that integrates reuse into other existing water supplies, future anticipated need, and other circumstances that are unique to the City. This initiative was based on the following limiting conditions with respect to expanding reuse:~~

- ~~1. The City's coastal collection system is located within a low-lying area with a high brackish groundwater elevation that results in over 90% of the collection infrastructure being perpetually submerged. This creates tidally influenced surcharge conditions that elevate influent chloride levels, rendering the combined effluent unsuitable for conventional reuse applications.~~
- ~~2. The 20.4 mgd reuse requirement, estimated under current interpretation of the baseline flow, exceeds the annual average potable water consumed within the City of Hollywood. Consequently, if 100% of existing water use in Hollywood was replaced with reclaimed water, sufficient demand would not exist to meet the requirement of the Outfall Rule Change with the exclusive use of reuse water.~~
- ~~3. When adjustments are made for wholesale water supplied to other utilities (forecast to be approximately 7 mgd in 2025) and the fact that irrigation is typically approximately 50% of residential demand, the estimated maximum irrigation demand within the City that is theoretically available to be replaced by reclaimed water is an estimated 9.1 mgd, in 2025.~~
- ~~4. The City has made significant investments in other alternative water supplies (AWS). Existing permitted traditional and alternative water supplies established in conformance to the Water Availability Rule (promulgated in 2007) provide adequate capacity to support forecasted water supply needs beyond the year 2030.~~
- ~~5. Aggressive conservation measures implemented since passage of the Outfall statute have successfully decreased water demand and thereby reduced opportunities for reclaimed water to further offset surficial water supply withdrawals.~~

~~Based on the above considerations, the City is currently formulating a more feasible strategy for compliance with the reuse portion of the statute which may involve the following:~~

- ~~6. Maximize utilization of the existing 4 mgd SRWWTP reclaimed water treatment capacity (target an additional 0.5 to 1.0 mgd).~~
- ~~7. Virtual reuse arrangement with a western community in Broward (target 1 to 2 mgd).~~
- ~~8. Recognizing the fact that conservation measures deliver equivalent benefits as reuse, credit water demand reduction achieved through conservation measures, implemented since passage of the Outfall Rule Change, across all outfall Large Users to provide an equivalent reuse benefit on a 1:1 basis (combined credit for all~~

Section 3
Water Suppliers

~~Large Users to be determined, estimated to be 3 mgd for Hollywood).~~

- ~~9. Credit the City's 8 mgd Floridan Aquifer supply and reverse osmosis treatment capacity as providing equivalent reuse benefit on a 1:1 basis.~~
- ~~10. Given the limited need for reclaimed water by the year 2025, allocate 30% of required reuse capacity to backup disposal classification (subject to filtration, disinfection and DIW disposal) as allowed under F.S.403.086(7) and subject to future use only as need emerges and where feasible relative to other AWS options (estimated backup disposal capacity is up to 6 mgd).~~
- ~~11. Exclude brackish groundwater not derived from a useful source of water supply, which results from tidal surcharging of the collection system, where its impact is determined to impair effluent quality so as to limit conventional reuse and produce continuous surcharge conditions that increase base condition flow beyond a level that can be feasibly utilized by reuse applications. Excluding brackish groundwater influence from the base condition flow would reduce the reuse requirement by an estimated 4.7 to 7.3 mgd.~~

~~The City of Hollywood will conduct additional meetings with FDEP and other regulatory agencies before finalizing the compliance steps; however, the City remains on track to meet the compliance schedule.~~

~~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

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

3.33.6 City of Hollywood Water Conservation Program

Since 2008, the City’s average gallons per capita demands have decreased substantially (from a historic 140 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). This corresponds 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.

Formatted: No bullets or numbering

Section 3
Water Suppliers

~~The reduction in gpcd is due~~ to a variety of conservation efforts that include ~~a~~ plumbing fixture replacement ~~programs~~program, public education, year-round irrigation restrictions, replacement of aging (leaky) water mains, and other measures. The impact ~~of the City's efforts appear~~appears to be ~~permanent because~~ ~~gpcd did not rebound~~ ~~with~~during the recent economic recovery ~~and provides equivalent impact to reclaimed water. Its success further diminishes opportunities for reuse integration due to the resulting reduced and intermittent irrigation demand.~~ Florida Statute 373.250(1) recognizes the importance of conservation and gives it equal consideration with reuse in ~~defining what's in~~promoting the ~~public's best~~public interest. Conservation programs are effective in producing ~~equivalent~~the same water use impact as ~~reuse~~using reclaimed water at a fraction of ~~its~~the cost.

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

<u>Year</u>	<u>Finished Water (mgd)</u>	<u>Population – Retail and Wholesale</u>	<u>Annual Average Usage (gpcd)</u>	<u>Five-Year Average Usage (gpcd)</u>	
<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4) = [(2) x 1,000,000] / (3)</u>	<u>(5)</u>	
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	127	
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		114
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		113

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 ~~the~~ 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. ~~Some BMPs that have been~~ The City has implemented, ~~include the following~~ water conservation BMPs.

Formatted: Not Expanded by / Condensed by

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

Section 3
Water Suppliers

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 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 will be 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.)

4.3. Expansion of Reuse Projects

2.4. Water-Efficient Landscape and Irrigation Evaluations

3.5. Ultra Low Flush (ULF) High Efficiency Toilet (HET) Rebates

4.6. Retrofit Kit Giveaways

5.7. Water Use Evaluations

6.8. Restaurant Rinse Valve Replacement

Between 2003 and 2013, the City observed an approximately 10 percent decrease in its 5-year rolling average per capita demand from 128 gpcd to 114 gpcd. This corresponds to an approximately 3 mgd reduction in its use of Biscayne Aquifer water. This could be due to a variety of factors, which include the City’s conservation program, water use restrictions, changes in behavior resulting from drought periods and economic conditions during that period, or other factors.

9. It should be noted that the City-adopted landscape irrigation limited to twice per week

Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.25" + Indent at: 0.5"

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.

10. 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 uses monthly promotional materials, public service announcements, consists of 19 municipalities and other media to promote consistent water utilities that collaborate on water conservation messaging 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 City also previously adopted the year-round irrigation restrictions of watering twice per week. Broward Water Partnership was one of 25 recipients.

Formatted: Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.25" + Indent at: 0.5"

3.42.1 Broward County Water System

Formatted: No bullets or numbering

Broward County Districts 3A and 3B/3C are supplied by the City of Hollywood WTP. These systems serve their own retail customers, as well as retail customers in a small portion of the City of Hollywood (less than one square mile). Hence, the raw water sources and treatment plant supplying the three Broward County districts in reference have been already described in this section. This subsection describes the water distribution systems of these service areas.

The transmission and distribution system for District 3A contains approximately 90 miles of pipe of 12 inch and larger and one 2.0 MG finished water storage tank. District 3A also has water interconnects with the City of Fort Lauderdale and the City of Dania Beach, which can be used for emergency purposes to maintain adequate water supply.

The transmission and distribution system for Districts 3B and 3C contains approximately 118 miles of pipe of 12 inch in diameter and larger and two storage tanks with a total storage volume of approximately 3.0 MG. Districts 3B and 3C are interconnected and have emergency interconnects with the City of Hollywood and the City of Miramar to maintain adequate water supply. Figures 4-10 and 4-11, provided in the 2014 Broward County 10-year Water Supply Facilities Work Plan, shows Broward County Districts 3A, 3B, and 3C’s distribution systems.

3.52.1 City of Fort Lauderdale Water System

Formatted: No bullets or numbering

According to its 10-Year Water Supply Facilities Work Plan, the City of Fort Lauderdale provides potable water services, among other utility services, to a service area population of approximately 228,500 residents and seven wholesale customers in the City of Fort Lauderdale and surrounding areas in central Broward County.

Port Everglades is one of seven City of Fort Lauderdale’s wholesale water customers. Fort

Section 3 Water Suppliers

~~Lauderdale's 2014 Water Supply Facilities Work Plan accounts for the demand of Port Everglades as part of its overall aggregate demand projections.~~

~~The City of Fort Lauderdale treats raw water from the Prospect wellfield at the Fiveash Water Treatment Plant and from the Dixie wellfield at the Peele Dixie Water Treatment Plant to supply its retail and wholesale service areas. The Peele Dixie system supplies Port Everglades.~~

~~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 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 on the same site as the retired lime softening facilities. The nanofiltration treatment plant was placed into service in 2008. The nanofiltration treatment plant has a maximum installed finished water treatment capacity of 12 mgd with all units in service.~~

~~The Peele Dixie water service area, which includes Port Everglades, has a remote storage tank (with its associated pump station) known as the Poinciana Park Water Tank, which consists of a 2.0 MG pre-stressed concrete ground storage tank and pumping station with backup power diesel engine generator.~~

~~The City of Fort Lauderdale's water distribution system consists of over 770 miles of 2 to 54-inch diameter water mains that convey the finished water from the treatment facilities to the individual customers. In general, the larger diameter transmission mains radiate from the treatment facilities and decrease in size as they extend throughout the service area. The major transmission mains travel east from the water treatment plants to the populated portions of the service area and the two systems are interconnected along major north-south avenues.~~

4. Water Demand Characterization

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

~~*This section characterizes HLWD-DPU's wholesale agreement with Broward County and develops average and maximum per-capita daily demand and maximum day and maximum-month peaking factors based on historical demand data. This section ends with a brief review of Port Everglades' water demand characterization, water demand forecast, and water supplier adequacy.*~~

~~The City's WTP serves the residents of the City of Hollywood as well as Broward County Districts 3A, 3B, and 3C. The City's WTP also serves and small portions of the Town of Davie, the City of Dania Beach, and the Seminole Tribe of Florida reservation, which are all billed as retail customers. The City provides wholesale potable water service to Broward County is billed as a wholesale customer. In 2013, the annual average daily finished water production of the City's WTP was approximately 21 mgd, of which approximately 6.2 mgd was sold to Broward County. The following subsection characterizes the retail customer water consumption and the subsection after describes the existing wholesale agreement.~~

4.1 Finished Water Wholesale Agreement

~~Broward County purchases finished water from the City for resale to through pipelines that serve the County's retail water customers located in its Districts 3A, 3B, and 3C customers. In 1991, Broward County entered into an interlocal resale water agreement with the City under which the City provided potable water to Districts 3B and 3C. In 1996, that agreement was amended to include C, District 3A. However, service to 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 3A actually started 3B/C serves residents and businesses in January 2002. The most recent amendment to the potable 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 sale agreement was made in 2004. The agreement does not have an expiration date and will continue in perpetuity unless there is mutual agreement for termination 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~~

Section 4
Water Demand Characterization

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 ~~would~~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 ~~introduced~~provided in this Section ~~5~~ uses the most recent projections for Districts 3A, ~~3B~~, and ~~3C~~ indicated ~~3B/C~~ provided in Table WS13 of the 2014 Broward County ~~10-Year~~ Water Supply-Facilities Work Plan ~~(dated November 2014)~~2020. The County's Districts 3A and 3B/C forecasts of water demand in annual average daily mgd are provided in Table 4-1.

-

4.2 — Water Demand Characterization

Formatted: Space Before: 12 pt, Tab stops: 6", Left + Not at 6.5"

Formatted: Font: 10 pt

4.2.1 **Table 4-1. Broward County Districts 3A and 3B/C Finished Water Maximum Day Demands, Maximum Month Demands, and Peaking Factors Demand Forecast**

Formatted: Table Title new, No bullets or numbering, Page break before

Table 4-1 presents the past ten year historical annual maximum day, annual maximum month, and annual average finished water production of the City's treatment facility (from 2003 through 2013). This information was obtained from the drinking water plant's Monthly Operating Reports (MORs) that are required to be submitted monthly to the Florida Department of Environmental Protection. The annual maximum day productions (MDPs) and annual maximum month productions (MMPs) are highlighted in Table 4-1. Maximum day finished water productions are given for each month of the year. The daily production records for each month were averaged to give an average daily finished water production for each month. The maximum month finished water production for each year was defined as the month with the highest average daily flow. Maximum month demands are expressed on an mgd basis assuming that a typical month has 30.4 days. Generally, the average daily production for the past five years, from 2009 through 2013, at the City's WTP was approximately 21.4 mgd.

Maximum day finished water peaking factors were calculated as the ratio of the highest maximum day for a given year to its average daily production. The maximum month finished water peaking factors were calculated by dividing the highest average monthly production for a given year by that year's annual average daily production. Based on these calculations, the maximum day peaking factor that will be carried forward for the demand projections is 1.27. The maximum month peaking factor that will be carried forward for raw water supply need projections is determined in the following section.

Section 4
Water Demand Forecast and Supply Adequacy

Table 4-1. Historical Finished Water Production

Year	Date	2003	2004	2005	2006	Average Daily Demand (mgd)				
2007	2008	2009	2010	2011	2012					
2013										
Jan	ADP	24.0	25.9	24.5	25.0	23.8	21.8	23.1	21.3	
		20.6	21.4	20.9						
	MDP	26.2	27.5	26.5	29.1	24.8	23.9	25.5	26.5	
		22.2	23.3	22.4						
2017 (Actual)										
2020										
2025										
2030										
2035										

- Formatted: Font: 9 pt
- Formatted: Table Heading Center, Indent: Left: 0", Space Before: 0 pt, Tab stops: Not at 0.73" + 1.76" + 2.26" + 2.77" + 3.3" + 3.84" + 4.34" + 4.84" + 5.34" + 5.84" + 6.34" + 6.85"
- Inserted Cells
- Formatted: Font: 9 pt
- Inserted Cells
- Formatted Table
- Formatted: Table Text Left, Centered, Indent: Left: 0", Space Before: 0 pt, Line spacing: single, Tab stops: Not at 1.76" + 2.26" + 2.77" + 3.3" + 3.84" + 4.34" + 4.84" + 5.34" + 5.84" + 6.34" + 6.85"
- Formatted: Font: 9 pt
- Deleted Cells
- Deleted Cells
- Split Cells
- Formatted: Table Text Left, Centered, Indent: Left: 0", Space Before: 0 pt, Line spacing: single, Tab stops: Not at 1.76" + 2.23" + 2.77" + 3.55"
- Formatted: Font: 9 pt
- Deleted Cells
- Deleted Cells
- Split Cells
- Inserted Cells
- Formatted
- Formatted: Font: 9 pt
- Deleted Cells
- Split Cells
- Split Cells
- Formatted
- Formatted: Font: 9 pt
- Formatted: Font: 9 pt
- Formatted
- Formatted: Font: 9 pt
- Formatted: Font: 11 pt, Not Raised by / Lowered by
- Inserted Cells
- Formatted Table

		2020																																																						
		<table border="1"> <tr><td>24.4</td><td>21.8</td></tr> <tr><td>22.4</td><td>24.3</td></tr> <tr><td>20.5</td><td>23.0</td><td>20.6</td></tr> <tr><td>20.6</td><td></td><td></td></tr> <tr><td>MDP</td><td>23.2</td><td>31.7</td><td>25.2</td><td>26.7</td></tr> <tr><td></td><td>23.9</td><td>24.4</td><td>23.7</td><td>23.8</td></tr> <tr><td></td><td>25.2</td><td>23.1</td><td>21.6</td><td></td></tr> </table>										24.4	21.8	22.4	24.3	20.5	23.0	20.6	20.6			MDP	23.2	31.7	25.2	26.7		23.9	24.4	23.7	23.8		25.2	23.1	21.6																					
24.4	21.8																																																							
22.4	24.3																																																							
20.5	23.0	20.6																																																						
20.6																																																								
MDP	23.2	31.7	25.2	26.7																																																				
	23.9	24.4	23.7	23.8																																																				
	25.2	23.1	21.6																																																					
		<table border="1"> <tr><td>Jul</td><td>ADP</td><td></td><td>23.2</td><td></td></tr> <tr><td></td><td></td><td>26.1</td><td>24.5</td><td>23.4</td></tr> <tr><td></td><td></td><td>22.2</td><td></td><td>21.8</td></tr> <tr><td></td><td></td><td>22.1</td><td></td><td>20.6</td></tr> <tr><td></td><td></td><td>21.0</td><td></td><td>21.0</td></tr> <tr><td></td><td></td><td>20.2</td><td></td><td></td></tr> <tr><td>MDP</td><td>25.8</td><td>32.8</td><td>26.8</td><td>25.0</td></tr> <tr><td></td><td>24.1</td><td>24.5</td><td>24.7</td><td>22.2</td></tr> <tr><td></td><td>23.8</td><td>23.2</td><td>21.4</td><td>21.0</td></tr> </table>										Jul	ADP		23.2				26.1	24.5	23.4			22.2		21.8			22.1		20.6			21.0		21.0			20.2			MDP	25.8	32.8	26.8	25.0		24.1	24.5	24.7	22.2		23.8	23.2	21.4	21.0
Jul	ADP		23.2																																																					
		26.1	24.5	23.4																																																				
		22.2		21.8																																																				
		22.1		20.6																																																				
		21.0		21.0																																																				
		20.2																																																						
MDP	25.8	32.8	26.8	25.0																																																				
	24.1	24.5	24.7	22.2																																																				
	23.8	23.2	21.4	21.0																																																				
Aug	ADP	23.1	24.3	25.1	23.7	22.8	21.6	23.1	20.5																																															
		21.1	20.6	21.4																																																				
	MDP	25.5	25.7	27.7	25.4	24.7	24.6	25.0	22.0																																															
		23.1	22.6	23.9																																																				
Sep	ADP	22.9	23.8	23.9	23.2	23.1	21.6	21.7	20.1																																															
		20.3	20.8	21.0																																																				
	MDP	25.2	26.0	25.9	25.3	25.9	23.6	23.4	21.8																																															
		21.7	24.8	22.2																																																				
Oct	ADP	24.8	24.2	23.6	24.7					22.2																																														
		22.2	21.7	23.0	21.2	20.9					24.7																																													
		21.1																																																						
	MDP	27.1	25.9	25.7	26.4																																																			
		25.5	23.7	24.7	23.6																																																			
		24.6	22.7																																																					
Nov	ADP	25.0	25.4	24.6	23.4	21.9	22.0	22.1	21.3																																															
21.0		20.5																																																						
	MDP	27.2	27.4	27.7	25.8	23.7	23.2	25.8	22.6																																															
		22.7	23.0	22.6																																																				
Dec	ADP	25.6	25.4	24.2	23.4	22.0	22.3	20.7	21.2																																															
	MDP	28.1		20.9	20.5	20.9																																																		
			27.0																																																					
			28.5		25.5	24.1	24.6	23.2	22.9																																															
					23.3	21.8	22.0																																																	
Overall	ADP	23.8	25.8	24.5	24.6	23.0	22.1	22.6	20.8																																															
		21.7	21.0	21.0																																																				
	Max Day	1.18	1.27	1.16	1.18	1.22	1.20	1.18	1.27	1.17	1.19																																													
	Peaking Factor																																																							
	MMP	25.6	27.9	25.4	26.7	25.6	23.8	23.9	21.3	23.0	21.7																																													
	Max Month	1.07	1.08	1.04	1.09	1.11	1.08	1.06	1.02	1.06	1.03																																													
	Peaking Factor																																																							

Formatted: Table Text Left, Centered, Indent: Left: 0", Space Before: 0 pt, Line spacing: single, Tab stops: Not at 1.76" + 2.26" + 2.77" + 3.3" + 3.84" + 4.34" + 4.84" + 5.34" + 5.84" + 6.34" + 6.85"

Formatted: Font: 9 pt

Formatted: Table Text Left, Centered, Indent: Left: 0", Space Before: 0 pt, Line spacing: single, Tab stops: Not at 1.76" + 3.3" + 3.84" + 4.34" + 4.84" + 5.34" + 5.84" + 6.34" + 6.85"

Formatted: Font: 9 pt

Formatted Table

²This month contained a maximum day data point of 36 mgd; however, because this data point does not appear to be reasonable based on the raw water production and finished water production on the consecutive days surrounding that data point, was about 7 mgd higher than any day during the 10-year period, and did not correspond to any known weather event, major main break, or fire that could have caused such a large demand.

³Data for these specific two months from most recent Source: [Broward County Water Master Supply Facilities Work Plan, 2020, Table WS2Q](#)

Formatted: Table Text Left, Indent: Left: 0", Space Before: 3 pt

Formatted: Font: 9 pt

Formatted: Font: 9 pt

Formatted: Font: 9 pt

4.2.2—Maximum-Month Raw Water Production and Peaking Factors for Supply Allocation

The water use permit establishes maximum month raw water withdrawals that cap the amount of raw water that can be used in any given month. To determine this, monthly raw water withdrawals were summed over the time period from 2003-2013. Based on these, the average monthly withdrawal was calculated for each year. Then, the maximum month raw water use during each year was divided by the average monthly raw water use to calculate the maximum-month peaking factor for that year. The monthly raw water usage and peaking factor calculations are shown in Table 4-2.

4.2.3—Fire Flow

According to the Insurance Services Office, Inc. (ISO), the fire flow duration is two hours for fire flows up to 1,500 gpm for residential and low rise buildings and three hours for fire flows of 3,000 gpm and 3,500 gpm for commercial and high rise buildings. According to the most recent Water Master Plan, the minimum needed fire flow storage for the City's commercial properties criterion can be approximated to 1.0 MG. Hence, 1.0 MG fire flow storage is added to the needed equalization storage projections to estimate the total storage needs. Similarly, 1.0 mgd fire flow is added to the maximum day forecast.

4.2.4—Average Per-Capita Daily Demand

The per capita daily water demand is a guideline used to measure the reasonable population-related water use associated with residential, business, institutional, miscellaneous metered and unaccounted uses. According to the guidelines given by the SFWMD, the average per capita daily use rate can be calculated for the last five years of record by dividing the average daily water use by the permanent population served by the utility for the same period of time. The per capita daily demand is expressed in gallons per capita per day.

In addition to calculating the per capita usage rate based on the SFWMD methodology, the single year maximum per capita demand for the 10 year period between 2003 and 2013 was also determined. Projections will be done for both the five year average and 10 year maximum per capita demand in order to provide a range of demand estimates that accounts for current trends in water use, while recognizing that the effects of recent economic conditions, drought restrictions, and other factors may have contributed to a reduction in per capita demand that may not represent true long term trends. Projecting demand at both low and high levels allows the City a margin of safety to provide an adequate water supply over the planning horizon.

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 Raw Water Withdrawals, Retail Population, Finished Water Production and Retail Per Capita Usage

Date	Population - Retail Customers (a)	Florida - Raw Water Production (MG)	Year							2012	2013			
			2003	2004	2005	2006	2007	2008	2009			2010	2011	
Jan			828	898	878	852	842	742	834	750	663	777	777	Deleted Cells
			849	898	878	919	891	809	834	759	747	777	777	Deleted Cells
Feb			0	0	0	35	56	52	0	59	74	73	73	Deleted Cells
			797	831	833	794	745	696	753	629	617	65	65	Deleted Cells
			797	831	833	829	801	748	753	687	691	72	72	Deleted Cells
Mar			0	0	0	82	78	74	0	42	85	77	77	Deleted Cells
			868	902	900	900	831	734	846	710	688	70	70	Inserted Cells
			868	902	900	982	909	808	846	752	773	78	78	Merged Cells
Apr			4	0	0	77	73	75	0	17	78	60	60	Formatted: Table Heading Center
			861	861	889	898	775	692	823	683	688	67	67	Formatted: Table Heading Center
			864	861	889	975	848	767	823	700	766	72	72	Formatted: Table Heading Center
May			7	0	0	81	82	80	29	17	77	54	54	Formatted: Font: 9 pt
			845	940	928	894	750	799	773	702	715	66	66	Formatted: Font: 9 pt
			850	940	928	975	832	878	802	720	793	71	71	Formatted: Font: 9 pt
Jun			34	0	0	18	68	35	6	79	38	71	71	Formatted: Font: 9 pt
			752	901	843	857	674	750	731	637	720	628	620	
			786	901	843	875	742	784	737	716	758	699	695	
Jul			75	0	0	0	65	71	17	47	42	55	69	
			840	873	903	849	715	721	750	682	728	682	638	
			908	873	903	849	780	793	767	729	770	737	707	
Aug			73	0	0	0	75	81	49	79	83	65	73	
			776	815	953	873	727	700	740	663	678	676	654	
			849	815	953	873	802	781	789	742	762	736	727	
Sep			42	0	47	0	77	47	50	57	32	67	78	
			778	782	827	829	724	702	682	631	662	642	607	

	With dra- wa- l- Dail- y- Flo- w- Basi- s- (MG D)1 43, 568			9	3		9	9	8	2	11	
20 18	Max- Mon- th- Pea- king Fact- or1 44, 439	21.94	1.07	1.086	7	1.0715	3	4.0	910	1.42	26.2	1.09
	Average	-	-	-	-	-	108	.6	-	-	1.17	

Formatted: Font: 9 pt

Formatted: Font: 9 pt

- Formatted: Font: 9 pt
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Formatted: Table Text Center
- Formatted: Font: 9 pt, Not Raised by / Lowered by
- Formatted: Table Text Center, Left
- Formatted: Font: 9 pt
- Formatted: Font: 9 pt
- Formatted: Font: 9 pt
- Formatted: Font: 9 pt
- Formatted: Font: 9 pt
- Formatted: Font: 9 pt
- Formatted: Font: 9 pt

- (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 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 City's service area per capita was calculated based on annual average finished water production rates summarized in Table 4-1 and historical and projected population data for the corresponding years. Historical population data for 2004-2006 was taken from the most recent Water Master Plan. 2007-2009 was derived via a straight line interpolation between the 2006 population data and the 2010 census data presented in Section 2, Table 2-2. Historical population levels and equivalent per capita demands are shown in Table 4-3, along with the associated finished water use and per capita demand.

Table 4-3. Historical Per-Capita Demands

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 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

Section 4
Water Demand Forecast and Supply Adequacy

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		Per-Capita- Flow
		mgdGPCD	gpcdAnnual Average Day (mgd)	
2004(1)	186,648(2)	26.4(3)	140(4) = (3) x (2) / 10^6	
2005	188,287	24.5	430	
2006-2018 - Actual	190,595,144.4 39	24.105.6	429.15.3	
2007	189,716	23.0	421	
2008	188,837	22.4	417	
2009-2020	187,058,146.1 80	22.108.6	420.15.9	
2010	187,078	20.8	414	
2011-2025	188,108,150.3 80	21.7108.6	445.16.3	
2030-2042	189,138,156.6 40	21.0108.6	444.17.0	
2013	190,168	21.0	410	
5-year- average 2005- 2013	22.7161,270	44.4108.6	17.5	
10-year- max 2010- 2040	26.4164,432	44.0108.6	17.9	

(a) Broward County Water Supply Facilities Work Plan 2020, Table WS12

The City's composite (retail plus wholesale customers) 2009-2013 average per capita daily demand was estimated to be 114 gpcd. This per capita demand will be used to prepare the low-range projected finished water and water supply demands in the next section. The 10-year maximum per capita demand was calculated to be 140 gpcd; this value will be used to prepare the high-range demand projections in the next section. Using both the high-range and the low-range will allow the City to estimate its baseline capacity needs, while giving it the flexibility to be prepared for rebounds in per capita demand.

4.2.5 — Non-Revenue Water (NRW)

The assessment of non-revenue water (NRW) is important to reduce lost revenue and for water conservation. A study done by others reviewed the City's existing water loss accounting methodology, water metering procedures, and historical water distribution system losses and indicated that the inaccuracy of finished water metering or unregistered losses at the WTP

- Deleted Cells
- Merged Cells
- Merged Cells
- Formatted Table
- Formatted: Font: Arial
- Formatted: Table Heading Center
- Formatted: Table Heading Center
- Formatted: Table Text Center

- Formatted: Table Text Center

- Formatted: Table Text Center

- Formatted: Table Text Center

- Formatted: Table Text Center
- Inserted Cells
- Formatted: Table Text Center

could be the most significant factor contributing to the previous NRW loss computational imprecision. Using the best available data, that study developed a preliminary estimate of the City's distribution system NRW loss of 8 percent between 2002 and 2005. The study recommended the use of the IWA/AWWA consensus methodology for future water loss assessments particularly for the development of a water loss audit and any required water loss reduction plan.

Since that time, the City has utilized its own methodology to determine NRW, which evaluates the finished water total minus (the City's total consumption, Broward County/City of Dania Sales minus Alandco, and the monthly water loss). The most recent one year period from October 2013 to September 2014 averaged a 7.2 percent loss, which is below the 10 percent threshold.

4.3 — Port Everglades Water Demand

Due to its varying land uses, Port Everglades' water demand characteristics differ from typical residential/commercial patterns. Generally, the 2008 City of Fort Lauderdale 10 Year Water Supply Facilities Work Plan characterizes the Port Everglades water demand as follows:

- Base 2010 water consumption: 1.31 mgd
- Maximum day peaking factor: 1.5
- Distribution system losses: 8.1%
- Expected annual water consumption growth: 5% — as approved by Port Everglades and its consultant Craven Thompson.

This characterization was not included in Fort Lauderdale's 2014 Water Supply Facilities Work Plan, so demand was projected based on the available information from the previous version of the plan. Based on these water demand parameters, Table 4.4 tabulates Port Everglades water demand forecast — with and without distribution losses.

Table 4.4. Port Everglades 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	Water Annual Average Daily Demand (in mgd)	2015	2020	2030
		2.0	2.2	2.5

- Deleted Cells
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Deleted Cells
- Inserted Cells
- Formatted Table

Section 4
Water Demand Forecast and Supply Adequacy

	<u>Retail</u>	<u>Districts 3A and 3B/C</u>	<u>Total</u>
Annual average daily flow without distribution losses	(1.68)	(2.14)	2.73
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	1.83	2.74
Maximum-day flow – including distribution losses (8.1%)		2.74(a)	3.46

Deleted Cells

Deleted Cells

Formatted: Table Heading Center

Formatted: Table Heading Center

Deleted Cells

Deleted Cells

Deleted Cells

Deleted Cells

Formatted: Table Text Center

Inserted Cells

Inserted Cells

Deleted Cells

Formatted Table

Formatted: Left

Deleted Cells

Deleted Cells

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

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

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

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

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.

Section 4
Water Demand Forecast and Supply Adequacy

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) = $\frac{(2) - (3)}{(2)} \times 100$
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%
Average	-	-	9.1%

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%
Total / Weighted Average	30	100%	10%

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

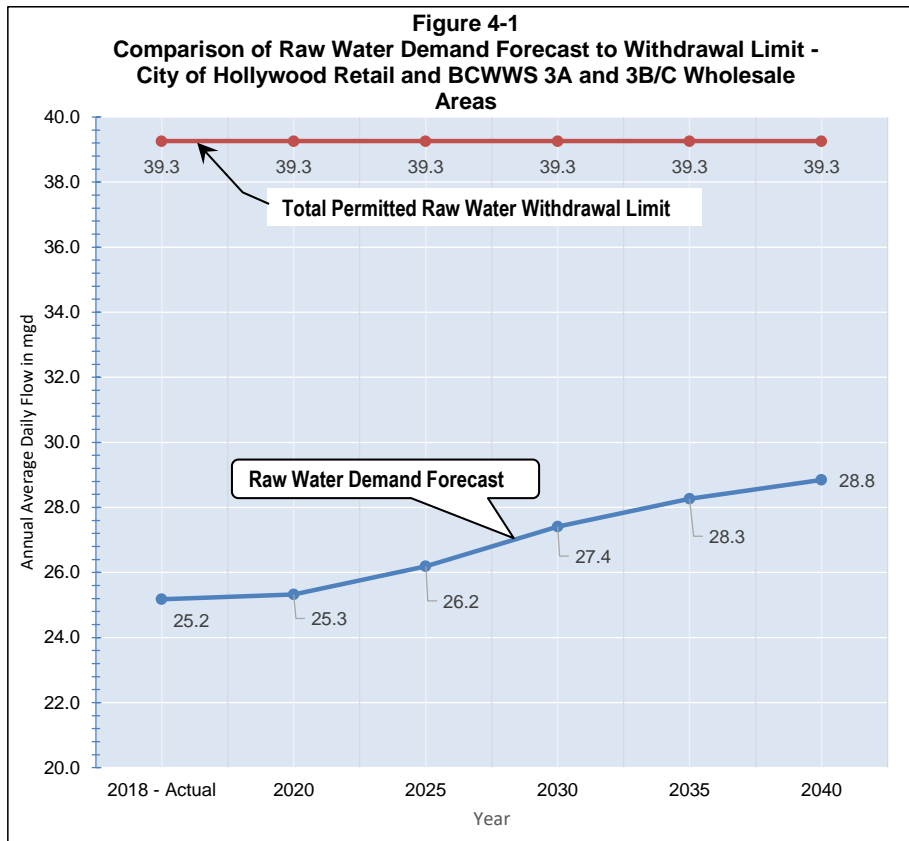
The City's combined permitted raw water withdrawal quantities total 39.3 mgd on an annual average day basis and 42.0 mgd on a maximum month basis as summarized in Table 4.10. The comparison of forecasted raw water withdrawal to the permitted quantity is provided in Figure 4-1.

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
Total	39.26	42.02

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.

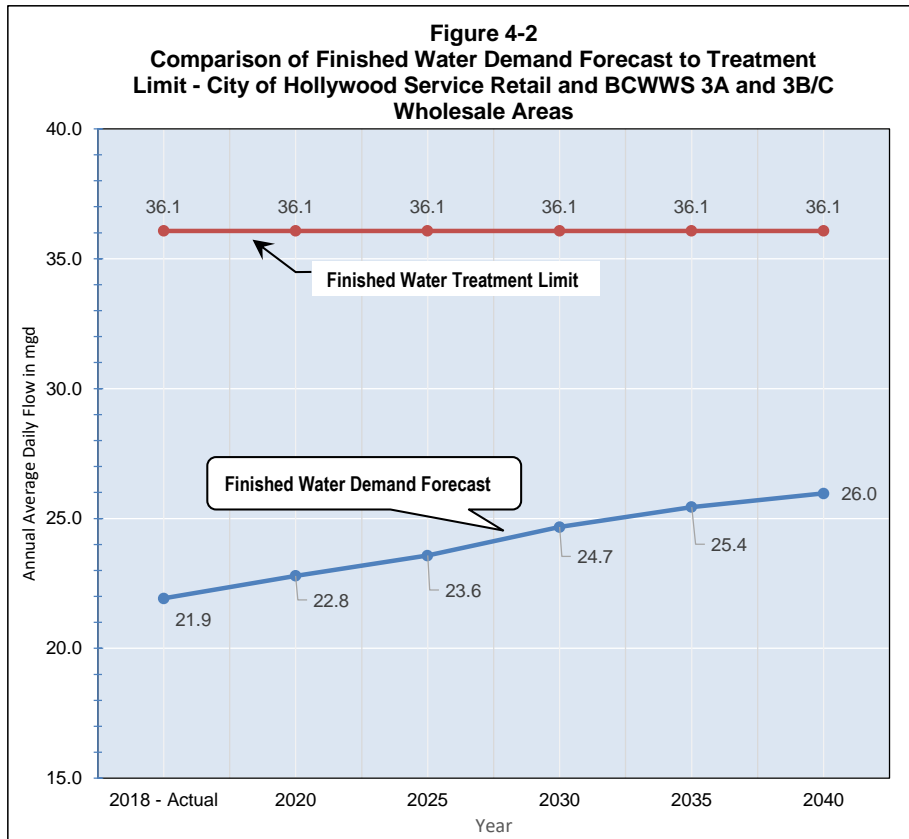
Table 4.11 Calculation of Finished Water Quantity Limit based on Raw Water Permit Limit

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

(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

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

The adequacy of the City of Fort Lauderdale water system to supply Port Everglades is implicitly ensured in the City of Fort Lauderdale ~~10-Year~~ Water Supply Facility Work Plan, ~~where~~ 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 appropriate capital expansions summarizes the regional water supply planning issues that have the potential to impact the City.

Formatted: Font: 8 pt

The City and the HLWD-DPU are identified to meet the overall City cognizant of Fort Lauderdale service area the regional issues that are impacting or have the potential to impact water supply, water demand. As the water supply adequacy for Port Everglades, 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”.

Table 5-1 summarizes the water supply-related recommendations from the Regional Climate Action Plan 2.0.¹ 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 addressed in incorporated throughout this section, the following sections will focus on the City of Hollywood WTP service area, including retail and wholesale.

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

5.—Water Demand Forecast and Water Supply Adequacy

This section evaluates the water supply facilities adequacy relative to the water demand forecast and demonstrates that the existing water supply facilities and conservation and reuse practices will meet projected demands.

The projected annual average daily, maximum month, and maximum day finished water demands of the City's service area over the planning horizon were estimated based on the population projections for the City's retail service area and the wholesale customer projected demands that were discussed in previous sections. Projected water demands were compared against the existing capacities of the City's Public Water System in order to assess requirements for new or expanded facilities.

5.1—Projected Finished Water Demands

Projected water demands were estimated based on a per capita coefficient approach for the City's retail service area. Projections were done at low (114 gpcd) and high (140 gpcd) projected per capita demands that were previously developed in Section 4. Average day projected demands for the Broward County 3A and 3B/C systems that were provided in the county's 2014 Water Supply Facilities Work Plan were used in the overall demand population for the City's service area. The 3A and 3B/C demands fall within the range that would be expected based on the low and high per capita demands established for the overall service area. The average daily retail per capita demand rates were assumed to be constant over the planning horizon.

The average daily water demand projections for the City's service area were estimated as the product of the retail population projections and the average daily retail per capita demand. The projections of Broward County's projections for Districts 3A, 3B, and 3C were added to the City's retail water demand projections to obtain the overall water demand forecast. The most recent projections for Districts 3A, 3B, and 3C were obtained from the 2014 Broward County 10 Year Water Supply Facilities Work Plan. The total finished water demand projections were estimated from through the planning horizon as follows:

$$WD_n = [Pop_n \times PC] + BC_n$$

Where,

- WD_n : Finished water demand in year n
- Pop_n : City's service area population in year n
- PC : Average per capita water demand
- BC_n : Projected water demand from Broward County in year n

The estimated average day finished water demand projections are presented in Table 5-1a (based on low per capita demand forecast) and 5-1b (based on high per capita demand forecast). These projections are lower than the water use permit approved in April 2008 due to recent Update and related comprehensive planning element updates of the Broward County demographic projections reflecting corrections related to economic growth and housing market expectations.

Formatted: Widow/Orphan control

Formatted: Font: 10.5 pt, Font color: Black

Table 5-1a. Forecasted Average Day Finished Water Demand Projections, 114 gpcd Retail Per-Capita

(1) Year	(2) City's Retail Service Area Population Projections	(3)=(2)*P er capita/AM	(4) Average-Day Finished Water Demand Projections for Retail Customers (mgd)	(5)=(4)+(3) Average-Day Finished Water Demand Projections for Broward County 3A and 3B/3C (mgd)	Total Average-Day Finished Water Demand Projections (mgd)
Item		Recommendations			
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.		
2014	144,554	16.5	WS-6.6 Develop a spatial database of resilience projects for water infrastructure.	23.1	6.6
WS-7			Modernize infrastructure development standards in the region.		

Deleted Cells

Deleted Cells

Deleted Cells

Deleted Cells

Formatted Table

Formatted: Space Before: 12 pt, After: 12 pt

Formatted: Table Text - Left

Deleted Cells

Formatted Table

Deleted Cells

Deleted Cells

Formatted: A3

Formatted: A3

Formatted: Space Before: 12 pt, Tab stops: 6", Left + Not at 6.5"

Formatted: Font: 10 pt

Section 5
Regional Issues

2020	149,573	17.1	6-W S-8	23.9	Address the resilience of the regional flood control system.
2025	150,720	17.2	6-W S-9	24.1	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.		
2030	155,405		WS- 17.7	7.2	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.		

Source: *2014 Broward County 10-

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

Formatted: Table Text - Left

Formatted: A3

Deleted Cells

Deleted Cells

Formatted Table

Deleted Cells

Formatted: A3

Formatted: Table Text - Left

Formatted: A3

Formatted: Table Text - Left

Deleted Cells

Deleted Cells

Formatted Table

Deleted Cells

Formatted: A3

Formatted: A3

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 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.

Section 5
Regional Issues

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.

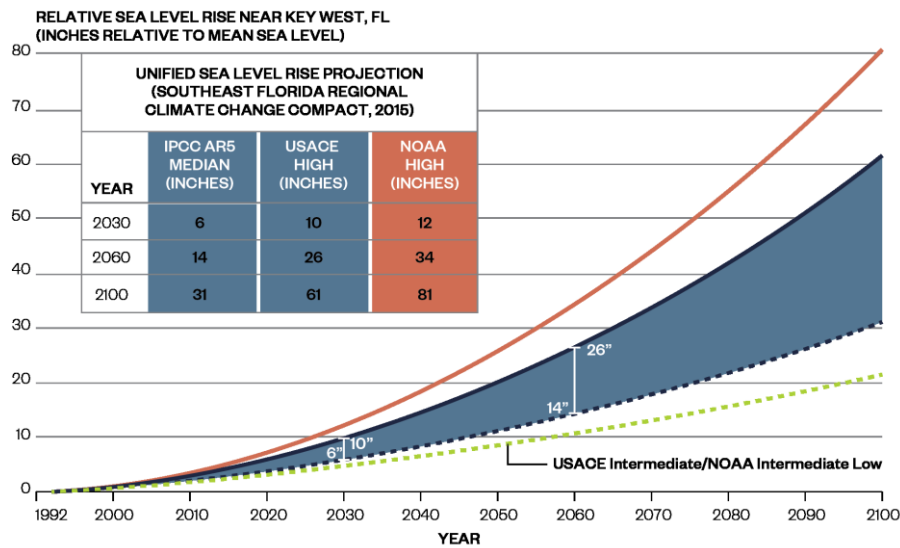


Figure 5-1 – Sea Level Rise Projection (2015)

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.

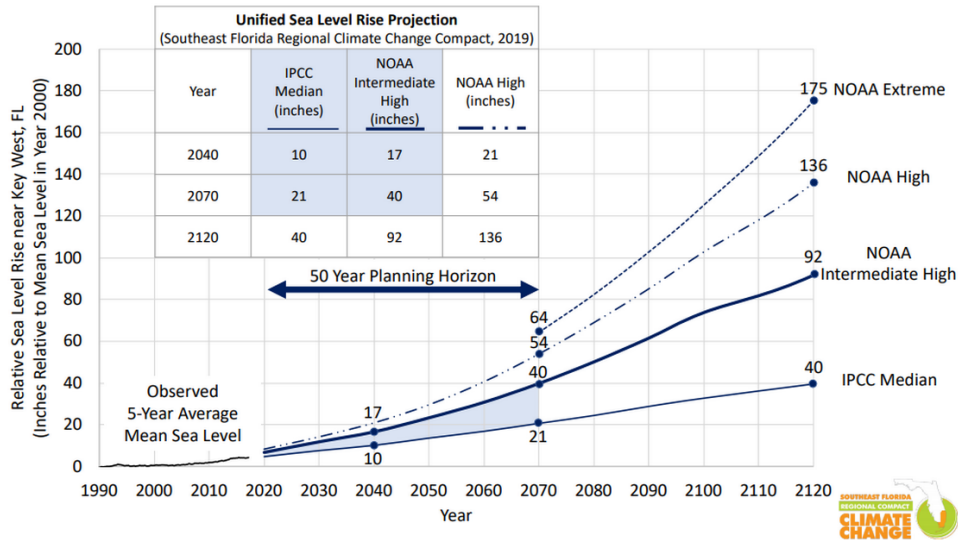


Figure 5-2 – Sea Level Rise Projection (2019)

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.

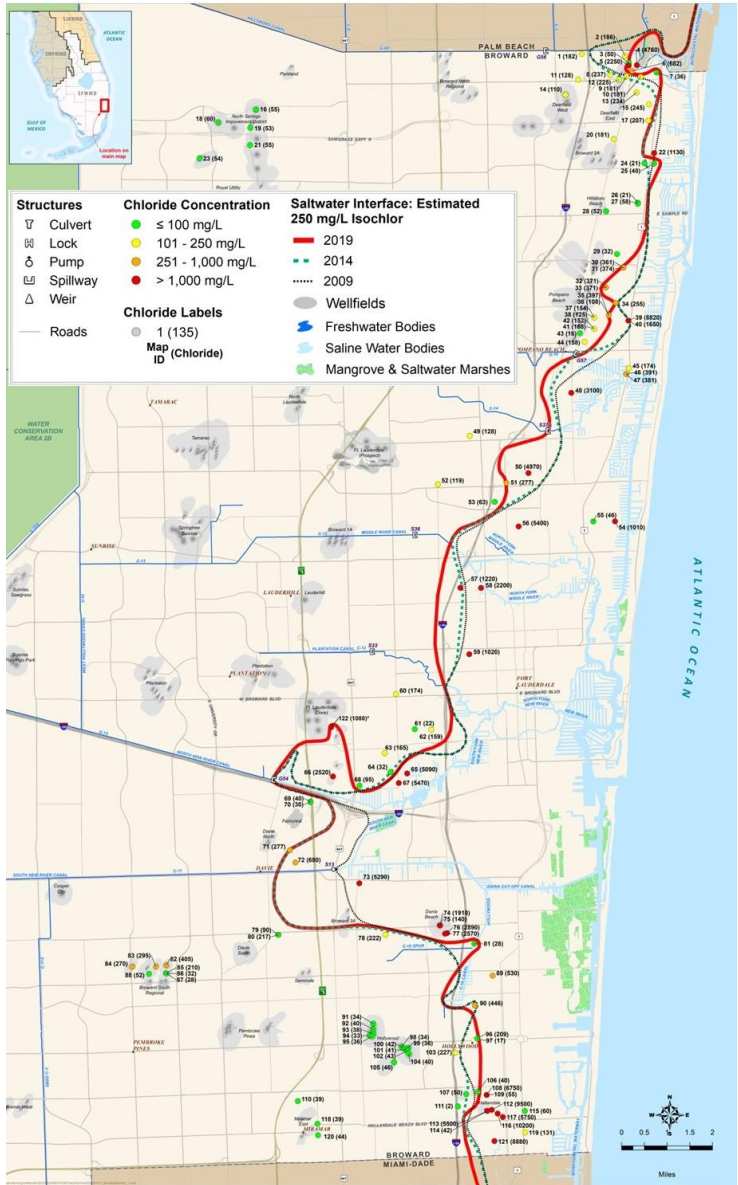


Figure 5-3 – 250 mg/L Isochlor Line in Broward County (SFWMD)

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.

Year: Water Supply Facilities Work Plan.

Table 5-1b. Forecasted Average-Day Finished Water Demand Projections, 140 gpcd Retail Per-Capita

(1) Year	(2) City's Retail Service Area Population Projections	(3)=(2)*Per capita/1M Average-Day Finished Water Demand Projections for Retail Customers (mgd)	(4) ² Average-Day Finished Water Demand Projections for Broward County 3A and 3B/3C (mgd)	(5)=(4)+(3) Total Average-Day Finished Water Demand Projections (mgd)
2015	144,554	20.2	6.6	26.8
2020	149,573	20.9	6.8	27.7
2025	150,720	21.4	6.9	28.0
2030	155,105	21.7	7.2	28.9

Source: *2014 Broward County 10-Year Water Supply Facilities Work Plan.

5.1.1 Projected Maximum-Day Finished Water Demands

A maximum-day peaking factor of 1.27 was used to estimate the maximum-day water demand of the City's service area. The average day demands for the water service area shown in Tables 5-1a and 5-1b were summed and peaked with the overall system peaking factor of 1.27 to estimate the expected maximum-day demands. The storage and pumping facilities at the Broward County 3A, 3B, and 3C facilities will compensate for the difference between the City of Hollywood's peaking factor and the County's system-specific peaking factors. A 1.0 mgd fire flow was added to this total to come up with the total maximum-day demand used for planning purposes. The total average day and maximum-day finished water demand projections of the City's system thus estimated are presented in Table 5-2.

Table 5-2. Forecasted Average-Day and Maximum-Day Demands

(1) Year	(2) Average-Day, Low Retail Per-Capita	(3) Average-Day, High Retail Per-Capita	(4)=[(2) * 1.27] + 1.0 Maximum-Day, Low Retail per-Capita (inc'l 1.0 mgd fire flow)	(5)=[(3) * 1.27] + 1.0 Maximum-Day, High Retail Per-Capita (inc'l 1.0 mgd fire flow)
Finished Water Forecasted Demand (mgd)				

Section 5

Water Demand Forecast and Water Supply Adequacy

2015	23.1	26.8	30.3	35.0
2020	23.9	27.7	31.4	36.2
2025	24.1	28.0	31.6	36.6
2030	24.9	28.9	32.6	37.7

5.2 — Raw Water Supply Adequacy Projections

The adequacy of raw water supplies were projected based on the maximum month peaking factor developed in Section 4, installed firm well capacities, average day and maximum month projected water usage, and treatment losses of the major water plant processes (LS, MS, and RO). Water supply peaking factors and demands were calculated separately from finished water because the demand patterns differ (finished water storage tanks are used to absorb peaks and valleys in finished water demands). Raw water usage was projected under both the low and high annual average daily finished water needs shown in Table 5-2.

As is typical of current operating practice, the City’s Biscayne Aquifer allocation is used to meet the majority of finished water demand. The City has proactively committed to using the Floridan Aquifer as its primary alternative water supply and has expended a significant amount of capital to enhance and expand its Floridan Aquifer raw water production and treatment capacity from 4.0 MGD to 8.0 MGD, and has completely replaced its two oldest treatment units to provide more cost effective and energy efficient treatment. Floridan water is used to meet demand beyond what can be satisfied via the Biscayne allocation.

The following assumptions were used to guide the development of the raw water capacity projections:

- 7. Raw water projections were done for both annual average daily flow and maximum month flow conditions, since both annual average and maximum month withdrawals are limited by the City’s Water Use Permit. Maximum day and maximum month permitted capacities, as well as firm wellfield capacities, are shown for the Biscayne and Floridan Aquifer supplies in Table 5-3.
- 8. The plant runs 12 MGD (6 x 2 mgd skids) of NF continuously, consistent with historical water plant operational practices. The MOR data supports this, with the 10 year average daily NF production averaging 11.4 mgd.
- 9. Demand is satisfied in the following manner: MS is used to meet the first 12 mgd of finished water demand, LS is used to meet demand above the MS production up to the permitted maximum Biscayne withdrawal, and RO is used to satisfy any remaining demand.
- 10. Treatment losses for the NF membranes are 13%, and are 20% for the RO membranes, consistent with design data and operational practices. Treatment losses for the LS facility average 2% based on MOR data.

Table 5-3. Water Supply Permitted Withdrawals and Firm Wellfield Production Capacities

Section 5
Water Demand Forecast and Water Supply Adequacy

Source	Finished Water Forecasted Demand (mgd)			
	Permitted AADF (mgd)	Permitted MME ² (mgd)	Total Capacity (mgd)	Firm Capacity (mgd)
Biscayne Aquifer (Total)	30.7	34.9	43.2	39.7
Floridan Aquifer (Total)	8.7	8.5	12.2	10.2

²Assumes 30.4 days in an average month

Table 5-3 shows that there is adequate firm wellfield capacity for both the Floridan and Biscayne Aquifer supplies. Therefore, projections were done using the permitted capacity for each source as the maximum amount that can be used to provide water supply. The projected water supply needs are shown in Table 5-4 for the low demand projections, and in Table 5-5 for the high demand projections. Figures 5-1 and 5-2 show the projected water supply needs graphically.

Section 5
 Water Demand Forecast and Water Supply Adequacy

Table 5-4. Water Supply Capacity Usage, Low Per-Capita Demand

		2015	2020	2025	2030
Finished Water AADF Required (MGD)	MS	12.0	12.0	12.0	12.0
	LS	11.1	11.9	12.1	12.9
	RO	0.0	0.0	0.0	0.0
	Total	23.1	23.9	24.1	24.9
Corresponding Raw Water AADF Required (mgd)	MS	13.8	13.8	13.8	13.8
	LS	11.3	12.1	12.3	13.1
	RO	0.0	0.0	0.0	0.0
	Total Biscayne	25.1	25.9	26.1	26.9
	Total Floridan	0.0	0.0	0.0	0.0
	Total Raw Water	25.1	25.9	26.1	26.8
Finished Water MMF Required (MGD)	MS	12.0	12.0	12.0	12.0
	LS	13.8	14.7	15.0	15.9
	RO	0.0	0.0	0.0	0.0
	Total	25.8	26.7	27.0	27.9
Corresponding Raw Water MMF Required (mgd)	MS	13.8	13.8	13.8	13.8
	LS	14.1	15.0	15.3	16.2
	RO	0.0	0.0	0.0	0.0
	Total Biscayne	27.9	28.8	29.1	30.0
	Total Floridan	0.0	0.0	0.0	0.0
	Total Raw Water	27.9	28.8	29.1	30.0

Note: Assumes 13% treatment losses for MS, 2% losses for LS, and 20% losses for RO.

Table 5-5. Water Supply Capacity Usage, High Per-Capita Demand

		2015	2020	2025	2030
Finished Water AADF Required (MGD)	MS	12.0	12.0	12.0	12.0
	LS	14.8	15.7	16.0	16.6
	RO	0.0	0.0	0.0	0.3
	Total	26.8	27.7	28.0	28.9
Corresponding Raw Water AADF Required (mgd)	MS	13.8	13.8	13.8	13.8
	LS	15.1	16.1	16.3	16.9
	RO	0.0	0.0	0.0	0.4
	Total Biscayne	28.9	29.9	30.1	30.7
	Total Floridan	0.0	0.0	0.0	0.4
	Total Raw Water	28.9	29.9	30.1	31.1
Finished Water MMF Required (MGD)	MS	12.0	12.0	12.0	12.0
	LS	18.1	19.1	19.4	20.4
	RO	0.0	0.0	0.0	0.0
	Total	30.1	31.1	31.4	32.4
Corresponding Raw Water MMF Required (mgd)	MS	13.8	13.8	13.8	13.8
	LS	18.4	19.5	19.8	20.8
	RO	0.0	0.0	0.0	0.0
	Total Biscayne	32.2	33.3	33.6	34.6
	Total Floridan	0.0	0.0	0.0	0.0
	Total Raw Water	32.2	33.3	33.6	34.6

Note: Assumes 13% treatment losses for MS, 2% losses for LS, and 20% losses for RO.

Figure 5-1
Water Supply Capacity Usage, Annual Average Basis

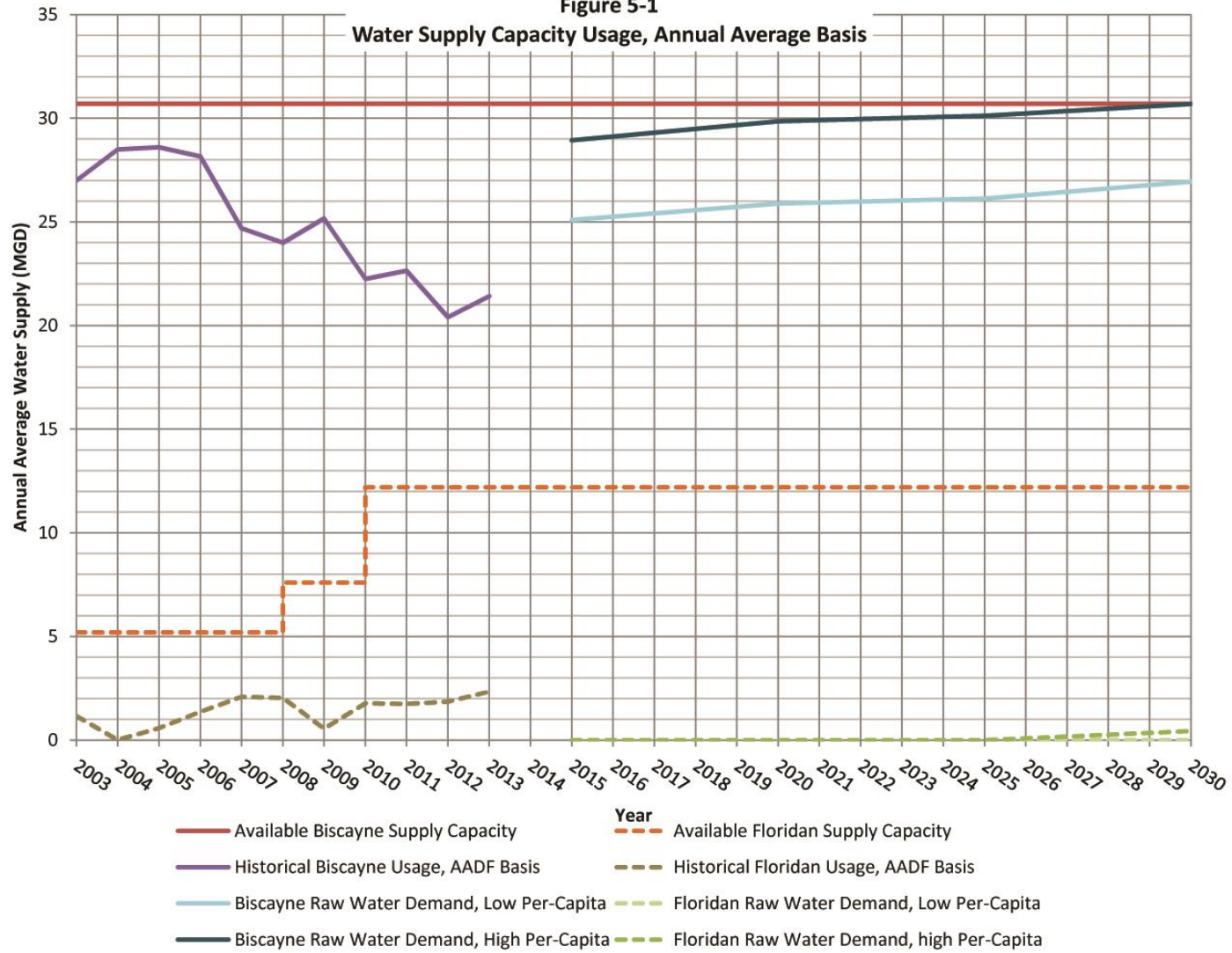
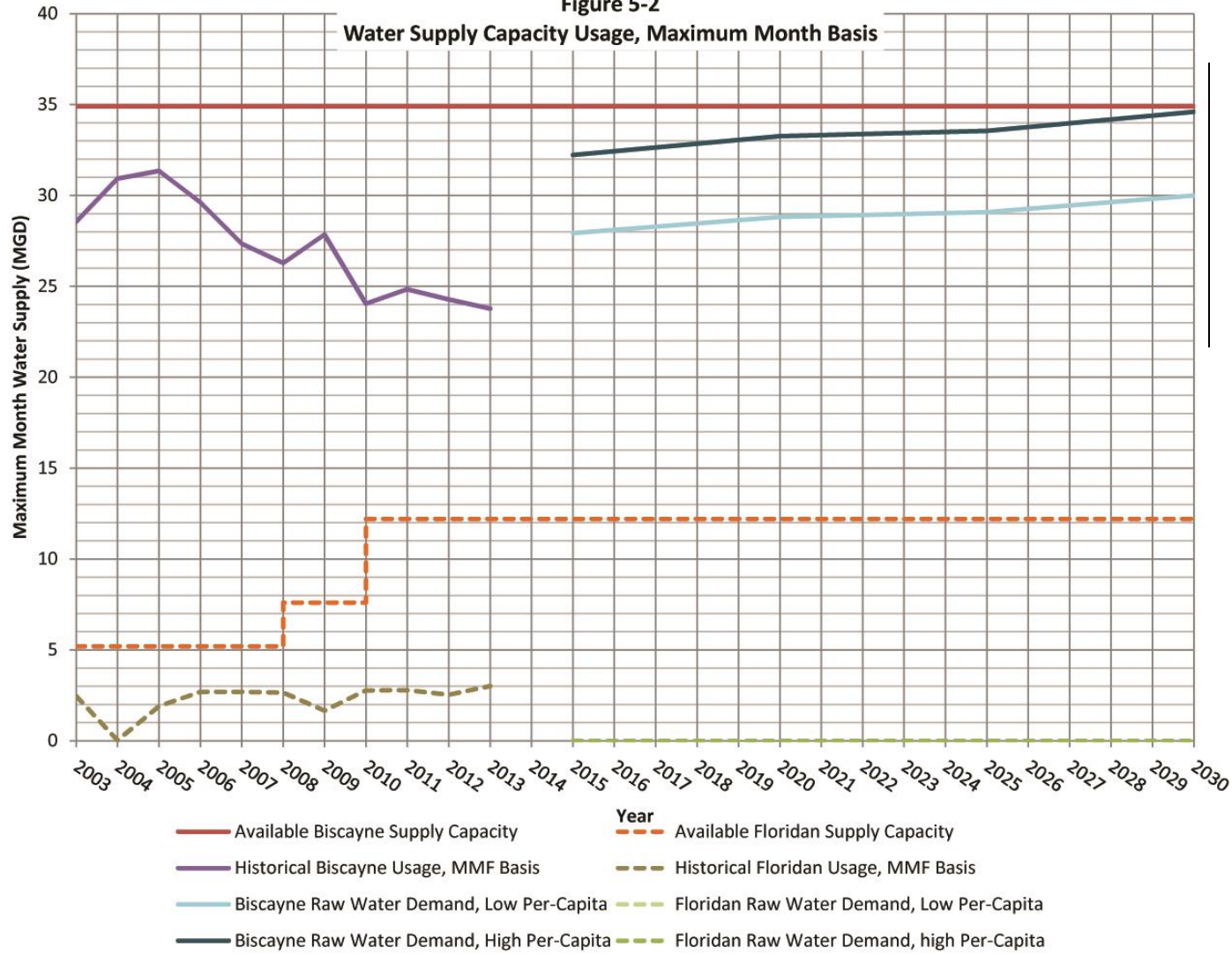


Figure 5-2
Water Supply Capacity Usage, Maximum Month Basis



5.2.1 — Water Supply Capacity Summary

Figures 5-1 and 5-2 show that the Biscayne allocation alone will be sufficient to supply demands until approximately 2026, after which both the Floridan and Biscayne supplies will be needed. The Floridan will continue to be the City's primary Alternative Water Supply, since it has been proactively invested in developing that supply over the last approximately 20 years.

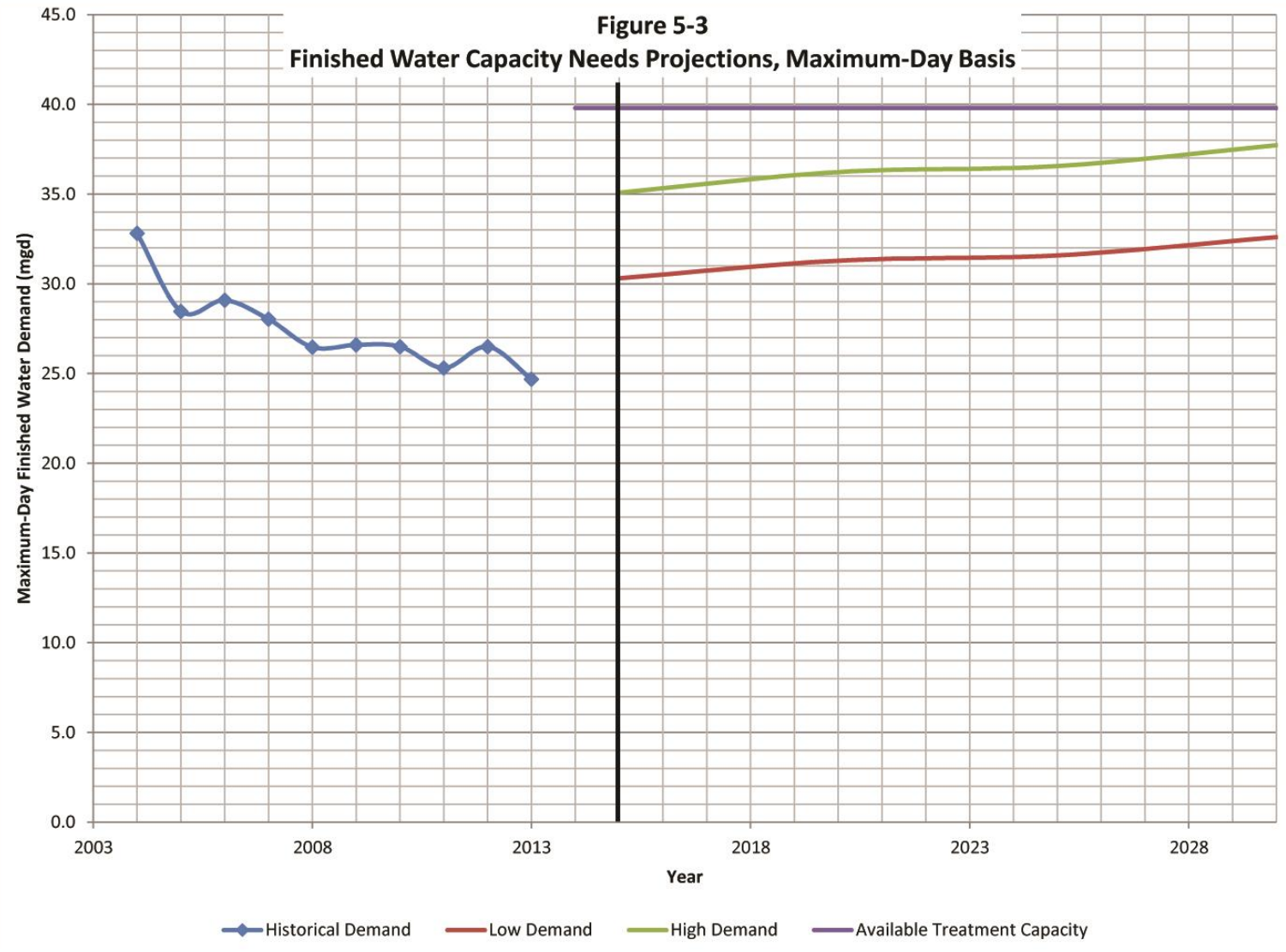
The historical Floridan usage reflects the City's current practice of continuously running one or more RO skids to provide a diverse water supply and maintain the units in good operating condition. While the Floridan Aquifer supply will be needed to meet demands projected over the planning horizon, the total production will remain relatively low (requirement of about 2 MGD), which limits the opportunity to use Floridan Aquifer recharge as a potential future water supply.

5.3 — Water Treatment Capacity Evaluation

To ensure maximum day water delivery while one unit of each treatment process is out of service, adequate firm treatment capacity must be available to meet the projected finished water demands. To establish this, the treatment capacities described in Section 3.1.2 were compared to the maximum day finished water demands shown in Table 5-2. This comparison is presented in Figure 5-3, along with historical finished water production for the entire HLWD-DPU service area. This figure shows that the City has adequate water treatment capacity to support projected demands through the planning horizon.

Figure 5-3

Finished Water Capacity Needs Projections, Maximum-Day Basis



5.4 Projected Peak-Hour Demands and Storage Needs

According to the Florida Administrative Code (FAC) 62-555, finished water storage needs comprise storage required for operational equalization to meet peak hour water demand and storage to meet fire flow requirements. Based on ISO requirements, the fire flow storage needed for the City's system was estimated to be approximately 1 MG in order to supply 3,500 gpm sustained for 3 hours (Water Master Plan). The equalization storage was estimated using the following two methodologies provided by the FDEP:

- FDEP Criterion 1: Multiplying the projected maximum day water demand by 25 percent.
- FDEP Criterion 2: Demonstrating sufficient storage available to sustain peak hour flows beyond treatment plant capacity for 4 hours.

Table 5-6 shows the storage needs estimated under each FDEP Criterion. To estimate the operational storage using FDEP Criterion 1, the City's retail maximum day demand was multiplied by 25 percent. Because Broward County Districts 3A and 3BC provide their own finished water storage, their maximum day demands were not included in the previous estimate.

To estimate the operational storage using FDEP Criterion 2, the total peak hour demand was estimated. Three peaking factors were initially considered for the City's retail service area:

- 2.5, representing a typical peaking factor established by AWWA;
- 2.28, established in the City's most recent Water Master Plan through a detailed hydraulic model analysis of diurnal demand variations and demand peaks; and
- 1.72, representing the highest observed peak flow observed in the four year period between 2010 and 2013. This second peaking factor was obtained by dividing the peak flow observed in 2010, 35.822 mgd, by that year's annual average flow, 20.8 mgd.

The factor of 2.28 was carried forward for the Criterion 2 analysis for the City's retail service area. Compared to the generic 2.5 factor developed by AWWA, the 2.28 factor reflects system specific information and demand patterns. The 1.72 calculated from actual operating data may not have captured the type of unusual high demand scenarios evaluated in the model (e.g. a fire flow event occurring concurrently with peak demand), and was therefore considered to be less appropriate than the 2.28 factor. Since Broward County 3A and 3BC have their own storage tanks and pumping systems, a peak hour peaking factor of 1.0 was used for their demands. Both projected peak hour water demands and storage needs are tabulated in Table 5-6.

Table 5-6. Peak-Hour Demand and Finished Water Storage Needs

Year	Peak-Hour Demand- (mgd) ⁽¹⁾		Planned-Treatment-Plant-Capacity- (TPC, mgd)	Storage Needs ⁽²⁾ .MG			
	Low-Per-Capita	High-Per-Capita		Criterion-1 ⁽³⁾ , Low-Per-Capita	Criterion-1 ⁽³⁾ , High-Per-Capita	Criterion-2 ⁽⁴⁾ , High-Per-Capita	Criterion-2 ⁽⁴⁾ , High-Per-Capita
2015	44.2	52.7	40.5	5.2	6.4	0.6	2.0
2020	45.7	54.5	40.5	5.4	6.6	0.9	2.3
2025	46.1	55.0	40.5	5.5	6.7	0.9	2.4
2030	47.5	56.7	40.5	5.6	6.9	1.2	2.7

Source: (1) Peak-hour flow rate = 2.28 x retail annual average demand + 1.0 x wholesale maximum-day demand

(2) Storage Needs = Fire flow storage (1 MG) + Equalization Storage (ES)

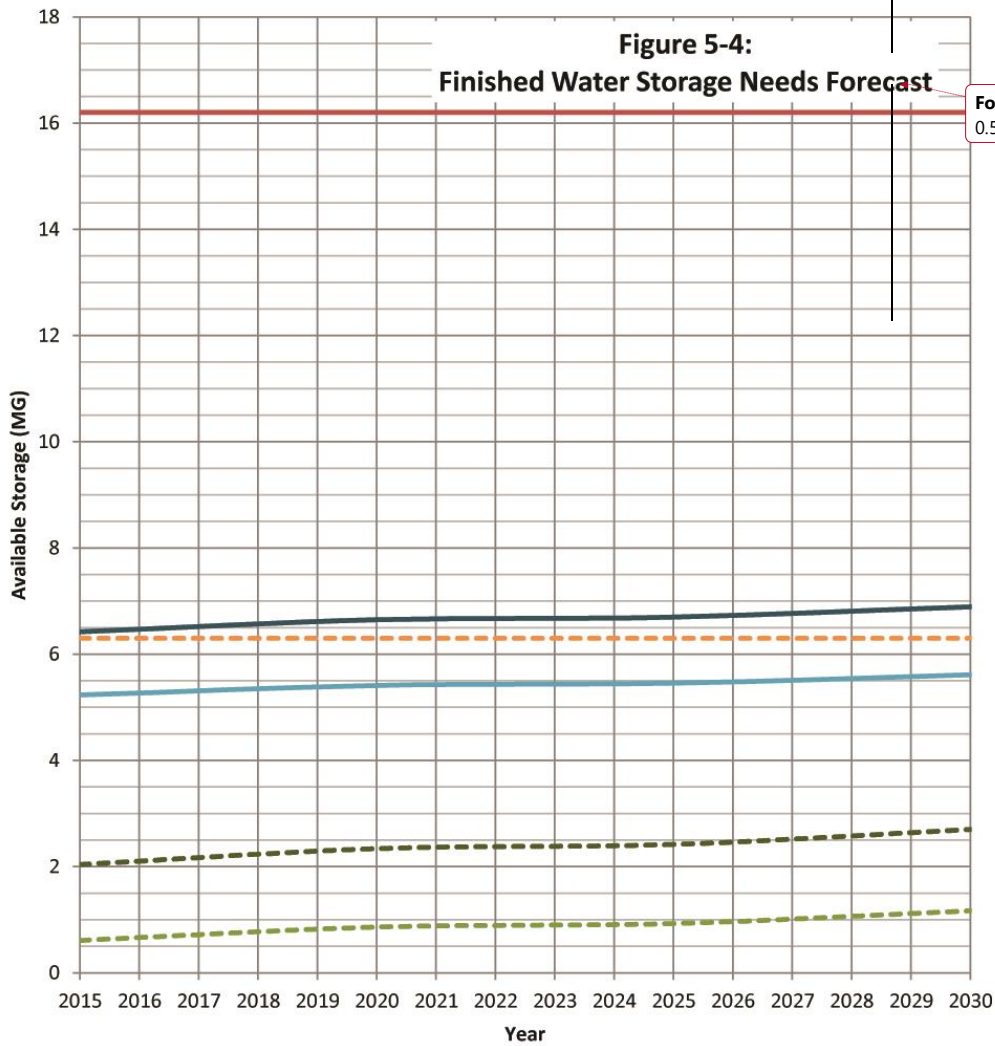
(3) FDEP Criterion 1: ES equal to 25 percent of the retail maximum-day demand (excludes 3A and 3B/C)

(4) FDEP Criterion 2: ES = (PHD - TPC) x 4 hours

5.4.1 Finished Water Storage Capacity Evaluation

To determine finished water storage capacity expansions, the projected storage needs are compared with the existing useful storage capacity. Currently, the City has 18 MG of total nominal storage capacity, 2 MG in elevated storage tanks in the distribution system, 5 MG in ground storage tanks in the distribution system, and the remaining 11 MG of ground storage on-site at the WTP. Since the City is complying with the Ground Water Rule by conducting triggered coliform monitoring, reservation of storage for disinfection is not required; however, a certain minimum level of water is maintained in the tanks at all times to provide adequate head for the high service pumps and maintain an adequate reserve to handle emergency conditions. A minimum capacity of 10% of each ground storage tank was reserved for this purpose. With a total systemwide storage volume of 18 MG, the useful storage volume is therefore 16.2 MG.

Figure 5-3 illustrates the finished water storage need projections along with the existing useful storage capacities. Comparing the projected storage needs estimated using FDEP Criterion 1 against the total useful range of storage volume in the system indicates that adequate storage is available through the planning horizon—as illustrated in Figure 5-3. Similarly, conservatively comparing the projected storage needs estimated using FDEP Criterion 2 against the remote finished water storage (7 MG total, 6.3 MG assuming that 10% of ground storage is reserved) indicates that adequate storage is available. Therefore, storage capacity expansion will not be required over the planning horizon.



Formatted: Left: 1.15", Right: 1.15", Top: 1", Bottom: 0.5", Width: 8.5", Height: 11"

- Systemwide Available Storage
- Storage Req'd, Criterion 1, low demand
- Storage Req'd, Criterion 1, high demand
- - - Remote Available Storage
- - - Storage Req'd, Criterion 2, low demand
- - - Storage Req'd, Criterion 2, high demand

Note: Available storage is 90% of ground storage and 100% of remote storage.

Formatted: Space Before: 12 pt, Tab stops: 6", Left + 9.13", Left + Not at 6.5"

Formatted: Font: 10 pt

6. Water Supply Capital Improvements

This section identifies the capital improvements required to build ~~all~~ public water supply facilities to serve the existing and new development within the City of Hollywood jurisdiction. ~~The five year schedule of Capital Improvements for HLWD-DPU is supported by an overview of financial feasibility.~~

Formatted: Font: 10 pt, Not Italic

The City's overall FY ~~2015 – 2019~~2020 – 2024 Capital Improvement Program (CIP) identifies capital improvement projects for the ~~City's 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. ~~Since~~**Because** the City ~~already~~ 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.

6.1 ~~Financial Feasibility~~

The City of Hollywood has historically supplemented its revenues from ~~impact fees with~~ the following ~~three main~~ 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 ~~as they will be sufficient for the implementation of~~ **to implement** the Capital Improvement Projects for repair, replacement, and upgrades of existing infrastructure, ~~with no~~. **No additional funding ~~being~~s** needed for water supply or treatment expansion. ~~The overall financial sufficiency of the City's CIP is demonstrated in the analysis included in the Comprehensive Plan / Capital Improvement Element.~~

Table 6-1 presents the ~~public utilities~~ **City's** funding priorities for upgrade, repair and replacement projects ~~over~~ **benefitting the City's water utility system over the next five years.** ~~There are no Broward County capital projects benefiting 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. ~~However, as of the date of this water supply plan, no rate increases are projected within the CIP's planning horizon.~~ **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. Public Utilities Funding over the Next Five Years

Section 6
 Water Supply Capital Improvements

<u>WMRP – Hlwd Blvd to US 1 to Pembroke Rd to S 21 Ave</u>	<u>\$10,185,000</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$10,185,000</u>
<u>WMRP – Johnson St to FL Turnpike to Hlwd Blvd to N 72 Ave</u>	<u>\$0</u>	<u>\$11,617,900</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$11,617,900</u>
<u>WMRP - Sheridan St to 26 Ave to Taft St to I-95</u>	<u>\$0</u>	<u>\$0</u>	<u>\$7,035,000</u>	<u>\$0</u>	<u>\$0</u>	<u>\$7,035,000</u>
<u>WMRP - Sheridan St. to N. 31 Ave to Hlwd Blvd to N. 35 Ave</u>	<u>\$0</u>	<u>\$0</u>	<u>\$8,268,750</u>	<u>\$0</u>	<u>\$0</u>	<u>\$8,268,750</u>
<u>WMRP – Sheridan St. to N. 31 Ave to Hlwd Blvd to N. 35 Ave</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$8,925,000</u>	<u>\$8,925,000</u>
<u>Total</u>	<u>\$15,086,359</u>	<u>\$16,360,025</u>	<u>\$17,853,750</u>	<u>\$6,092,500</u>	<u>\$11,300,000</u>	<u>\$66,692,634</u>

Source: City of Hollywood FY 2015 CIP

Formatted: Space Before: 12 pt, Tab stops: 6", Left + Not at 6.5"

Formatted: Font: 10 pt

7. Water Supply Goals, Objectives, and Policies

Formatted: Bottom: 0.63", Footer distance from edge: 0.61", Different first page header

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 in track changes.

7.4 7.1 Land Use Element

Formatted: Outline numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 2 + Alignment: Left + Aligned at: 0" + Indent at: 0.28"

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

Formatted: Indent: Left: 0.38", Hanging: 0.5", Space Before: 6 pt, No bullets or numbering

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.~~

Formatted: Font color: Red, Strikethrough

- 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 ~~SFWMD~~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.

Formatted: Font color: Red, Strikethrough

Formatted: Space Before: 12 pt, Tab stops: 6", Left + Not at 6.5"

Formatted: Font: 10 pt

Section 7
Goals, Objectives, and Policies

- 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 Resources Management Division (~~WRMDBCWMD~~), and the Broward County Environmental Protection and Growth Management Department ~~Environmental Quality Control Board (EQCBEPGMD)~~ (now known as the Office of Natural Resource Protection(~~BCEPGMD~~)) in the development review process ~~to ensure~~ 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 ~~uses,~~ which conflicts with the functions of the natural drainage and natural groundwater aquifer recharge areas, and will not permit development in ~~those areas shown as~~ conservation areas.

~~7.2~~ 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~~ landscaping irrigation.

Formatted: Font color: Red, Strikethrough

Formatted: Font color: Red, Strikethrough

Formatted: No underline

Formatted: Not Strikethrough

Formatted: Indent: Left: 0.38", Hanging: 0.5", No bullets or numbering

Formatted: No underline

Formatted: Font color: Red, Strikethrough

Formatted: Font color: Red, Strikethrough

Formatted: Font color: Red, Strikethrough

Formatted: Left, Space Before: 0 pt, Tab stops: 6.5", Right + Not at 5.81"

Section 7

Water Supply Goals, Policies and Objectives, and Policies

- 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 ~~2013~~2018~~3~~ 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.

- ~~(b)~~(a) Ground-water monitoring for saltwater showing no further intrusion.
- ~~(e)~~(b) Increase in number of water reuse systems.
- ~~(d)~~(c) Decrease in percent of water being used for non-potable uses.
- ~~(e)~~(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 ~~recently completed~~ Water Conservation Plan ~~in~~ 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

Formatted: Left

Formatted: Font color: Red, Strikethrough

Formatted: Font color: Red

Formatted: No underline

Formatted: Page break before

Formatted: Font color: Red, Strikethrough

Formatted: No underline

Formatted: No underline, Font color: Red, Strikethrough

Formatted: Font color: Red

Formatted: Font color: Red, Strikethrough

Formatted: No underline

Formatted Table

Formatted: Left, Space Before: 0 pt, Tab stops: 6.5", Right + Not at 5.81"

Section 7
Goals, Objectives, and Policies

Table 7-2. Water Conservation Best Management Practices

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

Formatted: Space Before: 0 pt, Page break before

Formatted Table

Formatted: Font color: Red, Strikethrough

Formatted: Font color: Red

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 3.2: Investigate the possibility of adopting a City water protection ordinance that would require uses that generate hazardous waste to locate at an established minimum distance from all surface water by June 2009.~~
- 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 7.3 Utilities Element

Formatted: Indent: Left: 0.38", Hanging: 0.5", No bullets + numbering

7.3.1 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.

Formatted: Left, Space Before: 0 pt, Tab stops: 6.5", Right + Not at 5.81"

Section 7

Water Supply Goals, Policies and Objectives, ~~and Policies~~

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

- 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 ~~ground water~~ groundwater recharge of the surficial aquifer system so as to maintain all of the functions of the ~~Biscayne~~ 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~~ 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 ~~salt water~~ 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.

Formatted: Left

Formatted: Font color: Red, Strikethrough

Formatted: Font color: Red, Strikethrough

Formatted: Font color: Red, Strikethrough

Formatted: Font color: Red, Strikethrough

Formatted: Font color: Red, Strikethrough

Formatted: Left, Space Before: 0 pt, Tab stops: 6.5", Right + Not at 5.81"

Section 7
Goals, Objectives, and Policies

- 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 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.

Formatted: Indent: Left: 0.38", Hanging: 0.32", No bullets or numbering

Formatted: Left, Space Before: 0 pt, Tab stops: 6.5", Right + Not at 5.81"

Section 7

Water Supply Goals, Policies and Objectives, and Policies

- Policy 2.2: The City of Hollywood shall use the information contained to assess 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 assess 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 (ann-annual avg. gpcd)	<u>122-114^(a)</u>
Per single family unit	350 ^(b)
Retail per square foot	<u>.01^(b)</u>
Office space per square foot	<u>.02^(b)</u>
Other non-residential per capita	20 ^(b)

~~Source: (a) 2007-2014 City of Hollywood Water Master Plan Developed in 2014 Water Supply Facilities Work Plan 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 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.

Formatted: Left

Formatted: Page break before

Formatted Table

Formatted: Underline

Formatted: Font: Arial, 9 pt, Bold, Underline

Formatted: Space Before: 0 pt

Formatted: Centered, Indent: Left: 0.1", Right: 0.09"

Formatted: Underline, Font color: Red

Formatted: Not Superscript/ Subscript

Formatted: Line spacing: single

Formatted: Space Before: 0 pt

Formatted: Line spacing: single

Formatted: Indent: Left: 0.1", Right: 0.09", Space Before: 3 pt

Formatted: Font: 9 pt, No underline, Strikethrough

Formatted: Font: 9 pt, No underline

Formatted: Font: 9 pt, No underline, (Int'l) Times New Roman

Formatted: Font: 9 pt, No underline, (Int'l) Times New Roman, Not Strikethrough

Formatted: Font: 9 pt, Not Strikethrough

Formatted: Font: 9 pt, No underline, Not Strikethrough

Formatted: Font: 9 pt, No underline, Not Strikethrough, Expanded by 0.5 pt

Formatted: Font: 9 pt, No underline

Formatted: Font: 9 pt, No underline

Formatted: Space Before: 6 pt, Line spacing: Exactly 8.85 pt

Formatted: Font: 9 pt

Formatted: Space Before: 6 pt, Line spacing: Exactly 9.15 pt

Formatted: Font: 9 pt, Font color: Red, Strikethrough

Formatted: Font: 9 pt

Formatted: Font: 9 pt, No underline

Formatted: Space Before: 6 pt

Formatted: Font: 9 pt

Formatted: Font: 9 pt

Formatted: Left, Space Before: 0 pt, Tab stops: 6.5", Right + Not at 5.81"

Section 7
Goals, Objectives, and Policies

- 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 ~~wastewater~~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 Hollywood shall identify opportunities to increase the efficiency and optimize the

Section 7

Water Supply Goals, Policies and Objectives, ~~and Policies~~

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 4.2: 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 4.3: 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 4.4: 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, ~~effective September 1, 1992 in Broward County.~~

Table 7-4. Plumbing Standards Fixture Flow Rate

Fixture	Flow Rate
Toilet	1.6 gal/flush

Formatted: Left

Formatted: Font color: Red, Strikethrough

Formatted: Font color: Red, Strikethrough

Formatted: Font color: Red, Strikethrough

Formatted: Not Strikethrough

Formatted Table

Formatted: Space Before: 0 pt, After: 0 pt

Formatted: Left, Space Before: 0 pt, Tab stops: 6.5", Right + Not at 5.81"

Section 7
Goals, Objectives, and Policies

Shower Heads	2.5 gal/minute
Faucets	2.0 gal/minute

- 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 unaccounted for water loss 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~~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~~Continuecontinue 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

Formatted: Space Before: 0 pt, After: 0 pt

Formatted: Space Before: 0 pt, After: 0 pt

Formatted: No underline

Formatted: Font color: Red, Strikethrough

Formatted: Font color: Red

Formatted: Font color: Red, Strikethrough

Formatted: No underline

Formatted: Font color: Red, Strikethrough

Formatted: Left, Space Before: 0 pt, Tab stops: 6.5", Right + Not at 5.81"

Section 7

Water Supply Goals, Policies and Objectives, and Policies

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 ~~the potential for whether or not~~ the construction, operation, and maintenance ~~will to~~ significantly 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 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
~~City of Hollywood Utilities Element Potable Water – Water Supply Plan – WS 7-15~~

Formatted: Left

Formatted: Font color: Red, Strikethrough

Formatted: Font color: Red

Formatted: Font color: Red, Strikethrough

Formatted: Font color: Red, Strikethrough

Formatted: Indent: Left: 0.38", Hanging: 0.5", No bullets or numbering

Formatted: Left, Space Before: 0 pt, Tab stops: 6.5", Right + Not at 5.81"

~~Section 7
Goals, Objectives, and Policies~~

investments in existing facilities~~;~~ and promotes orderly compact urban growth.

Formatted: Font color: Red, Strikethrough

Objective 1: Create a 5-year schedule of Capital Improvements, which will be coordinated 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:
 - ~~7~~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.
 - ~~a~~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.
 - ~~b~~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.
 - ~~e~~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.

Formatted: Outline numbered + Level: 3 + Numbering
Style: a, b, c, ... + Start at: 1 + Alignment: Left +
Aligned at: 0.55" + Indent at: 0.89"

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.

Formatted: Left, Space Before: 0 pt, Tab stops: 6.5",
Right + Not at 5.81"

Section 7

Water Supply Goals, Policies and Objectives, and Policies

- 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	
Per capita per day (ann. avg. gpcd)	122 114 ^(a)
Per single family unit	350 ^(b)
Retail per square foot	0.1 ^(b)
Office space per square foot	0.2 ^(b)
Other non-residential per capita	20 ^(b)

Source: ~~(a) 2007 2014, City of Hollywood Water Master Plan Developed in- 2014 Water Supply Facilities Work Plan 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 5.2: 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.

~~(c)~~ 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

Formatted: Left

Formatted Table

Formatted: Font: 8 pt

Formatted: Indent: Left: 0.5", Right: 0.2", Space Before: 12 pt, Line spacing: single

Formatted: Font: Arial, 9 pt, Lowered by 4 pt

Formatted: Centered, Indent: Left: 0.22", Right: 0.21", Space Before: 0.05 pt

Formatted: Indent: Left: 1", First line: 0", Right: 0.95", Space Before: 6 pt, Tab stops: 4", Left

Formatted: Font: 9 pt, No underline

Formatted: Font: 9 pt

Formatted: Font: 9 pt, Not Strikethrough

Formatted: Font: 9 pt, No underline

Formatted: Font: 9 pt

Formatted: Font: 9 pt, No underline

Formatted: Font: 9 pt, No underline, Not Expanded by / Condensed by

Formatted: Font: 9 pt, No underline

Formatted: Footnote Reference, Font: Arial, 11 pt

Formatted: Font: 9 pt

Formatted: Indent: Left: 1", Space Before: 6 pt

Formatted: Font: 9 pt, Font color: Red, Strikethrough

Formatted: Font: 9 pt

Formatted: Font: 9 pt, No underline

Formatted: Font: 9 pt

Formatted: Tab stops: 5.55", Left

Formatted: Left, Space Before: 0 pt, Tab stops: 6.5", Right + Not at 5.81"

Section 7
Goals, Objectives, and Policies

issuance by the City of a certificate of occupancy or its functional equivalent.

- Policy 5.3: Proposed plan amendments and requests for new development or redevelopment shall be evaluated according to the following guidelines to whether the proposed action would:

- 7a) 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.

Formatted: Body Numbering, Numbered + Level: 1 + Numbering Style: a, b, c, ... + Start at: 1 + Alignment: Left + Aligned at: 0.25" + Indent at: 0.5"

7.5 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, ~~FPEPFDPEP~~, Broward County, FDOT, and surrounding municipalities to insure

Formatted: Indent: Left: 0.38", Hanging: 0.5", No bullets or numbering

Formatted: Left, Space Before: 0 pt, Tab stops: 6.5", Right + Not at 5.81"

Section 7

Water Supply Goals, Policies and Objectives, and Policies

utilization of joint processes and collaborative planning efforts, when feasible to complete capital improvements.

- 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.

Formatted: Left

Formatted: Font color: Red, Strikethrough

Formatted: Indent: Left: 0.6"

Formatted: Font color: Red

Formatted: Font color: Red, Strikethrough

Formatted: Left, Space Before: 0 pt, Tab stops: 6.5", Right + Not at 5.81"

Section 7
Goals, Objectives, and Policies

- 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 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: 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 ~~Supplies~~ Supplies, Facilities Work Plan ~~2020 Update 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 Plan 2015 Update by reference and as respectively included in Appendix A and Appendix B.~~ Facilities Work Plan 2020.5.

Formatted: Font color: Red, Strikethrough

Formatted: Font color: Red, Strikethrough

Formatted: No underline

Formatted: No underline, Strikethrough

Formatted: No underline

Formatted: No underline

Formatted: No underline, Font color: Red, Strikethrough

Formatted: No underline

Formatted: No underline, Font color: Red, Strikethrough

Formatted: No underline, Font color: Red

Formatted: No underline

Formatted: No underline, Font color: Red, Strikethrough

Formatted: No underline, Font color: Red

Formatted: No underline

Formatted: Font color: Red

Formatted: Highlight

Formatted: Left, Space Before: 0 pt, Tab stops: 6.5", Right + Not at 5.81"