

INFRASTRUCTURE ELEMENT ADOPTION DOCUMENT

III. GOALS, OBJECTIVES AND POLICIES

GOAL

The goal of the Infrastructure Element of the Comprehensive Plan for the City of Pembroke Pines is to ensure the provision of adequate water and wastewater treatment facilities, solid waste, and drainage facilities, the protection of the natural groundwater aquifer, to promote the conservation and protection of surface and groundwater resources with the purpose of securing future water supplies, and for the preservation and enhancement of the regional ecosystem in order to provide for the health, safety and welfare of the residents of the City of Pembroke Pines and its visitors.

A. SANITARY SEWER

OBJECTIVE I

Insure the adequate treatment of sewage within the community at the time of building permit issuance by maintaining the adopted level of service beyond the year 2030.

Evaluation Measure Objective I - Record of maintaining the adopted level of service beyond the year 2030.

Policy 1.1 - Maintain sanitary sewer service capacity beyond incorporation of any needed improvements into the City's Capital Improvements Program.

Policy 1.2 - Coordinate with the private sector for the extension of facilities as needed to meet future demands through a provision for voluntary contribution for construction of connections to the City sanitary sewer system.

Policy 1.3 - Since sanitary sewer facilities have been determined to be available to serve the future population, monitor service demand and capacity in 2025 and again in 2030 so as to identify any unforeseen facility deficiencies.

Policy 1.4 - Develop a plan for prioritizing needs and correcting deficiencies upon their identification, and that decisions regarding the location of infrastructure investments are made with priority for the lowest income neighborhoods.

Policy 1.5 - Average design capacities as depicted on Table I, Wastewater Demand, shall not be exceeded.

Policy 1.6 - Continue interlocal agreement with the City of Hollywood for the treatment of sewerage for the area east of Flamingo Road and examine alternative methods of service delivery to improve level of service.

Policy 1.7 - Standards equal 93 gallons/capita/day and 1,000 gallons/acre/day.

OBJECTIVE II

Continue to provide wastewater treatment operations to meet demands within the City in an efficient, economical and environmentally sensitive manner beyond the year 2030.

Evaluation Measure Objective II - Maintain record of water treatment operations relating to demand and capacity; and update for both the short term and long term planning horizons.

Policy 2.1 - Implement the Five Year Capital Improvement Program for the City to insure coordinating the extension of, capacity increase and other facility improvements to meet future needs.

Policy 2.2 - Every five years, establish priorities for providing for future facility needs to be implemented through the Capital Improvement Program, and that decisions regarding the location of infrastructure investments are made with priority for the lowest income neighborhoods.

Policy 2.3 - Continue to require the use of existing sanitary sewer facilities by all new development so as to discourage urban sprawl.

Policy 2.4 - Maximize the use of the City's existing facilities.

Policy 2.5 - All new land use amendments shall be consistent with existing and programmed sanitary sewer facilities.

Policy 2.6 - All new development permits may be issued only when determined to be consistent with existing and programmed sanitary sewer facilities.

Policy 2.7 - LDR's will be updated by 2008 to reflect criteria in reviewing land use plan amendments for consistency with existing and programmed sanitary sewer facilities.

Policy 2.8 - Coordinate with the Broward County Department of Planning and Environmental Protection in conducting wastewater treatment and disposal operations which consider environmental quality impacts for commercial and industrial uses.

Policy 2.9 - Continue to coordinate with the Broward County Department of Planning and Environmental Protection in maintaining an inventory of commercial and industrial uses which utilize, produce, or dispose of hazardous chemicals as a means to track potential sources of water contaminants.

Policy 2.10 – Utilize inventory of septic tank locations in the City (see FLU-Appendix) in the preparation of a report to be submitted with the next EAR on the feasibility of converting from septic tanks to sanitary sewer as an alternative means to protect ground water quality.

Policy 2.11 - The City shall require existing development using septic tanks to hook up to centralized sewer facilities as they become available in order to phase out septic tank systems in an economically feasible and environmentally sound manner.

Policy 2.12 - New septic tank systems shall only be permitted in accordance with the criteria and requirements of the Florida Department of Health.

Policy 2.13 - The City shall coordinate with the Broward County Department of Planning and Environmental Protection to encourage the use of reclaimed water as part of the City's wastewater management strategies where economically, environmentally and technically feasible.

Policy 2.14 - The City will incorporate all updated Infrastructure Element objectives and policies which require coordination with other governmental entities in the City's Intergovernmental Coordination Element (ICE).

Policy 2.15 - The City will continue to update on an as needed basis, the infrastructure map which shows potable water, sanitary sewer, groundwater, floodplains, and solid waste facilities.

B. SOLID WASTE

OBJECTIVE III

Ensure that adequate solid waste facilities are provided to meet current and future demands of all the residents of the City through the year 2030.

Evaluation Measure Objective III - Maintain record of solid waste facility operations relating to demand and capacity; and update for both the short term and long term planning horizons.

Policy 3.1 - Continue to recognize Reuter, Inc. in its role as a transfer site for solid waste disposal outside Broward County and its role in providing recycling services for the residents of the City.

Policy 3.2 - Ensure that the recycling facility is designed to protect the environment and the residents of the community through a review of its design and an annual review of its operations.

Policy 3.3 - Continue to coordinate with the solid waste service providers to monitor service demand and capacity on an annual basis so as to identify any facility deficiencies.

Policy 3.4 - In coordination with private solid waste service providers, develop a plan for prioritizing needs and correcting deficiencies upon their identification, and that decisions regarding the location of infrastructure investments are made with priority for the lowest income neighborhoods.

OBJECTIVE IV

Insure that an adequate level of service is maintained by the solid waste facility operators contracted by the City through an annual review which addresses needed increases in capacities of facilities to meet future needs.

Evaluation Measure Objective IV - Maintain record of solid waste facility operations relating to demand and capacity; and update on a yearly basis.

Policy 4.1 - Continue to coordinate with contracted solid waste facility operators on an annual basis to monitor the solid waste demands of the community, and to provide for the extension of, capacity increase, and other facility improvements to meet future needs.

Policy 4.2 - By 2010, the City will establish and implement a citywide education program for commercial and residential recycling activities to achieve the state's 30 percent waste reduction target.

Policy 4.3 - The City shall continue its newspaper recycling program and continue to request grant funds to initiate recycling of aluminum, glass and plastics.

Policy 4.4 - On an annual basis, priorities for meeting future facility needs will be updated and reviewed, and that decisions regarding the location of infrastructure investments are made with priority for the lowest income neighborhoods.

Policy 4.5 - Standard equals 5.0 lbs./capita/day.

Policy 4.6 - Continue to require the use of existing and programmed solid waste facilities so as to discourage urban sprawl.

Policy 4.7 - All new land use amendments shall continue to be consistent with existing and programmed solid waste facilities.

Policy 4.8 - All new development permits shall continue to be issued only when determined to be consistent with existing and programmed solid waste facilities.

Policy 4.9 - LDR's will be updated by 2008 to reflect criteria in reviewing land use plan amendments for consistency with existing and programmed solid waste facilities.

C. DRAINAGE

OBJECTIVE V

Continue to coordinate with appropriate drainage service facilities and agencies to maintain and provide for an adequate level of service, and to ensure that drainage facilities are designed to protect the health, safety and welfare of the residents.

Evaluation Measure Objective V - Record of review of site plans by the City's Development Review Committee to insure adequate drainage by all applicable regulating agencies.

Policy 5.1 - All development shall comply with the design criteria of the South Florida Water Management District (SFWMD), the South Broward Drainage District (SBDD), the Central Broward Drainage District (CBDD), the Broward County Water Resources Management Division (BCWRMD), the Broward County Department of Planning and Environmental Protection (BCDPEP) and the City's Environmental Services Division.

Policy 5.2 - Continue to implement a plan to protect the natural groundwater aquifer through implementation of Best Management Practices.

Policy 5.3 - Comply with the following level of service standards:

Facility Type	Level of Service Standard
Road Protection	Residential streets not greater than fifty feet wide rights-of-way to have crown elevations no lower than the elevation for the respective area depicted on the Broward County "Flood Criteria Map." Rights-of-way greater than fifty feet wide to have an ultimate edge of pavement no lower than the elevation for the respective area depicted on the "Flood Criteria Map." In all cases, residential streets shall be designed in accordance with the Broward County flood maps.
Buildings	<p>"The minimum lowest floor elevation" shall be the highest of the following:</p> <ol style="list-style-type: none">1. Minimum floor elevation as set forth in the South Florida Water Management District's Surface Water Management Permit.2. The elevation shown on the "100 Year Floor Elevation" Map, Latest Revision, prepared by Broward County Transportation Department.3. Twelve (12") inches above the highest point of the paved roadway/drive-lane nearest to the building.
Off-Site Discharge	Not to exceed the inflow limit of SFWMD primary receiving canal or the local conveyance system, whichever is less. Within the SBDD pumped basins, the allowable discharge is not applicable. The discharge for the entire basin is controlled by the District's pump station.
Storm Sewers	Design frequency minimum to be three year rainfall intensity of the State Department of Transportation Zone 10, rainfall chart as shown on the attached exhibit. SBDD requires that an initial time of concentration of 10 minutes be used or calculations be provided to justify a time of concentration greater than 10 minutes. The time of overland flow is dependent on the slope of the ground and the nature of the ground cover, for example, whether the surface is paved, rocky or grassed.

Flood Plain	Calculated flood elevations routing based on the ten-year and one hundred-year return frequency rainfall of the three-day duration shall not exceed the corresponding elevations of the Broward County "Flood Criteria Map" and the "100 Year Floor Elevation" Map, or in accordance with SBDD permits.
Antecedent Water	The control elevation for each of the District's basins are set by SFWMD permits.
Water Quality Pretreatment Standards and On-Site Storage	<p>a. Retention and/or detention in the overall system, including swales, lakes, canals, greenways, etc., shall be provided for one of the three following criteria or equivalent combinations thereof:</p> <ol style="list-style-type: none"> 1. Wet detention volume shall be provided for the first inch of runoff from the developed project, or the total runoff of 2.5 inches times the percentage of imperviousness, whichever is greater. 2. Dry detention volume shall be provided equal to 75 percent of the above amounts computed for wet detention. 3. Retention volume shall be provided equal to 50 percent of the above amounts computed for wet detention. <p>b. Commercial or industrial zoned projects shall provide at least one half inch of dry detention or retention pretreatment as part of the required retention/detention, unless reasonable assurances can be offered that hazardous materials will not enter the project's surface water management system.</p> <p>c. Systems with inlets in greased areas will be credited with up to 0.2 inches of the contributing areas. Full credit will be based on a ratio of 10:1 impervious area runoff to pervious area with proportional credit granted for greater ratios.</p> <p>d. Storage requirements for each SBDD basin are in accordance with SBDD's Public Facility Report.</p>

Best Management Practices (BMP'S)

Prior to discharge to surface or ground water BMP's will be used to reduce pollutant discharge.

Policy 5.4 - By 2008, update LDR's to reflect the drainage level of service standards as amended.

Policy 5.5 - Continue to coordinate with South Broward Drainage District and Central Broward Drainage District on an annual basis to prioritize replacement needs, and correct existing facility deficiencies, and that decisions regarding the location of infrastructure investments are made with priority for the lowest income neighborhoods.

Policy 5.6 - The City will continue to update the map series for the drainage facilities on an as needed basis in accordance with the Broward County and applicable Drainage District and South Florida Water Management maps as an amendment to the Infrastructure Element.

Policy 5.7 - The City will incorporate all updated Infrastructure Element objectives and policies which require coordination with other governmental entities in the City's Intergovernmental Coordination Element (ICE) during the amendment cycle following the update.

Policy 5.8 - The City establishes water quality standards for stormwater discharge in accordance with Chapter 60-25, F.A.C.

OBJECTIVE VI

Continue to coordinate with the SFWMD, SBDD, and CBDD to coordinate the extension of, capacity increases and other facility improvements to meet future needs.

Evaluation Measure Objective VI - The City's Environmental Services Division in coordination with the appropriate drainage facility agencies shall maintain a record of drainage facility operations relating to demand and capacity; and update the record for both the short term and long term planning horizons.

Policy 6.1 - Continue to coordinate with appropriate drainage facility agencies on an annual basis to review the status of the drainage system to meet future needs.

Policy 6.2 - Continue to coordinate with appropriate drainage facility agencies to maximize the use of existing facilities by all new development so as to discourage urban sprawl.

Policy 6.3 - All new land use amendments shall be consistent with existing and programmed drainage facilities.

Policy 6.4 - All new development permits shall be issued only when determined to be consistent with existing and programmed drainage facilities.

Policy 6.5 - LDR's will be updated by 2008 to reflect criteria in reviewing land use plan amendments for consistency with existing and programmed drainage facilities.

D. POTABLE WATER SUPPLY AND WATER RESOURCE MANAGEMENT COORDINATION

OBJECTIVE VII

Insure the adequate provision of potable water services within the community at the time of building permit issuance by maintaining the adopted level of service.

Evaluation Measure Objective VII - Continue to maintain the adopted level of service beyond the year 2030.

Policy 7.1 - Maintain potable water service capacity through incorporation of any needed improvements into the City's Capital Improvements Program (*cross- reference CE Updated Policy 2.15 and CIE Policy 2.7*).

Policy 7.2 - Since potable water facilities have been determined to be available to serve the future population beyond the year 2030,, monitor service demand and capacity yearly so as to identify any unforeseen facility deficiencies.

Policy 7.3 - Develop a plan for prioritizing needs and correcting deficiencies upon their identification, and that decisions regarding the location of infrastructure investments are made with priority for the lowest income neighborhoods.

Policy 7.4 - Peak and average flow design capacities shall not be exceeded.

Policy 7.5 - Continue to ensure that water supply and distribution mains provide adequate flow for both fire fighting and consumer needs.

Policy 7.6 - Level of service standard of 82.68 gallons/capita/day is the level of service for the area served by the City of Pembroke Pines. s. Level of Service 127 gallons per day is the level of service for the area served by Broward County Water and Wastewater Services.

Policy 7.7 - The City will continue to update and adopt the 10-Year Water Supply Facilities Work Plan to increase the coordination between land use and future water supply planning within 18 months of the adoption of the regional water supply plan as required by Section 373.709 and Chapter 163, State Statutes, typically every five years.

Policy 7.8 – The adopted 2020 Broward County 10-Year Water Supply Facilities Work Plan, as adopted on 2/3/2021, is hereby incorporated by reference into the Comprehensive Plan.

Policy 7.9. The adopted 2020 City of Pembroke Pines 10-Year Water Supply Facilities Work Plan, adopted on February 3, 2021, is hereby incorporated into the City's Comprehensive Plan located within the appendix section of the Infrastructure Adoption Element.

Policy 7.10. The adopted 2015 City of Pembroke Pines 10-Year Water Supply Facilities Work Plan is hereby deleted in its entirety and replaced by the adopted 2021 City of Pembroke Pines 10-Year Water Supply Facilities Work Plan

OBJECTIVE VIII

Continue to provide potable water services to meet demands within the City in an efficient, economical and environmentally sensitive manner beyond the year 2030.

Evaluation Measures Objective VIII - Maintain record of water treatment operations relating to demand and capacity. Update both for the short term and long term planning horizons. Increase education efforts in the practices of water conservation beyond the year 2030.

Policy 8.1 - Continue to encourage the use of water conservation devices in new construction.

Policy 8.2 - The City's Utility Division will increase water conservation education programs for the residents of the City beyond the year 2030.

Policy 8.3 - Coordinate with the private sector for the extension or expansion of capacity to meet future demand.

Policy 8.4 - Continue to implement City of Pembroke Pines Code of Ordinances No. 996 which creates a water conservation plan for the City that is consistent with SFWMD's Chapter 40E-21(Water Shortage Plan).

Policy 8.5 - Continue to require the use of existing and programmed potable water facilities by all new development so as to discourage urban sprawl.

Policy 8.6 - Maximize utilization of existing potable water facilities by requiring hook-ups if water lines are within 1/4 mile from proposed subdivision or 100 ft. from a single family unit.

Policy 8.7 - All new land use amendments shall be consistent with existing and programmed potable water facilities (*cross-reference ICE Policy 2.11*).

Policy 8.8 - All new development permits shall be issued only when determined to be consistent with existing and programmed potable water facilities.

Policy 8.9 - LDR's will be updated by 2008 to reflect criteria in reviewing land use plan amendments for consistency with existing and programmed potable water facilities.

Policy 8.10 - The City will continue to update the infrastructure map on an as needed basis which shows potable water, sanitary sewer, groundwater and solid waste facilities.

OBJECTIVE IX

To ensure that the City of Pembroke Pines addresses the availability and appropriate use of regional water supplies as well as the impacts of development upon water resource management programs and planning efforts of the South Florida Water Management District, and those of other local, regional, state and federal agencies (*cross-reference update to existing FLU Objective X*).

Evaluation Measure Objective IX – Record of water use permits consistent with the City's adopted WSFP, South Florida Water Management District's (SFWMD) Lower East Coast Water Supply Plan, and the Broward County Integrated Water Resource Plan.

Policy 9.1 – The City will maintain a Water Supply Facilities Work Plan (WSFP) for at least a 10 year planning period addressing water supply facilities necessary to serve existing and future development within the City’s water service area, consistent with the City’s consumptive use permit.

Policy 9.2 – The City’s WSFP is provided in Appendix VI of this element.

Policy 9.3 – The City’s adopted WSFP will be updated at a minimum every five years within 18 months of updates of the SFWMD’s Lower East Coast Water Supply plan that affect the City (*cross-reference FLU Policy 10.6, Updated IE Policy 10.6, CE Policy 2.18, and ICE Policy 1.9*).

Policy 9.4 – The WSFP will be used to prioritize and coordinate the replacement, expansion and/or upgrade of existing facilities used to withdraw, treat, transmit, store and distribute water to meet future needs.

Policy 9.5 – The City’s WSFP considers, identifies and evaluates alternative sources of water that can be used to meet existing and future needs as well as alternative water supply project or projects available to the city should the city grow beyond the projected buildout date.

Policy 9.6 – The City will provide annual progress reports to the SFWMD on the water supply development project(s) identified in the WSFP by November 15th of each year.

Policy 9.7 – the City’s will conserve potable water resources, including the implementation of reuse programs and potable water conservation strategies and techniques as identified in the WSFP.

Policy 9.8 – The City will continue to ensure coordination among the Planning, Environmental Services and Utilities Divisions with SFWMD, Broward County Water Wastewater Services (BCWWS), and other agencies in the implementation of alternative water supply projects, establishment of level of service stands and resource allocations, changes in service areas, potential for annexation, and the sharing and updating of information to meet ongoing water supply needs (*cross-reference FLU Policy 11.13, and ICE Policies 1.9 & 2.12*).

Policy 9.9 - The City shall apply conservation strategies as identified by the Water Conservation Plan submitted with the City’s consumptive use permit including but not limited to “Florida Friendly” landscaping, leak detection program, water conserving rate structure, permanent irrigation ordinance and installation of rain sensor devices, and amend the Land Development Regulations accordingly during the next amendment cycle

E. NATURAL GROUND WATER AQUIFER RECHARGE

OBJECTIVE X

Ensure the quality of the City's water supply and protect aquifer recharge through the incorporation of Best Management Practices.

Evaluation Measure Objective IX - Record of land use amendments and development permits within wellfield protection zones.

Policy 10.1 - Continue to coordinate with the Broward County Water Resources Management Division and the Broward County Department of Planning and Environmental Protection in ensuring development permits are in compliance with the Broward County Wellfield Protection Ordinance through the monitoring of development permits.

Policy 10.2 - The City will update the LDR's by 2008 to provide that no land use amendments will be approved which violate the Broward County Wellfield Protection Ordinance.

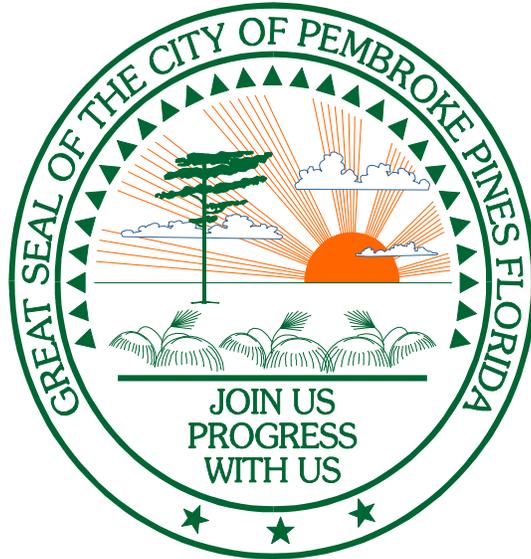
Policy 10.3 - Continue to coordinate natural groundwater aquifer recharge systems of existing developments with future development through the use of master agreements.

Policy 10.4 - The City will incorporate all updated Infrastructure Element objectives and policies which require coordination with other governmental entities in the City's Intergovernmental Coordination Element (ICE) during the amendment cycle following the update.

Policy 10.5 - In recognition that the City's role regarding the protection of the natural groundwater aquifer recharge system is limited to coordinating with Broward County agencies, data on the status of water quality in the City's wellfields along with effects of saltwater intrusion on groundwater resources will be collected, and existing data and analyses will be updated in the adopted WSFP.

Policy 10.6 - The City's adopted Water Supply Facilities Work Plan will be updated at a minimum every five years to increase the coordination between land use and future water supply planning within 18 months of updates of the SFWMD's Lower East Coast Water Supply Plan that affect the City. (*cross-reference FLU Policy 10.6, IE Policy 9.3, CE Policy 2.18, and ICE Policy 1.9*).

Policy 10.7 – The City's water quality will be protected in the traditional and new alternative water supply sources (*cross reference CE Policy 2.17*).



CITY OF PEMBROKE PINES, FLORIDA

10 YEAR WATER SUPPLY FACILITIES WORK PLAN

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CGA Project No. 91-0134.17

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
PART 1 - SECTION ONE INTRODCUTION.....	3
1.01 Purpose & Scope.....	3
1.02 Statutory History	3
1.03 Statutory Requirements.....	4
1.04 Relevant Regional Issues	6
PART 2 - SECTION TWO 10 YEAR PROJECTIONS.....	9
2.01 Population Projections	9
2.02 Water Demands and Future Raw Water Supplies.....	10
2.03 Wellfields Information.....	11
2.04 Service Area and Other Service Providers.....	12
2.05 Facilities	14
PART 3 - SECTION THREE ALTERNATIVE WATER SUPPLY CONSIDERATIONS	28
3.01 Assessment of Continued and Increased Water Withdrawals From the Biscayne Aquifer	28
3.02 Plans For Water Shortages Due to Wellfield Failures	28
3.03 Conservation Measures to Help Reduce Aquifer Stress	29
3.04 Descriptions of the Alternatives Considered.....	29
PART 4 - SECTION FIVE EVALUATIONS OF ALTERNATIVES	32
4.01 General.....	32
4.02 Economic Considerations – Alternative Reuse.....	32
4.03 Technical Feasibility – Alternative Reuse	33
4.04 Environmental Assesment – Alternative Reuse.....	33
PART 5 - CONCLUSION	34
5.01 Water Supply	34
5.02 Alternative Reuse.....	34
5.03 Intergovernmental Coordination.....	35
5.04 Comprehensive Plan Goals, Objectives, and Policies.....	35

TABLES

Table 2-1 City of Pembroke Pines Historical and Projected Population	17
Table 2-2 City of Pembroke Pines Water Use For 3 Year Period	17
Table 2-3 City of Pembroke Pines Past Water Use	20
Table 2-4 City of Pembroke Pines Projected Water Use.....	20

Table 2-5 City of Pembroke Pines Central Wellfield Description 21
Table 2-6 City of Pembroke Pines Water Treatment Plant Features 22

FIGURES

Figure 2-1 Central and Eastern Wellfield (June 3, 2020) 23
Figure 2-2 Interconnections (June 3, 2020) 24
Figure 2-3 Existing Water Treatment Plant & Central Wellfield (June 3, 2020) 25
Figure 2-4 Academic Village Booster Station (June 3, 2020) 26
Figure 2-5 Holly Lake Booster Station (June 3, 2020) 27

APPENDIX

Appendix A Combined Wellfield Pumpage Reports 1
Appendix B Broward County 10 YEAR Water Supply Facilities Work Plan (APRIL 21, 2020) 2
Appendix C Hollywood Water Supply Capital Improvements 3
Appendix D Broward County Water Supply Development Projects Listed In 2018 LECWSP ... 4
Appendix E Hollywood Capital Improvements Listed In 2018 LECWSP 5

EXECUTIVE SUMMARY

The South Florida Water Management District (SFWMD) approved the 2018 Lower East Coast Water Supply Plan Update (2018 LEC Update) on November 8, 2018. As a result, the City of Pembroke Pines (City) is required per Section 163.3177(6)(c)(3), Florida Statutes to prepare and adopt the Water Supply Facilities Work Plans (Work Plan) into their Comprehensive Plans no later than 18 months after the approval of the 2018 LEC Update. The City will be incorporating the adopted Work Plan as part of the Infrastructure Element within the Water Supply section of the Comprehensive Plan. The City's Work Plan must confirm the ability of the water supply and facilities to meet the water demand for the next 10-year planning period from 2020 to 2030. This Work Plan includes an analysis of water demands and flow projections that were developed using population projections and actual per capita water demands. The per capita water demand of 82.68 gallons per day per capita was calculated based on the actual treated water supply data from 2017 through 2019. Based on this per capita water demand and the future population projections established in the 2018 LEC Update, the current water supply facilities have the capacity to meet the future water demand for the required 10-year planning period and beyond through the year 2040.

On February 15, 2007 as part of the SFWMD's water use permit program, the Regional Water Availability Rule was adopted which reduced reliance on the regional system for future water supply needs, mandates the development of alternative water supplies, and increased water conservation and reuse. In the 2018 LEC Update, the SFWMD has identified the following regional issues for 2040 in the Lower East Coast Planning Region:

1. Fresh surface water and groundwater are limited; further withdrawals could have impacts on the regional system, wetlands, existing legal uses, and saltwater intrusion. As a result, additional alternative water supplies need to be developed.
2. Surface water allocations from Lake Okeechobee and the Water Conservation Areas are limited in accordance with the Lake Okeechobee Service Area RAA criteria.
3. Construction of additional storage systems (e.g., reservoirs, aquifer storage and recovery systems) to capture wet season flow volumes will be necessary to increase water availability during dry conditions and attenuate damaging peak flow events from

Lake Okeechobee.

4. Expanded use of reclaimed water is necessary to meet future water supply demands and the Ocean Outfall Law.
5. Expanded use of brackish groundwater from the Floridan aquifer system requires careful planning and wellfield management to prevent undesirable changes in water quality.

Although sufficient capacity is available in the City's water supply and facilities to meet future demand through 2040, the City will continue to address these regional issues by developing appropriate policies and establishing best practices at the local level which may include the following:

1. Employment of alternative sources of water supply. The City has investigated Alternative Water Supplies and prepared a study examining a project that would provide for Biscayne Aquifer recharge with highly treated reclaimed water. The "Alternate Water Supply (AWS) Facility Phase II Pilot Study Summary Report", dated October 17, 2011, was prepared by Calvin, Giordano and Associates, Inc. Although this Biscayne Aquifer recharge project with highly treated reclaimed water appears to be technically feasible, it would appear to not be financially feasible from an economic standpoint due to the stringent water quality requirements established in the Broward County of Ordinances Chapter 27 for water discharged into the ground, surface or marine waters. Therefore, the City has no plans at this time to implement the Biscayne Aquifer recharge project and is investigating other alternative sources of water supply, such as the use of the C-51 Reservoir, as a contingency plan to meet potential shortfalls.
2. Promotion of water conservation. The City continues to be a participant in both the Broward Water Partnership and Conservation Pays programs.
3. Adherence to Broward County standards for water use including mandates for the use of water-conserving appliances in the construction of new homes, restrictions on the hours of lawn irrigation, and establishment of a Florida Landscape Ordinance.
4. Incorporation of objectives and policies within the Comprehensive Plan that ensure resiliency of existing and future water resources.

PART 1 - SECTION ONE

INTRODCUTION

1.01 PURPOSE & SCOPE

The purpose of the City of Pembroke Pines (City) Water Supply Facilities Work Plan (Work Plan) is to identify and plan for the water supply sources and facilities needed to meet the water needs within the City of Pembroke Pines during the 10-year period from 2020 – 2030, and to address water supply related issues affecting Florida’s Lower East Coast Region. Section 163.3177(6)(c)(3), Florida Statutes requires local governments to prepare and adopt Work Plans into their Comprehensive Plans no later than 18 months after the water management district approves a regional water supply plan or its update. The 2018 Lower East Coast Water Supply Plan Update (2018 LEC Plan) was approved for the region by the South Florida Water Management District (SFWMD) on November 8, 2018. Therefore, the deadline for local governments within the Lower East Coast jurisdiction to adopt a Work Plan and amend their Comprehensive Plans to ensure consistency with the 2018 LEC Plan is May 8, 2020. This 10-Year Work Plan has been prepared for the City of Pembroke Pines, located in Broward County, and will be incorporated as part of the Infrastructure Element within the Water Supply section of the Comprehensive Plan.

Water supply options will be developed based upon withdrawals from the Biscayne Aquifer and Alternative Water Supplies. Also, the Eastern and Western wellfields will be reviewed as potential water supply resources. Water demands and flow projections will be developed by using population projections and actual per capita water demands.

1.02 STATUTORY HISTORY

The Florida Legislature enacted bills during the 2002, 2004, 2005, 2011, 2012, 2015, and 2016 sessions to address the state’s water supply needs. These bills, particularly Senate Bills 360 and 444 enacted during the 2005 legislative session, strengthened the statutory links between the regional water supply plans (RWSPs) prepared by water management districts and the Comprehensive Plans prepared by local governments through changes to Chapters 163 and 373, Florida Statutes (F.S.). These changes improved coordination between local land use planning and

regional water supply planning.

1.03 STATUTORY REQUIREMENTS

There are multiple statutory provisions each local government must consider when updating its Work Plan, as summarized below:

1. Coordinate appropriate aspects of the Comprehensive Plan with the applicable RWSP [Section 163.3177(4)(a), F.S.].
2. Ensure the Future Land Use Plan is based on availability of adequate water supplies and public facilities and services [Section 163.3177(6)(a), F.S.]. Data and analyses demonstrating that adequate water supplies and associated public facilities will be available to meet projected growth demands must accompany all proposed Future Land Use Plan and Plan amendments submitted for review.
3. In consultation with the water supplier, ensure adequate water supplies and potable water facilities are available to serve new development no later than the issuance by the local government of a certificate of occupancy or its functional equivalent [Section 163.3180(2), F.S.].
4. For local governments subject to an RWSP, revise the General Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater Aquifer Recharge element (the “Infrastructure element”) through a Comprehensive Plan amendment to:
 - a. Identify and incorporate the alternative water supply project(s) selected by the local government from projects identified in the applicable RWSP, or alternative project(s) proposed by the local government under Section 373.709(8)(b), F.S. [Section 163.3177(6)(c), F.S.];
 - b. Identify the traditional and alternative water supply projects and the conservation and reuse programs necessary to meet water needs identified in the applicable RWSP [Section 163.3177(6)(c)3., F.S.]; and
 - c. Update the Work Plan for at least a 10-year planning period for constructing the public, private, and regional water supply facilities identified in the element as necessary to serve existing and new development [Sections 163.3177(6)(c)3. and (5), F.S.].
5. Revise the Five-Year Schedule of Capital Improvements to include water supply, reuse,

and conservation projects and programs to be implemented during the 5-year period [Section 163.3177(3)(a)4., F.S.].

6. To the extent necessary to maintain internal consistency after making changes described in Paragraph 1 through 5 above, revise the Conservation element to assess projected water needs and sources for at least a 10-year planning period, considering the applicable RWSP and water use permit(s) [Section 163.3177(6)(d), F.S.]. The comprehensive plan must address the water supply sources necessary to meet the existing and projected water use demand for the established planning period, considering the applicable RWSP [Section 163.3167(9), F.S.].
7. To the extent necessary to maintain internal consistency after making changes described in Paragraphs 1 through 5 above, revise the Intergovernmental Coordination element to ensure consistency between the Comprehensive Plan and the applicable RWSP [Section 163.3177(6)(h)1., F.S.].
8. Local governments are required to comprehensively evaluate and update the Comprehensive Plan to reflect changes in local conditions every seven years. The evaluation could address the local government's need to update their Work Plan, including the development of alternative water supplies, and determine whether the identified alternative water supply projects, traditional water supply projects, and conservation and reuse programs are meeting local water use demands [Section 163.3191(3), F.S.].
9. Local governments may be exempt from updating their Work Plan if they meet certain criteria. A local government that does not own, operate, or maintain its own water supply facilities and is served by a public water supply entity with a permitted allocation of 300 million gallons per day or greater is not required to amend its Comprehensive Plan when an RWSP is updated if the local government uses less than 1 percent of the public water supply entity's total permitted allocation. However, the local government must cooperate with the public water supply entity that provides service within its jurisdiction and must keep the Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater Aquifer Recharge element up to date, pursuant to Section 163.3191, F.S. A local government should contact the Florida Department of Economic Opportunity (DEO) to verify its qualifications for the

exemption [Section 163.3177(6)(c)4., F.S.].

10. Local governments with a Sector Plan adopted in accordance with Section 163.3245, F.S., should incorporate information from the adopted Sector Plan, Master Plan, and Detailed Specific Area Plan into the Work Plan. The focus should be on water needs, water supply and resource development, conservation measures, and intergovernmental coordination activities with the SFWMD and water supply development projects needed to address projected development in the Sector Plan area [Section 163.3245, F.S.].

1.04 RELEVANT REGIONAL ISSUES

As the State agency responsible for water supply in the Upper and Lower East Coast planning areas, the SFWMD plays a pivotal role in resource protection, through criteria used for Consumptive Use Permitting. As pressure increased on the Everglades ecosystem resource, the SFWMD Governing Board initiated rulemaking to limit increased allocations dependent on the Everglades system. As a result, the Regional Water Availability Rule was adopted by the Governing Board on February 15, 2007 as part of the SFWMD's water use permit program. This reduced reliance on the regional system for future water supply needs, mandates the development of alternative water supplies, and increased water conservation and reuse.

The following are the regional issues identified for 2040 in the Lower East Coast Planning Region:

1. Fresh surface water and groundwater are limited; further withdrawals could have impacts on the regional system, wetlands, existing legal uses, and saltwater intrusion. As a result, additional alternative water supplies need to be developed.
2. Surface water allocations from Lake Okeechobee and the Water Conservation Areas are limited in accordance with the Lake Okeechobee Service Area RAA criteria.
3. Construction of additional storage systems (e.g., reservoirs, aquifer storage and recovery systems) to capture wet season flow volumes will be necessary to increase water availability during dry conditions and attenuate damaging peak flow events from Lake Okeechobee.
4. Expanded use of reclaimed water is necessary to meet future water supply demands and the Ocean Outfall Law.

5. Expanded use of brackish groundwater from the Floridan aquifer system requires careful planning and wellfield management to prevent undesirable changes in water quality.

The City of Pembroke Pines will continue to address these regional issues by developing appropriate policies and establishing best practices at the local level which may include the following:

1. Employment of alternative sources of water supply. The City has investigating Alternative Water Supplies and prepared a study examining a project that would provide for Biscayne Aquifer recharge with highly treated reclaimed water. The “Alternate Water Supply (AWS) Facility Phase II Pilot Study Summary Report”, dated October 17, 2011, was prepared by Calvin, Giordano and Associates, Inc. Although this Biscayne Aquifer recharge project with highly treated reclaimed water appears to be technically feasible, it would appear to not be financially feasible from an economic standpoint. Therefore, the City has no plans at this time to implement this project and is investigating other alternative sources of water supply such as the use of the C-51 Reservoir.
2. Promotion of water conservation.
3. Adherence to Broward County standards for water use including mandates for the use of water-conserving appliances in the construction of new homes, restrictions on the hours of lawn irrigation, and establishment of a Florida Landscape Ordinance.
4. Incorporation of goals, objectives and policies within the Comprehensive Plan that ensure resiliency of existing and future water resources in areas.

With portions of the City of Pembroke Pines being provided water service from other utilities, such as Broward County Water and Wastewater Services (BCWWS) and the City of Hollywood, the proposed water supply projects identified in the 2018 LEC Plan for those utilities has been incorporated into this Work Plan. Although these utilities have identified their ability to meet their water demand for the year 2040, these projects are being proposed to diversify their water sources or improve their current treatment methods to increase capacity. Those projects include:

1. City of Hollywood plans to expand its reverse osmosis treatment plant by 2.00 MGD

and install two additional Floridan Aquifer System wells, which will provide a total of 4.00 MGD of additional water.

2. BCWWS (District 1) has constructed two Floridan Aquifer System wells and plans to add reverse osmosis treatment to its water treatment plant, which will provide a total of 3.00 MGD of additional water.
3. BCWWS (District 2A/North Regional Wellfield) plans to add Florida Aquifer System wells and expand its water treatment plan to include reverse osmosis treatment or utilize 3.00 MGD in Phase 1 of the C-51 Reservoir for impact offsets, which will provide a total of 9.00 MGD of additional water.
4. BCWWS (South Regional Wellfield) has entered into an agreement for 3.00 MGD capacity allocation in Phase 1 of the C-51 Reservoir with Palm Beach County Aggregates.
5. BCWWS (District 2A/North Regional Wellfield) has entered into an agreement for 3.00 MGD capacity allocation in Phase 1 of the C-51 Reservoir with Palm Beach County Aggregates.

PART 2 - SECTION TWO

10 YEAR PROJECTIONS

2.01 POPULATION PROJECTIONS

Projections of population growth are essential for estimating future water demands. Anticipated population growth within the City of Pembroke Pines is projected on the basis of historical trends and expected land use development. Population projections developed in this Section are used to estimate future water demands.

Historical population and growth trends are available from the U.S. Census Bureau, the City's Planning & Economic Development Department, Broward County, South Florida Water Management District (SFWMD), and the University of Florida Bureau of Economic and Business Research (BEBR) medium range population projections. We have used the 2018 LEC Plan population forecasting model results for population estimates which uses the Bureau of Economic and Business Research population projections report published in *Projections of Florida Population by County, 2020-2040, with Estimates for 2016* (Rayer, S. and Y. Wang, 2017).

The City boundary is not anticipated to change unless future annexation occurs. If boundary expansions take place in the future, the only areas likely to expand are the northwestern or northeastern portions of the City. The northwestern area is comprised of estate type homes, ranches and agricultural type land uses, and is therefore not anticipated to have a significant impact on future water demands and wastewater flows.

Land use revisions are usually difficult to get approved since the City, County, Regional Planning Council and Department of Economic Opportunity (DEO) must approve revisions to the current approved land uses. Land use revisions are particularly difficult to accomplish in Broward County. It is therefore believed that the current land uses will remain unchanged.

Table 2-1 shows the historic and projected population for the entire City of Pembroke Pines. Build-out is expected to occur in next few years with infill occurring after build-out, based upon the City Planning & Economic Development Department's current estimations.

2.02 WATER DEMANDS AND FUTURE RAW WATER SUPPLIES

Before facilities can be sized, the future demands for water within the City served by the facilities must be determined. To project future water demands, past consumption and future expected consumption must be analyzed. A thorough review of the City's past and present water consumption and demands was performed, which included the Water Treatment Plant Monthly Operation Reports from January 2017 through December 2019. The past three years of data was analyzed and are presented in Table 2-2. The January 2019 to December 2019 data indicates the Average Daily Demand (ADD) for raw water was 12.81 Million Gallons per Day (MGD). Total raw water pumped from the Biscayne Aquifer was 4,673.96 MG. The Maximum ADD per month pumpage was 13.41 MGD and occurred in March 2019. The average peak factor ratio of Maximum ADD pumpage to average monthly ADD pumpage over the past three years was 1.05. See Appendix A for Combined Wellfield Pumpage Reports for the East and Central Wellfields.

Historical and Past Water Usage was also analyzed from 2010 through 2019 and the results are shown in Table 2-3. The City is a largely year round residential community with no seasonal demand peaks. Water use is relatively constant over the entire year. The City does not allow irrigation with potable water so there is no effect due to increased or decreased irrigation demand. Due to water restrictions imposed as a result of draught conditions, and the permanent water restrictions in place as mandated by the SFWMD, the average gallons per capita day for the past three years has been used for forecasting future water usage and it is projected that the population will continue to use less water than previously due to:

- A conservation rate structure and,
- Public awareness of the need to conserve water.

Projected water use for the City was calculated and is presented in Table 2-4. Projected water use was calculated from 2020 through 2040. The ADD was based upon a 2017 through 2019 treated water data and the per capita water usage was calculated to be 82.68 gallons per capita per day (gpcd). For the year 2040, the estimated ADD was calculated to be 13.43 MGD.

Broward County WWS supplies water to a portion of Pembroke Pines which is within District 3BC. The residential area is bounded to the east by the Florida Turnpike, SW 72nd Ave to the

west, SW 9th St. to the north and South Airport Rd. to the south. The area also includes North Perry Airport. Based on Table WS23, in the 2020 Broward County Water Supply Facilities Work Plan, Table 2-4 indicates projected use by the City of Pembroke Pines.

The City of Pembroke Pines routinely coordinates with Broward County WWS concerning the management of their water distribution system. Although there is no formal interconnect agreement that governs this coordination, these coordination efforts and development procedures that are in place are adequate to ensure future water demand is available. At this time, the future water demand for this small portion of the City of Pembroke Pines that is served by Broward County WWS is not anticipated to increase because this area has reached buildout conditions.

2.03 WELLFIELDS INFORMATION

Figure 2-3 is a map of the City's two wellfields that are both located on Johnson Street. The wellfields are approximately one mile apart. The City's only water use withdrawal facilities are the nine (9) wells located in these two wellfields. Table 2-5 describes wells 1 through 5, which are located at the water treatment plant (Central Wellfield), and wells 6, 9, 10, and 11, which are located on the corner of N.W. 72 Avenue and Johnson Street (Eastern Wellfield). The nine wells are owned and operated by the City of Pembroke Pines.

The following capital improvement projects, affecting the wellfield system, will be completed in the next five years.

1. New raw water main between the eastern wellfield and the water treatment plant. This will provide a redundancy as the existing 24" Raw Water Main will also be rehabilitated. The project is anticipated to be completed in 2022.
2. Variable frequency drives will be installed on the pumps at the central wellfield. This will allow more control of the pumps to better meet regulatory requirements. The project is anticipated to be completed in 2020.
3. Evaluation of raw water well #6. A physical and hydrogeological assessment will be performed to determine how to address the current state of the well and what steps may be taken to upgrade the well. The project is anticipated to be completed in 2020.

The current water use permit expires on August 18, 2030. The current permitted withdrawal amount is 5695 million gallons (MG) per year which equates to approximately 15.60 MGD.

2.04 SERVICE AREA AND OTHER SERVICE PROVIDERS

The City of Pembroke Pines current and future water service area with interconnects is presented as Figure 2-2. The City currently has four (4) emergency interconnects with neighboring municipal water systems, which include one (1) with Cooper City, two (2) with the City of Miramar, and one (1) with the City of Sunrise but does not provide water to these or other surrounding municipalities. The Town of Southwest Ranches is not serviced by the City of Pembroke Pines nor are there plans to provide water service in the future. There are, however, 5 individual homes (population of approximately 12 people total) in the Town of Southwest Ranches that requested and were allowed to connect to the City's water system. The City intends to continue to provide service to these accounts but has no plans to make additional connections. There are no domestic water self-supply systems in the City.

Broward County Water and Wastewater Services (BCWWS) provide water to a small portion of the southeastern section of the City of Pembroke Pines. The residential area is bounded to the east by the Florida Turnpike, SW 72nd Ave to the west, SW 9th St. to the north and South Airport Rd. to the south. The area also includes North Perry Airport. Table 2-4 indicates Pembroke Pines's projected water use from BCWWS. Projected water use was calculated from 2020 through 2040 using population numbers and a per capita water usage of 127 gallons per capita per day from the 2020 Broward County Water Supply Facilities Work Plan. BCWWS purchases water through an agreement with the City of Hollywood. Currently, the City of Hollywood has no capital needs to meet future demands (see attached section, from the Hollywood Water Supply Capital Improvements, in appendix). However, if capacity is needed, the reverse osmosis system can be expanded as outlined in the 2018 LECWSP (see attached section from, Hollywood Capital Improvement listed in 2018 LECWSP, in appendix). BCWWS intends to continue to provide service to these homes and has accounted for this area in its Work Plan. The estimated water distribution from BCWWS to the City of Pembroke Pines is as follows:

Broward County's WUP No. 06-00038 -W states a maximum allowable annual average raw water withdrawal from the Biscayne Aquifer, of 11,205 MG (30.7 MGD). WUP No. 06-00038-W also

states a maximum allowable annual average raw water withdrawal from the Floridan Aquifer of 3,168 MG (8.7 MGD). The maximum monthly withdrawal from the Biscayne Aquifer is 1,062.20 MG and the maximum month withdrawal from the Florida Aquifer is 259.00 MG.

The Broward County Water Supply Facilities Work Plan has taken into consideration the City of Pembroke Pines' customers in its Work Plan and additional coordination between the two governmental entities will occur (see attached section, Broward County Water Supply Facilities Work Plan, in appendix)

- Current and future water sources:

Current water sources for the Broward County water system consist of purchasing finished water from the City of Hollywood WTP and reselling to a small portion of the City's jurisdiction. The City of Hollywood's WTP treats water from its own Biscayne Aquifer wellfield, the Broward County South Regional Biscayne Wellfield, as well as water from the Floridan Aquifer wells.

- Existing and future water treatment facilities and capabilities to meet demand over planning period:

Each district under BCWWS has different water treatment facilities treating their water, District 1 service area contains all of Lauderdale Lakes and portions of the cities of Fort Lauderdale, Lauderdale, North Lauderdale, Oakland Park, Plantation, Pompano Beach and Tamarac. The raw water is treated at the District 1 Water Treatment Plant, operating under permit no. 06-58-00009. The projected raw water use of the year 2040 accounts for 56% of the water treatment plant capacity, thus the facility is capable of meeting future demands.

District 2 service area contains portions of the cities of Deerfield Beach, Lighthouse Point and Pompano Beach; and provides water to portions of the City of Coconut Creek. The raw water is treated at the District 2 WTP, operating under permit no. 06-58-00010. The projected raw water use of the year 2040 accounts for 49% of the water treatment plant capacity, thus the facility is capable of meeting future demands.

District 3 service area contains portions of the cities of Dania Beach, Davie, Fort Lauderdale, Miramar, West Park Pembroke Park, Pembroke Pines and Hollywood, as well as Fort Lauderdale-Hollywood International Airport. District 3 does not have water treatment facilities. The water for District 3 is supplied by the City of Hollywood under CUP no. 06-00038-W.

- Infrastructure and capital improvement needs of BCWWS, including needs identified in the 2018 lower east coast water supply plan update.
- The City of Hollywood Capital Improvement Plan can be seen in the Hollywood Water Supply Capital Improvements, page WS 6-1, attached in appendix.

Furthermore, the Broward County Capital Improvements Plan is displayed in the 2018 LECWSP update (see attached section, Broward County Water Supply Development Projects listed in 2018 LECWSP, in appendix).

2.05 FACILITIES

A. WATER TREATMENT PLANT

The existing water treatment plant has a rated capacity of 18.0 million gallons per day (MGD). Six (6) MGD treatment capacity was added for redundancy. The facility is located at the intersection of Johnson Street and University Drive in the City of Pembroke Pines. The City has two (2) 2.0 million gallons (MG) and one (1) 1.0 million gallons (MG) finished water storage tanks located at the water treatment plant. The method of treatment is by lime softening, carbon dioxide injection, filtration, ion exchange, and disinfection with sodium hypochlorite. Figure 2-3 shows the layout of the water treatment plant and various components of the water treatment process, and Table 2-6 details the predominant features of the water treatment plant. The water treatment plant is supplied by a total of nine (9) wells.

In addition to the water treatment plant, the City has two (2) water booster pumping stations. The first is located in the north central part of the City at Academic Village, and the second is located in the extreme western end of the City at Holly Lake. The Academic Village booster pump station is rated at 5,200 gallons per minute (GPM) and includes one (1) 2.5 million gallon (MG) finished water storage tank, a high service pump building, and a sodium hypochlorite disinfection facility.

The Holly Lake booster pump station is rated at 10,000 gallons per minute (GPM) and includes two (2) 2.5 million gallons (MG) finished water storage tanks, a high service pump building, and a sodium hypochlorite disinfection facility. Figures 2-4 and 2-5 show the layout of Academic Village and Holly Lake booster stations respectively.

The City has four (4) large mag-meters for raw water flow on the incoming or influent end of the water treatment plant. These meters register all raw water entering the plant from both wellfields. The City has installed individual mag-meters for metering flow from all wells. The City also meters finished (treated) water leaving the plant with two (2) large (24" and 16") water meters. Each customer receiving water has a water meter to register and total the amount of water consumed.

The shallow Biscayne Aquifer is the sole source of water for the City of Pembroke Pines as well as most of Broward County. The Biscayne Aquifer lies just below the surface. The City's wellfield draws from a portion of the Biscayne Aquifer approximately 112 feet deep. Private irrigation wells are reported to draw from a shallower portion of the aquifer.

The City of Pembroke Pines has the highest municipal firefighting rating available with an ISO rating of 1. Fire hydrants are available throughout the City and are tested annually. The City's high service pumps at the water treatment plant, Academic Village Booster Station, and at the Holly Lake Booster Station provide the City with up to 34,055 GPM pumping capacity. Emergency power for the pumps is provided at each site. The total water storage tank capacity is 12.5 MG and provides the City with more than a 10-hour firefighting duration.

The following capital improvement projects, affecting the water treatment plant, will be completed in the next five years.

1. Install three (3) 30" isolation valves on the lime softening treatment units discharge process pipes. This will allow the pipes to be cleaned and maintained without interfering with water treatment plant operations. The project is anticipated to be completed in 2020.
2. Install an inline flowmeter/totalizer on the existing 30" treated water distribution pipe. This will allow more accurate measurement of the treated water leaving the water treatment plant. The project is anticipated to be completed in 2020.

B. WASTEWATER TREATMENT PLANT

The City is separated into two wastewater collection and treatment zones, the eastern and western zones. Each serves approximately ½ of the City. The western portion of the City is considered to be the area west of Flamingo Road. Wastewater flows are presented from readings of the effluent meter at the Pembroke Pines WWTP from injection wells 1 and 2. The average Pembroke Pines wastewater effluent production for the western portion of the City amounted to approximately 6.85 MGD in 2017-2019.

In addition, the City of Pembroke Pines owns and operates a wastewater collection and transmission system east of Flamingo Road. The wastewater generated by this area is transmitted to the City of Hollywood regional wastewater treatment facility and is governed by a Large User Agreement. The wastewater from this area averages (years 2017-2019) approximately 7.64 MGD. Therefore, the total amount of wastewater generated the eastern and western portions of the City is approximately 14.49 MGD.

Table 2-1 City of Pembroke Pines Historical and Projected Population

YEAR	HISTORICAL AND PROJECTED POPULATION
2010	*152,002
2011	*152,733
2012	*153,464
2013	*154,195
2014	*154,926
2015	*155,657
2016	**161,337
2017	**162,041
2018	**162,744
2019	**163,448
2020	**164,152
2025	**165,917
2030	**167,682
2035	**167,210
2040	**166,913

* Populations Based on South Florida Water Management District Lower East Coast Water Supply Plan Update - 2013

** Populations Based on South Florida Water Management District Lower East Coast Water Supply Plan Update - 2018

**Table 2-2 City of Pembroke Pines Water Use For 3 Year Period
FROM: January 2019 TO: December 2019**

DATE	RAW WATER PUMPED AVG DAY (MG)	TOTAL RAW WATER PUMPED (MGM)	TOTAL WATER TREATED (MGM)
Jan-19	13.08	405.43	398.86
Feb-19	12.88	360.59	355.69
Mar-19	13.41	415.77	409.34
Apr-19	13.01	390.40	387.40
May-19	12.68	393.05	378.93
Jun-19	12.72	381.46	372.79
Jul-19	12.62	391.20	378.94
Aug-19	12.49	387.30	369.08
Sep-19	12.68	380.38	369.13
Oct-19	12.90	399.91	387.27
Nov-19	12.67	380.24	371.22
Dec-19	12.52	388.23	381.11
TOTAL		4673.96	4559.76
AVERAGE	12.81	389.50	379.98
MAX PUMPED (DAY)	15.12		
PEAK FACTOR	1.18		

Information obtained from the City of Pembroke Pines 2019 Water Balance Summary Sheet.

FROM: January 2018 TO: December 2018

DATE	RAW WATER PUMPED AVG DAY (MG)	TOTAL RAW WATER PUMPED (MGM)	TOTAL WATER TREATED (MGM)
Jan-18	12.65	392.25	420.04
Feb-18	12.89	360.90	385.51
Mar-18	13.02	403.57	433.40
Apr-18	13.22	396.47	409.83
May-18	12.44	385.73	410.85
Jun-18	12.31	369.35	398.69
Jul-18	12.47	386.61	418.95
Aug-18	12.48	386.90	413.78
Sep-18	12.60	378.13	402.76
Oct-18	12.65	392.07	415.99
Nov-18	12.99	389.62	414.02
Dec-18	13.10	406.14	430.46
TOTAL		4647.74	4954.28
AVERAGE	12.73	387.31	412.86
MAX PUMPED (DAY)	15.52		
PEAK FACTOR	1.22		

Information obtained from the City of Pembroke Pines 2018 Water Balance Summary Sheet.

FROM: January 2017 TO: December 2017

DATE	RAW WATER PUMPED AVG DAY (MG)	TOTAL RAW WATER PUMPED (MGM)	TOTAL WATER TREATED (MGM)
Jan-17	12.72	394.36	400.28
Feb-17	12.96	362.86	383.19
Mar-17	12.71	393.97	423.43
Apr-17	12.67	380.08	402.37
May-17	12.47	386.56	415.46
Jun-17	11.81	354.25	378.64
Jul-17	11.96	370.73	400.67
Aug-17	12.25	379.90	405.78
Sep-17	12.48	374.45	399.44
Oct-17	12.42	384.91	404.11
Nov-17	12.53	375.92	402.35
Dec-17	12.59	390.46	419.19
TOTAL		4548.45	4834.91
AVERAGE	12.46	379.04	402.91

MAX PUMPED (DAY)	16.23		
PEAK FACTOR	1.30		

Information obtained from the City of Pembroke Pines 2017 Water Balance Summary Sheet.

Table 2-3 City of Pembroke Pines Past Water Use

YEAR	PAST POPULATION PEMBROKE PINES SERVICE AREA	PAST POPULATION BROWARD COUNTY SERVICE AREA	(1, 2) AVERAGE DAY DEMAND (MG) PEMBROKE PINES SERVICE AREA	(1, 2) PER CAPITA USAGE PEMBROKE PINES SERVICE AREA	(3, 4) PER CAPITA USAGE BROWARD COUNTY SERVICE AREA	(3, 4) AVERAGE DAY DEMAND (MG) BROWARD COUNTY SERVICE AREA
2010	*148,050	***3,952	11.98	80.39	118	0.47
2011	*148,762	***3,971	11.90	80.00	126	0.50
2012	*149,474	***3,990	11.90	79.64	122	0.49
2013	*150,186	***4,009	12.59	83.80	127	0.51
2017	**157,863	***4,178	13.25	83.91	122	0.51
2018	**158,498	***4,246	13.57	85.64	127	0.54
2019	**159,133	***4,315	12.49	78.50	127	0.55

(1) Based on Pembroke Pines 10 Year Water Supply Facilities Work Plan (gpcd) – 3/12/15 for 2010- 2013.

(2) Based on a 2017, 2018 and 2019 average per capita (gpcd) usage of 82.68.

(3) Based on Broward County 10 Year Water Supply Facilities Work Plan - 4/21/20 for 2010 – 2017.

(4) Based on Broward County 10 Year Water Supply Facilities. Work Plan – 4/21/20 per capita (gpcd) usage of 127 and Table WS23 for 2018 and 2019.

* Population based on South Florida Management District Lower East Coast Water Supply Plan Update - 2013

**Population based on South Florida Management District Lower East Coast Water Supply Plan Update – 2018

***Population based on Broward County 10 Year Water Supply Facilities Work Plan – 4/21/20

Table 2-4 City of Pembroke Pines Projected Water Use

YEAR	(1) PROJECTED POPULATION PEMBROKE PINES SERVICE AREA	(2) PROJECTED POPULATION BROWARD COUNTY SERVICE AREA	(3) AVERAGE DAY DEMAND (MG) PEMBROKE PINES SERVICE AREA	(4) AVERAGE DAY DEMAND (MG) BROWARD COUNTY SERVICE AREA	(5) MAXIMUM DAY DEMAND (MG) PEMBROKE PINES SERVICE AREA	(6) MAXIMUM DAY DEMAND (MG) BROWARD COUNTY SERVICE AREA
2020	159,768	4,384	13.21	0.56	15.82	0.60
2025	161,583	4,334	13.36	0.55	16.00	0.59
2030	163,388	4,294	13.51	0.55	16.19	0.58
2035	162,793	4,417	13.46	0.56	16.12	0.60
2040	162,436	4,477	13.43	0.57	16.09	0.59

(1) Based on SFWMD Lower East Coast Water Supply Plan Update – 2018.

(2) Based on Broward County 10 Year Water Supply Facilities Work Plan – 4/21/20.

(3) Based on a 2017, 2018 and 2019 average per capita (gpcd) usage of 82.68.

(4) Based on Broward County 10 Year Water Supply Facilities. Work Plan – 4/21/20 per capita (gpcd) usage of 127 and Table WS23.

(5) Based on a three year average peak factor of 1.23.

(6) Based on Broward County 10 Year Water Supply Facilities Work Plan – 4/21/20 five year average peak factor of 1.08.

Table 2-5 City of Pembroke Pines Central Wellfield Description

DESCRIPTION	WELL No. 1	WELL No. 2	WELL No. 3	WELL No. 4	WELL No. 5
Map Designation	WEST	WEST	WEST	WEST	WEST
Existing or Proposed	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING
Diameter (inches)	12	12	12	16	16
Total Depth (feet)	112.5	112	111	144	115
Cased Depth (feet)	105	105	105	114	103
Screened Interval	NONE	NONE	NONE	NONE	NONE
Pumped or Flowing	PUMPED	PUMPED	PUMPED	PUMPED	PUMPED
Working Valve, If Artesian (yes or no)	NO	NO	NO	NO	NO
Pump Manufacturer and Model Number	B.JACKSON 12 HQR	INGERSOLLRAND 10 NKH	FAIRBANKS MORSE11M- 7000	PEERLESS1 2 HXB	PEERLESS1 4 HXB
Pump Type (Centrifugal, Jet, Deep Jet, Turbine, etc.)	TURBINE	TURBINE	TURBINE	TRUBINE	TURBINE
Intake Depth (NGVD)	39'	23'	23'	23'	30'
Pump or Flow Capacity (GPM at Ft. of Head)	2000 GPM@ 45'	1000 GPM@ 32'	825 GPM@ 58'	2100 GPM@ 43'	2350 GPM@ 57'
Active (yes or no)	YES	YES	YES	YES	YES
Year Drilled	1963	1963	1963	1973	1973
Type of Meter	MAG	MAG	MAG	MAG	MAG

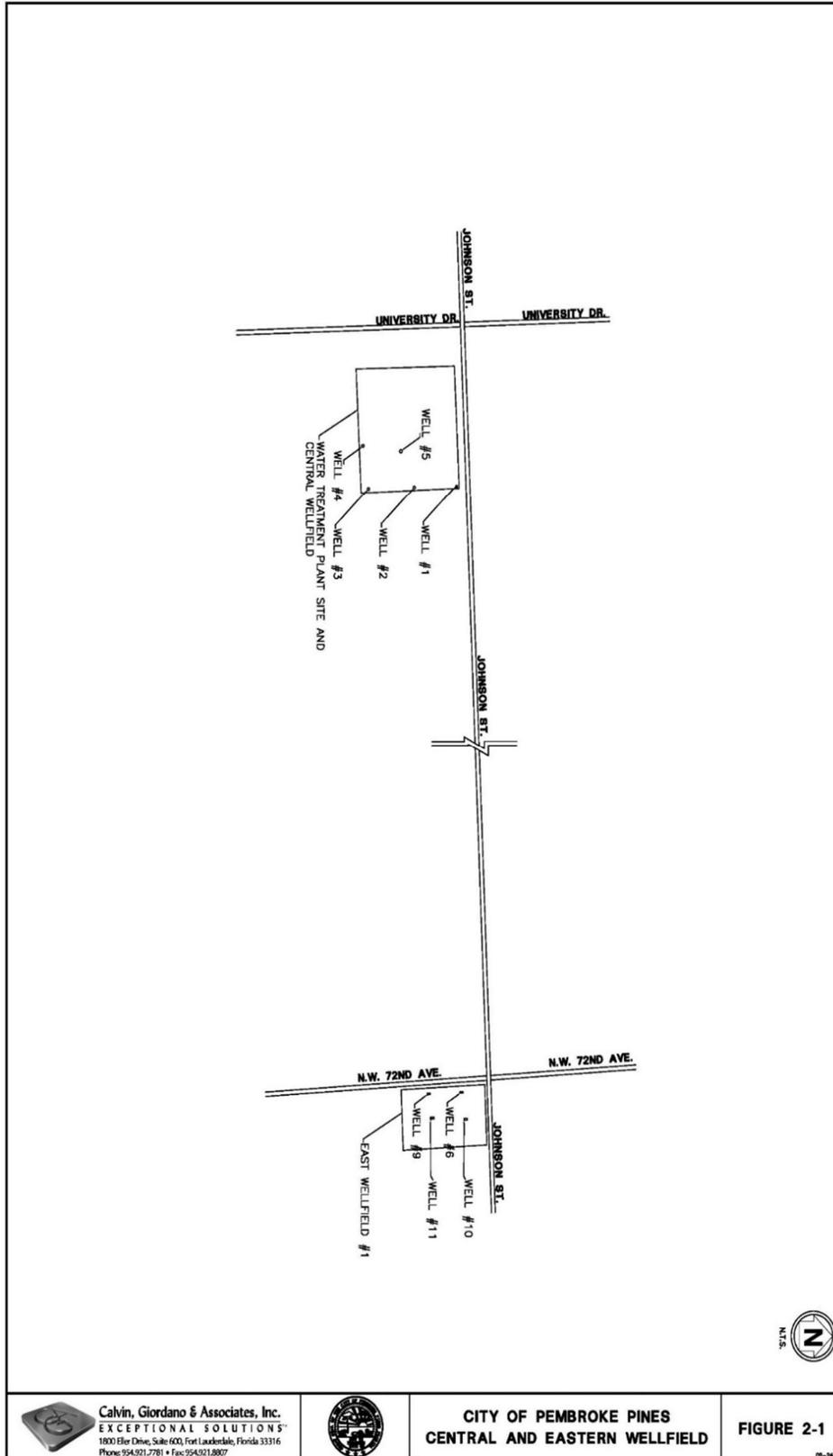
DESCRIPTION	WELL No. 6	WELL No. 9	WELL No. 10	WELL No. 11
Map Designation	EAST	EAST	EAST	EAST
Existing or Proposed	EXISTING	EXISTING	EXISTING	EXISTING
Diameter (inches)	10	18"	18"	18"
Total Depth (feet)	94	125'	123'	125'
Cased Depth (feet)	90	102'	100'	102'
Screened Interval	NONE	NONE	NONE	NONE
Pumped or Flowing	PUMPED	PUMPED	PUMPED	PUMPED
Working Valve, If Artesian (yes or no)	NO	NO	NO	NO
Pump Manufacturer and Model Number	FLOWAY16MKL	FLOWAY16MKL	B. JACKSON15HQ	B. JACKSON15HQ
Pump Type (Centrifugal, Jet, Deep Jet, Turbine, etc.)	TURBINE	TURBINE	TURBINE	TURBINE
Intake Depth (NGVD)	39'	47'	49'	49'
Pump or Flow Capacity (GPM at Ft. of Head)	1580 GPM@ 52'	3000 GPM@ 60'	3000 GPM@ 60'	3000 GPM@ 60'
Active (yes or no)	YES	YES	YES	YES
Year Drilled	2000	1994	1995	1995
Type of Meter	MAG	MAG	MAG	MAG

Information obtained from South Florida Water Management District Permit No. 06-00135-W, dated 8/16/2010.

Table 2-6 City of Pembroke Pines Water Treatment Plant Features

COMPONENT	DESCRIPTION
RAW WATER WELLS:	The City has nine (9) raw water wells. Five are located on the water treatment plant site (Central Wellfield) and four (4) are located one mile east of the water treatment plant at the Eastern Wellfield site. The total rated capacity of the wellfields is 18,855-gpm.
WATER TREATMENT UNITS:	There are four (4) steel pre-engineered Accelator treating units (softeners) each rated at 6.0 MGD.
CO2 INJECTION SYSTEM	There are four (4) 40 lbs./hr. CO2 injection systems and one (1) 26 ton CO2 storage tank.
GRAVITY SAND FILTERS:	There are four (4) Greenleaf multi-media four cell filter units.
LIME SILOS:	There are three (3) lime silos for storing and mixing the lime.
CLEARWELL AND TRANSFER PUMPS:	Pumps transfer water from the clearwell to the storage tanks and to the Ion Exchange filters and the clearwell as needed.
GROUND STORAGE TANKS:	There are two (2) 2.0 MG and one (1) 1.0 MG pre-stressed concrete ground storage tanks.
HIGH SERVICE PUMP STATION:	Nine (9) motors range from 40 hp to 125 hp; pumps are 4" through 8" size and are capable of pumping a total of 18,120 gallons per minute (GPM).
BACKWASH BASIN AND TRANSFER PUMPS:	Recovers filter backwash water and transfers water to the head of the plant.
SLUDGE POND:	Provides for a discharge of lime softening sludge.
MAINTENANCE BUILDING:	Houses the office of maintenance supervisors and equipment for both the distribution system and the treatment system.
CONTROL BUILDING:	Houses the plant laboratory, water quality testing equipment, and the controls and monitoring equipment used by the chief water plant operator.
CHEMICAL FEED BUILDING:	Houses the plant chemical feed processing equipment.
ELECTRICAL BUILDING:	Houses the FPL transformer and the emergency diesel generator set including switchgear.

Information obtained from Broward County Health Department Permit No. 0125162-203-WC, dated 2/2/2007.




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CITY OF PEMBROKE PINES
CENTRAL AND EASTERN WELLFIELD

FIGURE 2-1

03-242

Figure 2-1 Central and Eastern Wellfield (June 3, 2020)

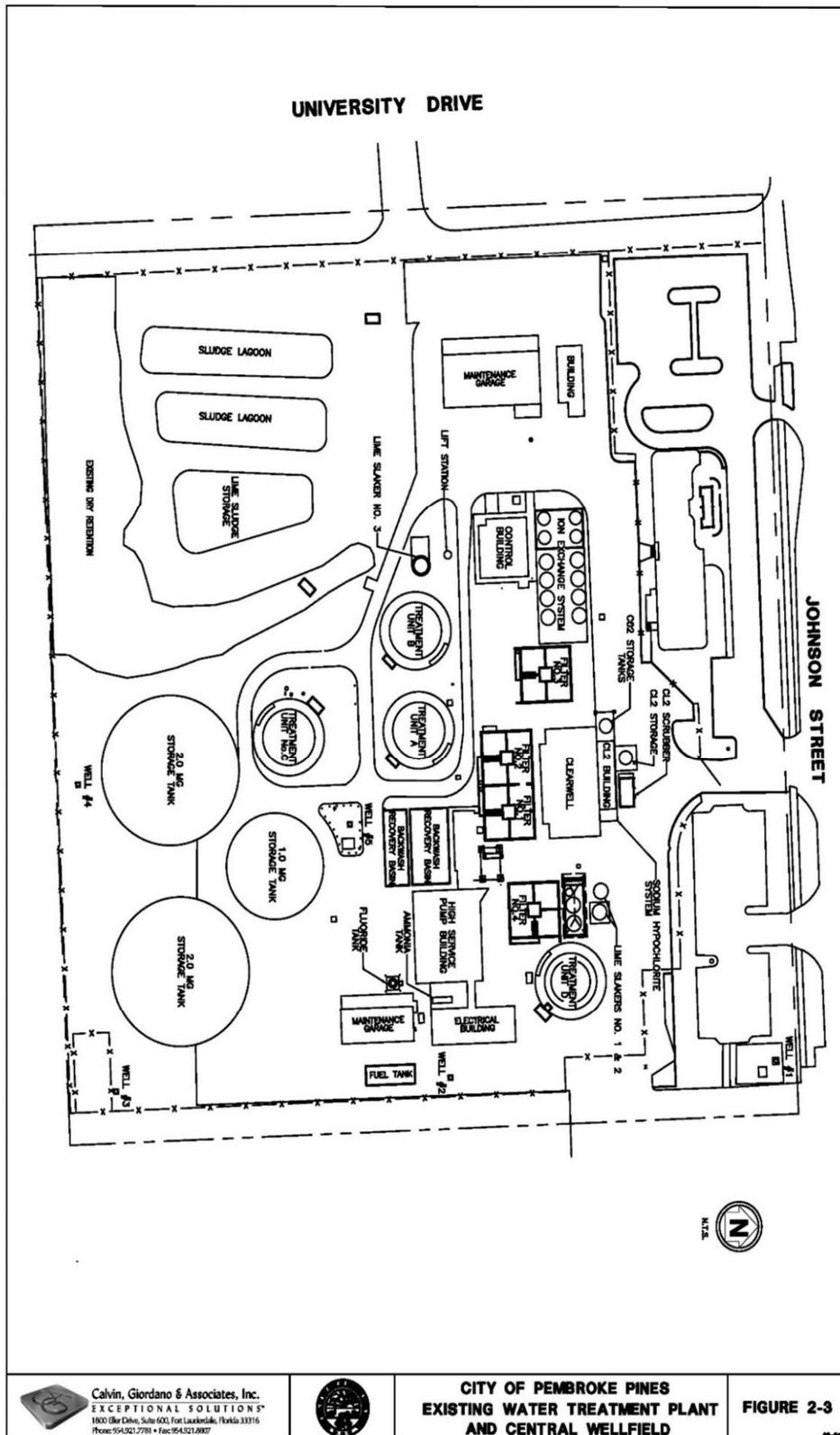


Figure 2-3 Existing Water Treatment Plant & Central Wellfield (June 3, 2020)

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CITY OF PEMBROKE PINES
EXISTING WATER TREATMENT PLANT
AND CENTRAL WELLFIELD

FIGURE 2-3

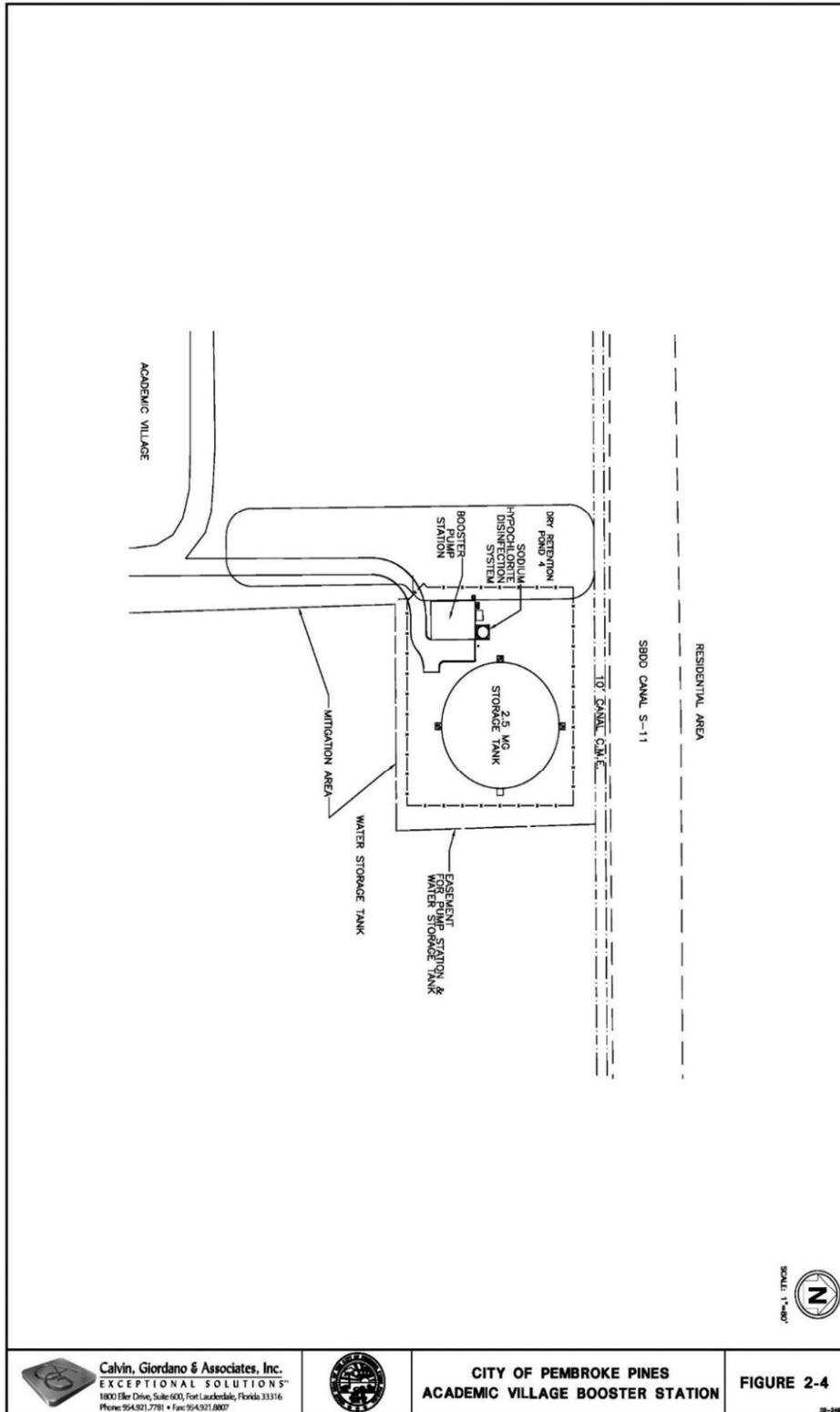


Figure 2-4 Academic Village Booster Station (June 3, 2020)

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CITY OF PEMBROKE PINES
 ACADEMIC VILLAGE BOOSTER STATION

FIGURE 2-4

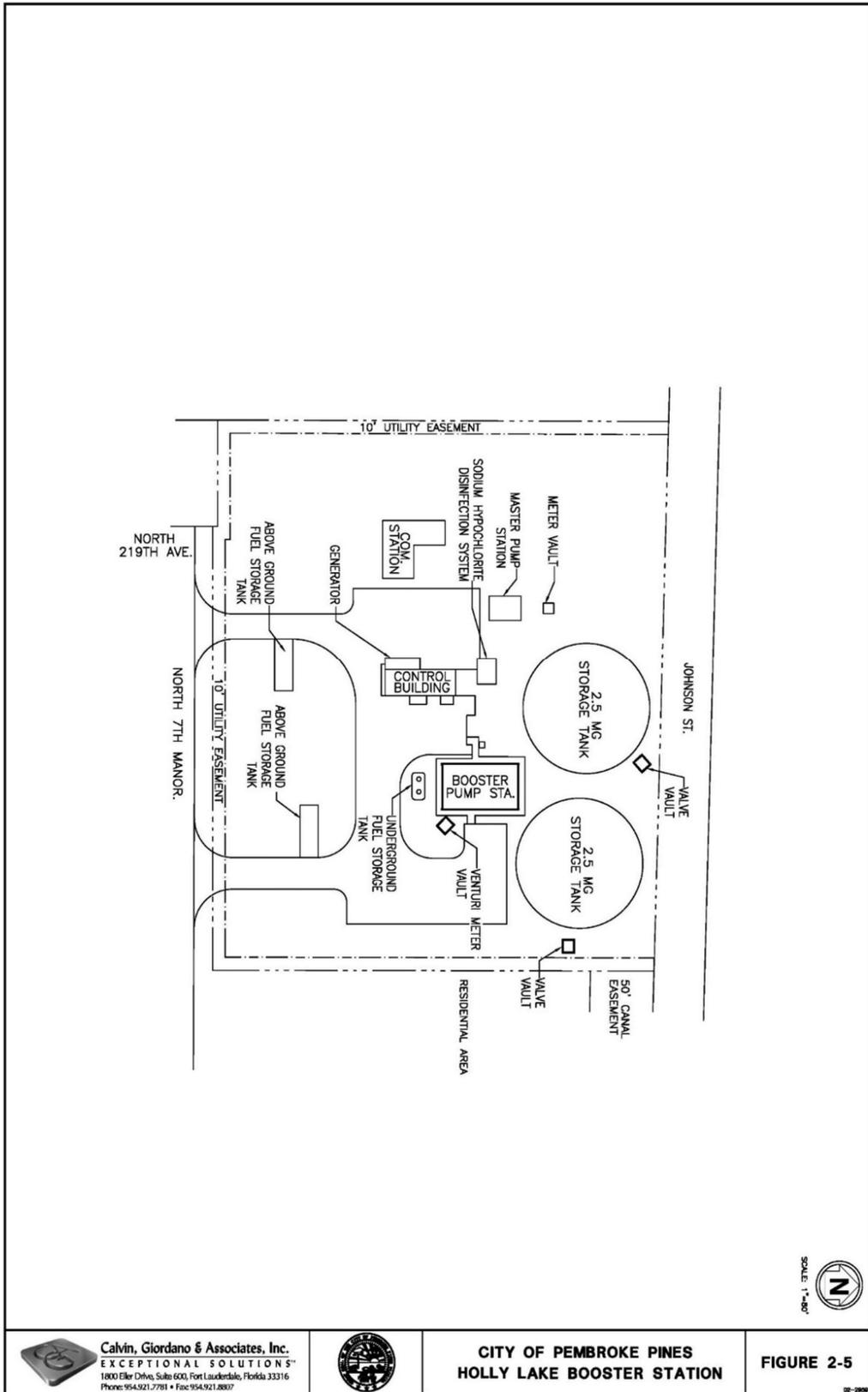


Figure 2-5 Holly Lake Booster Station (June 3, 2020)



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CITY OF PEMBROKE PINES
HOLLY LAKE BOOSTER STATION

FIGURE 2-5



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PART 3 - SECTION THREE

ALTERNATIVE WATER SUPPLY CONSIDERATIONS

3.01 ASSESSMENT OF CONTINUED AND INCREASED WATER WITHDRAWALS FROM THE BISCAVNE AQUIFER

A. Saline Intrusion of Wellfields

The City's eastern wellfield is located approximately 2 miles from the C-10 spur canal, the closest possible source of saline water. The potential for saline intrusion into the eastern wellfield was evaluated in the detailed model prepared for the eastern wellfield by Blasland, Bouck and Lee, Inc. for the latest Consumptive Water Use Permit (CUP). The model indicated that the City of Hollywood's wellfield restricted the City of Pembroke Pines eastern wellfields cone of influence and prevents possible saline intrusion from the C-10 spur canal. Therefore, the potential for adverse impacts from saline water intrusion as a result of the proposed maximum daily withdrawal rate is considered minimal.

B. Broward County Wellfield Protection Ordinance

The City has complied with the Broward County Wellfield Protection Ordinance, and there are no current or anticipated wellfield protection ordinance problems with the City and their wellfields. Increased withdrawals over the last ten (10) years have shown no major changes in draw down in the area of the City wellfields and therefore no problems are anticipated with saltwater intrusion or from any other potential problems.

3.02 PLANS FOR WATER SHORTAGES DUE TO WELLFIELD FAILURES

The City currently has sufficient backup raw well capacity and also has sufficient finished water storage capacity to handle peak hour demands and fire flow demands in its current system. Both the east and the central wellfields have emergency power provisions to maintain operation during power outages. The City's water transmission and distribution system is also interconnected with several neighboring municipal water systems that are available in the event of a wellfield failure that could interrupt their water supply.

3.03 CONSERVATION MEASURES TO HELP REDUCE AQUIFER STRESS

The City's Water Conservation Plan was submitted with the full Consumptive Water Use Permit Application. The City does not allow irrigation with potable water. The City has implemented a water conservation plan with elements such as Florida Friendly Landscaping, a leak detection program, water conserving rate structure, and a permanent irrigation ordinance and rain sensor devices. These items contribute to the overall plan for water conservation and help reduce stress on the aquifer and allow the City to maintain one of the lowest per capita water use values in the county. Detailed descriptions of the City's conservation efforts can be found in the Comprehensive Plan Conservation Element Adoption Document (2020), Future Land Use Element Adoption Document (2020), and the Infrastructure Element Adoption Document (2020).

The City has an Agreement with Broward County, titled Cost Share Support of Water Conservation Incentives Program, established in October 2016. The Agreement is County wide and is intended to conserve water quality and quantity. It establishes an enduring water conservation ethic using education, rebates and incentives. The program uses print media, internet, posters, mailings, newsletters (electronic and printed), Facebook and Twitter to educate the public on the use of water conserving plumbing fixtures and other water conservation efforts. Incentives and rebates are given for the installation of water conserving plumbing fixtures.

The City has an established Water Utility Rate Schedule which has an ascending water rate as usage increases. The first 3,000 gallons/month is \$0.00579/gallon increasing constantly to \$0.00646/gallon at 10,000 gallons/month.

3.04 DESCRIPTIONS OF THE ALTERNATIVES CONSIDERED

Water supply options were developed herein outlining the City's plan to supply potable water for the next 10-years. The City has considered multiple options for a long-term water supply plan, including reuse systems for irrigation reuse and aquifer recharge with highly treated reclaimed water. The City is also aware of and investigating the C-51 Reservoir as an alternative water source on a technical level and is considering it as a contingency plan to address any potential shortfalls.

A. ALTERNATIVE REUSE SYSTEMS

In 2011, the City completed a pilot study project evaluating the feasibility of recharging the surficial aquifer system using highly treated reclaimed water. The “Alternate Water Supply (AWS) Facility Phase II Pilot Study Summary Report”, dated October 17, 2011, was prepared by Calvin, Giordano and Associates, Inc. In this system, wastewater would be highly treated to greater than secondary standards and then discharged to either surface water or surficial aquifer ground water. However, the Broward County Code of Ordinance Chapter 27 currently has some of the most stringent water quality requirements in the State of Florida for discharge into the ground, surface, or marine waters. At this time, it appears that reverse osmosis membrane technology may be the only technology that may meet these regulations. Traditional Advanced Waste Treatment (AWT) technologies will not meet these stringent nutrient limitations for phosphorous and nitrogen.

Pretreatment processes would also be required prior to reverse osmosis treatment and disinfection requirements would be met through the use of UV light in place of chlorine. The pretreatment processes would include strainers to remove large particles and ultrafiltration membranes to remove reverse osmosis foulants. The reverse osmosis system would then be used to meet the stringent water quality requirements followed by UV disinfection. At that point, the highly treated reclaimed water would be discharged to the exfiltration trenches or directly into the Biscayne Aquifer through injection wells. The reject water that did not meet the water quality requirements would either be retreated or pumped down the existing deep injection wells at the City’s WWTP.

Reuse water storage tanks should not be required as there is no diurnal customer demands and effluent not meeting standards would be retreated or disposed of through the deep well system. The system would be continuously monitored and it can be stopped immediately upon effluent being out of specification.

B. Use of the C-51 Reservoir

The C-51 Reservoir project is a public-private partnership for the construction of 60,000 acre-feet of storage for use as an alternative water supply in Southeast Florida. Water supply authorities and public water supply utilities along with the property owners have investigated the feasibility of this regional reservoir to capture and store excess surface water runoff discharged into Lake Work Lagoon and release it into the C-51 Canal during dry periods to meet water demands. The C-51

Reservoir is a rock mine that is owned by Palm Beach Aggregates in Central Palm Beach County, north of the C-51 Canal in Palm Beach County adjacent to the SFWMD's L-8 flow equalization basin. Many public water supply utilities, such as BCWWS, have executed agreements with the property owners to purchase capacity as part of the total reservoir and have processed modifications to their Water Use Permit to reflect this alternative water supply source as a means to meet future demands. Although the City has sufficient water supply allocated in their Water Use Permit to meet future demands for the next 10-year planning period, the use of the C-51 Reservoir as an alternative water source is being investigated on a technical level and is being considered as a contingency plan to meet potential shortfalls.

PART 4 - SECTION FIVE EVALUATIONS OF ALTERNATIVES

4.01 GENERAL

When evaluating alternative water supply options, multiple considerations must be evaluated including the economic affects to the City's residents, technical feasibility of the implementation, and the impacts to the environment.

4.02 ECONOMIC CONSIDERATIONS – ALTERNATIVE REUSE

The City of Pembroke Pines only serves the western half of the City with wastewater service. The eastern portion of the City is served by the City of Hollywood, over which the City of Pembroke Pines has no control. As a result, the customers affected by a reuse program initiated by the City of Pembroke Pines would likely be confined to those residents in the western half of the City. This may create disparity in rates charged to the City's residents.

The City's wastewater treatment plant customers would be responsible for paying the majority of the cost for treatment. While the cost of creating systems to use reclaimed water is greater than systems for disposal via ocean outfalls or deep injection wells, the latter options provide for no beneficial use of the water. The benefit for potable water customers is a reduction in competition for the water resource and possible recharge of the aquifer. A cost-benefit analysis should be conducted to determine the proper cost allocations between wastewater customers and water customers.

The present value analysis would normally include an evaluation of water saved by implementing the reuse alternatives, however, the City does not allow potable water to be used for irrigation. City Ordinance No. 50.01.35 approved in 1982 forbids the use of the City's municipal water for irrigation purposes. When implemented, the City's proposed alternative reuse system will not actually be saving potable water, therefore, the "benefit of water savings analysis" was not performed. While it is recognized that there is a benefit to the environment by not having to withdraw groundwater to irrigate lawns and golf courses, the use of private, un-metered wells make it impossible to quantify and qualify a value or cost for groundwater as can be done with potable water.

4.03 TECHNICAL FEASIBILITY – ALTERNATIVE REUSE

A proposed wastewater reclamation facility should not have any technical problems in the design, construction and operation that would render it "technically infeasible." The design of an advanced type wastewater treatment plant and ancillary equipment are within the capabilities of most Professional Consulting Civil/Environmental Engineering firms in the State of Florida. The City's wastewater effluent can be transformed into usable aquifer recharge quality water using today's technology. The level of technology required in Broward County may be higher than other parts of the State due to the stringent water quality requirements.

The construction of a proposed reuse facility for Pembroke Pines should not pose any severe technical problems nor be any problem for a qualified contractor. A wastewater reclamation facility would be located on the existing City Wastewater Treatment Plant site.

4.04 ENVIRONMENTAL ASSESMENT – ALTERNATIVE REUSE

Although the City may not be able to conserve potable water by implementing reuse because its citizens are not allowed to use potable water for irrigation, there would be benefits of additional Biscayne Aquifer water available for potable uses and possibly irrigation. The Biscayne Aquifer is the City's sole source of raw drinking water. Another environmental advantage to reusing wastewater is that the City would reduce the quantity of discharge secondary effluent pumped through the deep injection wells down into the boulder zone.

The physical impact on the environment due to the implementation of the reuse system should be minimal. The pipelines will run inside the City's right of way and on the WWTP site. The wastewater reclamation facility would also be on the existing WWTP site. Complaints from neighboring communities (Century Village) due to noise and dust may occur.

The negative biological impact due to the reuse project will be insignificant. Actually, the impact should be positive as the effluent will help re-hydrate the surficial aquifer. Plant effluent would be filtered and disinfected before being discharged into the environment. Safety features in the treatment system would provide immediate shutdown of the system and transfer of reject water if the monitoring system detects insufficient treatment. Therefore, untreated reuse water would not leave the WWTP site.

PART 5 - CONCLUSION

5.01 WATER SUPPLY

The per capita water demand of 82.68 gallons per day per capita for the City of Pembroke Pines water service area was calculated based on the actual treated water supply data from 2017 through 2019. Based on this per capita water demand and the future population projections established in the 2018 LEC Update, the City's current water supply facilities have the capacity to meet the future water demand within their service area. In addition, an evaluation of the Broward County Water Supply Facilities Work Plan has been performed and, based on their per capita water demand of 127 gallons per day per capita, sufficient capacity exists for the small area of the City that is within their service area. Therefore, it has been concluded that the existing water supply facilities serving the City is sufficient to meet the future demand for the required 10-year planning period and beyond through the year 2040.

5.02 ALTERNATIVE REUSE

Although there are multiple benefits to the implementation of a wastewater reclamation system, the City would not be generally in favor of incurring the additional expense associated with treating reclaim water for aquifer recharge due to the increases on the rate payers. The City of Pembroke Pines currently has 9.5 MGD of deep well injection capacity that has already been permitted, bonded, and paid for and based on flow projections this capacity is sufficient to meet the City's needs well into the future. The City also has an 18 MGD lime softening water treatment plant with innovative ion exchange color removal technology that has already been permitted, bonded, and paid for and based on flow projections this capacity is sufficient to meet the City's demands through 2040.

Generally, for the above financial reasons illustrated above, an alternative water supply using aquifer recharge with highly treated reclaimed water would be deemed to not be financially feasible at the present time, especially since the City's water withdrawal permit is sufficient through buildout. Although the evaluation concluded that this would be feasibility from a technical standpoint, it is not feasible from a financial standpoint. Therefore, the City has decided to not pursue aquifer recharge with highly treated reclaimed water as the primary options for an alternative water supply. However, the City is investigating the use of the C-51 Reservoir as an

alternative water source on a technical level and is being considered as a contingency plan to meet potential shortfalls in the future.

5.03 INTERGOVERNMENTAL COORDINATION

The City, in preparation of this Work Plan, coordinated with a number of governmental agencies in order to establish consistency with the future water supply planning efforts. The City's Work Plan incorporates the relevant information included in the water supply facilities planning 2020 documents prepared by the Broward County Water and Wastewater Services Department (BCWWS) City of Hollywood and the SFWMD current LEC Plan

The City routinely coordinates with BCWWS concerning the management of their water distribution system. Although there is no formal interconnect agreement that governs this coordination, these coordination efforts and development procedures that are in place are adequate to ensure future water demand is available. At this time, the future water demand for this small portion of the City of Pembroke Pines that is served by Broward County WWS is not anticipated to increase because this area has reached buildout conditions.

In addition, the City has incorporated the Intergovernmental Coordination Element into the Comprehensive Plan to identify and resolve incompatible goals, objectives and policies; to identify and resolve incompatible development between and among local government comprehensive plans; and to determine and respond to the needs for coordination processes and procedures with adjacent local governments, and regional and state agencies. The City has reviewed the goals, objectives and policies of the Intergovernmental Coordination Adoption Element related to water supply and determined no updates were needed at this time.

5.04 COMPREHENSIVE PLAN GOALS, OBJECTIVES, AND POLICIES

Comprehensive Plan Goals, Objectives, and Policies (GOPs) are included in the adopted Future Land Use Element (2020), Infrastructure Element (2020), and Conservation Element (2020) to ensure implementation and future updates of the 10 Year Work Plan as required by Section 163.3177 (6) (c), F.S. As GOPs are often amended outside of the cycle for Work Plan amendments (i.e. Evaluation and Appraisal Report amendments every seven (7) years), the GOPs are contained in the Comprehensive Plan and are not part of the officially adopted Work Plan. Associated

Comprehensive Plan amendments to relevant GOPs will be adopted concurrently with the Work Plan update.

APPENDIX A

COMBINED WELLFIELD PUMPAGE REPORTS

APPENDIX B

BROWARD COUNTY 10 YEAR WATER SUPPLY FACILITIES WORK PLAN (APRIL 21, 2020)

APPENDIX C

HOLLYWOOD WATER SUPPLY CAPITAL IMPROVEMENTS

APPENDIX D

BROWARD COUNTY WATER SUPPLY DEVELOPMENT PROJECTS LISTED IN 2018 LECWSP

APPENDIX E

HOLLYWOOD CAPITAL IMPROVEMENTS LISTED IN 2018 LECWSP