Water Supply Facilities Work Plan
2020 - 2040

City of Atlantic Beach, Florida

Prepared by:

Planning & Community Development Department
800 Seminole Road
Atlantic Beach, FL 32233
904-247-5817

November 2019

Table of Contents

1.0 Introduction and Objective 1
2.0 Background 2
3.0 Data and Analysis 3
3.1 Public Water System Service Area 3
3.2 Potable Water Facilities 4
3.2.1 Water Supply Wells 4
3.2.2 Water Treatment Plants 5
3.2.3 Distribution System 6
4.0 Consumptive Use Permit 7
5.0 Capacity, Supply and Demand Projections 8
5.1 Water Capacity and Supply 8
5.2 Historical Water Demand 8
5.3 Demand Projections 9
6.0 Reclaimed Water, Conservation Practices and Source Protection 10
6.1 Reclaimed Water 10
6.2 Conservation Practices 10
6.3 Source Protection 11
7.0 NFRWSP Coordination 13
8.0 Capital Improvement Projects 14

List of Tables

Table 3-1 – Water Supply Well Inventory 5
Table 3-2 – Water Treatment Plants.....6
Table 4-1 – Atlantic Beach Service Area Per Capita Residential Water Use Projections.....7
Table 4-2 – Atlantic Beach Service Area Projections – Average Daily Water Use 7
Table 5-1 – Historical Water Production 8
Table 5-2 – Projected Water Production.....9
Table 8-1 – Water Production Capital Improvement Projects (FY20 - FY25) 14
Table 8-2 – Water Distribution Capital Improvement Projects (FY20 - FY25) ... **Error! Bookmark not defined.**

List of Figures

Figure 3-1 – City of Atlantic Beach Potable Water System Service Area 3

1.0 Introduction and Objective

Chapters 163 and 373 F.S. establishes a link between regional water supply plans prepared by water management districts and local government comprehensive plans. Water management districts are required by Florida Statutes to prepare a water supply plan for a 20-year planning period in order to ensure that existing water sources are adequate to meet projected water demand. Concurrently, local governments within a regional water supply planning area are required to develop a water supply facilities work plan (WSFWP) to ensure that adequate water supply is available to meet future demands over a minimum 10-year planning period. This plan covers a 20-year planning period concurrent with the City's Consumptive Permit. The plan includes identification of water supply facilities and identification of capital improvement projects required to provide for projected water demands. The City of Atlantic Beach Comprehensive Plan has been updated to reflect goals, objective and policies as needed to reflect the water supply facilities work plan.

The City falls within the boundaries of the St. Johns River Water Management District (SJRWMD). In January of 2017, the governing boards of both the SJRWMD and Suwanee River Water Management District approved the North Florida Regional Water Supply Plan (NFRWSP) that covers 14 counties in North Florida counties, including the City of Atlantic Beach. The data and analysis provided in this plan supports the requirement for the City to develop a WSFWP that is consistent with the NFRWSP.

This plan addresses the planning period of 2020-2040. The work plan will be adopted by reference into the City's Comprehensive Plan in February 2020 and will be updated as the SJRWMD governing board approves updated regional water supply plans that affects the City.

2.0 Background

The City of Atlantic Beach is located in eastern Duval County and is bordered by the Atlantic Intracoastal Waterway on the west and the Atlantic Ocean on the east. The City of Neptune Beach borders the City to the south and the City of Jacksonville borders the northern side of the City. The City's public water system service area includes all of the City of Atlantic Beach (Atlantic Beach Service Area) and extends north of the city limits into the City of Jacksonville (Buccaneer Service Area).

The Buccaneer Service Area was formerly a private utility that the City purchased in 1986. The two systems are now interconnected. The service area for the entire Atlantic Beach public water system is approximately 3,468 acres (Atlantic Beach Service Area = 1,984 acres and the Buccaneer Service Area = 1,664 acres).

The population served by the City's public water system in 2018, based on the total number of residential dwelling units multiplied by the average number of persons per household, was 23,585, an increase of 1,055 from 2014. Using the University of Florida Bureau of Economic and Business Research (BEBR) population estimates and census data for areas outside of the City limits, the population served in the City's service area in 2020 is projected to be 25,670. Although the City is primarily built-out, the population served by the City's public water system is projected to increase to 28,290 by 2030 and 30,313 by 2040, primarily through infill and redevelopment. This represents a projected increase of 2,620 residents by 2030 and 4,643 residents by 2040.

3.0 Data and Analysis

3.1 Public Water System Service Area

The City provides potable water to customers within the City's limits (Atlantic Beach Service Area) as well the Buccaneer Service Area which is located in the City of Jacksonville north of the city limits, as shown in Figure 3-1. The potable water supply, treatment and distribution systems are maintained and operated by the City's Public Utilities Department.

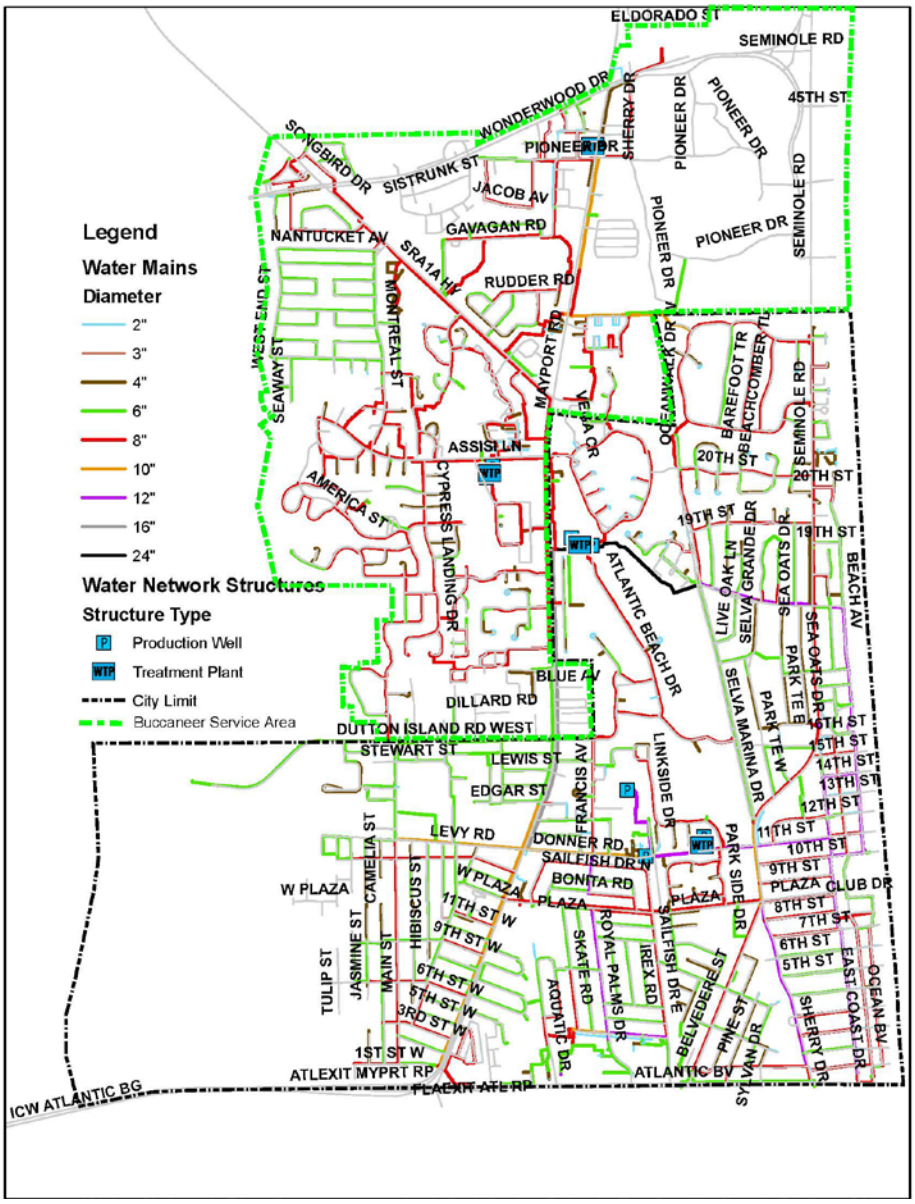

Figure 3-1 – City of Atlantic Beach Potable Water System Service Area

The City purchased Buccaneer Service Company in 1986 and took over its potable water system. The Public Service Commission cancelled Buccaneer's certificates after completion of the sale. Because the City provides potable service outside its municipal limit in the Buccaneer service area, it is important for the City to monitor and participate, as necessary, in the City of Jacksonville's land use and water supply planning processes. This will help the City to account for current and future water needs within its service area. Policies G.1.1.2, G.1.1.3 and G.1.1.5 contain enabling language relative to the coordination and provision of utility services within a portion of the City of Jacksonville.

3.2 Potable Water Facilities

The City of Atlantic Beach public water system consists of nine Florida aquifer supply wells, four water treatment plants with ground storage tanks, two elevated storage tanks and an interconnected distribution system. There are approximately 30 individual residences with potable water provided by private wells in the Atlantic Beach Service Area that are not served by the potable water distribution system. There are additional residences served by private wells in the Buccaneer Service. There are no current plans to connect these private users to the City's public water supply system. The use of private wells within the City's service area shall be in accordance with the requirements of Chapter 64E-6, FAC.

3.2.1 Water Supply Wells

Ground water from the Floridan aquifer is extracted via nine supply wells, all located near one of the City's four water treatment plants. Table 3-1 provides a summary of these water supply wells. As water levels in the ground storage tanks at each water treatment plant drops, one of the wells associated with that water treatment plant will turn on to refill the ground storage tank and then turn off as the tanks reach capacity. The wells are programmed to alternate each time water is called for to prevent over-pumping of any well and to ensure equal run time.

Table 3-1 – Water Supply Well Inventory

Well Name	WTP	Casing Dia. (in)	Casing Depth (ft)	Total Depth (ft)	Capacity (gpm)
1	WTP #1	12	450	1020	950
2	WTP #1	18	407	899 Est.	1500
2R	WTP #1	16	405	900	1500
3	WTP #2	16	394	1014	2000
5	WTP #2	16	422	684	2000
1N	WTP #4	6	329	429	350
2S	WTP #4	12	404	619	350
3W	WTP #3	12	390	713	850
5N	WTP #3	12	382	731	1100

The City's comprehensive plan contains the following policies to promote conservation and ensure the protection and availability of potable water:

- Well Field Protection (Policy A.1.1.3)
- Public Facilities Planning (Policies C1.1.1-4, C.1.2.1 & C.1.2.2)
- Protection of Aquifer Recharge Areas (Policy C.3.1.1)
- Water Conservation (Policies D.3.2.2 & C.1.5.1-3)
- Reclaimed Water (Policy C.1.5.4)
- Well Head Protection (Policy D.3.2.3 & D.3.2.9)
- Level of Service (Policies A.1.13.4, H.1.2.1 & H.1.2.17)

3.2.2 Water Treatment Plants

The City's public water supply system is served by four water treatment plants with a total capacity of 8.52 million gallons per day (MGD). Two are in the Atlantic Beach Service Area and two are in the Buccaneer Service Area. Potable water treatment at all four water treatment plants consist of aeration, storage and disinfection. Raw water is pumped from the Floridan aquifer wells through multiple tray aerators to remove hydrogen sulfide. The raw water is then stored in ground storage

tanks prior to gas chlorination for disinfection at the high service distribution pumps. Table 3-2 is a summary of the major components of each water treatment plant.

Table 3-2 – Water Treatment Plants

Name	Location	Ground Storage (gal)	Elevated Storage (gal)	High Service Pumps (gpm)	Capacity (MGD)
WTP #1	469 11th St, Atlantic Bch, FL	2 @ 200,000 each	100,000	4 @ 1,000	3.5
WTP # 2	2301 Mayport Rd, Atlantic Bch, FL	500,000	300,000	3 @ 1,000 2 @ 500	2.9
WTP #3	902 Assisi Ln, Jacksonville, FL	2 @ 150,000 each	----	3 @ 750 1 @ 1,000	1.87
WTP #4	2848 Mayport Rd, Jacksonville, FL	80,500	----	2 @ 250	0.25

Planned improvements at the water treatment plants include upgraded SCADA system to provide for better system control and the addition of an additional 500,000 gal ground storage tank to WTP #2 to provide redundancy. The addition of another ground storage tank at WTP #2 will also lay the ground work for additional improvements to the distribution system to assure maintenance of adequate fire flow and pressure throughout the distribution system.

3.2.3 Distribution System

The City's distribution system is interconnected and looped for redundancy and consists of approximately 93 miles of 4-inch to 24-inch water mains of various age and materials. Most of the older, larger diameter pipe is cast iron (CI). The newer pipe installations are either ductile iron (DI) or polyvinyl chloride (PVC). In addition, there are some areas that contain transite pipe (asbestos cement). Over the years, the vast majority of 2-inch water mains have been replaced in an effort to boost system pressure and transite pipe replacement is conducted as conditions warrant. Fire protection is provided throughout the service area.

Modeling of the distribution system completed in 2016 indicated that there are several areas within the distribution system that may not be able to provide adequate water pressure for fire protection. The potential deficiencies in the distribution system found during the modeling effort are being addressed in the City's 5-year capital improvement plan, see Section 8.0.

4.0 Consumptive Use Permit

The City of Atlantic Beach withdraws ground water from the Upper and Lower Floridan aquifers under authorization of SJRWMD Consumptive Use Permit (CUP) 810-8 issued October 11, 2019. CUP 810-8 authorizes the use of a daily average of 3.75 million gallons per day (MGD) of ground water for public supply use, including household, commercial, irrigation, water utility and unaccounted for, through 2039.

Based on historic and anticipated gallons per capita per day usage, the currently authorized Floridan aquifer withdrawal contained in the City's CUP 810-8 is much less than the previously authorized 2019 CUP allocation of 4.65 MGD. The authorized withdrawal of ground water in CUP 810-8 is based on the data provided in Table 4-1.

Table 4-1 – Atlantic Beach Service Area Per Capita Residential Water Use Projections

Year	Projected Population*	Projected Per Capita Usage (gpd)	Projected Demand (MGD)
2020	25,670	94	2.41
2025	27,474	94	2.58
2030	29,055	94	2.73
2035	30,509	94	2.87
2040	31,857	94	2.99

* BEBR & Census Data

Table 4-2 – Atlantic Beach Service Area Projections – Average Daily Water Use

Year	Residential Water Use (MGD)	Commercial Use (MGD)	Irrigation (MGD)	Water Utility Use (MGD)	Water Losses (MGD)	Raw Water Demand (MGD)
2020	2.4130	0.219	0.200	0.06	0.17	3.07
2025	2.5826	0.237	0.200	0.06	0.18	3.26
2030	2.7312	0.254	0.200	0.06	0.19	3.44
2035	2.8678	0.270	0.200	0.06	0.20	3.60
2040	2.9946	0.285	0.200	0.06	0.21	3.75

5.0 Capacity, Supply and Demand Projections

5.1 Water Capacity and Supply

The nine Floridan aquifer supply wells currently serving the City's public water supply system with an operating capacity of 8.52 MGD are adequate to meet water demands well past the 20-year planning horizon of this plan.

The NFRWSP did not identify the City as an area with water shortages through the 2035 planning horizon provided water conservation, implementation of management measures and implementation of water resource and water supply development projects identified in the NFRWSP are completed. The NFRWSP findings indicate that the City may continue utilizing Floridan aquifer as its source of potable water. No alternative water supply source was identified, therefore the City will continue conservation efforts and efforts to maximize the amount of reclaimed water available for reuse.

5.2 Historical Water Demand

Table 5-1 provides historical water production and population data over the past five years. Water production over the past five years has increased from an annual average daily flow of 2.1 MGD in 2014 to 2.32 MGD in 2018, an increase of 10%.

Table 5-1 – Historical Water Production

Year	Average Annual Daily Production (MGD)	Population Served*
2014	2.10	22,530
2015	2.02	22,674
2016	2.37	23,024
2017	2.32	23,313
2018	2.32	23,585

* BEBR & Census Data

5.3 Demand Projections

The water demand projections contained in the NFRWSP for the City remain constant at 2.2 MGD through the 2035 planning period, see Table 5-2 below. The NFRWSP also holds the population of the City constant over that same time period. Based on growth due to infill and redevelopment, a combination of BEBR and census data predict that the population will grow to 30,509 by 2035 and 31,857 by 2040. The CUP reflects this projected growth and associated water demand projections based on a residential demand of 94 gallons per capita per day plus commercial & industrial use, recreation & landscape irrigation and water utility use, which is consistent with the Comprehensive Plan. Regardless of the scenario, the City of Atlantic Beach has adequate water supply over this planning period with a current production, treatment and distribution capacity of 8.52 MGD.

Table 5-2 – Atlantic Beach Service Area Summary Table

	2020	2025	2030	2035	2040
Projected Population*	25,670	27,474	29,055	30,509	31,857
Projected Water Demand	3.07	3.26	3.44	3.60	3.75
CUP Allocation	3.75	3.75	3.75	3.75	3.75
WTP Capacity (Combined)	8.52	8.52	8.52	8.52	8.52

* BEBR & Census Data

6.0 Reclaimed Water, Conservation Practices and Source Protection

6.1 Reclaimed Water

As part of the NFRWS planning process, the City of Atlantic Beach evaluated the potential feasibility of implementing reuse within the City and committed to complete a reuse treatment and distribution program. This commitment included upgrading the WWTF to meet reuse standards and implementing a reuse program. The program was projected to offset 0.5 MGD of ground water withdrawal through irrigation at Atlantic Beach Country Club, located within the City limits. This project was included in Appendix K of the NFRWSP.

The City has completed the upgrade of the WWTF to reuse treatment standards and is currently permitted by FDEP to provide an average of 0.5 MGD of reuse to the Atlantic Beach Country Club located within the City limits. The WWTF has consistently provided reuse for on-site use at the WWTF and for irrigation on the golf course, common areas and 178 single family homes within the Atlantic Beach Country Club. The City does not currently provide reuse irrigation water outside of the Atlantic Beach Country Club. However, as the reuse system is expanded it is expected to include irrigation on right of ways immediately adjacent to the Atlantic Beach Country Club.

Monthly average reclaimed water production and utilization was 0.26 MGD over the past five years with a maximum monthly average of 0.61 MGD. The City continues to look for funding opportunities to expand its reclaimed water program and will continue to evaluate potential reuse opportunities as they arise in accordance with the City's Reuse Feasibility Study, as authorized by Comprehensive Plan Policy C.1.5.4.

6.2 Conservation Practices

The City of Atlantic Beach updated the Water Conservation Plan in May 2019 as part of the CUP renewal application. This plan identified the following practices that will be continued by the City in a continued effort to reduce daily water withdrawals:

- *Water Conservation Public Education Program* – This ongoing program includes a xeriscaping exhibit, website information and conservation related flyers & documents disseminated to the City' water customers.
- *Outdoor Water Use Reduction Program* – The City has adopted each of the provisions set forth in Rule 40C-2.042(2)(a), FAC, which regulates small irrigation uses below consumptive use permit thresholds, encourages and promotes the use of reclaimed water for irrigation, has incorporated Florida Friendly landscape design criteria in to City code and has enacted a fertilizer ordinance.
- *Rate Structure* – The City maintains an inclining block rate structure to encourage water conservation.
- *Water Loss Reduction Program* – Water audits are conducted annually, the City has an ongoing meter replacement program to replace or repair older water meters and will resume annual testing of 3-inch or larger water meters.
- *Indoor Water Use Conservation* – The City provides educational pamphlets to its customers and has adopted water conservation regulations requiring water conserving fixtures and toilets in its plumbing code.

Policies regarding conservation of potable water resources have been incorporated in to the City's Infrastructure Element of the Comprehensive Plan (Policies C.1.5.1-4.) Although per capita water use within the City's grid has been relatively constant over the past five years, additional water conservation policies are not anticipated at this time. As the effectiveness of the updated Water Conservation Plan is benchmarked on an annual basis, adjustments will be made to enhance water conservation efforts and establish new or modified best management practices as appropriate in an effort reduce water withdrawals on a per capita basis.

6.3 Source Protection

Wellfield protection measures are authorized by Comprehensive Plan Policy D.3.2.3 and are encoded in the City's land development regulations. These regulations require a 500ft setback from any potable water supply well. These wellhead protection areas are mapped to assist the City in safeguarding it's ground water resources. Any new potable water well will have its associated wellhead protection area mapped as well. In addition, areas that may be identified as

potential recharge areas are to be designated as conservation areas on the City's Future Land Use Map (Comprehensive Plan Policy C.3.1.1.)

Historically, many residences within the city's service area obtained potable water via onsite artesian wells. Over the years, the majority of these wells have been capped or grout filled. No remaining uncontrolled free flowing artesian wells have been identified in the City's service area. If such a well is found, the City will work with the property owner to properly abandon the well.

The City remains committed to protecting ground water resources and additional changes to the Conservation and Coastal Management Element of the City's Comprehensive Plan are not anticipated at this time.

7.0 NFRWSP Coordination

In accordance with Section 163.3177(6)(h)1, F.S., the City ensures coordination of its Comprehensive Plan with the NFRWSP. Policy C.1.2.2 contains enabling language to ensure maintenance of the City's water supply facilities work plan in coordination with the NFRWSP. This policy also commits the City to provide or maintain its identified water supply facilities pursuant to Section 163.3177(6)(c), F.S.

The NFRWSP identified two project options relative to the City of Atlantic Beach:

AMI Implementation – Implementation of a pilot project for AMI meter and software installation for 650 meters.

Atlantic Beach Country Club Reclaimed Water System Expansion – Install pipeline to supply reclaimed water to the golf course and residential homes.

The Atlantic Beach Country Club reclaimed water system expansion has been completed and is functioning as designed. The AMI meter and software implementation has not been implemented. Given the cost of the 650 AMI meter system with respect to the anticipated benefits, the City opted to instead to shift that funding to provide an updated SCADA system at all of the water treatment plants. The City has allocated $216,000 to the SCADA system and plans to complete the installation in FY 2020. The new SCADA system will result in better control of the City's potable water supply wells and distribution system resulting in reduced water losses and more efficient operations.

8.0 Capital Improvement Projects

The City has sufficient water supply capabilities to meet projected demand requirements over the planning period of this plan. Capital improvement projects that have been identified to help maintain and improve the City's potable water system with respect to conservation, water loss reduction, pressure and quality over the next five years are provided in Tables 8-1 and 8-2.

Table 8-1 – Water Capacity & Storage Capital Improvement Projects (FY20 - FY25)

Project Description	Estimated Cost
500,000 Gallon Ground Storage Tank – WTP #2	$800,000
Decommission & Reconstruct WTP #4	$3,500,000
Well #5 – Acid Cleaning and Video Logging	$35,000