Exhibit B – Water Supply Facilities Work Plan

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City of Margate
Water Supply Facilities Work Plan 2025 Update

November 10, 2025

40624-004

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Executive Summary

Background

The City of Margate (City) provides potable water service to approximately 67,341 residents and businesses within its service area, including the southern portion of Coconut Creek (10.7 square miles). The City owns and operates its entire water supply, treatment, and distribution system, which includes a 13.5 million-gallon-per-day (mgd) lime softening water treatment plant (WTP), 12 Biscayne Aquifer wells, and three (3) ground storage tanks, two located at the WTP facility and one at Coral Gate Park. The distribution system comprises more than 213 miles of mains and four interconnects with neighboring municipalities.

This 2025 Water Supply Facilities Work Plan Update fulfills regulatory requirements under the 2023–2024 Lower East Coast Water Supply Plan and provides updated water demand forecasts, supply capacity evaluations, regional considerations, and capital improvements planning through 2045.

Water Demand and Supply Capacity

Key points regarding the City's water demand and supply capacity include:

- Forecasted treated water demand is projected to increase from 5.78 mgd in 2025 to 6.42 mgd by 2045.
- The existing 13.5 mgd WTP treatment capacity remains sufficient to meet projected demand through 2045.
- With the C-51 Reservoir allocation, the City's Consumptive Use Permit (CUP) authorizes withdrawals of up to 10.1 mgd, ensuring compliance under current operating conditions.

PFAS Regulation and Compliance

The Environmental Protection Agency's (EPA) 2024 rule establishes enforceable limits of 4 parts per trillion (ppt) for two per- and polyfluoroalkyl substances (PFAS): perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS), with compliance required by 2031. The City's raw water exceeds this standard, and lime softening alone cannot sufficiently remove PFAS. The City's plan for achieving compliance includes a pilot study (2024–2026) that evaluates ion exchange, nanofiltration, and reverse osmosis treatment alternatives. Preliminary results and cost analysis indicate ion exchange, combined with lime softening, as the most feasible solution. This approach provides effective PFAS removal without the substantial capital and operational costs of full nanofiltration or reverse osmosis conversion. Unlike nanofiltration or reverse osmosis, ion exchange does not result in additional ~25% treatment losses, keeping the City within its permitted withdrawal capacity through 2045.

Capital Improvements and Funding

Key points regarding the City's Capital Improvement Plan (CIP) include:

- The FY 2026 CIP includes targeted rehabilitation and system upgrades to maintain reliability.
- The City has earmarked $30 million in FY 2027 for PFAS compliance and anticipated regulatory requirements (FDEP, SFWMD, and Florida Legislature).
- While these allocations support near-term compliance, the high costs of nanofiltration or RO conversion remain prohibitive, reinforcing the City's selection of ion exchange as the preferred PFAS treatment strategy.

Regional Climate Considerations

The City is currently insulated from direct impacts of sea level rise and saltwater intrusion but continues to monitor regional groundwater quality. Extreme weather resilience and infrastructure hardening remain planning priorities, supported by intergovernmental agreements with Coconut Creek and neighboring utilities.

Conclusion

The City of Margate's water supply system is adequate to meet long-term demand projections, provided that planned capital improvements and regulatory compliance measures are implemented. The most pressing challenge is PFAS regulation, which requires treatment modifications and full compliance by 2031. The City's current strategy, pilot testing of ion exchange media while retaining lime softening, balances regulatory compliance with financial feasibility and long-term sustainability.

1. History and Statutory Overview

The City of Margate (City) in northern Broward County is approximately ten miles inland from the Atlantic Coast. The City is bordered on the north and east by the City of Coconut Creek, on the north and west by the City of Coral Springs and on the south by the City of North Lauderdale. The City is 9.17 square miles in size with no opportunity for annexation of additional lands. The City was chartered as a town government in 1955 and incorporated as a City in 1961.

In 1957, a private utility company, the Margate Utilities Corp., was established and the City's first water treatment plant and distribution system were built. In June 1968, the company was sold to the Margate Utility Authority (MUA), a not-for-profit corporation. In 1977, the City assumed the operation of the utility and MUA's debt.

The City's Department of Environmental and Engineering Services (DEES) currently owns and operates the potable water supply and wastewater treatment facilities serving the entire geographical area within the City's corporate limits and a portion of the City of Coconut Creek. The location of the City and its service area within Broward County is provided in **Figure 1-1**. The detailed service area boundary map is provided in **Figure 1-2**. The City and its water service area are primarily residential with a mix of apartments, condominiums, single-family homes, shopping centers, schools, and health care facilities.

The City's water utility draws its raw water from the Biscayne Aquifer, the primary water supply source in Broward and Miami-Dade counties and southeastern Palm Beach County. Water withdrawal from the Biscayne Aquifer is governed by the South Florida Water Management District (SFWMD) through the issuance of Consumptive Use Permits (CUPs).

Chapter 163, Part II, Florida Statutes (F.S.), requires local governments to prepare and adopt 10-Year Water Supply Facilities Work Plans into their comprehensive plans within 18 months after the South Florida Water Management District (SFWMD) approves a regional water supply plan or its update. The 2023-2024 Lower East Coast Water Supply Plan Update (2023-2024 LEC Plan Update) was adopted by the District's Governing Board on September 23, 2024. Therefore, local governments within the Lower East Coast Region are required to amend their comprehensive plans and include an updated 10-year Water Supply Facilities Work Plan and related planning elements by February 22, 2026.

The State of Florida requires that the 10-Year Water Supply Facilities Work Plan 2025 Update address the development of traditional and alternative water supplies and management strategies, including conservation and reuse. The data and analyses, including population projections and water demand, must span at least a 10-year planning period and be consistent with the 2023-2024 LECWSP Update. The data presented herein are for the planning period through the year 2045.

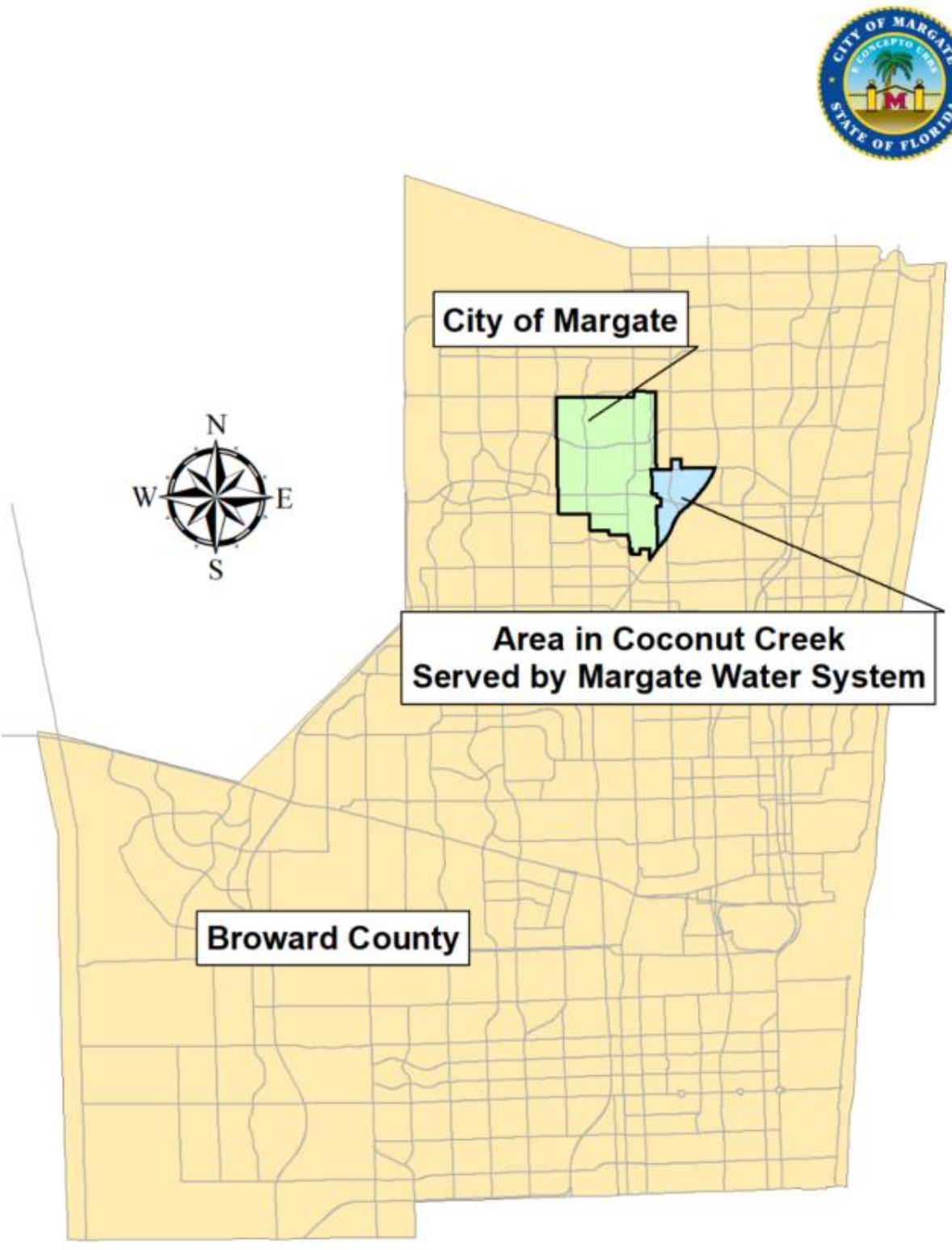


Figure 1-1: Location of City of Margate's Water Service Area

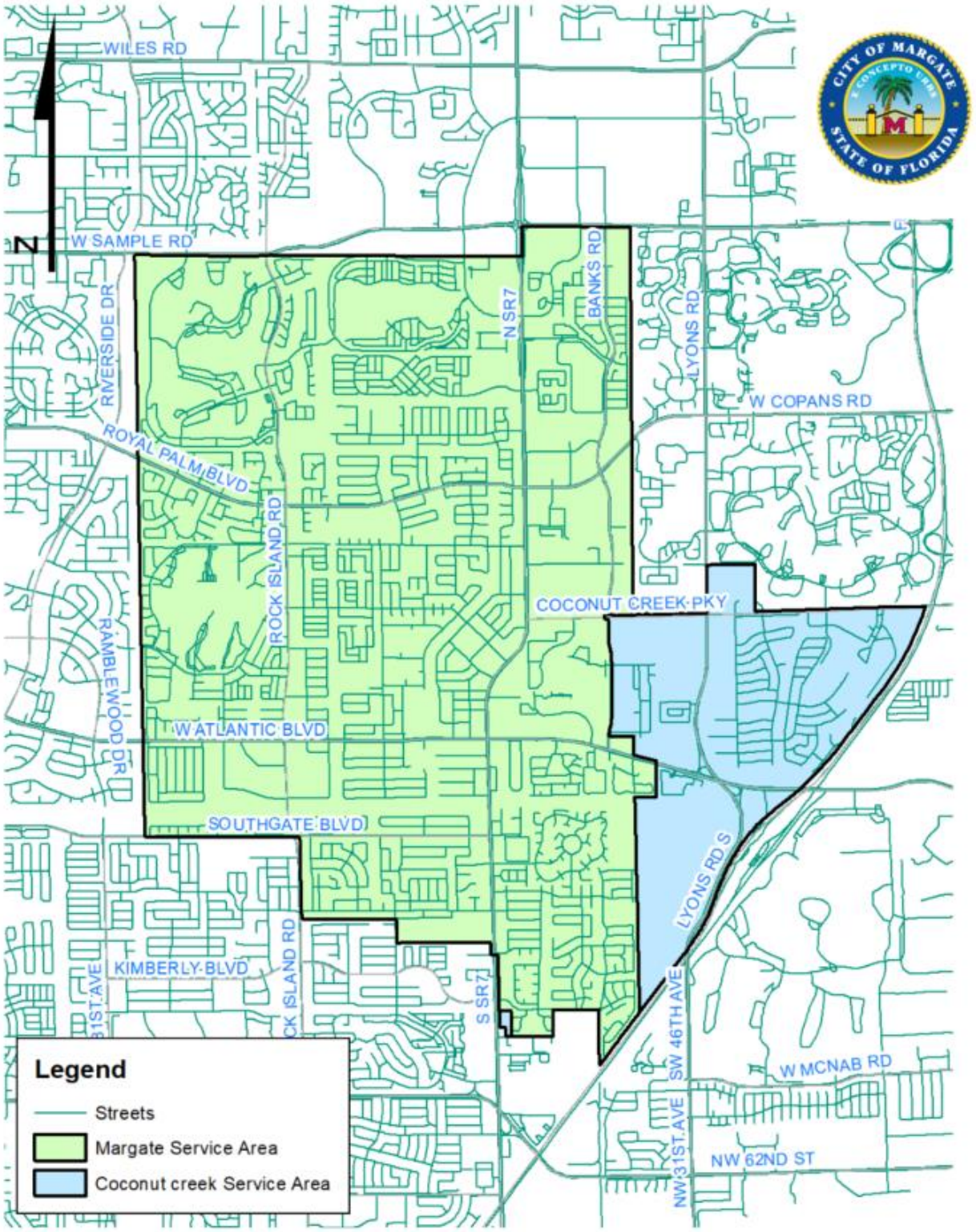


Figure 1-2: City of Margate's Water Service Area Boundaries

2. Work Plan Objectives

The City withdraws potable water from the Biscayne Aquifer in conformance with its consumptive use permit (CUP) number 06-00121-W issued by SFWMD. The City's 20-year CUP was issued on September 2, 2020, and expires on December 27, 2065. The Base Condition Allocation from the Biscayne aquifer provided under the City's water use permit expires on September 1, 2040, and will need to be renewed prior to this date. The 2.0 mgd of water supply that will be used as offset water to support additional permitted withdrawals from the Biscayne Aquifer expires on December 27, 2065, and will need to be renewed prior to this date. This work plan addresses the City's provision of potable water to serve water demands in its service area for the required 10-year planning period and through 2045.

This Water Supply Facilities Work Plan 2025 Update includes the following items.

- Assessment of the City's current water supply sources and treatment capacities (Section 3.0)
- Identification of water conservation and reuse practices and regulations within the City's service area. (Section 3.0)
- Five-year population and water demand projections through the year 2045 within the City's jurisdiction and in the portion of the City of Coconut Creek served by the City (Section 4.0).
- Recognition of the regional water supply planning issues that have the potential to impact the City. (Section 5.0)
- Identification of the City's water supply capital improvement projects including alternative water supply (AWS). (Section 6.0)
- Identification of Goals, Objectives, and Policies (GOP's) required to implement the Work Plan and water supply concurrency requirements. (Section 7.0)

3. Water Supply System

3.1 System Overview

3.1.1 Service Area

The City provides water service within both the municipal boundary and its broader utility service area. The incorporated City limits encompass 9.17 square miles and includes a population of approximately 58,927 residents. In addition to serving customers within Margate, the City also provides potable water to the southern portion of the City of Coconut Creek. When including this additional service area, the total water utility service area covers 10.7 square miles and serves approximately 67,341 people, based on the 2025 Broward County PFAM TAZ population projections.

Land use within the municipal boundary and the extended service area is predominantly residential. The City owns and maintains the entire water supply, treatment, and distribution system, and is the sole entity responsible for planning, financing, constructing, and operating the facilities that supply water within its service area.

The City's water system includes a 13.5-million gallon per day (mgd) water treatment plant (WTP) fed with raw water from 12 Biscayne Aquifer wells; two ground storage tanks located at the WTP facility (2.0-million-gallon (MG) concrete and 1.9 MG steel tank), a water distribution system with 213.4 miles of distribution mains, a remote 2.0 MG water storage tank at Coral Gate Park, and four interconnects with neighboring municipalities. The distribution system includes 16,982 service connections to residential, commercial and local government customers.

3.1.2 Large Users of Utility Potable Water

The City's billing records were evaluated to identify water customers with the highest consumption over the past five years. The top 100 consumers include schools, multifamily communities and a regional hospital. The top 10 users of potable water from the City's system are listed in **Table 3-1**.

Table 3-1: City of Margate Water Service Area Top 10 Potable Water Customers by Water Use

Customer Name	Average Gallons Per Year from 2020 to 2024
Northwest Regional Hospital	27,588,380
Coral Cay Plantation - Mobile Home Community (MHC)	19,506,740
School Board of Broward County (Schools)	14,067,560
City Of Margate	11,626,380
Broward College	6,867,420
JM Lexus	6,104,380

Skyler Pensacola Inc.	4,416,500
Margate Village Condominiums	4,037,120
Aztec RV Resort	3,716,080
Mida Commons LLC	3,676,900

3.1.3 Large Users with Individual Consumptive Use Permits (CUPs)

Large users with individual consumptive use permits were identified in May 2025 using the SFWMD water use permit portal and searching by Section/Township/Range. The overwhelming majority of the CUPs identified within the service area are for landscape irrigation purposes. These include CUPs issued to golf courses, parks, condominiums, schools, churches and commercial facilities. The number of CUPs and the acreage associated with these permits by water use type are provided in **Table 3-2**. There are about 188 CUPs serving about 3,452 acres within the City of Margate's water service area. Landscape irrigation is the dominant water use.

Table 3-2: Number of SFWMD Consumptive Use Permits and Acres Permitted in the City of Margate Water Service Area

Water Use Type	Number of CUPs	Acres Served
Landscape	185	3,201.44
Golf Course	2	100.00
Broward College	1	49.25
Total	**188**	**3,451.69**

3.1.4 Private Wells and Septic Systems

The City is not aware of private wells for potable water located within its service area or other uses exempt from permitting (40E-2.051, Florida Administrative Code) such as firefighting. The only unsewered area within the City's water service area is in the City of Coconut Creek and is comprised of 24 single-family lots each about one-acre in size and totaling 26 acres.

3.2 Description of the City's Water Supply System

3.2.1 Raw Water Sources

The City is permitted by the SFWMD to extract water from the Biscayne Aquifer using a total of twelve raw water wells. Raw water extracted from the Biscayne Aquifer is metered at the City's water treatment plant. The location of the raw water wells is mapped in **Figure 3-1**.

3.2.2 Treatment Facilities

Raw water mains from each well combine into a 30-inch raw water header main, which then splits to feed two parallel treatment trains. Separate venturi meters record the flow entering each of the two parallel trains. Each train consists of cascade aerators to oxidize iron and manganese (for subsequent precipitation and removal by the filters) and remove hydrogen sulfide and carbon dioxide; a lime softening unit to reduce hardness; and a 4-bay filter unit consisting of four 2.5 mgd bays with granular media. Chloramines are used for disinfection. Treated water is collected in a clearwell and subsequently transferred to the two on-site ground storage tanks (2.0 MG concrete and 1.9 MG steel). A remote 2.0 MG concrete storage tank located at Coral Gate Park is also used for additional storage. The softening units are upflow solids contact clarifiers, with integral mixing and quiescent zones, rated at 13.5 mgd each. A process flow schematic of the WTP is provided in **Figure 3-2**. An overview of the overall WTP site plan is provided in **Figure 3-3**.

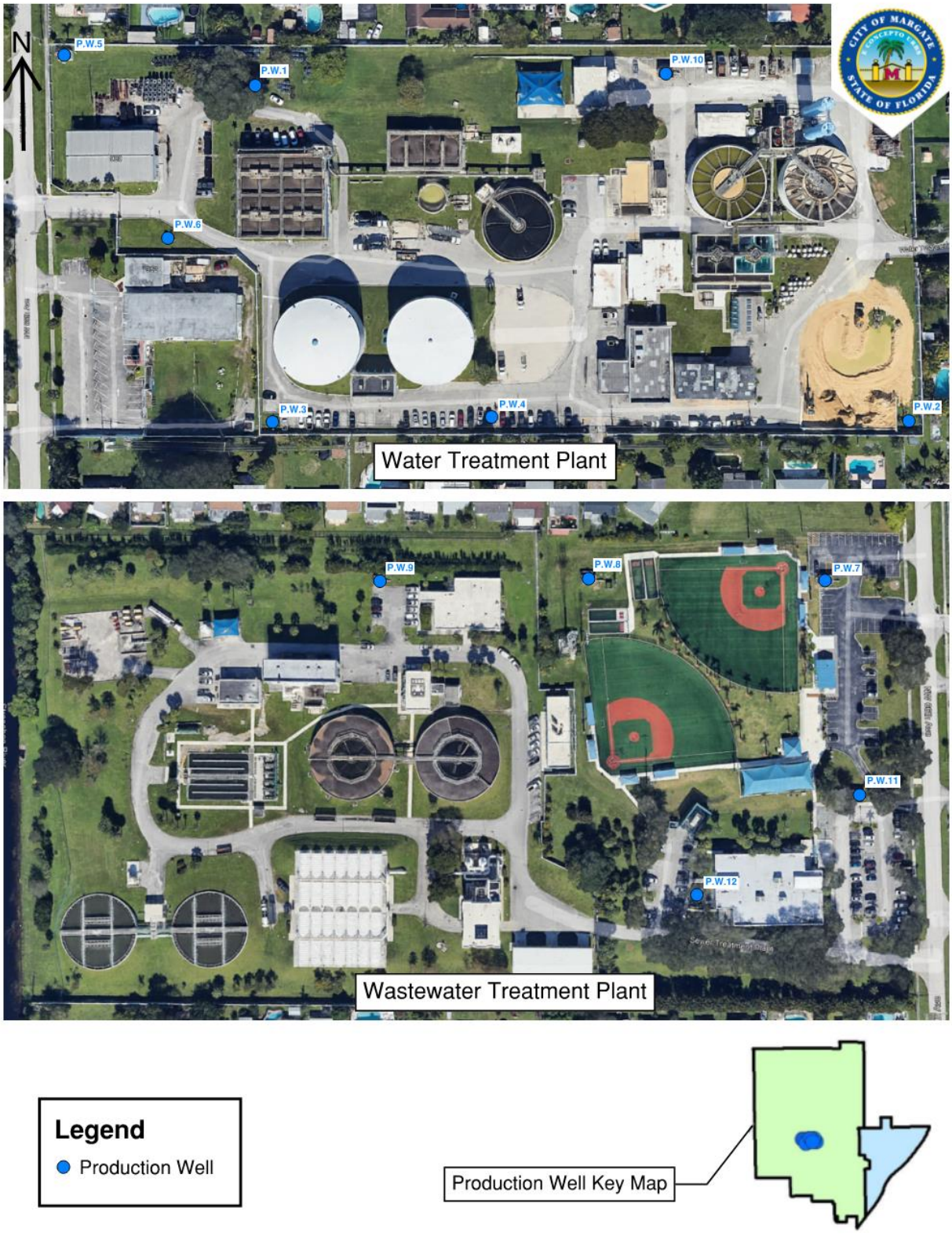


Figure 3-1: Raw Water Well Locations

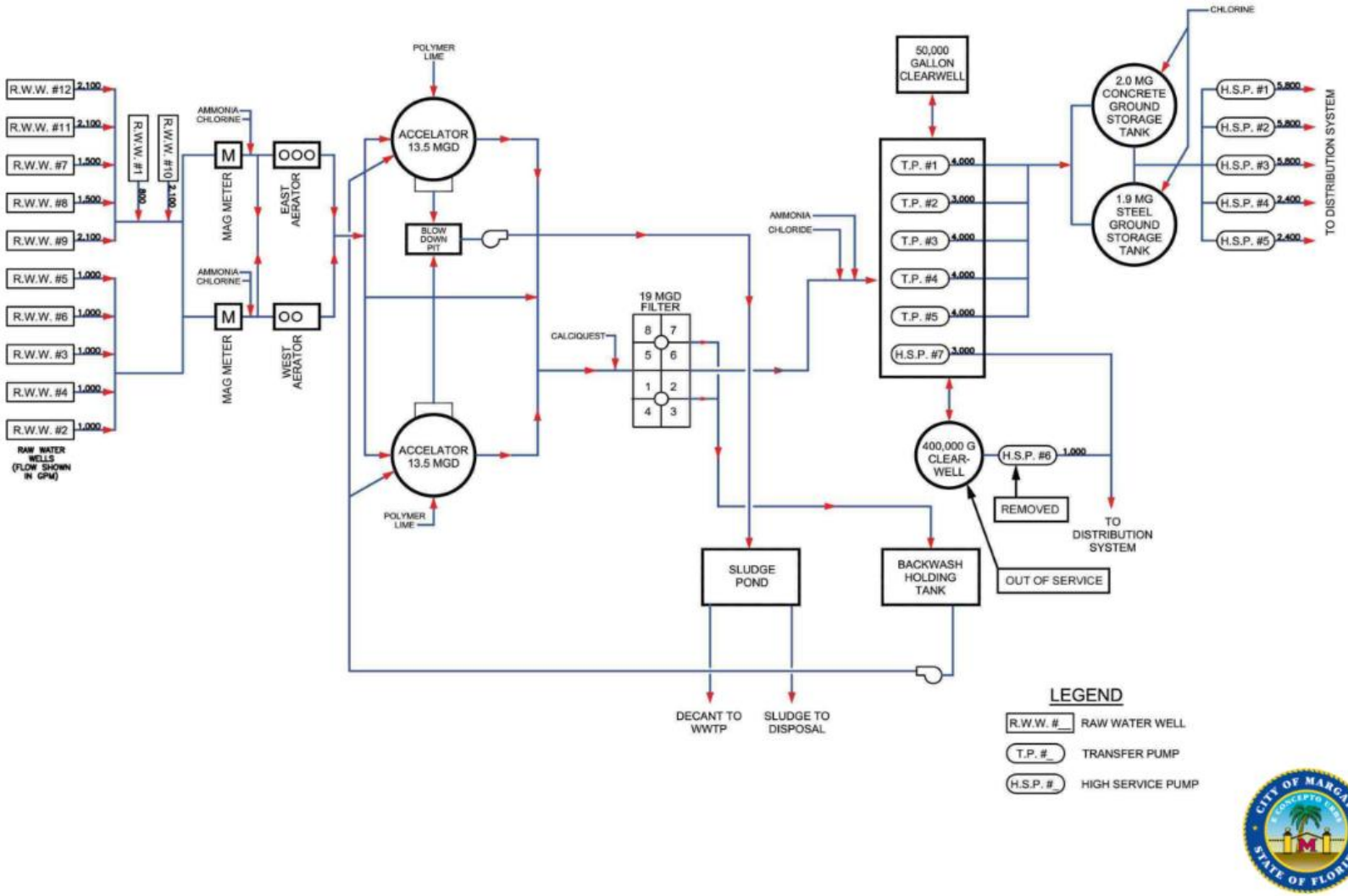


Figure 3-2: City's Water Treatment Plant Process Flow Diagram

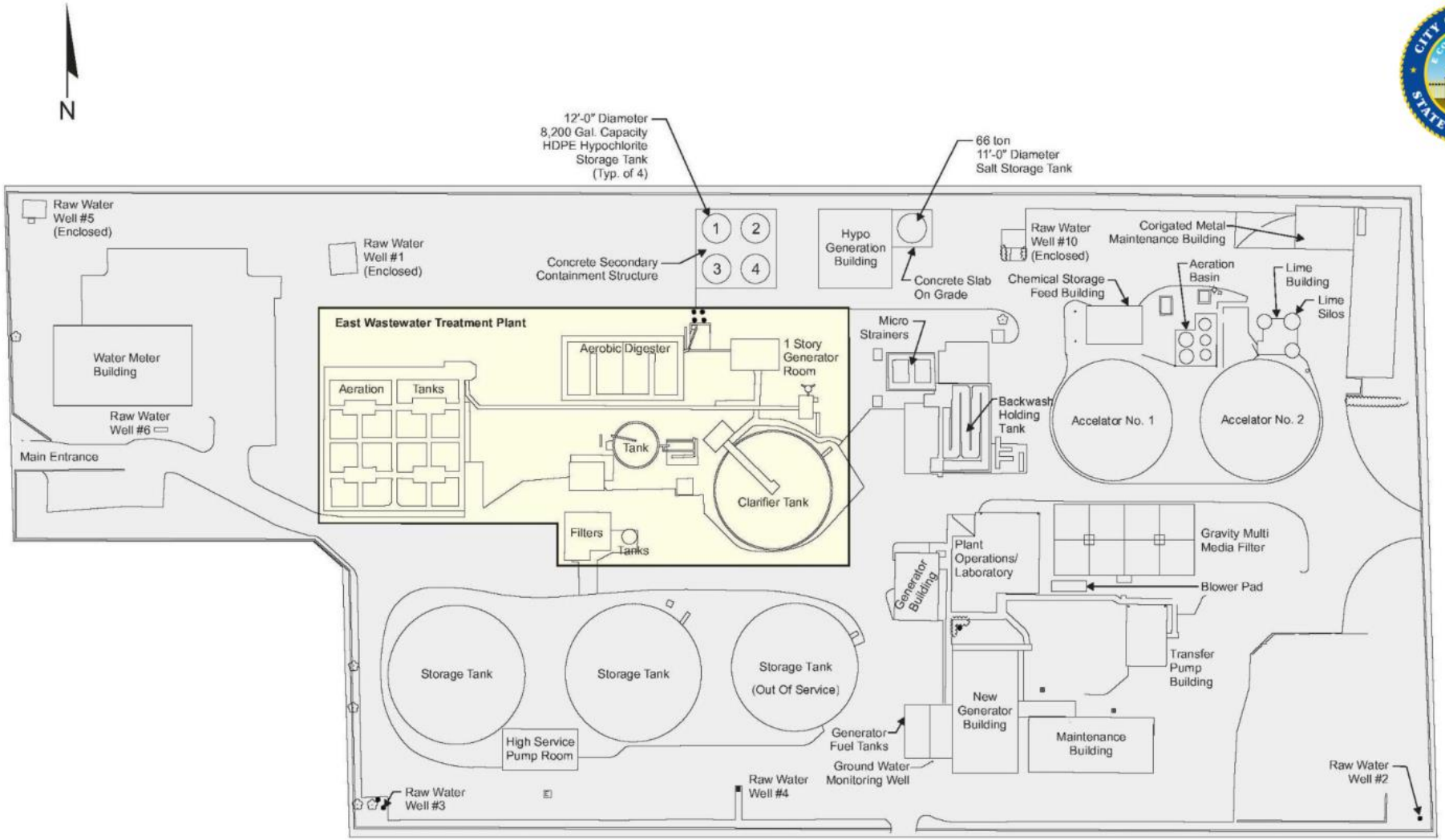


Figure 3-3: Water Treatment Plant Existing Site Plan

3.2.3 Storage Facilities

From the clearwells, water is transferred to two aboveground storage tanks located at the WTP: a 1.9 MG steel tank and a 2.0 MG concrete tank. A remote 2.0 MG tank, located at Coral Gate Park, approximately 1.5 miles from the plant in the northeast portion of the City's service area, is connected to the distribution mains and is filled or emptied using a valve located within the remote facility. This valve is controlled from the treatment plant via the Supervisory Control and Data Acquisition (SCADA) system.

3.2.4 Distribution System

High service pumps at the treatment plant are equipped with variable frequency drives to maintain an average pressure of 70 pounds per square inch (psi). The City's distribution system consists of 213.4 miles of distribution mains and 16,982 service connections. The service area includes the entire City of Margate and that portion of the City of Coconut Creek located south of Coconut Creek Parkway. An overview of the City's distribution system is provided in **Figure 3-4**.

3.2.5 Interconnects

The City's distribution system has four interconnects with neighboring community water systems for use during emergency situations. There is a 4-inch interconnect along the southern boundary with the City of North Lauderdale, a 12-inch interconnect at the northern boundary with the City of Coral Springs, an 8-inch interconnect along the western boundary with the Coral Springs Improvement District, and a 10-inch interconnect along the eastern boundary with the City of Pompano Beach. All interconnects are straight piped and are isolated by valves located on either side of the service area boundaries. The interconnect locations are also shown in **Figure 3-4**.

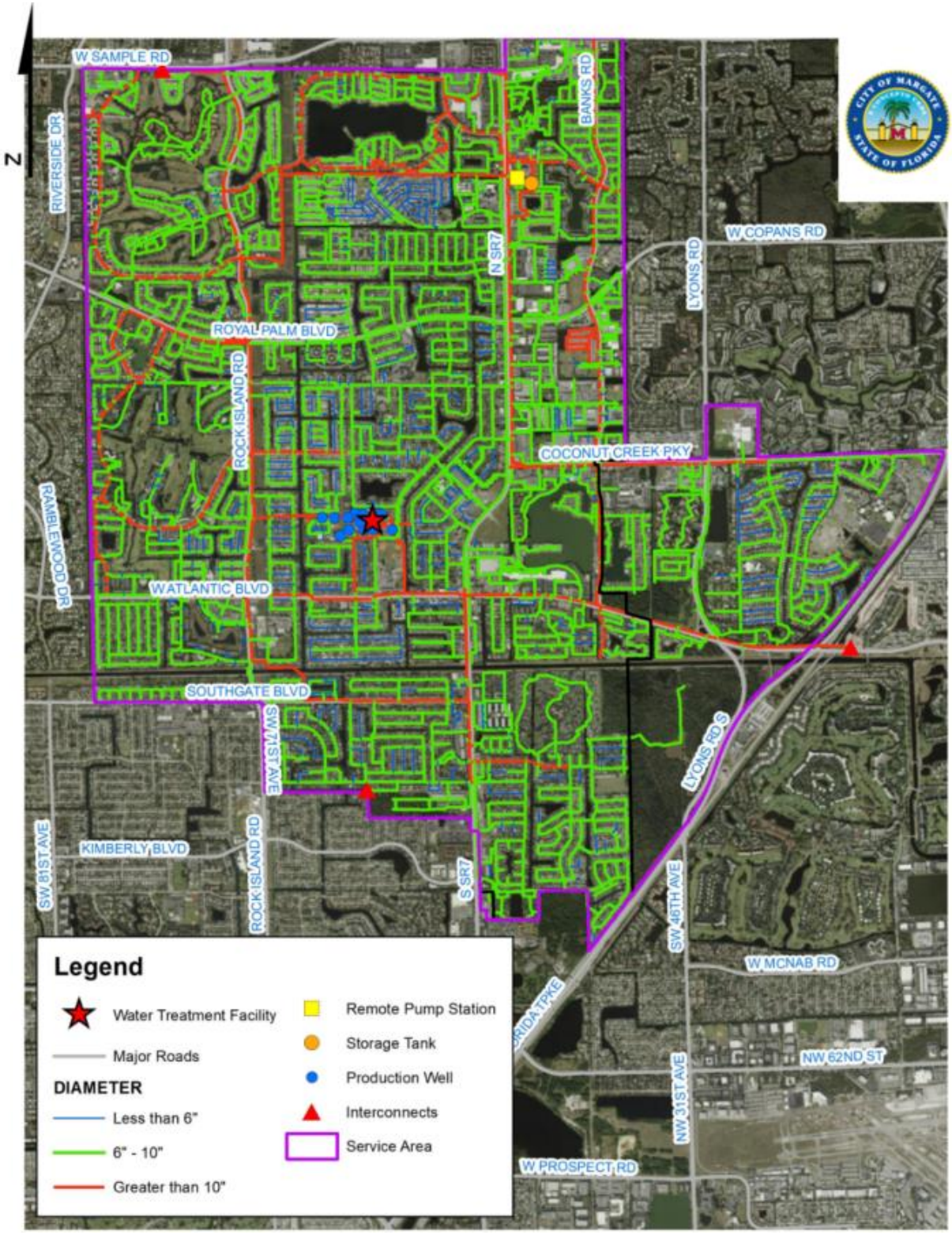


Figure 3-4: City of Margate Water Distribution System

3.2.6 PFAS Pilot Study

On April 10, 2024, the EPA announced the final National Primary Drinking Water Regulation (NPDWR), establishing an enforceable maximum contaminant limit (MCL) of 4 parts per trillion (ppt) for two per- and polyfluoroalkyl substances (PFAS): perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS). A compliance date of 2031 is expected to be announced in the near future.

The City's existing water supply contains PFAS above the MCL. The City's WTP uses lime softening treatment. Lime softening cannot remove PFAS.

To achieve compliance with the PFAS regulations, the City is currently performing a pilot test study at its WTP to evaluate the performance of three different PFAS adsorbents. The City will evaluate pilot test results at the conclusion of the study in early 2026 and decide whether to move forward with constructing a full-scale media adsorbent facility to treat lime softened water, or evaluate other PFAS removal alternatives, such as the implementation of nanofiltration and/or reverse osmosis skids. A photo of the pilot setup on site is shown below **in Figure 3-5**. The impacts of each of these alternative methods on the City's future water use are evaluated in Section 4.0 – Water Demand Forecast and Supply Adequacy.

Figure 3-5: City of Margate Ion Exchange Pilot Skid

3.3 Water Utility Consumptive Use Permit

The City's current CUP was renewed by the SFWMD in September 2020 (Permit No. 06-00121-W). This permit allows the City to withdraw a specified quantity of water from the Biscayne Aquifer until the permit expires on December 27, 2065. The City's CUP provides for the following permitted water quantities in Condition 5: Allocation:

Total annual allocation is:

- 3,686.72 million gallons (MG). (10.10 million gallons per day (mgd)).
- Total maximum monthly allocation is 337.34 MG.

Until the City has received offset water to prevent a net increase in the volume or cause a change in timing on a monthly basis of surface and groundwater withdrawn from the Lower East Coast Everglades Waterbodies, the total allocation from the Biscayne aquifer shall be limited to the base condition allocation of:

- 3,112.8 MG per year (8.53 mgd)
- 285.34 MG maximum month.

When the required volume of offset water has been delivered to the City, the following allocations shall apply:

- 3,686.72 MG per year (10.10 mgd).
- 337.34 MG maximum month.

Between September 1, 2040, and December 27, 2065, without renewal of the base allocation, withdrawals from the Biscayne aquifer that are offset from the C-51 Reservoir, Phase 1 Project shall be limited to:

- Annual allocation shall not exceed 730 MG (2.00 mgd).
- Maximum Monthly allocation shall not exceed 66.92 MG.

The Base Condition Allocation from the Biscayne aquifer provided under the City's water use permit expires on September 1, 2040, and will need to be renewed prior to this date. The 2.0 mgd of alternative water supply from the C-51 that will be used as offset water to support additional permitted withdrawals from the Biscayne Aquifer expires on December 27, 2065, and will need to be renewed prior to this date.

It is noted that all references to values in "mgd" relative to water supply allocation are only for informational purposes. The water use permit does not contain water supply allocation limits in terms of "mgd".

3.4 City's Water Conservation Program

The City continues to implement the conservation programs summarized below.

Broward Water Partnership Conservation Program – The City of Margate is a partner community in the Broward Water Partnership (marketed as the "Conservation Pays" program), a collaboration of 19

municipalities and water utilities with the goal of saving 30 mgd countywide. The City actively participates in the partnership to provide residents and businesses with rebates for replacing older toilets with new, high-efficiency models, provide residents with free, high-efficiency faucet aerators and showerheads, and provide food service businesses with high-efficiency pre-rinse spray valves. The program provides for a consistent marketing and media campaign to promote the program and advance overall water conservation efforts. In Fiscal Years 2020 through 2024 (October 1, 2019 – September 30, 2024), the City issued 293 toilet rebates and distributed 1,149 high-efficiency fixtures.

NatureScape Irrigation Service – The City of Margate has partnered with Broward County for their NatureScape Irrigation Service (NIS). The goal of NIS is to reduce urban water consumption and improve the quality of surface waters through efficient irrigation and environmentally friendly landscape practices. The NIS program targets large properties such as government facilities, parks, schools, and multi-family complexes where conservation efforts can produce the greatest water savings. Over the past 4 years, the City has audited 20 properties with a combined annual water savings of 4,810,546 gallons. The City also participates in the NIS Residential Irrigation Program (RIR) that targets residential sites and provides rebates for sprinkler head replacements, coverage improvements, and switching from mechanical to digital timers. In the last 4 years, 20 rebates have been distributed with an estimated water savings of 798,423 gallons.

Lawn and Ornamental Irrigation Limits – Landscape irrigation is addressed in Chapter 39, Article VI, Section 39-56 (and Section 23-12(F)) of the City Code of Ordinances which provides for restriction of irrigation to two days per week. Irrigation is not permitted between the hours of 10:00 a.m. and 4:00 p.m. No more than one (1) inch of water may be applied per cycle, and overspray is not permitted.

Use of Florida-Friendly Landscaping Principles – Section 39-57 of the City Code adopts by reference Chapter 373.185, Florida Statutes regarding Florida-friendly landscape planning requirements. Compliance is administered through the City's Development Review Committee.

Requirements of Rain-Sensor Over-Rides for New Lawn Sprinkler Systems – Section 39-58 of the City Code requires the installation of a rain-sensor override on all new automatic lawn sprinkler systems. Compliance is administered through the City's Building Department.

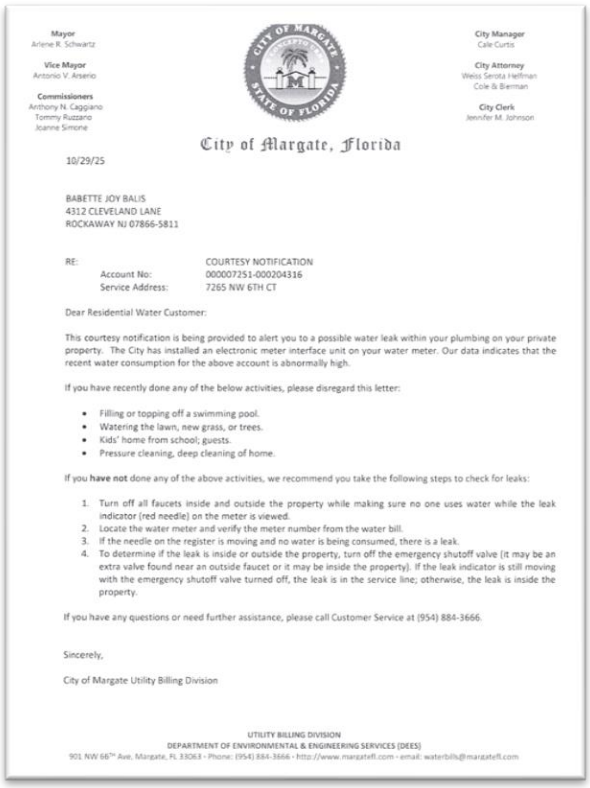
Turf Limitation and Minimum Non-Turf Landscaping for Commercial Development – Sec. 23-6, 23-7, and 23-8 provide for minimum non-turf landscaping in addition to a maximum of thirty (30) percent turf for perimeter landscaping strips, parking areas, and pedestrian zones.

Requirement of Ultra-Low Volume Plumbing – Section 4613(C) of the Florida Building Code was adopted by reference and is included in Section 39-60 of the City Code.

Leak Detection Programs – In 2024, the City of Margate completed deployment of Advanced Metering Infrastructure (AMI) across its water utility service area, including installation of Neptune T-10 residential meters. These meters offer high-accuracy measurement across a broad flow range and feature a lead-free, high-copper alloy maincase and a polymer nutating-disc chamber designed to maintain precision under variable flow and orientation conditions. The system complies with NSF/ANSI 61 and 372 standards.

To support data analytics and operational efficiency, the City implemented the Neptune 360 cloud-based platform, enabling real-time monitoring of water consumption and anomaly detection without reliance on

on-premise infrastructure. The platform facilitates identification of reverse flows, continuous usage, and other irregularities, forming the basis of the City's Customer Leak Detection and Notification Program.



Mayor
Arlene R. Schwartz

Vice Mayor
Antonio V. Arserio

Commissioners
Anthony N. Caggiano
Tommy Ruzzano
Joanne Simone

City Manager
Cale Curtis

City Attorney
Weiss Serota Helfman
Cole & Bierman

City Clerk
Jennifer M. Johnson

City of Margate, Florida

10/29/25

BABETTE JOY BALIS
4312 CLEVELAND LANE
ROCKAWAY NJ 07866-5811

RE: COURTESY NOTIFICATION
Account No: 000007251-000204316
Service Address: 7265 NW 6TH CT

Dear Residential Water Customer:

This courtesy notification is being provided to alert you to a possible water leak within your plumbing on your private property. The City has installed an electronic meter interface unit on your water meter. Our data indicates that the recent water consumption for the above account is abnormally high.

If you have recently done any of the below activities, please disregard this letter:

- Filling or topping off a swimming pool.
- Watering the lawn, new grass, or trees.
- Kids' home from school; guests.
- Pressure cleaning, deep cleaning of home.

If you **have not** done any of the above activities, we recommend you take the following steps to check for leaks:

1. Turn off all faucets inside and outside the property while making sure no one uses water while the leak indicator (red needle) on the meter is viewed.
2. Locate the water meter and verify the meter number from the water bill.
3. If the needle on the register is moving and no water is being consumed, there is a leak.
4. To determine if the leak is inside or outside the property, turn off the emergency shutoff valve (it may be an extra valve found near an outside faucet or it may be inside the property). If the leak indicator is still moving with the emergency shutoff valve turned off, the leak is in the service line; otherwise, the leak is inside the property.

If you have any questions or need further assistance, please call Customer Service at (954) 884-3666.

Sincerely,

City of Margate Utility Billing Division

UTILITY BILLING DIVISION
DEPARTMENT OF ENVIRONMENTAL & ENGINEERING SERVICES (DEES)
901 NW 66TH Ave, Margate, FL 33063 - Phone: (954) 884-3666 - http://www.margatefl.com - email: waterbills@margatefl.com

The initiative supports Margate's non-revenue water (NRW) reduction strategy, enhances compliance with permitted withdrawal limits, and aligns with regional conservation objectives under the Broward Water Partnership and the South Florida Water Management District's Lower East Coast Water Supply Plan. Estimated annual water savings range from 1.2 to 3.7 million gallons, with a mid-case estimate of 2.36 million gallons/year (approximately 6,460 gpd or 0.0065 MGD), based on observed notification volumes, customer response rates (20–50%), and average leak volumes avoided (averaging approximately to 2,494 gallons per fixed leak). The resulting benefits include a measurable reduction in non-revenue water loss, support for the City's permitted withdrawal compliance, and increased customer awareness of water conservation. This initiative also complements the Broward County Water Partnership's regional conservation goal of achieving 30 MGD in savings countywide.

Water Conservation Public Education Programs – The City has an ongoing water conservation educational program using communications on its website, social media, Margate Matters (newsletter), annual Water Quality Report, and other available means. Additionally, the City, in partnership with the Florida Section of the American Water Works Association, sponsors an annual water conservation poster contest for students in the City's water service area. Nine local schools are invited to participate to educate their students on water conservation. The students then create a poster that depicts water conservation with the City ultimately voting on winners in grade-based categories. The winner from each category is then submitted to the statewide contest.

Water Conservation Rate Structures – Margate employs an increasing block rate structure where higher rates are charged for greater water use as summarized in the table below. This rate structure provides an economic incentive to conserve water.

Monthly Consumption (gallons)	Monthly Charge per 1,000 Gallons ($) Inside Margate
0 to 6,000	$5.06
6,001 to 15,000	$6.32
15,000 to 25,000	$7.60
Above 25,000	$8.85

Impact of the City's Water Conservation Programs on Water Use – The City's water conservation programs appear to have increased customer water use efficiency. As demonstrated in Section 4.0, water use per person has fallen each year over the past five years, from 90.5 gallons per person per day (gpcd) in 2020 to 80.6 gpcd in 2024. This reflects a reduction in total water use as the total population served increased each year. Over the past two years (2023 to 2024), total water use fell by 4.1 percent, while the total number of customer accounts increased by 0.93 percent.

3.5 City's Reuse Program

The City does not currently treat wastewater for reuse. A reuse feasibility study was completed in 2005 and concluded that implementing a reclaimed water program was not feasible because the identified end users were obtaining water at a much lower cost. In 2008, a water reuse program was again considered to obtain water offsets that could be added to the City's CUP to augment the City's water supply. Afterward, the 2009 economic downturn and the City's water conservation programs reduced water use to the point that the offsets were not needed. The reuse project was put on hold and has since been evaluated periodically. In 2025, the City conducted a new reuse feasibility study as required for submission with the wastewater treatment facility's operational permit renewal. The study enforced the prior conclusions, as current conditions continue to indicate that a reuse program remains economically and logistically unfeasible for the service area.

3.6 Intergovernmental Coordination

The City of Margate DEES Utilities maintains open and effective communication, as needed with Broward County and the City of Coconut Creek regarding water supply and infrastructure issues. This coordination typically occurs between Margate's Director of Environmental & Engineering Services, Broward County's Director of Water and Wastewater Services, and Coconut Creek's Director of Utilities and Engineering, along with their respective staff.

Recent discussions have focused on coordinating watermain replacements and repairs in conjunction with paving services scheduled by the City of Coconut Creek, ensuring infrastructure improvements are completed efficiently and without conflict. To further formalize collaboration, on June 18, 2025, the City of Margate approved a resolution adopting an Interlocal Agreement with the City of Coconut Creek. The agreement establishes a framework for coordinating Margate's South Creek Watermain Improvements Project and Coconut Creek's South Creek Neighborhood Improvements Project. The agreement ensures

that Margate will complete all phases of water and wastewater infrastructure work in the South Creek area prior to the start of Coconut Creek's roadway and mobility improvements, thereby avoiding redundant road restoration. The Interlocal Agreement also outlines responsibilities for right-of-way restoration, emergency repairs, permit waivers, and access easements necessary for Margate's utility infrastructure, including a sanitary lift station near Windmill Park.

4. Water Demand Forecast and Supply Adequacy

The City's water utility service area includes the entire City of Margate, and a portion of the City of Coconut Creek located south of Coconut Creek Parkway. The population, raw water pumpage, and treated water production of the Margate service area as presented in this section reflect this geographic area.

Population projections and the average historic five-year water demand per person per day were used to forecast water demand within the City's water service area. The historic and forecasted populations are from the Broward County Planning and Development Management Division, PFAM 2024, published 9/10/2024. The data are presented by Traffic Analysis Zone (TAZ) and include the City of Margate and the area of Coconut Creek served by the City. A map of the TAZs in the City's water service area is provided in **Figure 4-1** on the following page.

Population estimates for the City's service area organized by TAZ are provided in **Table 4-1**. For TAZs split between more than one municipality, the Broward County Planning and Development Division divided the population within that TAZ between each municipality pursuant to the Broward County Land Use Plan.

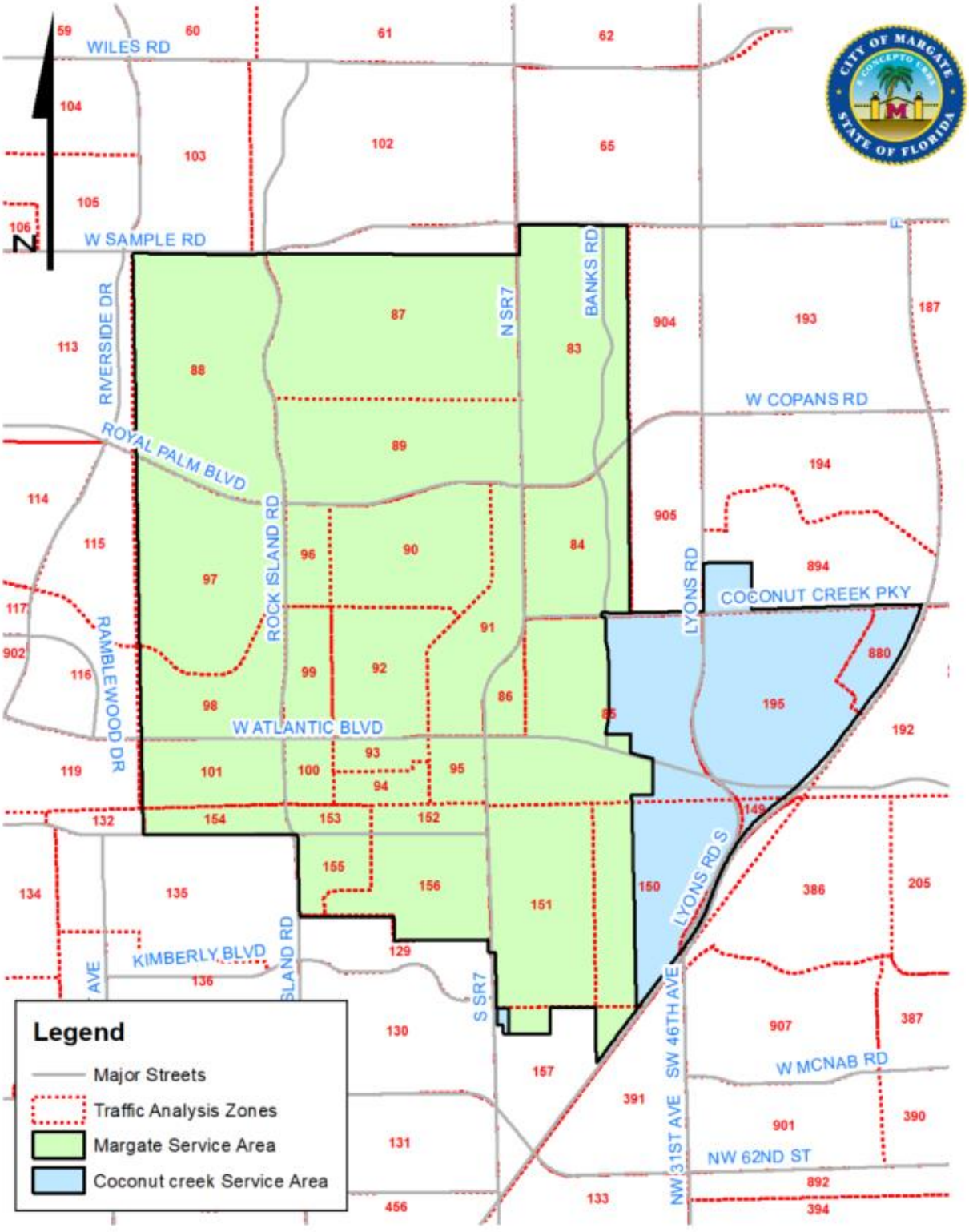


Figure 4-1: TAZs Within the City of Margate Water Service Area

Table 4-1: Historic and Forecasted Population by TAZ in the City of Margate's Water Service Area: Years 2015-2045 (5-Year Increments)

TAZ	2015	2020	2025	2030	2035	2040	2045
83	3,720	4,777	4,586	4,558	4,520	4,879	5,114
84	244	345	1,660	2,182	2,319	2,715	2,988
85	1,655	1,764	5,215	7,703	8,345	8,749	9,000
86	2,370	2,104	1,945	1,923	1,899	2,060	2,163
87	6,017	6,364	6,087	6,036	5,984	5,932	5,896
88	5,733	6,472	6,178	6,115	6,062	6,022	6,615
89	4,285	4,708	4,493	4,464	4,429	4,388	4,399
90	2,823	3,117	3,064	3,034	3,009	2,986	3,062
91	1,219	1,178	1,156	1,143	1,138	1,128	1,180
92	1,925	1,844	1,800	1,784	1,770	1,751	1,738
93	1,096	1,291	1,275	1,267	1,256	1,254	1,243
94	692	591	559	557	555	553	617
95	770	774	795	789	787	778	799
96	427	453	449	445	444	443	441
97	5,313	5,905	5,586	5,508	5,440	5,400	5,971
98	2,381	2,779	2,902	2,868	2,845	2,836	2,820
99	895	847	837	826	825	819	818
100	196	139	146	146	146	146	146
101	2,135	2,366	2,248	2,223	2,198	2,188	2,403
148	0	0	0	0	0	0	0
149	2,439	2,430	2,298	2,272	2,251	2,398	2,492
150	2	104	100	100	100	100	100
151	5,479	5,371	4,973	4,900	4,806	4,975	5,067
152	682	626	609	603	599	596	595
153	394	452	447	444	446	446	446
154	647	579	571	569	567	565	565
155	1,078	1,026	1,000	991	985	982	980
156	2,203	2,189	2,764	2,973	3,281	3,474	3,608
157	364	514	499	495	492	487	485
195	3,092	2,664	2,594	2,570	2,554	2,538	2,527
880	0	520	505	499	497	494	494
Total	**60,275**	**64,293**	**67,341**	**69,988**	**70,548**	**72,082**	**74,772**
	Growth	**2,446**	**4,018**	**3,048**	**2,647**	**561**	**1,533**

(a) *The populations reported in this table represent only the portion of the TAZ within the City's Water Service Area. The data include the City of Margate jurisdiction and the area of Coconut Creek served by the City. The Coconut Creek TAZs are 85, 150, 195 and 880. Source: Broward County Planning and Development Management Division, 2024.*

The City's service area population and treated water production from 2020 to 2024 is provided in **Table 4-2**. The amount of treated water supplied to customers in the City of Margate and the amount supplied to customers in Coconut Creek are not known. Billing records indicate that about 90 percent of the City of Margate's treated water supply is sold to customers within the City of Margate and 10 percent is sold to customers in Coconut Creek.

Table 4-2: City of Margate's Historic Water Service Area Population and Total, Per Capita, and Maximum Monthly Treated Water Production (Calendar Year 2020 to 2024)

Year	Service Area Population	Treated Water Production				
		Annual Average (mgd)	Daily Per Capita (gallons)	Maximum Month (MG)	Average Month (MG)	Maximum to Average Month Ratio
(1)	(2)	(3)	(4) = [(3) x 10^6] / (2)	(5)	(6)	(7) = (5) / (6)
2020	64,293	5.82	90.5	206.07	177.48	1.16
2021	64,891	5.59	86.2	199.40	170.10	1.17
2022	65,495	5.72	87.3	195.79	173.93	1.13
2023	66,105	5.61	84.8	196.51	170.49	1.15
2024	66,720	5.38	80.6	193.63	164.10	1.18
5-year Average			**85.9**			**1.16**
3-year Average			**84.2**			**1.15**

Sources: *Yearly populations from 2021 through 2024 were interpolated between the years, 2020 and 2025, from population data by TAZ provided by Broward County and adjusted for the percentage of Margate's service area within each TAZ. Treated water production is from the City of Margate's Monthly Operating Reports.*

The service area population, the annual average daily treated water production, and the average daily per capita water use are provided in columns (2), (3) and (4) of the table. The annual service area population values are from Table 4-1. In 2020, the City's water utility provided water service to 64,293 people. By 2024, the population served had grown to 66,720. In 2020, the annual average daily treated water production was 5.82 mgd, which fell to 5.38 mgd by 2024. This trend reflects a significant reduction in water use per person per day, from 90.5 gallons in 2020 to only 80.6 gallons in 2024.

The average per capita water use over the five-year period is 85.9 gallons per person per day which was used to prepare the forecast of treated water demand through 2045. Use of the five-year period is consistent with the method used by the SFWMD in determining annual average daily permitted water quantities for public water supply permittees and applicants. (SFWMD Applicant's Handbook for Water Use Permit Applications, page WUAH – 48).

The maximum month treated water production and the average monthly treated water production over the past five years in million gallons are provided in columns (5) and (6) of the table. Both the maximum month and average month treated quantities fell over the five-year period. The ratio of maximum to average month production is provided in column (7) and averages 1.15 over the past three years. This ratio was used to forecast the maximum month water production consistent with the method used by the SFWMD in determining the maximum month permitted water quantities for public water supply permittees and applicants.

Calculation of the forecasted treated water demand that must be met by the City's water production is provided in **Table 4-3**. Annual average monthly treated water demand was forecast as the product of service area population [column (2)] and daily per capita water use of 85.9 gallons [column (3)] converted to monthly demand [column (4)]. This value was further converted to annual average daily demand in column (5). Annual average daily demand is forecast to be 5.78 mgd in 2025 and is forecast to increase to 6.42 mgd by 2045.

Maximum month treated water demand in million gallons [column (6)] was calculated as the product of average monthly demand [column (4)], and the historic three-year maximum to average ratio of 1.15 as was calculated in **Table 4-2**. The maximum month treated water demand forecast was converted to average daily mgd in column (7). Maximum month average daily demand is forecast to be 6.67 mgd in 2025 and is forecast to increase to 7.40 mgd by 2045. Given that the City's water treatment plant capacity is 13.5 mgd, there is enough treatment capacity available through 2045.

Table 4-3: City of Margate Forecasted Water Service Area Population and Treated Water Demand, Five-year increments from 2025 to 2045

Year	Service Area Population	Treated Water Demand				
		Daily Per Capita (gallons)	Average Month (MG)	Annual Average Daily (mgd)	Maximum Month (MG)	Maximum Month Average Daily (mgd)
(1)	(2)	(3)	(4) = {[(2) x (3) x 365] / 12} / 10^6	(5) = [(2) x (3)] / 10^6	(6) = (4) x 1.15	(7) = (6) / (365/12)
2025	67,341	85.9	175.92	5.78	202.79	6.67
2030	69,988	85.9	182.83	6.01	210.76	6.93
2035	70,548	85.9	184.30	6.06	212.45	6.98
2040	72,082	85.9	188.30	6.19	217.06	7.14
2045	74,772	85.9	195.33	6.42	225.16	7.40

The comparison of forecasted treated water demand to the available water treatment capacity is provided in **Figure 4-2**. During the period 2020 to 2045, there is enough treatment capacity available to supply the forecasted demand.

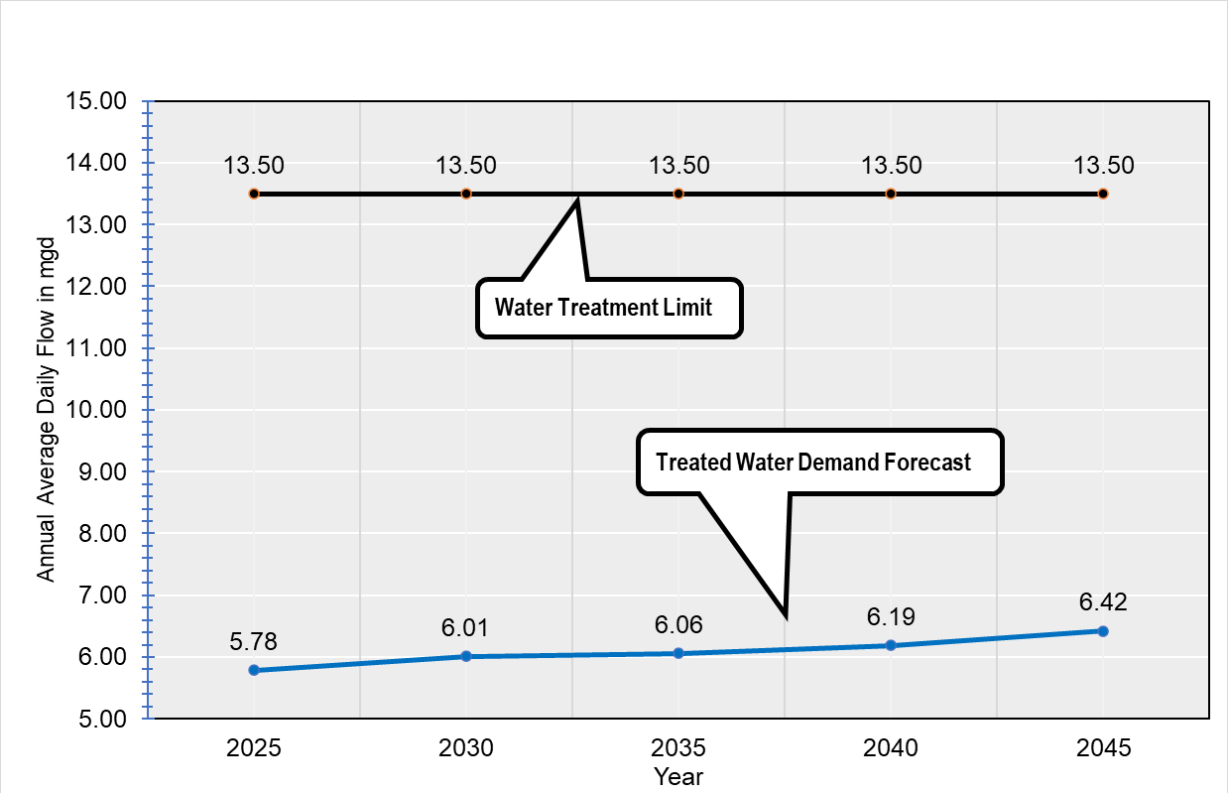


Figure 4-2: Comparison of Treated Water Demand Forecast to Treatment Limit for the City of Margate Water Service Area, mgd

The forecasted treated water demand was converted to raw water withdrawal demand under two scenarios: (1) the water treatment process is ion exchange and (2) the water treatment process is nanofiltration. The addition of one of these two treatment technologies is under consideration, and each has a different percentage of raw water loss. The higher the raw water loss during treatment, the more raw water is needed to produce the same amount of treated water. The ion exchange process is expected to increase the treatment plant water loss by five percentage points over current levels and the nanofiltration process is expected to increase the treatment plant water loss by 15 percentage points over current levels.

The calculation of the current average percentage of raw water loss after treatment is provided in **Table 4-4**. Annual average daily raw water pumpage is provided in column (2) and average daily treated water production is provided in column (3). The percentage treatment loss is calculated from these two values in column (4). Treatment loss was 19.6 percent in 2020 and increased to 25.0 percent in 2024. The average over the past five years is 20.1 percent.

It should be noted that raw and treated water demands for each alternative treatment process scenario were calculated using a conservative approach. Since the City's average treatment loss is 20.1 percent over the past five years, additional treatment losses resulting from the potential process change were added to the existing treatment loss. For example, since the expected additional treatment loss using ion exchange is 5 percent, the total expected treatment loss would be 25.1 percent. The same is true for nanofiltration, where the expected treatment loss is 15 percent, so the total expected treatment loss would be 35.1 percent.

Table 4-4: City of Margate's Historic Raw Water Pumpage, Treated Water Production and Percent Treatment Loss

Year	Raw Water Pumpage, Average Daily mgd	Treated Water Production, Average Daily mgd	Percent Treatment Loss (Raw - Treated)/(Raw)
(1)	(2)	(3)	(4) = [(2) - (3)] / (2)
2020	7.24	5.82	19.6%
2021	6.73	5.59	16.9%
2022	7.01	5.72	18.5%
2023	7.04	5.61	20.4%
2024	7.18	5.38	25.0%
		Average Percent Treatment Loss:	**20.1%**

Using ion exchange as the treatment process, the calculations of annual average daily and maximum month raw water pumpage needed to meet forecasted treated water demand are provided in **Table 4-5**. The annual average daily raw water withdrawal is provided in column (3) and is the ratio of the annual average treated water demand and one minus the proportional treatment loss (0.201 + 0.05 = 0.251). The result is an annual average raw water withdrawal requirement of 7.72 mgd in 2025 that increases annually to 8.57 mgd in 2045.

Maximum month raw water pumpage is provided in column (5) and is similarly calculated as the ratio of the maximum month treated water demand and one minus the proportional treatment loss (0.251). The result is a maximum month raw water pumping requirement of 271 million gallons in 2025 that increases annually to 301 million gallons in 2045.

Table 4-5: City of Margate Forecasted Raw Water Pumpage with Ion Exchange Treatment, Annual Average Daily and Maximum Month, Five Year Increments from 2025 to 2045

Year	Treated Water Demand, Average Daily mgd	Raw Water Pumpage, Average Daily mgd	Treated Water Demand, Maximum Month MG	Raw Water Pumpage, Maximum Month MG
(1)	(2)	(3) = (2) / (1-0.251)	(4)	(5) = (4) / (1-0.251)
2025	5.78	7.72	202.79	270.64
2030	6.01	8.02	210.76	281.28
2035	6.06	8.09	212.45	283.53
2040	6.19	8.26	217.06	290.70
2045	6.42	8.57	225.16	300.51

Using nanofiltration as the treatment process, the calculations of annual average daily and maximum month raw water pumpage needed to meet forecasted treated water demand are provided in **Table 4-6**. The annual average daily raw water withdrawal is provided in column (3) and is the ratio of the annual average treated water demand and one minus the proportional treatment loss (0.201 + 0.15 = 0.351). The result is an annual average raw water withdrawal requirement of 8.91 mgd in 2025 that increases annually to 9.89 mgd in 2045.

Maximum month raw water pumpage is provided in column (5) and is similarly calculated as the ratio of the maximum month treated water demand and one minus the proportional treatment loss (0.351). The result is a maximum month raw water pumping requirement of 312 million gallons in 2025 that increases annually to 347 million gallons in 2045.

Table 4-6: City of Margate Forecasted Raw Water Pumpage with Nanofiltration Treatment, Annual Average Daily and Maximum Month, Five Year Increments from 2025 to 2045

Year	Treated Water Demand, Average Daily mgd	Raw Water Pumpage, Average Daily mgd	Treated Water Demand, Maximum Month MG	Raw Water Pumpage, Maximum Month MG
(1)	(2)	(3) = (2) / (1-0.351)	(4)	(5) = (4) / (1-0.351)
2025	5.78	8.91	202.79	312.33
2030	6.01	9.26	210.76	324.60
2035	6.06	9.33	212.45	327.20
2040	6.19	9.53	217.06	334.32
2045	6.42	9.89	225.16	346.79

The raw water quantities permitted to be pumped from the City's wellfield by the SFWMD are provided in **Table 4-7**. The City may submit a request to the SFWMD to use their 2.0 mgd allocated C-51 Reservoir offset when raw water pumpage exceeds 8.53 mgd. At that time, the average daily permitted raw water withdrawal will be 10.10 mgd.

Without offset water from the C-51 Reservoir, the City may withdraw up to an annual average daily quantity of 8.53 mgd from the Biscayne aquifer through its twelve withdrawal wells. This quantity represents the City's "base condition water use". Under the SFWMD's Regional Water Availability (RWA) Rule adopted on February 16, 2007, raw water withdrawals from the Biscayne Aquifer are limited to the permittee's "base condition water use", which is defined as the basis for establishing permitted water quantities. For a water utility, the "base condition water use" is the maximum quantity of water withdrawn by the applicant from the permitted source during any consecutive twelve-month period during the five years preceding April 1, 2006.

Table 4-7: City of Margate's Permitted Raw Water Quantities from the Biscayne Aquifer

Time Period	Annual (MG)	Average Daily (mgd)	Maximum Month (MG)	Maximum Month Average Daily (mgd)
(1)	(2)	(3) = (2) / 365	(4)	(5) = (4) / [365/12]
Established Base Condition Water Use	3,112.80	8.53	285.34	9.38
Permitted Allocation with Offset	3,686.72	10.10	337.34	11.09

Source: *SFWMD Water Use Permit Number 06-00121-W*

Withdrawals from the Biscayne aquifer above the established base condition water use are only authorized if the Permittee has received the required offset water from an alternative water supply to prevent an increase in volume or change in timing of surface and groundwater withdrawn from the Lower East Coast Everglades Waterbodies over the base condition water use.

On December 4, 2019, the City signed a capacity allocation agreement for 2.00 mgd of storage capacity in the C-51 Reservoir that allows the City to withdraw an additional estimated 2.00 mgd from the City's wellfield. The C-51 Reservoir became operational in October 2023. In the City's permit modification application, which was approved by the SFWMD on September 2, 2020, the City requested that 1.57 mgd of this 2.00 mgd be used as offset water to supply future water demands through 2065. This offset allows the City to withdraw an annual average daily quantity of 10.10 mgd and an annual average daily maximum month quantity of 11.09 mgd. The C-51 Reservoir, Phase 1, is fully operational and the City is able to withdraw all of its allocated 10.10 mgd from the City wellfield.

Comparison of the forecasted annual average daily raw water withdrawal to the permitted quantity under ion exchange is provided in **Figure 4-3**. During the period 2025 to 2045, the forecast of average daily raw water withdrawals from the City's Biscayne Aquifer wellfield where ion exchange is the treatment process is less than the City's raw water withdrawal limit. Comparison of the forecasted annual average daily raw

water withdrawal to the permitted quantity under nanofiltration is provided in **Figure 4-4**. During the period 2025 to 2045, the forecast of average daily raw water withdrawals from the City's Biscayne Aquifer wellfield is less than the City's raw water withdrawal limit.

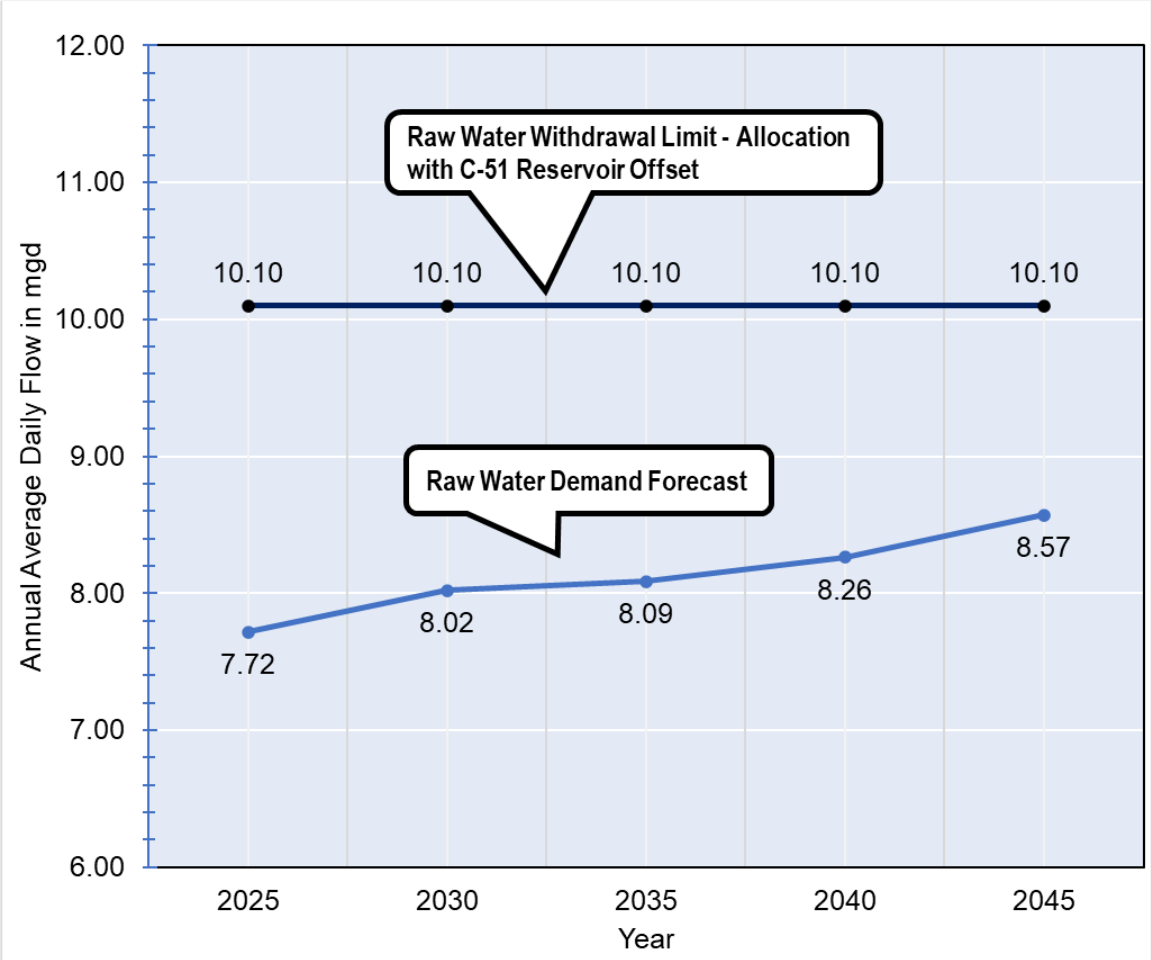


Figure 4-3: Comparison of Raw Water Demand Forecast for Ion Exchange Treatment to Withdrawal Limit for the City of Margate Water Service Area, mgd

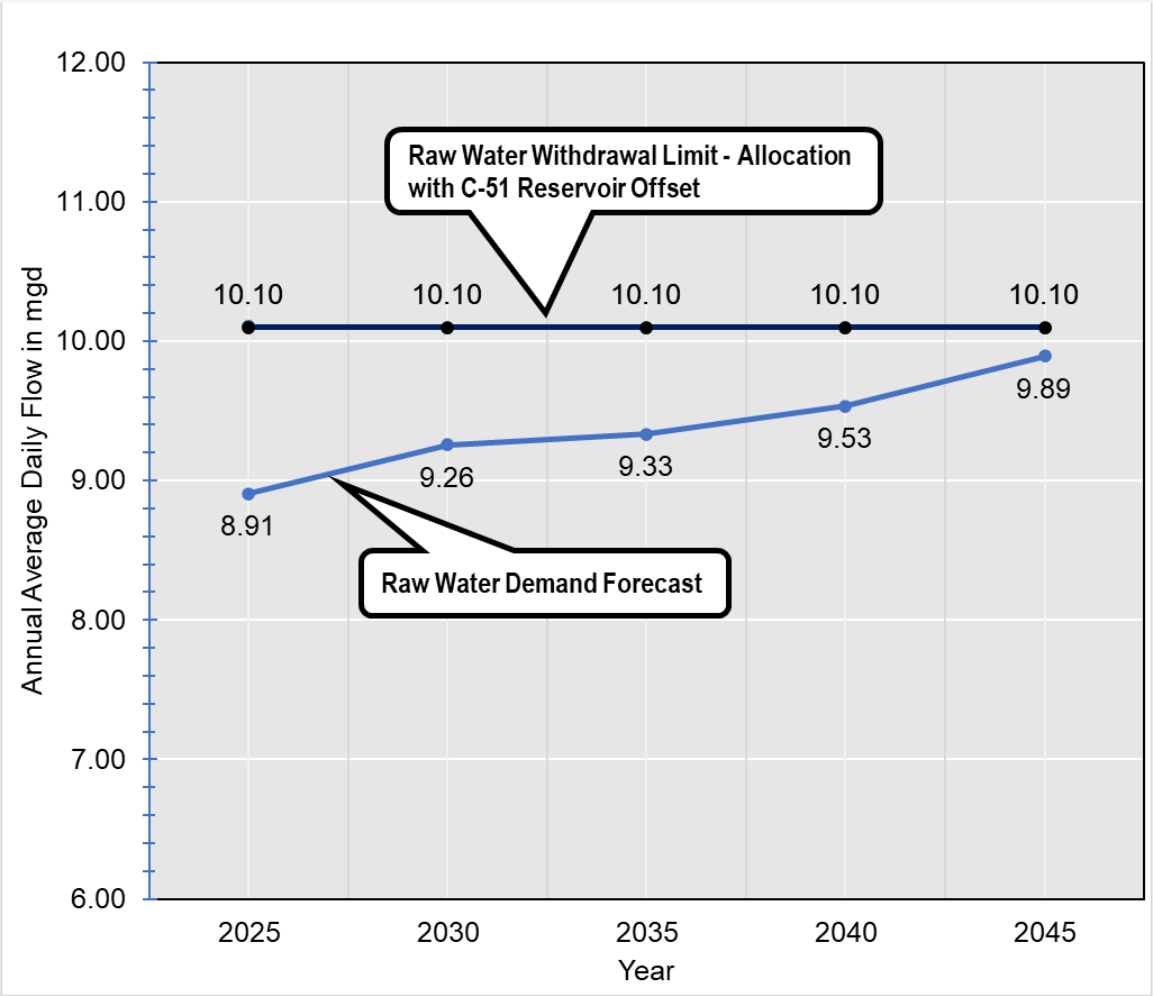


Figure 4-4: Comparison of Raw Water Demand Forecast for Nanofiltration Treatment to Withdrawal Limit for the City of Margate Water Service Area, mgd

Under ion exchange, comparison of the maximum month raw water withdrawal to the maximum month permitted quantity finds that the permitted quantity is sufficient to provide for the maximum month raw water demand through 2045 as demonstrated in **Figure 4-5**.

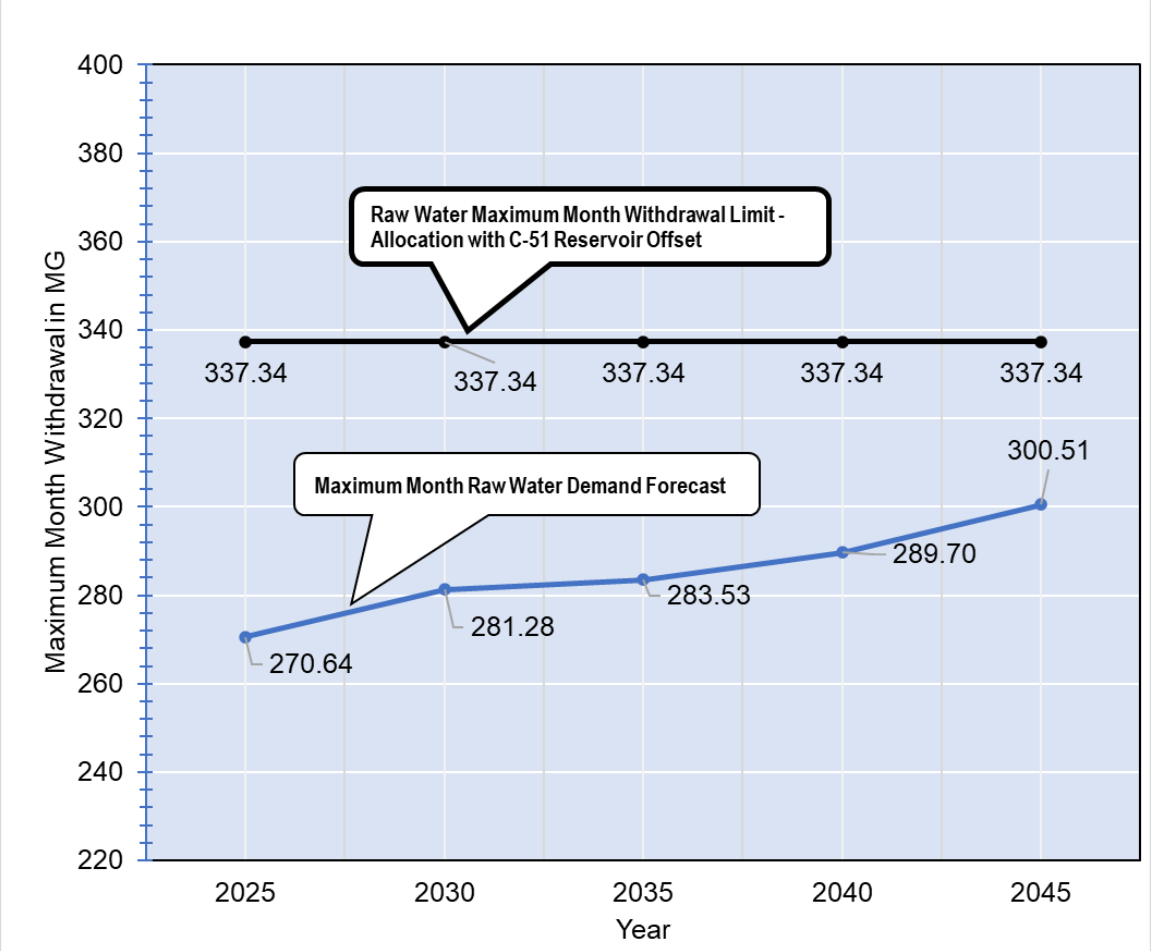


Figure 4-5: Comparison of Raw Water Maximum Month Forecast for Ion Exchange Treatment to Withdrawal Limit for the City of Margate Water Service Area, Million Gallons

Under nanofiltration, comparison of the maximum month raw water withdrawal to the maximum month permitted quantity finds that the permitted quantity is sufficient to provide for the maximum month raw water demand through 2040 as demonstrated in **Figure 4-6.** However, by 2041 the maximum month raw water demand is expected to exceed the permitted maximum month quantity.

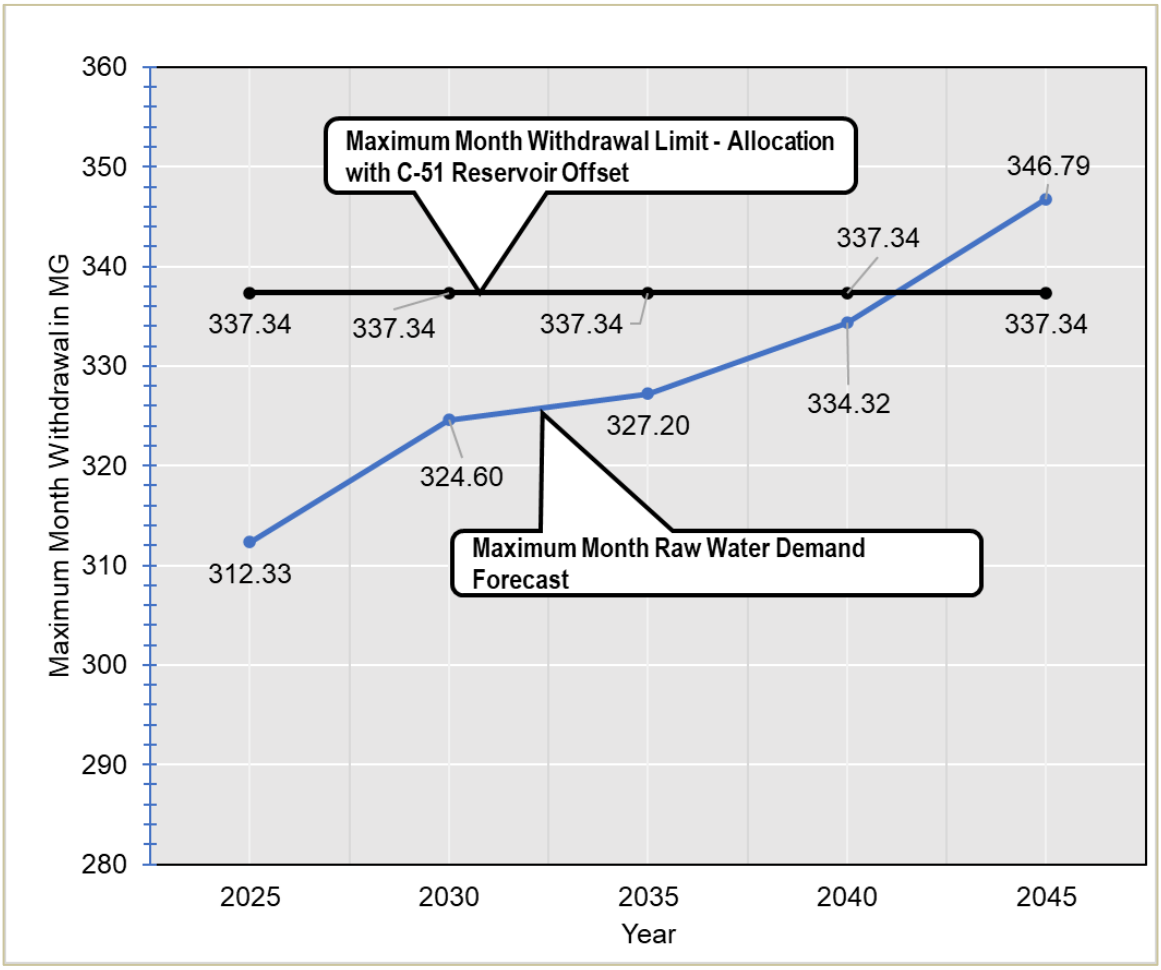


Figure 4-6: Comparison of Raw Water Maximum Month Forecast for Nanofiltration Treatment to Withdrawal Limit for the City of Margate Water Service Area, million gallons

5. Regional Issues

The City is aware of and studies the regional issues that impact or have the potential to impact water supply, water demand, and utility infrastructure. The City works with other local governments and utilities within the region to address these issues. This section summarizes the regional issues being followed by the City including:

- Climate Change
- Regional Climate Action Plan
- Sea Level Rise
- Saltwater Intrusion
- Extreme Weather Events
- Infrastructure Development
- Regional Water Availability Rule
- C-51 Reservoir
- Lake Okeechobee Surface Water Allocation Limitations
- Lake Okeechobee System Operating Manual (LOSOM)
- Infrastructure Planned to Attenuate Damaging Peak Flow Events from Lake Okeechobee
- Use of brackish groundwater from the Floridan Aquifer
- Regulatory Criteria for Per- and Polyfluoroalkyl Substances (PFAS)

Each is discussed in turn. Much of the information provided in this section was taken from the Broward County Water Supply Facilities Work Plan, 2020, DRAFT.

5.1 Climate Change

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

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

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

5.2 Regional Climate Action Plan and Broward County Climate Action Plan

Southeast Florida's unique geographic characteristics make it one of the most vulnerable regions to be impacted by climate change and sea level rise. These characteristics include low land elevations, flat topography, a porous geology, and dense coastal development. In combination, climate change and sea level rise are expected to present significant challenges relating to water resource planning, management, and infrastructure for communities throughout the region.

The Southeast Florida Regional Climate Change Compact (Compact) serves Broward, Miami-Dade, Monroe, and Palm Beach counties, inclusive of 109 municipal governments, including the City of Margate, and the Miccosukee Tribe of Indians of Florida, encompassing a total regional population of more than 6.2 million people. The Compact is a collaborative regional approach to address climate change. Compact members are actively involved in implementing the Compact's goals and strategies. These goals and strategies are documented in the Regional Climate Action Plan (RCAP) and the recently updated Broward County Climate Action Plan (BCCAP). The RCAP and the BCCAP have each been updated over the years. The most recent RCAP update was issued in 2022, titled "Climate Action Plan 3.0". The most recent BCCAP update was in 2025, titled "Broward County Climate Action Plan 2025."

The goal of the RCAP is to identify, develop, and implement integrated water management strategies and infrastructure improvements concurrently with existing and enhanced water conservation and alternative water supply source efforts to mitigate the adverse effects of climate change, including sea level rise on water resources systems and operations (Regional Climate Action Plan, 2022). The RCAP includes 17 recommendations that address "Water".

The water supply-related recommendations from the Regional Climate Action Plan 3.0 are summarized in **Table 5.1**. These recommendations are intended to advance water management strategies and infrastructure improvements needed to mitigate the adverse impacts of climate change and sea level rise.

Table 5-1 - Water Supply Recommendations of the 2022 Regional Climate Change Action Plan

Item	Recommendations
WS-1	Practice integrated water resources management and planning.
WS-2	Foster innovation, development and exchange of ideas for managing water.
WS-3	Foster scientific research for water resource management.
WS-4	Coordinate innovative regional investments in water management technologies.
WS-5	Expand the use of green infrastructure/nature-based and net zero solutions in water management.

Item	Recommendations
WS-6	Ensure consistency in water resource scenarios used for policy and planning consideration of future climate conditions.
WS-7	Assess the potential of climate impacts on water infrastructure.
WS-8	Modernize infrastructure development standards in the region.
WS-9	Address the resilience of the regional flood control system.
WS-10	Integrate combined surface and groundwater impacts into the evaluation of at-risk infrastructure and the prioritization of adaptation improvements.
WS-11	Implement strategies and capital projects to increase adaptive and resilient water infrastructure and improve water quality.
WS-12	Phase out septic systems where appropriate to protect public health and water quality.
WS-13	Coordinate saltwater intrusion mapping across Southeast Florida.
WS-14	Develop a spatial database of resilience projects for water infrastructure.
WS-15	Support the Comprehensive Everglades Restoration Plan (CERP).
WS-16	Expand regional surface water storage.
WS-17	Expand information and engagement with property owners to support adaptation on private property to contend with increased flooding and higher groundwater.

The water supply-related recommendations from the BCCAP are similar to the above table. These recommendations are intended to:

- Ensure existing water resources are protected and remain available through conservation and sustainable management.
- Promote integrated water resource management across all projects to optimize storage, recharge, treatment, reuse, and management as a single sustainable system.
- Preserve water capacity by diversifying source alternatives.
- Balance the water needs of natural systems and public use.

These recommendations are incorporated throughout this Water Supply Facilities Work Plan Update and related comprehensive planning element updates.

5.3 Sea Level Rise

The City of Margate and its raw water wells are located well inland from the Atlantic Ocean, and at this time, no impacts are expected from sea level rise. However, development of cost-effective sea level rise adaptation strategies to ensure the sustainability of the water supply in Broward County is critical to the wellbeing of all county residents, including those in Margate. The sea level rise projection was recently

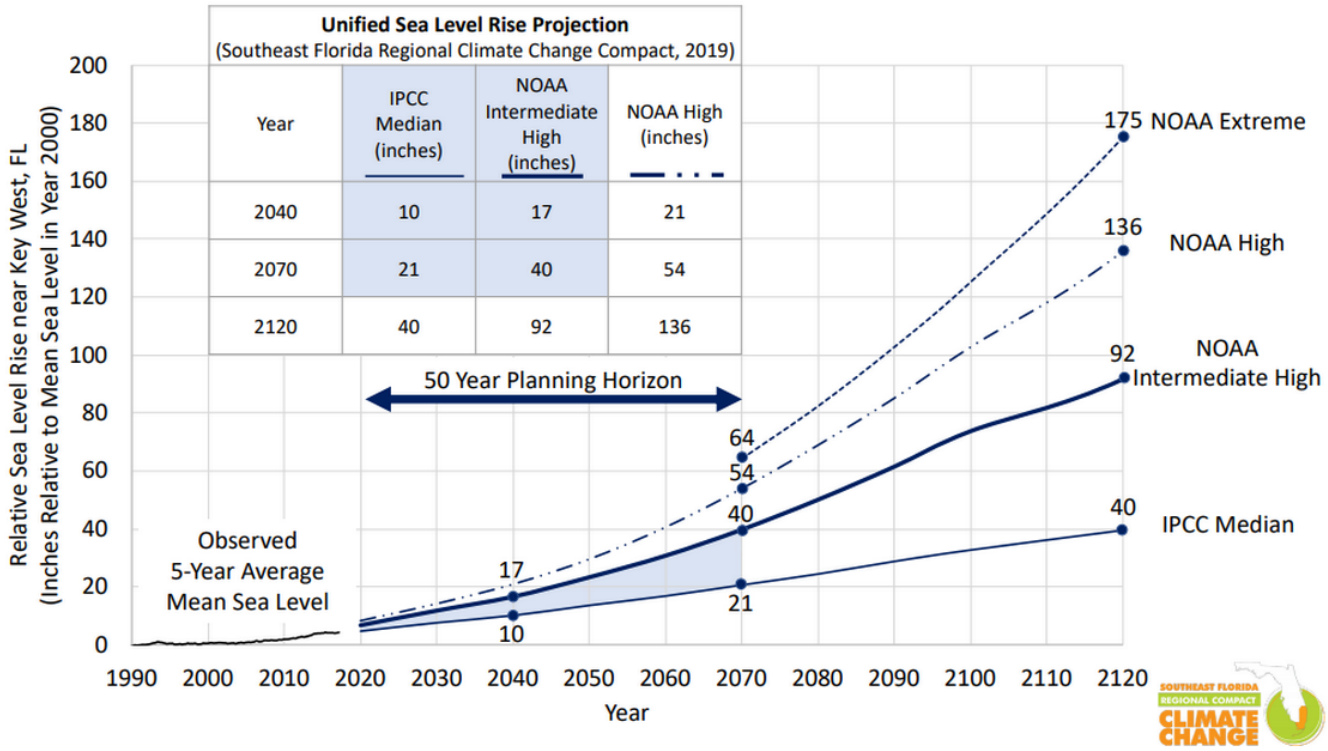


Figure 5-1: Sea Level Rise Projection (2019)

updated by the Compact (in December 2019) that increases the projected magnitude of sea level rise. The revised projection is provided in **Figure 5-1**. This update is now being used as the basis for planning throughout the region.

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

5.4 Saltwater Intrusion

The Biscayne Aquifer is the City's primary water supply. It is a shallow, surficial, highly transmissive aquifer. Coastal saltwater intrusion of the aquifer has occurred in eastern parts of Broward County. The extent of saltwater intrusion is measured by the depth and location of the 250 mg/L chloride concentration toe. The mapping of this saltwater intrusion front is supported by local governments throughout the region, the United States Geologic Survey (USGS), and the SFWMD. The SFWMD's 250 mg/L Isochlor Line in Broward County is illustrated in **Figure 5-2** along with the City boundary, in which all raw water supply wells are located. At the toe of the saltwater front, chloride concentrations exceed drinking water standards of 250 mg/L and thus restrict and/or require abandonment of wellheads located east of the saltwater intrusion line. It has been concluded that movement of the saltwater front is primarily caused by the historic lowering of the water table in western Broward County for the construction of regional drainage canals. While the City's Biscayne Aquifer wellfields are located sufficiently west of the 250 mg/L Isochlor, the City monitors its movement and the potential impact on the City's water supply.

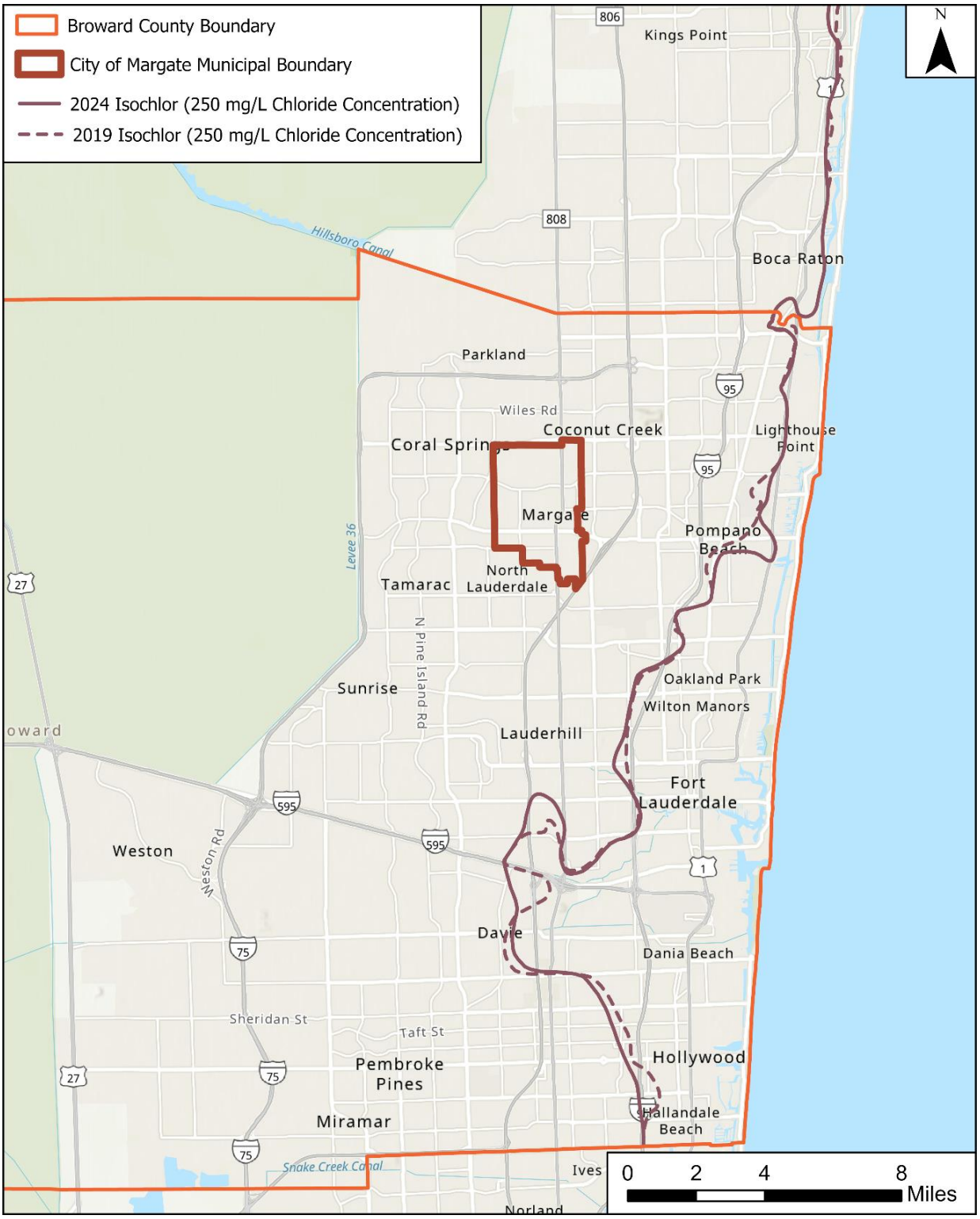


Figure 5-2: 250 mg/L Isochlor Line in Broward County (SFWMD)

5.5 Extreme Weather Events

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

5.6 Infrastructure Development

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

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

Options that provide for a diversification of water projects and protection of resources will be fundamental and may include changing treatment technologies; developing regional water storage such as the C-51 Reservoir; improving (or relocating) infrastructure in low lying areas; and enhancing operational flexibility. The City's planning effort regarding water supply infrastructure includes the use of water capacity from the C-51 Reservoir as an alternative water supply source.

5.7 Regional Water Availability Rule

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

5.8 C-51 Reservoir

The C-51 Reservoir, owned and operated by Palm Beach Aggregates (PBA), is an alternative water supply project in South Florida designed to support the Lower East Coast (LEC) Utilities in meeting long-term water demands while protecting the Everglades and other sensitive ecosystems. Developed in response to the 2007 Regional Water Availability Rule, the reservoir aims to store excess stormwater during wet seasons for use during dry periods. The project is planned in two phases, with a total storage capacity of 62,000 acre-feet. Phase 1 (operational as of April 2024) provides 16,000 acre-feet, and Phase 2 (if implemented) would add 46,000 acre-feet. The reservoir connects to the L-8 Reservoir and is integrated into the SFWMD Regional System. It offers a cost-effective and environmentally sustainable alternative to other water supply methods like desalination or reverse osmosis. Participating utilities can use the reservoir to replace or supplement existing water supply projects, enhancing regional water security and resilience.

On December 4, 2019, the City of Margate entered an "Agreement for Capacity Allocation in Phase 1 of the C-51 Reservoir" with PBA, LLC (The C-51 Reservoir, Phase 1 Permittee) to purchase a Capacity Allocation in Phase 1 of the C-51 Reservoir for 2.00 mgd as AWS for the City. On September 2, 2020, the City received a water use permit modification from the SFWMD to add this additional quantity as an offset to obtain additional permitted withdrawals of up to 2.00 mgd from the Biscayne Aquifer.

The site of the C-51 Reservoir is adjacent to the SFWMD's existing L-8 Flow Equalization Basin in Palm Beach County and is expected to share the same impermeable geologic formation that provides for significant inground storage capacity. The C-51 Reservoir is included in the 2023-2024 LECWSP Update as an alternative water supply to help meet forecasted increases in regional water demand in 2045. Beyond water supply, the reservoir captures excess stormwater flows and enhances stormwater management including the reduction of harmful discharges and associated nutrient loads to the Lake Worth Lagoon and mitigation of saltwater intrusion by maintaining higher canal stages and recharging coastal wellfields.

Water utilities have executed agreements with the property owner, PBA, to purchase storage capacity. To date, agreements have been executed for all 35 mgd of the Phase 1 storage capacity: Miami-Dade County (15 mgd); Broward County (6 mgd); City of Sunrise (5 mgd); City of Fort Lauderdale, (3 mgd); City of Margate (2 mgd); City of Pompano Beach (2 mgd); City of Hallandale Beach (1 mgd) and City of Dania Beach (1 mgd). These utilities have received or are processing modifications to their water use permits to reflect this AWS source as a means for meeting future water demands. Senate Bill 92 (2019) clarified the language and intent of the project and allowed the SFWMD to negotiate for any portion of the project not already committed to partners for water supply.

5.9 Lake Okeechobee Surface Water Allocation Limitations

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

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

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

5.10 Lake Okeechobee System Operating Manual (LOSOM)

The Lake Okeechobee System Operating Manual (LOSOM) is the updated water management plan developed by the U.S. Army Corps of Engineers (USACE) to replace the 2008 Lake Okeechobee Regulation Schedule (LORS08). LOSOM was designed to reflect the improved safety of the Herbert Hoover Dike and to better balance the needs of South Florida's communities, ecosystems, and water users. Developed over five years with input from more than 50 stakeholder groups, LOSOM emphasizes system-wide benefits, including reducing harmful discharges to estuaries, improving water supply reliability, and enhancing environmental conditions. It allows for more flexible, real-time decision-making based on current conditions and promotes collaboration between federal agencies and local stakeholders. LOSOM also supports the goals of the Comprehensive Everglades Restoration Plan (CERP) by enabling more water to flow south into the Everglades. LOSOM went into effect as of August 12, 2024, and the Jacksonville District of the USACE implements the plan. A copy of the LOSOM plan is available at this link: 2024 LOSOM Water Control Plan. The USACE maintains a LOSOM information website at this link: USACE LOSOM Webpage.

If Lake Okeechobee's level drops below Zone D, the system enters the Water Shortage Management Band, which can trigger restrictions on water use (SFWMD, 2025b). This could reduce the amount of water available to recharge the Biscayne Aquifer, the City's primary drinking water source. The City closely coordinates with the SFWMD to prepare for water supply restrictions during periods of limited rainfall.

5.11 Infrastructure Planned to Attenuate Damaging Peak Flow Events from Lake Okeechobee

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

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

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

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

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

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

These infrastructure features will provide various functions such as reducing seepage from WCA-3A, reducing phosphorus loading to WCA-3A, capturing stormwater otherwise lost to tide, and providing conveyance features for urban and natural system water deliveries. The preserve areas will benefit federally listed threatened and endangered species and many wading birds. This project provides water supplies identified in the Everglades MFL recovery strategy. The project received congressional authorization in 2014. Design efforts are under way for the C-11 Impoundment, and construction began in October 2017 on a portion of the mitigation area. Construction of the C-11 Impoundment is expected to be completed in 2027. The WCA-3A/3B Seepage Management Area is anticipated to begin construction in 2027. Construction of the C-9 Impoundment is expected to begin in 2030. The City continues to monitor the status of environmental restoration projects in the LEC.

5.12 Use of Brackish Groundwater from the Floridan Aquifer

The use of brackish water from the Floridan Aquifer for potable use after treatment is considered an alternative water supply. At this time, the City of Margate does not plan to develop this resource.

5.13 Regulatory Criteria for Per- and Polyfluoroalkyl Substances (PFAS)

5.13.1 The City is Impacted by the PFAS Rule

The City's water supply contains PFAS compounds, including perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) as illustrated in **Figure 5-3**.

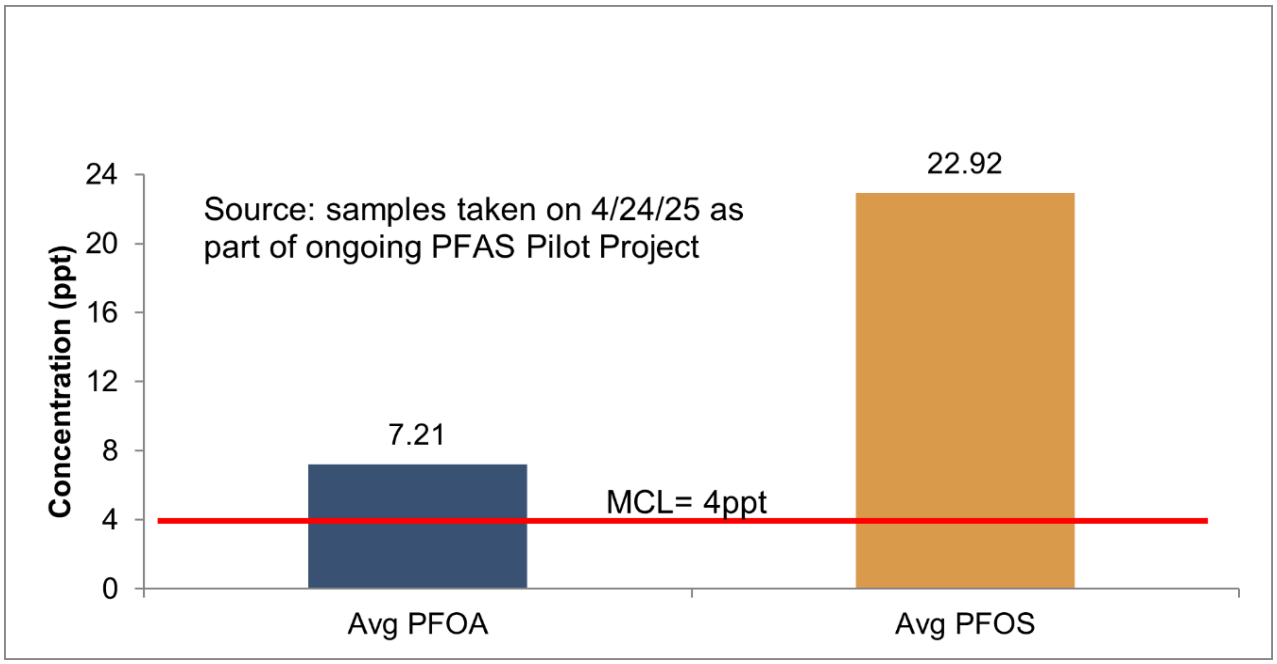


Figure 5-3: Average PFOA and PFOS Concentrations from the City's 12 Supply Wells

Consequently, the City must comply with the PFAS Rule, described below.

5.13.2 The PFAS Rule

The Per- and Polyfluoroalkyl Substances (PFAS) National Primary Drinking Water Regulation (a.k.a., PFAS Rule) was promulgated in April 2024 (USEPA, 2024). This rule requires removal of PFAS from drinking water to four parts per trillion (ppt) for key compounds (i.e., PFOA and PFOS). Utilities impacted by this rule must reduce PFOA and PFOS by late 2028 to ensure compliance.

5.13.3 PFAS Rule Changes

On May 14, 2025, the EPA introduced a plan to modify the PFAS Rule (USEPA, 2025). As part of the modifications, it was announced that only PFOA and PFOS will have enforceable MCLs. Furthermore, the compliance deadline for public water systems was extended to 2031. In the May 2025 announcement, the EPA states they plan to finalize the rule in the Spring of 2026.

5.13.4 SFWMD Position on the PFAS Rule

The SFWMD states in the 2023-2024 LEC Water Supply Plan Update Planning Document that regulatory criteria for PFAS could require changes in the level of treatment required and may result in increased demands. Since public water systems do indeed need to comply with four ppt MCLs of PFOA and PFOS

by 2031, it has a significant impact on the LEC Planning Area and the City within the planning period of this Water Supply Facilities Work Plan Update.

Conventional lime softening and filtration treatment processes, employed by the majority of the public water systems in the LEC Planning Area, do not sufficiently remove PFAS compounds. Public water systems switching to the most common alternative treatment process in the LEC Planning Area that can remove PFAS compounds, reverse osmosis, may result in increased raw water demands to make up for the reject water that does not pass through the membranes (and is typically disposed of as a concentrate).

5.14 City's Strategy for Compliance with the PFAS Rule

The City is currently conducting a PFAS Pilot Study as described in Section 3.2.6 above. The study is ongoing. Once the study is completed, the City will determine the next steps to define its strategy to comply with the PFAS Rule. The City has designated $30 million dollars to be used in 2027 to meet EPA regulations, including those related to PFAS in their raw water supply. The City has an additional $30 million that will be used in 2031 to fulfill anticipated regulatory requirements from the FDEP, the SFWMD, and the Florida Legislature (City of Margate, 2025).

6. Water Supply Capital Improvements

The City's capital improvement projects includes multiple facility upgrades and rehabilitation projects. The fiscal-year (FY) 2026 approved five-year capital improvement plan is provided in **Table 6-**1 on the following page. All capital improvement items are intended to replace and rehabilitate the existing water infrastructure as components reach the end of their useful lives. The proposed CIP list has been drafted to address current needs; however, it will be revised periodically to reflect upcoming priorities and evolving regulatory or operational requirements.

Table 6-1: City of Margate Five-Year Capital Improvement Program for Water Services

Item	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	Total Five-Year
Water Line Replacement	$10,000,000	$0	$0	$2,000,000	$2,000,000	$14,000,000
Water & Wastewater Equipment Purchase	$500,000	$500,000	$500,000	$500,000	$500,000	$2,500,000
Infiltration and Inflow (I&I) Reduction	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$5,000,000
Rehabilitate Generator Systems	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$5,000,000
Water and Wastewater System Control Improvements	$500,000	$500,000	$500,000	$500,000	$500,000	$2,500,000
SCADA Upgrades and AI Integration	$0	$1,000,000	$2,000,000	$0	$0	$3,000,000
Water Treatment Plant Process Optimization and Technology Upgrades	$0	$1,000,000	$1,600,000	$2,000,000	$2,000,000	$6,600,000
Lime Sludge Handling System Improvements	$0	$2,000,000	$4,000,000	$0	$0	$6,000,000
Capital Projects - Other	$1,000,000	$1,100,000	$1,215,000	$1,335,000	$1,500,000	$6,150,000
Rehabilitate WTP Ground Storage Tanks	$600,000	$500,000	$0	$0	$0	$1,100,000
WTP and WWTP Facilities Remodeling	$1,300,000	$1,150,000	$800,000	$0	$0	$3,250,000
Facilities Hardening	$300,000	$300,000	$0	$0	$0	$600,000
Facilities Expansion	$1,500,000	$1,000,000	$0	$0	$0	$2,500,000
PFAS Monitoring, Pilot Testing, and Compliance Program	$0	$0	$20,000,000	$0	$0	$20,000,000
Total – Budget Including Bond Funds	**$17,700,000**	**$11,050,000**	**$32,615,000**	**$8,335,000**	**$8,500,000**	**$78,200,000**

Source: *Total – Budget Including Bond Funds Items from "City of Margate FY 2026 Adopted Budget and Five-Year Capital Improvement Program". Some items include the costs associated with both water and wastewater service*

7. Comprehensive Plan Goals, Objectives, and Policies

The City of Margate Comprehensive Plan addresses the needs and aspirations of the community. This has tremendous implications regarding the importance of community input in the development and implementation of the Comprehensive Plan. The Comprehensive Plan also plays a significant role within Florida's growth management system. The Comprehensive Plan is required to be consistent with the State Comprehensive Plan (Chapter 187, Florida Statutes), and to be consistent with the Regional and County Comprehensive Plans. In short, the Comprehensive Plan provides a critical link between the City of Plantation, State of Florida, Regional, and Broward County plans. The Comprehensive Plan focuses on those issues facing the City of Margate over a twenty-year time horizon. The Comprehensive Plan establishes the long-term direction of goals as well as short-term objectives and policies to guide implementation efforts

The following comprehensive plan goals, objectives, and policies (GOPs) have been reviewed for consistency with the 10-year Water Supply Facilities Work Plan 2025 Update. The City intends to adopt the Work Plan updates into its Comprehensive Plan using Option 2. The recommended revisions to the GOPs include the following:

Goal Statement

Regularly assess the sufficiency of the City's water supply to water customers in the City and in its water service area and identify water supply sources to address deficiencies.

Objective 1.1:

Annually update population and water demand projections to quantify water supply needs.

Policy 1.1.1.:

Track and update population projections annually, as published by Broward County Planning Services Division. Compare projections with the figures published in the South Florida Water Management District's ~~2018~~ 2023-2024 Lower East Coast Water Supply Plan Update and the City's ~~2020~~ 2025 Water Supply Facilities Work Plan Update.

Policy 1.1.2:

Track and update water demand projections annually based on actual demand figures as recorded in the monthly operating reports. Compare projections with the figures published in the South Florida Water Management District's ~~2018~~ 2023-2024 Lower East Coast Water Supply Plan Update and the City's ~~2020~~ 2025 Water Supply Facilities Work Plan Update.

Policy 1.1.3:

Based on changes identified in Policy #1.1.1 and 1.1.2, modify the scope and size of future AWS projects or other water resources projects which may be required to address long term water supply needs.

Policy 1.1.4:

The City shall maintain and enhance its electronic Customer Leak Detection and Notification Program to identify continuous water use and notify customers of possible leaks through the City's Advanced Metering Infrastructure (AMI) and Neptune 360 software. When sustained use of three (3) to ten (10) days is detected, courtesy notification letters shall be issued to customers, and high-use sites shall receive technician follow-up if consumption exceeds 1,000 gallons in a single day. The City shall continue to distribute leak detection dye tablets and educational materials to customers and track the number of notifications issued annually. This program supports the City's long-term water conservation goals, reduction of non-revenue water, and compliance with the South Florida Water Management District's Lower East Coast Water Supply Plan objectives

Objective 1.2:

On an annual basis, track regional water resources projects and/or changes in treatment technologies, which may impact the selection of AWS projects, including the participation in the C-51 Reservoir project, to address future water supply.

Policy 1.2.1:

As needed, proactively participate in regional pilot or bench scale studies which have a potential to mitigate or minimize the future demands and/or costs associated with implementation of AWS projects.

Policy 1.2.2:

Develop inter-local agreements to facilitate participation in programs stated in Policy # 1.2.1.

Objective 1.3:

As needed, identify revenue sources to fund additional AWS projects, if required, to address water supply needs of the current planning period and beyond.

Policy 1.3.1:

By 2026, develop a comprehensive water and wastewater master plan to identify system needs over a long-term planning period (i.e. beyond the current 10-year planning period).

Policy 1.3.2:

As needed, perform a comprehensive rate study to identify revenue sources to implement the recommendations of the master plan identified in Policy# 1.3.1.

Policy 1.3.3:

As needed, revise the rate structure or identify additional funding sources to fund the projects identified in the master plan to meet the water supply needs beyond the current 10-year planning period.

Policy 1.3.4:

Adopt an ordinance, if required, which incorporates the revised rate structure to projects to meet the water supply needs beyond the current 10-year planning period.

8. References

1. Applicant's Handbook for Water Use Permit Applications, South Florida Water Management District, West Palm Beach, Florida, Effective September 7, 2015

2. Broward County Water Supply Facilities Work Plan, Fort Lauderdale, Florida, April 2020

3. City of Margate, Water Use Permit No. 06-00121-W, Issued by the South Florida Water Management District on September 2, 2020

4. City of Margate Water Supply Facilities Update, Margate, Florida, 2020

5. Water Supply Facilities Work Plan Updates – SFWMD Technical Assistance Guide, South Florida Water Management District, West Palm Beach, Florida, January 2019

6. City of Margate. (2025). *Mayor Office Margate.*

7. USEPA. (2024). U.S. Environmental Protection Agency. (2024). Per- and Polyfluoroalkyl Substances (PFAS) National Primary Drinking Water Regulation (NPDWR). Federal Register, 89(82), 32532–32757.

8. USEPA. (2025). *EPA News Releases Website*. Retrieved July 10, 2025, from https://www.epa.gov/newsreleases/epa-announces-it-will-keep-maximum-contaminant-levels-pfoa-pfos

9. SFWMD. (2024a). *2023-2024 Lower East Coast Water Supply Plan Update.* Retrieved 2024, from https://www.sfwmd.gov/our-work/water-supply/lower-east-coast

10. SFWMD. (2024b). Broward County Estimated Position of the Saltwater Interface 2024. Retrieved April 2, 2025, from:

    https://www.sfwmd.gov/sites/default/files/documents/Broward_Isochlor_2024.pdf

11. SFWMD. (2025b). *LOSOM Technical Summary April 7, 2025.* Retrieved May 26, 2025, from https://www.sfwmd.gov/sites/default/files/documents/LOSOM_outlook_04082025.pdf

12. SFWMD. (2018a). *2018 Lower East Coast Water Supply Plan Update - Planning Document.*