

**Recovery Strategy for the  
Implementation of Lakes Brooklyn and Geneva  
Minimum Levels**

**July 13, 2021**



**St. Johns River Water Management District  
Division of Water Supply Planning and Assessment  
Bureau of Water Supply Planning**

## Introduction

As a part of fulfilling its mission and statutory responsibilities, the St. Johns River Water Management District (District) establishes minimum flows and levels (MFLs) for priority water bodies within its boundaries. MFLs establish a minimum hydrologic regime and define the limits at which further consumptive use withdrawals would be significantly harmful to the water resources or ecology of an area. MFLs are one of many effective tools used by the District to assist in making sound water management decisions and preventing significant adverse impacts due to water withdrawals.

Lakes Brooklyn and Geneva are sandhill lakes located in Clay and Bradford counties, Florida (see Figure 1) and adjacent to the city of Keystone Heights, Florida. Lakes Brooklyn and Geneva are part of a chain of lakes and wet prairies in the Upper Etonia Creek Basin. Minimum levels for Lakes Brooklyn and Geneva were originally adopted in January 1996. The District completed a reevaluation of minimum levels for Lakes Brooklyn and Geneva in 2020. The reevaluated minimum levels recommended for Lakes Brooklyn and Geneva are based on implementation of updated methods and more appropriate environmental criteria. The updated methods include results from a new regional steady state groundwater model and a local scale transient model used to quantify the effects of local and regional groundwater withdrawals, and the analysis of an additional 20 years of hydrologic data. The status assessment for Lakes Brooklyn and Geneva indicate that they are currently not meeting their proposed MFLs based upon current (average of 2014–2018) groundwater withdrawals with a P50 lake deficit of 1.6 feet for Lake Brooklyn and 0.3 feet for Lake Geneva. Therefore, Lakes Brooklyn and Geneva are in recovery, and a recovery strategy is required (subsection 373.0421(2), *Florida Statutes* (F.S.)). Additionally, the estimated pumping conditions at 2045 were assessed and when added to the current deficit resulted in an estimated total deficit for Lakes Brooklyn and Geneva at the P50 of 3.9 feet and 1.5 feet, respectively.

Consistent with the provisions for establishing and implementing MFLs provided for in section 373.0421, F.S., the Recovery Strategy (Strategy) for the Implementation of Lakes Brooklyn and Geneva MFLs identifies a suite of projects and measures that, when implemented, recovers the MFLs for Lakes Brooklyn and Geneva and prevents the MFLs from being violated in the future due to consumptive uses of water, while also providing sufficient water supplies for all existing and projected reasonable beneficial uses.

To meet the requirements for the Strategy according to subsection 373.0421(2), F.S., this Strategy contains the following information:

- A listing of specific projects and measures identified for implementation of the plan
- A regulatory component to achieve the MFLs
- A timetable for implementation

On January 17, 2017, the St. Johns River Water Management District and the Suwannee River Water Management District Governing Boards approved the 2015–2035 North Florida Regional Water Supply Plan [NFRWSP] (SJRWMD and SRWMD, 2017) which identified that groundwater withdrawals beyond 2010 were not sustainable without creating adverse environmental impacts.

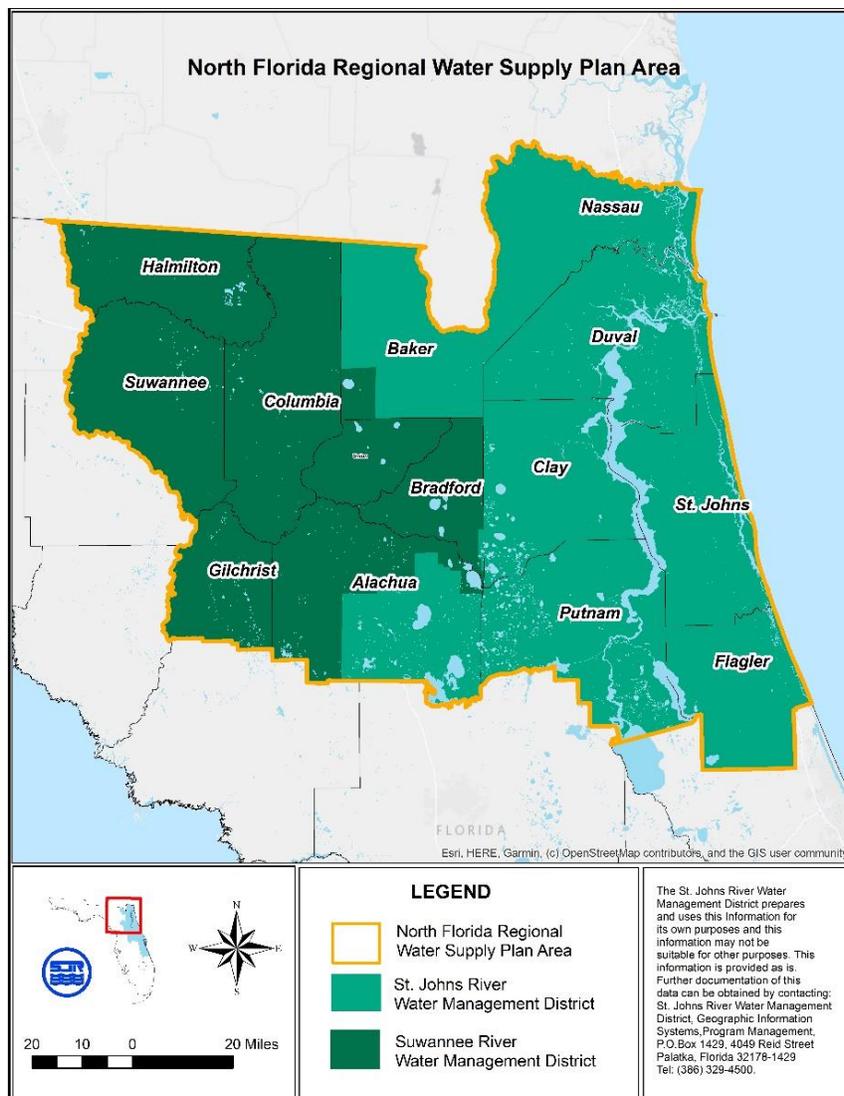
The MFLs for Lakes Brooklyn and Geneva support the conclusions of the NFRWSP. Like the NFRWSP, this Strategy focuses on water conservation, water supply development and water resource development (WRD) projects. A regulatory component is also included that utilizes existing rules to provide a structure for consumptive use permittees to address individual and cumulative impacts to Lakes Brooklyn and Geneva. The combination of projects and regulatory measures provide assurance that the MFLs for Lakes Brooklyn and Geneva will be achieved while meeting future demands.



**Figure 1. Location of Lakes Brooklyn and Geneva and associated monitoring stations**

## Stakeholder outreach

The District has been coordinating with stakeholders within the region since 2012 regarding potential projects to benefit Lakes Brooklyn and Geneva. Stakeholder outreach activities specifically related to the updated MFLs and the Strategy began in April 2018 with briefings to members of the Save Our Lakes Organization (SOLO), the North Florida Utility Coordination Group (NFUCG), and the Florida Pulp and Paper Association. On October 26, 2020, all District consumptive use permittees within the NFRWSP area (see Figure 2) were advised by letter of the draft MFLs for Lakes Brooklyn and Geneva and encouraged to participate in the development of the Recovery Strategy. A draft Recovery Strategy for the Implementation of Lakes Brooklyn and Geneva Minimum Levels was posted for public viewing on the District website on December 3, 2020, and a public workshop was held on December 10, 2020, in Palatka, Florida.



**Figure 2. Map of the North Florida Regional Water Supply Plan area.**

## Lakes Brooklyn and Geneva MFLs and Status Assessment

The District completed a reevaluation of the minimum levels for Lakes Brooklyn and Geneva in 2020. After peer review and staff evaluation of relevant criteria, 10 environmental metrics were chosen for evaluation and assessment at Lakes Brooklyn and Geneva. Of these 10 metrics, the open-water area criterion was determined to be the most sensitive for both Lakes Brooklyn and Geneva. (Sutherland, et. al., 2020).

Three minimum levels (see Table 1) were recommended for Lakes Brooklyn and Geneva. These three levels were calculated from the MFLs condition exceedance curve for each lake. Adopting these three minimum levels will ensure the protection of the minimum hydrologic regime at low, average and high levels for Lakes Brooklyn and Geneva.

**Table 1. Recommended minimum levels for Lakes Brooklyn and Geneva, Clay and Bradford counties, Florida (from Sutherland et al, 2020).**

| System        | Percentile | Recommended minimum lake level (ft; NAVD88) |
|---------------|------------|---|
| Lake Brooklyn | 25         | 111.5                                       |
|               | 50         | 106.2                                       |
|               | 75         | 98.6  |
| Lake Geneva   | 25         | 101.7                                       |
|               | 50         | 98.3  |
|               | 75         | 89.3  |

The recommended minimum levels for Lakes Brooklyn and Geneva will protect relevant water resource values from significant harm due to water withdrawals. The recommended MFLs are preliminary and will not become effective until after adoption.

As part of the reevaluation, an assessment was conducted to compare the proposed minimum levels (minimum MFLs hydrologic regime) to existing and projected hydrologic regimes to determine the current and future status of the MFLs. The status assessment utilized the North Florida Southeast-Georgia Regional Groundwater Flow Model version 1.1 (NFSEG) and the Keystone Heights Transient Groundwater Flow Model v2.0 (KHTM) to determine the current status associated with the MFLs for these two lakes.

Proposed MFLs and current-pumping conditions were compared to determine lake freeboards/deficits for the final suite of environmental criteria. The current-pumping condition represents the average 2014–2018 pumping condition and is based on the best available data as of July 2020. The status assessment for Lakes Brooklyn and Geneva indicate that they are currently not meeting their proposed MFLs. A comparison of the MFLs and current-pumping conditions for Lakes Brooklyn and Geneva yields a lake level deficit of 1.6 feet and 0.3 feet, respectively.

Therefore, Lakes Brooklyn and Geneva are in recovery, and a recovery strategy is required. The 2035 water use estimations were extrapolated out to 2045 resulting in an 8% increase over expected 2035 withdrawals. This 8% increase was applied to the results of the 2035 status assessment for Lakes Brooklyn and Geneva levels producing an estimated 2045 deficit for Lakes Brooklyn and Geneva of 3.9 feet and 1.5 feet, respectively.

Consistent with the provisions for establishing and implementing MFLs provided for in section 373.0421, F.S., the recovery strategy for Lakes Brooklyn and Geneva MFLs identifies a suite of projects and measures that, when implemented, will recover these lakes from impacts due to withdrawals. Since the MFLs status of Lakes Brooklyn and Geneva are in recovery, a portion of the current groundwater pumping and all future groundwater demands that have a potential impact will need to be met through increased water conservation, alternative water supplies, or impact offsets (e.g., recharge).

## Influence by use type

Identifying the water uses that have the largest potential impact on the water resource of concern is an important first step in the development of a recovery strategy. This assessment guides the development of strategies, including projects, that result in the greatest benefit to the constrained water resource. The NFSEG model was used to determine the impact by use type for Lake Brooklyn, because it has the greater recovery deficit. Public supply water use represents 44.3% of the change in the potentiometric surface of the Upper Floridan aquifer (UFA) at Lake Brooklyn from current pumping within the District (see Figure 3). The second largest user group is domestic self-supply at 27.0%.

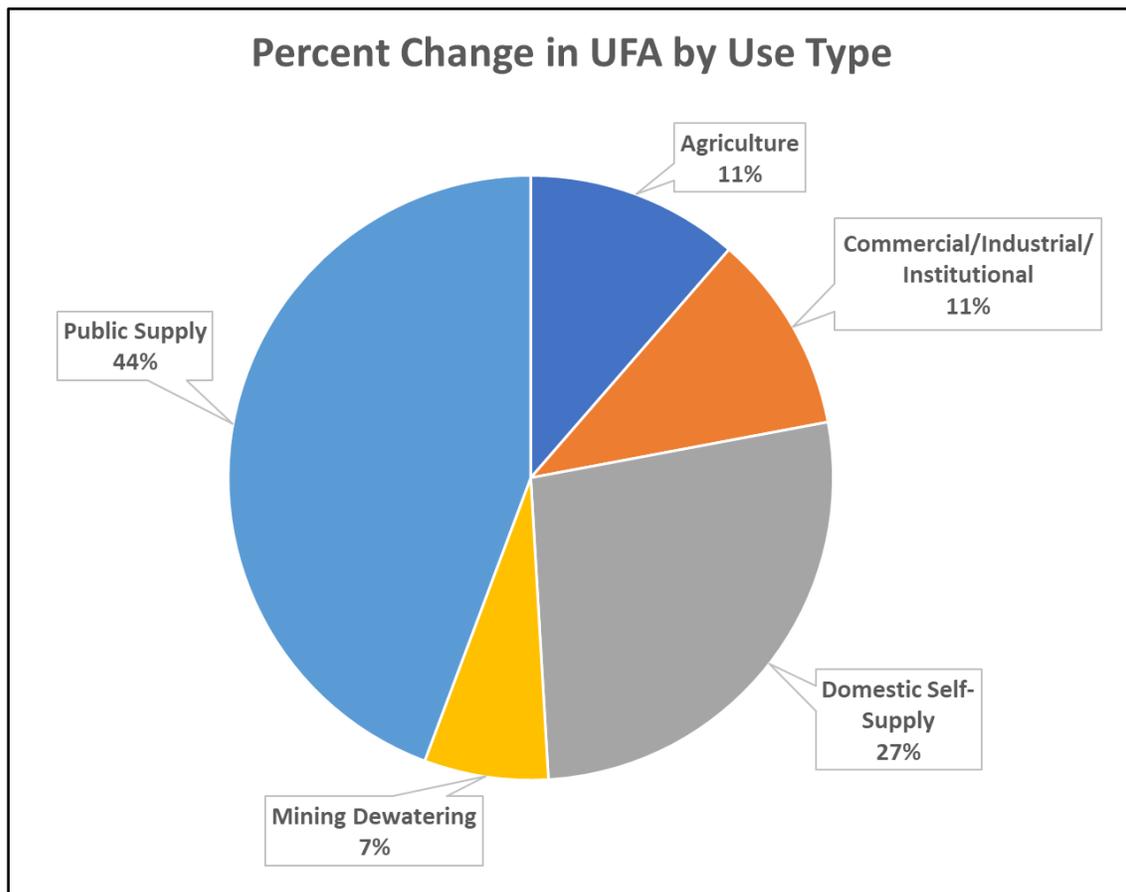


Figure 3<sup>1</sup>. Percent change in Upper Floridan Aquifer levels at Lake Brooklyn by category from withdrawals in the District.

### Domestic Self-Supply near Keystone Heights

Impacts from domestic self-supply withdrawals within 10 miles of Lake Brooklyn in the District were investigated. The results of this investigation indicate that current pumping from domestic self-supply withdrawals near Keystone Heights represent nearly 50% of the total DSS change in the

<sup>1</sup> The combined change to UFA at Lake Brooklyn from current pumping for the landscape/recreation/aesthetic, power generation, and other small categories make up less than 1.0% of the remaining change and thus are not shown in Figure 2, but are considered in this Strategy.

UFA levels at Lake Brooklyn from withdrawals in the District. This investigation highlights how, cumulatively, nearby small withdrawals can significantly influence the UFA levels at Lake Brooklyn.

The impact from domestic self-supply withdrawals could be mitigated by development of a source of supply other than the UFA or by relocating the UFA withdrawals farther from the lakes. For example, the development of a public water supply system would allow for the centralization of the UFA withdrawal to a location farther away from the lakes and thus provide a benefit to the UFA at Lake Brooklyn. Optimization of the UFA withdrawal location and the individuals served could be further explored to address the impact from domestic self-supply withdrawals near Lake Brooklyn.

## **Projects and Measures that Achieve the Strategy Objective**

Achieving and ensuring the maintenance of the MFLs for Lakes Brooklyn and Geneva will require the implementation of projects and measures in addition to the careful management of local and regional groundwater withdrawals. Projects and measures include enhanced conservation, aquifer recharge, development of alternative water supplies, and expansion of reclaimed water systems. The benefits predicted from the suite of proposed projects and measures, together with the regulatory component, provide assurance that the MFLs for Lakes Brooklyn and Geneva will be achieved through 2045.

Numerous projects and measures within the District from the NFRWSP were completed between 2014 and 2020. Examples of these projects include water conservation measures utilizing technological improvements such as soil moisture monitoring and advanced metering, implementation of best management practices, and reuse system expansion through increased treatment, distribution and storage systems. Appendix A provides further information on projects from the NFRWSP that have been completed. The primary benefit from these completed projects is reducing future demand from the Floridan aquifer.

Additional water conservation measures, water resource development projects, and water supply projects will be necessary to meet future water use demands while ensuring that the MFLs for Lakes Brooklyn and Geneva will be met. Potential stakeholder projects and measures from the NFRWSP along with their estimated benefits are listed in Appendix B.

Actual projects and measures implemented to achieve the goals of the Strategy objective may differ from those described in this document. Moreover, projects and measures identified in the Strategy do not become permit conditions by virtue of their inclusion in an approved Strategy. The projects described in this Strategy or alternative projects that the District concurs will provide an equivalent benefit, may be developed and incorporated as consumptive use permit (CUP) conditions through standard permitting procedures and future Strategy revisions, as appropriate.

### **Water conservation**

Water conservation is an important component of any prevention or recovery strategy as it directly affects projected water demand and, therefore, the magnitude of resource impacts. Best

management practices such as improved irrigation scheduling, conversion to more efficient irrigation systems, and moisture sensor-controlled automation can reduce the amount of water applied to crops and landscape. A large portion of these savings occurs through passive water conservation. Passive water conservation occurs when showerheads, appliances, urinals, and faucet aerators are replaced with more efficient fixtures or systems in homes, commercial establishments, institutions, or any facility with household type use.

Potential water conservation quantities were estimated based on the methodologies employed for the NFRWSP. The conservation savings potential within the District was estimated to be 23 million gallons per day (mgd) through both passive water conservation strategies and active water conservation programs funded by local governments or public water supply utilities.

### **Reclaimed water potential**

The reclaimed water projects summarized in Appendixes A and B provide details on the actual projects completed or planned to be constructed to expand the use of reclaimed water as identified in the NFRWSP. Implementation of reclaimed water provides an offset to withdrawals from traditional water sources and reduces potential impacts. Much of this reclaimed water will provide a source of irrigation water for recreational, residential, and commercial users.

### **Black Creek WRD project**

The 10 mgd Black Creek WRD project, identified in the NFRWSP, is currently in the design and permitting phase. The Black Creek WRD development project will provide regional recharge to the Floridan aquifer. In addition to these regional benefits, when fully implemented, this project has the potential to increase median lake levels in Lakes Brooklyn and Geneva by up to 9.9 ft and 4.9 ft, respectively. The estimated construction and 20-year operation and maintenance cost for the project is \$81.4 million. The St. Johns River and Keystone Heights Lake Region Projects legislative appropriations provided nearly \$43.4 million to the Black Creek WRD Project, and the District is also contributing \$5 million toward the project. Once the necessary permits have been issued and sufficient funding has been secured, construction could be completed within 3 years.

The project will provide sufficient benefits to Lakes Brooklyn and Geneva to offset the impacts from current and future water uses that are not subject to individual permitting requirements such as domestic self-supply and other water uses that are below consumptive use permitting thresholds. It is anticipated that additional benefits could be available to offset a portion of existing impacts from individual consumptive use permittees. Permittees would also have the opportunity to partner with the District on the project to ensure the project could be constructed and operated in a manner such that sufficient benefits would be available to fully offset their current and future impacts to Lakes Brooklyn and Geneva. Entities who have executed agreements to participate in the Black Creek WRD project have addressed their proportional share of impacts to the MFLs and are in compliance with the Recovery Strategy up to the amount of lift purchased by that entity.

## Regulatory Component

A regulatory component to the recovery strategy is necessary to not only ensure that existing and future groundwater use is consistent with the recovery and maintenance of the MFLs for Lakes Brooklyn and Geneva, but also to outline the necessary actions by permittees to address their proportional share of the required recovery of the minimum levels for Lakes Brooklyn and Geneva.

### Current permitting rules

Presently, the District possesses a comprehensive system of rules, which regulate consumptive uses of water. These permit criteria are listed in Chapter 40C-2, Florida Administrative Code (F.A.C.), and are expanded upon in the District's *Applicant's Handbook: Consumptive Uses of Water* (A.H). Several existing permit requirements will continue to provide assurance that existing and new permitted consumptive uses are consistent with the Strategy objective:

- Permitting criterion requiring that reasonable-beneficial uses *must not cause harm to the water resources of the area*. See Rule 40C-2.301(2)(g), F.A.C. According to the definition of an MFL, withdrawals that result in MFLs not being achieved are considered significantly harmful to that water body.
- Permitting criterion requiring that reasonable-beneficial uses *must be in accordance with any minimum flow or minimum level and implementation strategy*. See Rule 40C-2.301(2)(h), F.A.C.
- Permitting criterion requiring that reasonable-beneficial uses *must be in such quantity as is necessary for economic and efficient use*. See Rule 40C-2.301(2)(a), F.A.C. To meet the requirements of this criterion, water use must be consistent with the demonstrated water demand for a particular water use.
- A standard limiting condition is placed on consumptive use permits requiring that the permittee's consumptive use of water as authorized by the permit shall not reduce a flow or level below any minimum flow or level established by the District or the Department of Environmental Protection pursuant to sections 373.042 and 373.0421, F.S. The condition further requires that if the permittee's use of water causes or contributes to such a reduction, then the District shall revoke the permit, in whole or in part, unless the permittee implements all provisions applicable to the permittee's use in a District-approved recovery or prevention strategy. See Rule 40C-2.381(2)(a)10., F.A.C.
- Another standard limiting condition requires that the permittee's consumptive use of water as authorized by this permit shall not significantly and adversely impact wetlands, lakes, rivers, or springs. If significant adverse impacts occur, the District shall revoke the permit, in whole or in part, to curtail or abate the adverse impacts, unless the impacts associated with the permittee's consumptive use of water are mitigated by the permittee pursuant to a District-approved plan. See Rule 40C-2.381(2)(a)9., F.A.C.

### Existing Permitted Uses

Nothing in this strategy shall be construed to automatically modify any consumptive use permits to reduce previously authorized allocations. Upon determination that groundwater withdrawals authorized by individual consumptive use permits held by a permittee will cause or contribute,

individually or cumulatively, to a violation of the MFLs for Lakes Brooklyn or Geneva, the District will notify them pursuant to the standard limiting conditions above of their responsibility to address their proportional share of the required recovery of the MFLs. Any modifications to existing consumptive use permits would be in accordance with chapter 373, Florida Statutes, and District rules.

### **Applications for New Quantities and Renewals**

Requests for withdrawals of new quantities of water or renewals of existing allocations that are projected to impact the MFLs for Lakes Brooklyn or Geneva would need to meet the conditions for issuance described above, including a demonstration that the proposed use will not cause or contribute, individually or cumulatively, to violations of the Minimum Levels for Lakes Brooklyn or Geneva.

### **Timeline**

The following timeline highlights the milestones toward achieving the recovery of the MFLs within 20 years.

- **Ongoing efforts**
  - Continue implementation of projects from the NFRWSP (Appendix B).
  - Incentivize water conservation and water supply projects through the District's cost-share programs.
  - Utilize existing Consumptive Use Permitting rules to require applicants to demonstrate their proposed use of water will not cause or contribute, individually or cumulatively to harm to the water resources of the area or to a violation of the Minimum Levels for Lakes Brooklyn and Geneva.
- **2021-2025**
  - Approval of MFL for Lakes Brooklyn and Geneva and associated Recovery Strategy by the District Governing Board.
  - Initiation of construction of Black Creek WRD project.
  - District's Consumptive use permittees whose groundwater withdrawals cause or contribute, individually or cumulatively, to the reduction of the water levels in Lakes Brooklyn or Geneva below their minimum levels will be notified that they must address their proportional share of required recovery of the minimum levels for Lakes Brooklyn and Geneva in accordance with this strategy.
  - Complete construction and begin operation of the Black Creek WRD project.
- **2025-2040**
  - Continue to work with the District's consumptive use permittees to implement their selected methods for addressing their proportional share of the required recovery of the minimum levels for Lakes Brooklyn and Geneva.
  - Continued operation of the Black Creek WRD project.

## **Funding**

### **Black Creek WRD Project**

The St. Johns River and Keystone Heights Lake Region Projects legislative appropriations provided nearly \$43.4 million to the Black Creek WRD Project. The District is also contributing \$5 million toward the project. The Black Creek WRD Project is an example of a regional project whereby entities could partner with the District by contributing to construction and operation and maintenance costs to offset their impacts.

### **Districtwide/REDI Cost-Share programs**

The District primarily provides funding assistance through the Districtwide Cost-Share program, which is administered annually and supports projects that benefit one or more of the District's four core missions: water supply (alternative water supply, non-traditional sources, and water conservation), water quality, natural systems restoration (including projects that provide a significant percent recovery for an MFL waterbody whose status is in prevention or recovery), and flood protection.

This funding assistance is exclusively available for construction-related costs with the District's percent match typically at 33% or up to 50% for conservation projects. The District's scoring criteria is geared such that projects that benefit an MFL water body that is determined to be in prevention or recovery receive the highest score in the core mission benefit ranking criterion, thereby giving weight to projects with demonstrated benefits that are listed within a prevention or recovery strategy. For the current fiscal year (FY), there is approximately \$20 million in the district-wide/REDI cost-share programs.

### **Agricultural Cost-Share program**

The District's Agricultural Cost-share Program provides funding assistance districtwide to agricultural operations for the implementation of projects that conserve water and/or result in nutrient loading reductions. This cost-share program provides up to 75%, not to exceed \$250,000 per project, for engineering, design, and construction costs of an approved project. The grower is expected to cover operation and maintenance costs; however, future requests for long-term maintenance items (such as drip tape) may be considered for funding. For FY 2019/20, the District funded about \$1.9 million and for the current fiscal year is expecting to fund \$1.1 million.

### **Tri-County Agricultural Area (TCAA) Water Management Partnership**

Multiple agencies are contributing funding, education, and technical assistance for growers in the TCAA of Flagler, Putnam, and St. Johns counties to implement projects that contribute to improving the health of the St. Johns River and implementation of effective water conservation measures. These projects are anticipated to contribute to the improved health of the river through on-farm and regional water management projects and practices that reduce the movement of nutrients to the river, improve irrigation efficiencies, which will result in more efficient farm management practices, while maintaining the long-term viability of agriculture in the TCAA. Funds allocated to this program vary year-to-year based upon funding availability from the Florida

Department of Agriculture and Consumer Services, Florida Department of Environmental Protection, and the District. For the FY 2019/20, there was about \$1.9 million funded for the TCAA Water management Partnership. Funding in the current fiscal year is expected be similar.

### **Other funding sources**

There are several grant programs being administered by the Florida Department of Environmental Protection at: <https://protectingfloridatogether.gov/state-action/grants-submissions>, which would provide funding for projects to assist in the recovery of these lakes. Specifically, in FY 2020, the Rivers and Springs Grants had \$25 million available for projects and the Alternative Water Supply Grants had \$40 million available.

## References

- SJRWMD and SRWMD. 2017. *North Florida Regional Water Supply Plan (2015–2035)*. St. Johns River Water Management District and Suwannee River Water Management District. Palatka, FL.
- Sutherland, A.B., F. Gordu, and S. Jennewein. 2020. *Minimum Levels Revaluation for Lakes Brooklyn and Geneva; Clay and Bradford Counties, Florida (Draft)*. St. Johns River Water Management District. Palatka, FL.

## **Appendices**

Appendix A: NFRWSP projects completed from 2014-2020

Appendix B: NFRWSP projects planned to be completed by 2030

## **Appendix A**

### **NFRWSP projects completed from 2014–2020 (updated October 2020)**

| Completion Date | County    | Project Name   | Implementing Entity                         | Project Type                 | Water Source         | Project Capacity (mgd) | Total Capital (\$M) |
|-----------------|-----------|--|---|------------------------------|----------------------|------------------------|---------------------|
| 2014            | Duval     | Queens Harbor Reclaimed Water Main Expansion                                     | JEA and Queens Harbor Golf and Country Club | Reuse - Pipeline             | Reclaimed Water      | 0.30                   | 0.5                 |
| 2015            | Clay      | AMI  | CCUA  | Conservation                 | Floridan             | 0.08                   | 0.0                 |
| 2015            | Duval     | Atlantic Beach Selva Marina Reclaimed Water System Expansion                     | City of Atlantic Beach                      | Reuse - Supply               | Reclaimed Water      | 0.50                   | 1.1                 |
| 2015            | Duval     | Gate Pkwy - Shiloh Mill Blvd to Town Ctr Pkwy - Reclaimed Water System Expansion | JEA   | Reuse - Pipeline             | Reclaimed Water      | 0.01                   | 0.3                 |
| 2015            | Flagler   | Palm Coast Royal Palms Parkway Reclaimed Water Line                              | City of Palm Coast                          | Reuse - Pipeline             | Reclaimed Water      | 0.05                   | 0.3                 |
| 2015            | Flagler   | Palm Coast Utilization of Concentrate as Raw Water Supply                        | City of Palm Coast                          | AWS                          | Concentrate          | 0.75                   | 1.2                 |
| 2015            | St. Johns | Nocatee Coastal Oaks Phase 4   | JEA   | Reuse - Supply               | Reclaimed Water      | 2.00                   | 1.1                 |
| 2015            | St. Johns | AMR - Ponte Vedra System   | SJCUD                                       | Conservation                 | N/A                  | 0.39                   | 4.3                 |
| 2015            | St. Johns | Outdoor BMP Retrofit   | SJCUD                                       | Conservation                 | N/A                  | 0.00                   | 0.1                 |
| 2015            | St. Johns | Soil Moisture Sensor Pilot Project   | SJCUD                                       | Conservation                 | N/A                  | 0.04                   | 0.3                 |
| 2016            | Clay      | Reclaimed Water SCADA System   | CCUA  | Reuse                        | Reclaimed Water      | 4.51                   | 0.7                 |
| 2016            | Duval     | Arlington East Water Reclamation Facility - Onsite Reuse Pump Upgrade            | JEA   | Reuse - Pipeline and Pumping | Reclaimed Water      | 0.60                   | 0.6                 |
| 2016            | Duval     | District II - Broward River Crossing Replacement                                 | JEA   | Reuse - Pipeline             | Reclaimed Water      | 0.08                   | 4.8                 |
| 2016            | Duval     | Intermediate Well Conversion   | San Jose Country Club                       | AWS                          | Intermediate aquifer | 0.27                   | 0.0                 |

| <b>Completion Date</b> | <b>County</b> | <b>Project Name</b>   | <b>Implementing Entity</b> | <b>Project Type</b>                | <b>Water Source</b> | <b>Project Capacity (mgd)</b> | <b>Total Capital (\$M)</b> |
|------------------------|---------------|---|----------------------------|------------------------------------|---------------------|-------------------------------|----------------------------|
| 2016                   | Flagler       | State Street Irrigation System Expansion                              | City of Bunnell            | Reuse - Pipeline                   | Reclaimed Water     | 0.10                          | 0.1                        |
| 2016                   | Flagler       | Palm Coast Matanzas Woods Reclaimed Pipeline                          | City of Palm Coast         | Reuse - Pipeline                   | Reclaimed Water     | 2.00                          | 2.5                        |
| 2016                   | St. Johns     | Nocatee Area - Artisan Lakes - N10 - Reclaimed Water System Expansion | JEA                        | Reuse - Pipeline                   | Reclaimed Water     | 0.02                          | 0.2                        |
| 2016                   | St. Johns     | Nocatee Area - Riverwood POD 17 - Reclaimed Water System Expansion    | JEA                        | Reuse - Pipeline                   | Reclaimed Water     | 0.02                          | 0.2                        |
| 2016                   | St. Johns     | Nocatee Area - Twenty Mile Village - Reclaimed Water System Expansion | JEA                        | Reuse - Pipeline                   | Reclaimed Water     | 0.02                          | 0.3                        |
| 2016                   | St. Johns     | Nocatee Storage and Repump Facility Tank Expansion                    | JEA                        | Reuse - Storage                    | Reclaimed Water     | 0.00                          | 0.3                        |
| 2016                   | St. Johns     | AI WWTP Reuse Storage Tank and Booster Pump Station                   | SJCUD                      | Reuse - Storage and Pumping        | Reclaimed Water     | 2.00                          | 1.5                        |
| 2016                   | St. Johns     | International Golf Parkway - Reclaimed Water System Expansion         | SJCUD                      | Reuse - Pipeline                   | Reclaimed Water     | 0.42                          | 2.4                        |
| 2016                   | St. Johns     | NW WWTF Reclaimed Water System Expansions/Improvements                | SJCUD                      | Reuse - Pipeline, Storage, Pumping | Reclaimed Water     | 3.00                          | 2.6                        |
| 2016                   | St. Johns     | SR 16 Corridor Reclaimed Water System Expansions/Improvements         | SJCUD                      | Reuse - Pipeline, Storage, Pumping | Reclaimed Water     | 1.00                          | 3.1                        |

| <b>Completion Date</b> | <b>County</b> | <b>Project Name</b>   | <b>Implementing Entity</b> | <b>Project Type</b>         | <b>Water Source</b> | <b>Project Capacity (mgd)</b> | <b>Total Capital (\$M)</b> |
|------------------------|---------------|---|----------------------------|-----------------------------|---------------------|-------------------------------|----------------------------|
| 2016                   | St. Johns     | AI WWTP Reuse Storage Tank and Booster Pump Station   | SJCUD/ SJRWMD              | Reuse - Storage and Pumping | Reclaimed Water     | 2.00                          | 1.5                        |
| 2016                   | St. Johns     | International Golf Parkway - Reclaimed Water System Expansion                                     | SJCUD/ SJRWMD              | Reuse - Pipeline            | Reclaimed Water     | 0.42                          | 2.4                        |
| 2017                   | Duval         | Bartram Park WTP - RW - Storage Expansion   | JEA                        | Reuse - Storage             | Reclaimed Water     | 0.05                          | 2.2                        |
| 2017                   | Flagler       | Palm Coast Grand Landing Reclaimed Water Transmission Main  | City of Palm Coast         | Reuse - Pipeline            | Reclaimed Water     | 0.56                          | 0.7                        |
| 2017                   | Flagler       | Palm Coast RCW Irrigation Along US-1 & Palm Coast Park  | City of Palm Coast         | Reuse - Pipeline            | Reclaimed Water     | 1.00                          | 1.5                        |
| 2017                   | St. Johns     | Bartram Park Reclaimed Water Storage Tank Expansion   | JEA                        | Reuse - Storage             | Reclaimed Water     | 0.53                          | 2.1                        |
| 2017                   | St. Johns     | Nocatee Area - Crosswater Pkwy - Coastal Oaks to South Village - Reclaimed Water System Expansion | JEA                        | Reuse - Pipeline            | Reclaimed Water     | 0.04                          | 0.4                        |
| 2017                   | St. Johns     | Nocatee Area - Twenty Mile Village Ph 4A - 4B - Reclaimed Water System Expansion                  | JEA                        | Reuse - Pipeline            | Reclaimed Water     | 0.02                          | 0.3                        |
| 2017                   | St. Johns     | Nocatee Booster Station   | JEA                        | Reuse - Pumping             | Reclaimed Water     | 1.20                          | 1.4                        |
| 2017                   | St. Johns     | Nocatee North Storage and Repump Facility - New 3.5 MG Reclaimed Water Storage Tank               | JEA                        | Reuse - Storage             | Reclaimed Water     | 0.07                          | 2.5                        |
| 2017                   | St. Johns     | City of St. Augustine Beach Reclaimed Water System Expansion                                      | SJCUD                      | Reuse - Pipeline            | Reclaimed Water     | 0.02                          | 0.6                        |

| Completion Date | County    | Project Name  | Implementing Entity        | Project Type     | Water Source    | Project Capacity (mgd) | Total Capital (\$M) |
|-----------------|-----------|---|----------------------------|------------------|-----------------|------------------------|---------------------|
| 2017            | St. Johns | NW Automated Metering Infrastructure System Expansion                         | SJCUD                      | Conservation     | N/A             | 0.14                   | 0.1                 |
| 2017            | St. Johns | Web Based Customer Portal   | SJCUD                      | Conservation     | N/A             | 0.37                   | 0.0                 |
| 2018            | Clay      | Old Jenning Road Reclaimed Storage Tank                                       | CCUA                       | Reuse - Storage  | Reclaimed Water | 1.70                   | 1.3                 |
| 2018            | Clay      | Tynes Blvd. Reclaimed Water Main Extension                                    | CCUA                       | Reuse - Pipeline | Reclaimed Water | 1.92                   | 0.3                 |
| 2018            | Duval     | Jacksonville Beach Water & Sewer Mains Extension                              | City of Jacksonville Beach | Reuse - Supply   | Reclaimed Water | 0.00                   | 0.4                 |
| 2018            | Duval     | 9B Reclaimed Water System Expansion   | JEA                        | Reuse - Pipeline | Reclaimed Water | 13.00                  | 0.5                 |
| 2018            | Duval     | Monument Rd - Cancun Dr to Hidden Hills Ln - Reclaimed Water System Expansion | JEA                        | Reuse - Pipeline | Reclaimed Water | 0.36                   | 0.6                 |
| 2018            | Duval     | RG Skinner Area - 9B to Parcels 10A - 11 - Reclaimed Water System Expansion   | JEA                        | Reuse - Pipeline | Reclaimed Water | 0.12                   | 1.1                 |
| 2018            | Duval     | RG Skinner Area - 9B to T-Line - Reclaimed Water System Expansion             | JEA                        | Reuse - Pipeline | Reclaimed Water | 0.12                   | 1.2                 |
| 2018            | St. Johns | Rivertown - Parcel 13 - Southern POD - Reclaimed Water System Expansion       | JEA                        | Reuse - Pipeline | Reclaimed Water | 0.02                   | 0.1                 |
| 2018            | St. Johns | St Johns Pkwy - Racetrack Rd to Espada Ln - Reclaimed Water System Expansion  | JEA                        | Reuse - Pipeline | Reclaimed Water | 0.01                   | 0.6                 |

| <b>Completion Date</b> | <b>County</b> | <b>Project Name</b>   | <b>Implementing Entity</b> | <b>Project Type</b>         | <b>Water Source</b> | <b>Project Capacity (mgd)</b> | <b>Total Capital (\$M)</b> |
|------------------------|---------------|---|----------------------------|-----------------------------|---------------------|-------------------------------|----------------------------|
| 2019                   | Duval         | Baymeadows Rd - Point Meadows Rd to Old Still PUD - Reclaimed Water System Expansion              | JEA                        | Reuse - Pipeline            | Reclaimed Water     | 0.01                          | 1.0                        |
| 2019                   | Duval         | JP - FDOT - SR 9A (I-295) - Managed Lanes - JTB - 9B Extension - Reclaimed Water System Expansion | JEA                        | Reuse - Pipeline            | Reclaimed Water     | 0.06                          | 0.3                        |
| 2019                   | Duval         | Mandarin Water Reclamation Facility - Equalization Storage Tank and Transfer Pump Station         | JEA                        | Reuse - Storage and Pumping | Reclaimed Water     | 0.03                          | 2.6                        |
| 2019                   | Duval         | Mandarin Water Reclamation Facility - High Level UV Upgrade                                       | JEA                        | Reuse - Supply              | Reclaimed Water     | 3.05                          | 4.2                        |
| 2019                   | Duval         | RG Skinner - North Rd - Reclaimed Water System Expansion  | JEA                        | Reuse - Pipeline            | Reclaimed Water     | 0.47                          | 3.0                        |
| 2019                   | Nassau        | Nassau RW Main - Radio Av to Harts Rd - Trans - Reclaimed Water System Expansion                  | JEA                        | Reuse - Pipeline            | Reclaimed Water     | 0.04                          | 2.3                        |
| 2019                   | Nassau        | William Burgess Rd - SR200 to Harts Rd - Trans - New - Reclaimed Water System Expansion           | JEA                        | Reuse - Pipeline            | Reclaimed Water     | 0.46                          | 2.5                        |
| 2019                   | St. Johns     | Bannon Lakes 2 MG Reclaimed Water Storage and Booster Pump Station                                | SJCUD                      | Reuse - Storage and Pumping | Reclaimed Water     | 0.42                          | 3.2                        |
| 2020                   | Clay          | Stormwater Harvest Pilot Project  | CCUA                       | Reuse - Pipeline            | Stormwater          | 0.40                          | 1.2                        |

| <b>Completion Date</b> | <b>County</b> | <b>Project Name</b>  | <b>Implementing Entity</b> | <b>Project Type</b>                       | <b>Water Source</b> | <b>Project Capacity (mgd)</b> | <b>Total Capital (\$M)</b> |
|------------------------|---------------|--|----------------------------|---|---------------------|-------------------------------|----------------------------|
| 2020                   | Clay          | Tynes Reclaimed Storage Tank and Pumping Facility                                  | CCUA                       | Reuse - Storage                           | Reclaimed Water     | 1.10                          | 4.0                        |
| 2020                   | Duval         | WTP SCADA System Upgrade   | City of Atlantic Beach     | Conservation                              | N/A                 | 0.48                          | 0.2                        |
| 2020                   | Duval         | Gate Pkwy - Glen Kernan to T-Line - Trans - New - Reclaimed Water System Expansion | JEA                        | Reuse - Pipeline                          | Reclaimed Water     | 0.18                          | 8.5                        |
| 2020                   | Duval         | Tredinick Pkwy - Millcoe Rd to Mill Creek Rd - Reclaimed Water System Expansion    | JEA                        | Reuse - Pipeline                          | Reclaimed Water     | 0.04                          | 1.6                        |
| 2020                   | St. Johns     | CR210 - Old Dixie Hwy to Twin Creeks - Trans - Reclaimed Water System Expansion    | JEA                        | Reuse - Pipeline                          | Reclaimed Water     | 0.06                          | 2.3                        |
| 2020                   | St. Johns     | Oak Bridge Golf Course Reuse Modification  | SJCUD                      | Reuse - Storage and Pumping, and Pipeline | Reclaimed Water     | 0.50                          | 1.9                        |

## **Appendix B**

**NFRWSP projects planned to be completed by 2030 (updated October 2020)**

| <b>Timeframe for Completion</b> | <b>County</b>   | <b>Project Name</b>   | <b>Implementing Entity</b> | <b>Project Type</b>         | <b>Water Source</b> | <b>Project Capacity (mgd)</b> | <b>Total Capital (\$M)</b> |
|---------------------------------|-----------------|---|----------------------------|-----------------------------|---------------------|-------------------------------|----------------------------|
| 2021                            | St. Johns       | Twin Creeks Reclaimed Water Storage Tank and Booster Pump Station                 | JEA                        | Reuse - Storage and Pumping | Reclaimed Water     | 2.00                          | 3.5                        |
| 2022                            | Alachua         | Low-Income Water Efficient Toilet Exchange Program                                | GRU                        | Conservation                | N/A                 | 0.00                          | 0.1                        |
| 2022                            | Clay            | Potable Reuse Pilot Project   | CCUA                       | Supply/Storage              | Reclaimed Water     | 0.03                          | 4.0                        |
| 2022                            | Clay            | Ridaught Reclaimed Water Ground Storage Tank                                      | CCUA                       | Reuse - Storage             | Reclaimed Water     | 1.10                          | 1.3                        |
| 2022                            | Clay            | Saratoga Springs Reclaimed Water Storage and Pumping Facility                     | CCUA                       | Reuse - Storage             | Reclaimed Water     | 1.10                          | 4.3                        |
| 2022                            | Clay            | Saratoga Springs Reclaimed Water Transmission/Distribution Main Extensions        | CCUA                       | Reuse - Pipeline            | Reclaimed Water     | 1.91                          | 1.2                        |
| 2022                            | Duval/St. Johns | US 1 - Greenland WRF to CR 210 - Reclaimed Water System Expansion                 | JEA                        | Reuse - Pipeline            | Reclaimed Water     | 0.06                          | 7.8                        |
| 2022                            | Nassau          | Nassau Area - Radio Av - Reclaimed Water Storage Tank and Booster Pump Station    | JEA                        | Reuse - Storage and Pumping | Reclaimed Water     | 1.44                          | 3.3                        |
| 2022                            | St. Johns       | CR210 - South Hampton to Ashford Mills - Trans - Reclaimed Water System Expansion | JEA                        | Reuse - Pipeline            | Reclaimed Water     | 0.02                          | 0.6                        |
| 2023                            | St. Johns       | CR210 - Longleaf Pine Pkwy to Ashford Mills Rd - Reclaimed Water System Expansion | JEA                        | Reuse - Pipeline            | Reclaimed Water     | 0.16                          | 5.0                        |

| <b>Timeframe for Completion</b> | <b>County</b> | <b>Project Name</b>   | <b>Implementing Entity</b> | <b>Project Type</b>                       | <b>Water Source</b> | <b>Project Capacity (mgd)</b> | <b>Total Capital (\$M)</b> |
|---------------------------------|---------------|---|----------------------------|---|---------------------|-------------------------------|----------------------------|
| 2024                            | Clay          | Peter's Creek AWT Plant Expansion and Reclaimed Water Facility (f.k.a. Green Cove Regional Reclaimed WTP) | CCUA                       | Reuse - Supply                            | Reclaimed Water     | 1.50                          | 22.0                       |
| 2024                            | St. Johns     | Nocatee South Reclaimed Water Storage Tank and Booster Pump Station                                       | JEA                        | Reuse - Storage and Pumping               | Reclaimed Water     | 2.00                          | 3.5                        |
| 2024                            | St. Johns     | SR 16 Corridor Reuse Transmission Main Expansion  | SJCUD                      | Reuse - Storage and Pumping, and Pipeline | Reclaimed Water     | 1.00                          | 3.7                        |
| 2025                            | Duval         | Davis - Gate Pkwy to RG Skinner - Reclaimed Water System Expansion  | JEA                        | Reuse - Pipeline                          | Reclaimed Water     | 0.12                          | 5.0                        |
| 2025                            | Duval         | Greenland Reclaimed Water Repump Facility - Storage Tank and Booster Pump Station                         | JEA                        | Reuse - Storage and Pumping               | Reclaimed Water     | 4.00                          | 5.0                        |
| 2025                            | Duval         | T-Line - Greenland Substation to GEC - Reclaimed Water System Expansion                                   | JEA                        | Reuse - Pipeline                          | Reclaimed Water     | 0.12                          | 3.1                        |
| 2025                            | Nassau        | Nassau Regional WWTF Reclaimed Water Storage Tank, UV Disinfection and Pumps                              | JEA                        | Reuse - Storage, Pumping and Supply       | Reclaimed Water     | 2.16                          | 6.1                        |
| 2025                            | St. Johns     | NW Wellfield VFD addition   | SJCUD                      | Conservation                              | Floridan            | 1.55                          | 1.0                        |
| 2025                            | St. Johns     | NW WRF Expansion (3 MGD to 6 MGD)   | SJCUD                      | Reuse - treatment, Storage, and Pumping   | Reclaimed Water     | 3.00                          | 40.0                       |
| 2025                            | St. Johns     | Promote Cost-Effective Conservation Programs  | SJCUD                      | Conservation                              | N/A                 | 1.14                          | 3.8                        |

| <b>Timeframe for Completion</b> | <b>County</b> | <b>Project Name</b>  | <b>Implementing Entity</b> | <b>Project Type</b>                       | <b>Water Source</b> | <b>Project Capacity (mgd)</b> | <b>Total Capital (\$M)</b> |
|---------------------------------|---------------|--|----------------------------|---|---------------------|-------------------------------|----------------------------|
| 2026                            | Duval         | Arlington East WRF - Reclaimed Water Filtration Expansion - Increase Capacity from 8.0 to 10.0 MGD | JEA                        | Reuse - Supply                            | Reclaimed Water     | 2.00                          | 2.8                        |
| 2026                            | Duval         | Monument Rd - Arlington East WRF to St Johns Bluff Rd - Reclaimed Water System Expansion           | JEA                        | Reuse - Pipeline                          | Reclaimed Water     | 0.06                          | 3.3                        |
| 2026                            | Duval         | Ridenour WTP - Reclaimed Water Storage and Repump  | JEA                        | Reuse - Storage and Pumping               | Reclaimed Water     | 3.00                          | 3.7                        |
| 2026                            | St. Johns     | CR210 - Twin Creeks to Russell Sampson Rd - Reclaimed Water System Expansion                       | JEA                        | Reuse - Pipeline                          | Reclaimed Water     | 0.06                          | 3.0                        |
| 2027                            | St. Johns     | RiverTown WTP - Reclaimed Water - New Storage and Pumping System                                   | JEA                        | Reuse - Storage and Pumping               | Reclaimed Water     | 2.00                          | 4.0                        |
| 2027                            | St. Johns     | Veterans Pkwy - Longleaf Pine Pkwy to CR210 - Reclaimed Water System Expansion                     | JEA                        | Reuse - Pipeline                          | Reclaimed Water     | 0.06                          | 8.8                        |
| 2027                            | St. Johns     | Develop supplemental reclaimed water source from stormwater harvesting (Potential I-95 Corridor)   | SJCUD                      | Reuse - Supply                            | Stormwater          | 2.00                          | 14.5                       |
| 2027                            | St. Johns     | SR 207 WRF Expansion   | SJCUD                      | Reuse - Storage and Pumping, and Pipeline | Reclaimed Water     | 2.25                          | 40.0                       |
| 2030                            | Alachua       | Brytan subdivision Reclaimed Water system expansion  | GRU                        | Reuse - Pipeline                          | Reclaimed Water     | 0.07                          | 1.1                        |
| 2030                            | Clay          | FCOB Stormwater Ponds  | CCUA                       | Reuse - Pipeline                          | Stormwater          | 2.50                          | 27.0                       |

