



# INTEROFFICE MEMORANDUM

## FROM THE DEPARTMENT OF ENVIRONMENTAL AND ENGINEERING SERVICES

**DATE:** November 7, 2019  
**TO:** Cale Curtis, City Manager  
**THRU:** Curt A. Keyser, P.E., DEES Interim Director (CK)  
**FROM:** Sierra R. Marrero, Project Manager (SM)  
**RE:** **Alternative Water Supply - C-51 Reservoir Project**

The City of Margate withdraws fresh water from the Biscayne Aquifer utilizing 12 raw water wells. In 2005, the City's Water Treatment Plant (WTP) was permitted by South Florida Water Management District (SFWMD) to withdraw 9.3mgd (million gallons per day). This was later reduced to 8.51mgd in 2010 following the 2007 Regional Water Availability Rule, which restricted withdrawals from specified waterbodies, including the Biscayne Aquifer, and required utilities to explore non-traditional sources and strategies to accommodate future water demands. After conducting an analysis of several water supply alternatives, DEES staff has identified the C-51 Reservoir Project as the most affordable and sustainable option and recommends execution of the C-51 Capacity Allocation Agreement with the SFWMD.

The C-51 Reservoir Project:

- Does not require any alternative or additional infrastructure modifications to our City's existing Water Treatment Plant.
- Provides a diversified water source and helps to meet future water supply needs while protecting wellfield capacity.
- Mitigates for saltwater intrusion and protects well fields.
- Serves as an alternative water supply to ensure compliance with Florida Statutes Section 373.019(1).
- Ensures validity of the City's consumptive use permit (CUP) for allocations for the C-51 through 2065.

### Alternative Water Supply Cost Analysis:

| Description                              | C-51 Reservoir     | Floridan Reverse Osmosis | Reclaimed Water for CUP Credit                      |   |   |
|--|--------------------|--------------------------|---|---|---|
|  |                    |                          | Treatment at WWTP for Public Access Area Irrigation | Biscayne Aquifer Recharge via Canal Discharge | Biscayne Aquifer Recharge via Groundwater Discharge |
| Influent (Water Source)                  | Biscayne Raw Water | Floridan Raw Water       | Secondary Effluent                                  | Primary Effluent                              | Primary Effluent                                    |
| Capacity                                 | 2.0                | 2.0                      | 1.01*   | 1.0   | 1.0   |
| Estimated Construction Costs (\$)        | \$9,200,000        | \$17,712,000             | \$13,230,000  | \$14,919,000                                  | \$15,794,000  |
| Estimated Capital Cost Range (\$/gallon) | \$4.60             | \$8.86                   | \$13.10   | \$14.92                                       | \$15.79   |

\*1.01 Capacity estimate based on service agreements with the following proposed reclaimed water users: Carolina Golf Club (0.38mgd), Oriole Golf and Tennis Club (0.33mgd), Margate Executive Golf Course (0.09mgd), Palm Springs III (0.06mgd), and Coral Cay (Colonies of Margate I, II, and III)(0.15mgd).

## **Background**

The City's current SFWMD permit allows for a daily average withdrawal of 8.51M gallons from the Biscayne Aquifer; the City currently utilizes approximately 79% of the allocated withdrawal allowance. Based on the standard growth projections for the City of Margate, the City will max out that allowance by 2024 and will not have the ability to stay within the current permitted withdrawal allocation.

As a means to offset the future water demands, the City of Margate previously committed to SFWMD and Florida Department of Environmental Protection (FDEP) to construct a reclaimed Water Treatment Plant and identified three (3) golf courses and two (2) communities as the primary users. This project would allow us to increase our consumptive use allocation by approximately 1.01 mgd. The total cost for the construction of the reclaimed plant was estimated in 2008 at \$13 Million; this did not incorporate any transmission mains to bring the reclaimed water to the customer, nor did it include the cost of operations and maintenance (O&M). The original commitment to SFWMD and FDEP was to have this facility constructed by 2013. The City was granted a one-time extension during our permit renewal in 2015 and is now required to construct the facility by 2021. These commitments are part of both our Wastewater Treatment Plant and Water Treatment Plant operating permits.

As an alternative to reclaimed water, the City was presented with the opportunity to take part in a regional water supply project that was created through a collaborative effort of several Broward and Palm Beach County water utilities, along with several other private parties. This C-51 Reservoir Project involves the development of a storage reservoir which results in a 35mgd water supply delivery source that is conveyed to utilities through a channel of canals that are managed by SFWMD. Utilities in Broward, Palm Beach, and Miami-Dade Counties have the opportunity to purchase allocations through this partnership and, upon receiving a SFWMD permit, will be guaranteed that allocation through 2065. Most CUP's are valid for 20 years, and the City's current CUP expires in 2025.

The construction cost for Phase I for the C-51 Reservoir project are estimated at \$161 Million, which is divided by the 35mgd that can be allocated based on storage capacity; this results in a total of \$4.6 Million for each mgd of allocation. Based on our projections, the City of Margate should secure a 2mgd allocation. The Department of Environmental and Engineering Services (DEES) is preparing a task work order with Hazen and Sawyer to provide a more accurate 50-year growth projection for the City based on a complete build out to ensure that the City secures the proper allocation. For a 2mgd allocation, the construction cost, which is due at the final completion of construction in September 2022 would be \$9.2 Million. There is an annual O&M fee, that is based on reimbursement to SFWMD, for the operations of the canals to bring water from the reservoir to City of Margate, that is a not to exceed \$73,102 per year (based on a 2mgd allocation).

It is important to note that the City of Margate will be able to substitute this project for the reclaimed project that is already committed to SFWMD and FDEP. The C-51 project will give us a 2mgd allocation which is guaranteed until 2065 for \$9.2M, while a reclaimed plant will give us a possible (not guaranteed) 1.01 allocation until 2045 for approximately \$13M (not including the cost of installation of transmission mains and connections throughout the City). The O&M costs to maintain a reclaimed plant are also significantly higher than the O&M for the C-51 thus making the C-51 a more cost effective alternative water supply.

Currently Sunrise, Broward County, Hallandale Beach, and Dania Beach have secured their allocations. Pompano Beach and Fort Lauderdale have recently submitted commitment letters, while Hollywood, Pembroke Pines, and Miami-Dade County are preparing theirs.

Please let me know if you have any questions or would like any additional information on this project.