BEFORE THE ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
ORDER NO. SJR 2017-002
FOR 2013-0017

IN RE: NORTH FLORIDA REGIONAL WATER
SUPPLY PLAN (2015-2035 Planning Horizon)
/

ORDER APPROVING THE NORTH FLORIDA REGIONAL WATER SUPPLY PLAN

THIS MATTER came before the Governing Board of the St. Johns River Water Management District ("District") on January 17, 2017. The Governing Board, having been fully advised of the matter, hereby approves the North Florida Regional Water Supply Plan with appendices (2015-2035)(NFRWSP), recognizing that the District's authority for water supply planning extends to water supply planning regions within the District's jurisdictional boundaries as established in section 373.069, F.S.

The NFRWSP is attached hereto:

DONE and ORDERED by the Governing Board of the St. Johns River Water Management District on January 17, 2017.

ST. JOHNS RIVER WATER
MANAGEMENT DISTRICT

By: ______________________
John A. Miklos, Chairman

Approved as to Legal Form and Content

William Abrams, Deputy General Counsel

Attest: Charles W. Drake
Charles W. Drake, Secretary

(Seal)

Filed January 17, 2017

Susan Gatchell
for District Clerk

BEFORE THE SUWANNEE RIVER WATER MANAGEMENT DISTRICT
ORDER NO. ____2017- 0001

IN RE: NORTH FLORIDA REGIONAL WATER
SUPPLY PLAN (2015-2035)
_________________________________/

ORDER APPROVING THE NORTH FLORIDA REGIONAL WATER SUPPLY PLAN

THIS MATTER came before the Governing Board of the Suwannee River Water Management District ("District") on January 17, 2017. The Governing Board, having been fully advised of the matter, hereby approves the North Florida Regional Water Supply Plan with appendices (2015-2035)(NFRWSP), recognizing that the District's authority for water supply planning extends to water supply planning regions within the District's jurisdictional boundaries as established in section 373.069, F.S.

The NFRWSP is attached hereto.

DONE and ORDERED by the Governing Board of the Suwannee River Water Management District on January 17, 2017.

SUWANNEE RIVER WATER
MANAGEMENT DISTRICT

By: ______________________
Don Quincey, Chairman

Approved as to Legal Form and Content
Tom Reeves, Board Counsel

Attest: ______________________
Virginia Johns, Secretary

Filed January 17, 2017

____
District Clerk

North Florida Regional Water Supply Plan (2015 – 2035)

St. Johns River Water Management District
Palatka, Florida

Suwannee River Water Management District
Live Oak, Florida

January 13, 2017

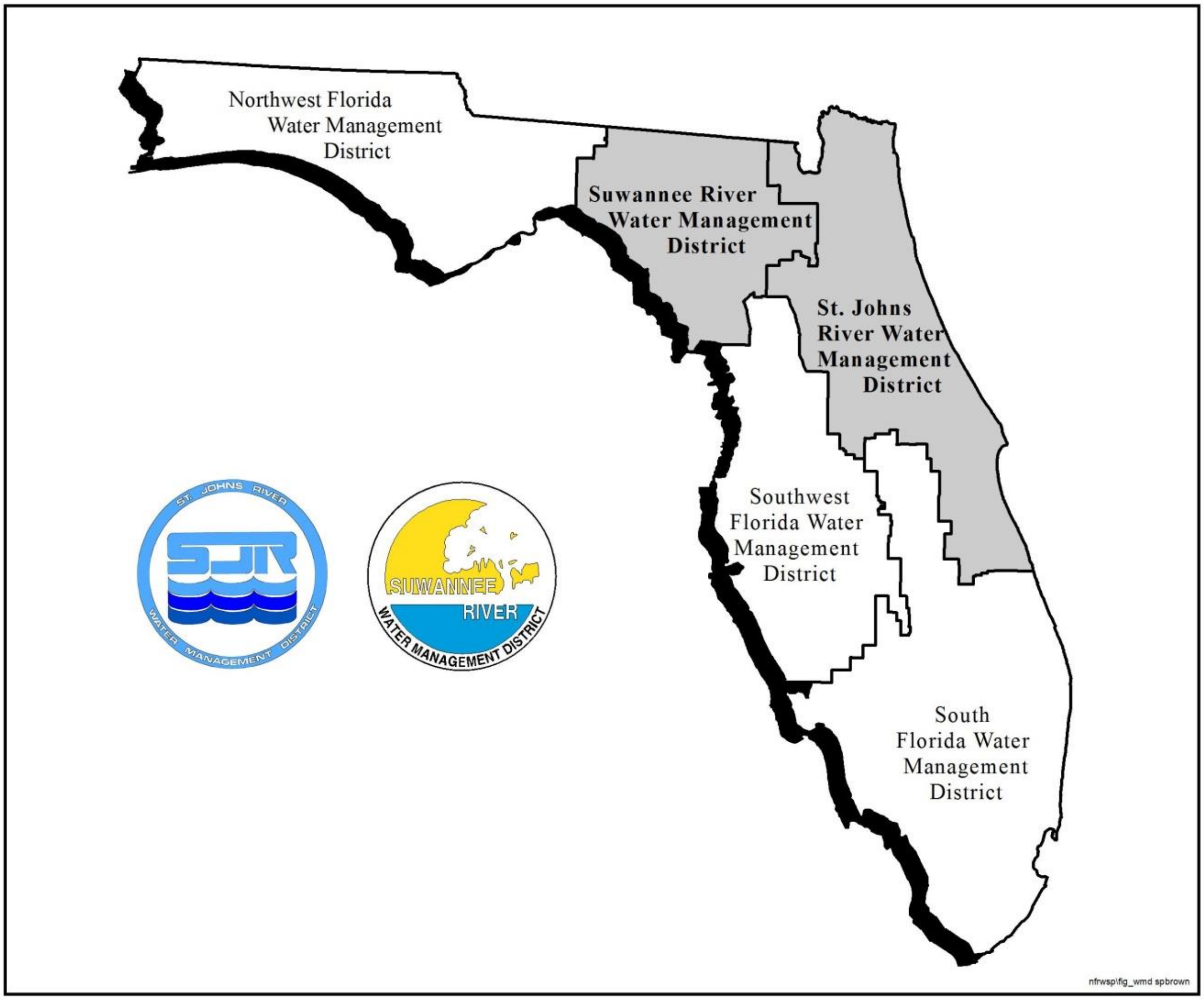

Figure 1: Location and Boundaries of the St. Johns River and Suwannee River Water Management Districts

Acknowledgements

The Florida Department of Environmental Protection (FDEP), St. Johns River Water Management District (SJRWMD) and Suwannee River Water Management District (SRWMD) recognize and thank the Stakeholder Advisory Committee, state agencies and other stakeholders for their contributions, comments, advice, information, and assistance throughout the development of the North Florida Regional Water Supply Plan. Furthermore, SJRWMD and SRWMD express their appreciation to all staff who contributed to the development and production of this collaborative regional water supply plan. For further information about this document, please visit northfloridawater.com.

Executive Summary

The North Florida Regional Water Supply Plan (NFRWSP) is the first-ever regional water supply plan for 14 north Florida counties and was developed through a highly collaborative process among the Suwannee River and St. Johns River water management districts and the Florida Department of Environmental Protection (FDEP), local governments, public supply utilities, environmental advocates and other stakeholders. Over the past four years, the water supply planning process included 36 Stakeholder Advisory Committee (SAC) meetings, more than 50 other stakeholder meetings and two public workshops to engage stakeholders to understand their individual perspectives as related to water resource issues in north Florida. This plan is a direct result of the collaboration between these groups who each share the common goals of preserving and extending our future water supply.

This water supply plan covers a 20-year planning period and is based on the best data and research available. A key component of the plan is the North Florida Southeast Georgia groundwater flow model (NFSEG), developed by the two districts in collaboration with the Southwest Florida Water Management District in a separate open-public process with stakeholder input. This groundwater flow model is the largest in the state and incorporates all elements of the water budget including: recharge, evapotranspiration, surface water flows, groundwater levels and water use. The development of the model utilized a state-of-the-art calibration process to incorporate the most current data and provides the best available approximation of all components of the water budget within the planning area and the model domain. This model provides the most technologically sophisticated picture of groundwater withdrawals on water resources in North Florida.

As a result of the collaborative process, the Districts determined fresh groundwater alone cannot supply the projected 117 million gallons per day increase in water demand during the 20-year planning horizon without causing unacceptable impacts to water resources. The NFRWSP identifies solutions to meet the current and future water use needs of the region while ensuring the natural resources of the area are protected.

One of the major highlights of this plan is its focus on conservation. In fact, the NFRWSP is the most comprehensive water conservation plan in the region. The plan illustrates water conservation efforts which could potentially reduce the projected 2035 water demand by as much 54 million gallons per day (mgd). This represents 46% of the projected 117 mgd increase in demand over the 20-year planning horizon and demonstrates the Districts' commitment to water conservation.

In addition to water conservation, the plan identifies an additional 160 mgd of potential project options to guide water users and suppliers in their efforts to meet the projected demand while protecting our natural resources. Project options range from aquifer recharge, rehydration of wetlands and potable reuse, to alternative water supply sources like reclaimed and stormwater. Both Districts are committed to working with local governments to share costs to help get these beneficial projects implemented.

Water supply planning is an ongoing process, with enhanced scientific methodologies and new data acquired all the time. District staff are already working on the science and data collection for the plan's five-year update. Through this process, the Districts have been able to create a roadmap that offers options to achieve sustainable water use through the planning horizon.

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List of Abbreviations and Acronyms

ASR	Aquifer Storage and Recovery
AWS	Alternative Water Supply(ies)
BEBR	Bureau of Economic and Business Research

BMPs	Best Management Practices
CFS	Cubic Feet per Second
CFWI	Central Florida Water Initiative
CII/MD	Commercial/Industrial/Institutional and Mining/Dewatering Self-supply
CUP/WUP	Consumptive/Water Use Permit
Districts	St. Johns River and Suwannee River Water Management Districts
DSS	Domestic Self-supply and Small Public Supply Systems
EDR	Electrodialysis Reversal
EQIP	Environmental Quality Incentive Program
F.A.C.	Florida Administrative Code
FAS	Floridan Aquifer System
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
F.S.	Florida Statutes
FSAID	Florida Statewide Agricultural Irrigation Demand
FWCA	Florida Water and Climate Alliance
GIS	Geographic Information Systems
GPCD	Gallons Per Capita Per Day
LFA	Lower Floridan Aquifer
LRA	Landscape/Recreational/Aesthetic Irrigation Self-supply
LSFI	Lower Santa Fe and Ichetucknee Rivers and associated priority springs
LSFRB	Lower Santa Fe River Basin
M	Million (as expressed in million dollars)
MFLs	Minimum Flows and Minimum Water Levels
mgd	Million Gallons Per Day
mg/L	Milligram per Liter
mg/L/yr	Milligram per Liter per Year
NFRWSP	North Florida Regional Water Supply Plan
NFSEG	North Florida Southeast Georgia Regional Groundwater Flow Model
NRCS	Natural Resources Conservation Service
OAWP	Office of Agriculture Water Policy
OFS	Outstanding Florida Springs
Partnership	North Florida Regional Water Supply Partnership
PG	Thermoelectric Power Generation Self-supply
PSC	Florida Public Service Commission
RO	Reverse Osmosis
RWSP	Regional Water Supply Plan
s.	Section
SAC	Stakeholder Advisory Committee
SAS	Surficial Aquifer System
SDWS	Secondary Drinking Water Standard
SFWMD	South Florida Water Management District
SJRWMD	St. Johns River Water Management District
SRWMD	Suwannee River Water Management District
ss.	Subsection and further subdivisions
TDS	Total Dissolved Solids

UFA	Upper Floridan Aquifer
WIFIA	Water Infrastructure Finance and Innovation Act
WMDs	Florida's Five Water Management Districts
WPSP	Water Protection and Sustainability Program
WRCA	Water Resource Caution Area
WSA	Water Supply Assessment
WWTF	Wastewater Treatment Facility

Chapter 1: About the North Florida Planning Region

Introduction

The North Florida Regional Water Supply Plan (NFRWSP) area includes 14 counties in the St. Johns River Water Management District (SJRWMD) and the Suwannee River Water Management District (SRWMD) (Districts): Alachua, Baker, Bradford, Clay, Columbia, Duval, Flagler, Gilchrist, Hamilton, Nassau, Putnam, St. Johns, Suwannee, and Union (Figure 2).

The following statistics apply within the NFRWSP area.

Population (2010):

SJRWMD: approximately 1.7 million

SRWMD: approximately 223,000

Total NFRWSP: 1.9 million

Primary Surface Water Basins:

SJRWMD: Lower St. Johns River and Nassau River, Northern Coastal, portions of the St. Marys River, Orange Lake, and the Florida Ridge.

SRWMD: Upper Suwannee, Santa Fe, Alapaha, and Ichetucknee. (Over 90 percent of the Alapaha and over 55 percent of the Suwannee river basins are located in Georgia).

Springs (4th magnitude and larger):

SJRWMD: There are 16 documented springs, of which there are no Outstanding Florida Springs (OFS).

SRWMD: There are 125 documented springs. In the Lower Santa Fe River, the following springs are OFS: July, Devil's Ear (Ginnie Group), Poe, Columbia, Treehouse, and Hornsby. In the Ichetucknee River, the following springs are OFS: Blue Hole and the Ichetucknee Group.

Overview of the North Florida Regional Water Supply Partnership

Partnership History

The North Florida Regional Water Supply Partnership (Partnership) was established in 2011 via a formal agreement executed by the Florida Department of Environmental

Protection (FDEP) and the Districts. The NFRWSP area includes 14 counties in north Florida; five are located within SRWMD, six are located within SJRWMD and three are located in both Districts (Figure 2). In total, the Partnership covers more than 8,000 square miles. The purpose of the Partnership is to protect natural resources and water supplies in north Florida. This is being achieved through collaborative planning, scientific-tool development and related efforts. The agreement and other information about the Partnership can be found at northfloridawater.com.

North Florida Regional Water Supply Partnership Stakeholder Advisory Committee

The Stakeholder Advisory Committee (SAC) was a key component of the Partnership. Established by the Partnership in 2012, the SAC provided non-binding advisory recommendations to the Partnership regarding the NFRWSP. The twelve SAC members were appointed by the Districts to represent the following stakeholder groups: public water supply, commercial/power generation, industrial/mining, agriculture, environmental, and local governments. Each stakeholder group was represented by two members on the SAC, one appointed by each District. The SAC members were responsible for representing the concerns and opinions of their respective group and facilitating submittal of applicable project options. Additional information about the SAC, including membership and meeting documents, is available at northfloridawater.com.

The SAC met 36 times from 2012 through completion of the draft NFRWSP. The SAC focused on the NFRWSP and provided the Districts with meaningful discussion and recommendations from a stakeholders perspective as the NFRWSP components were brought forward for consideration. In addition, the results and methodologies employed for the NFRWSP were reviewed by the SAC, stakeholders and the Districts' water use regulation staff. The SAC members made many significant and positive contributions to the NFRWSP.

At the final meeting on November 2, 2016, the SAC unanimously, in a 12-0 vote, stated that: "SAC supports the Draft RWSP and recommends that the SRWMD and the SJRWMD Governing Boards approve the Joint North Florida Regional Water Supply Plan."

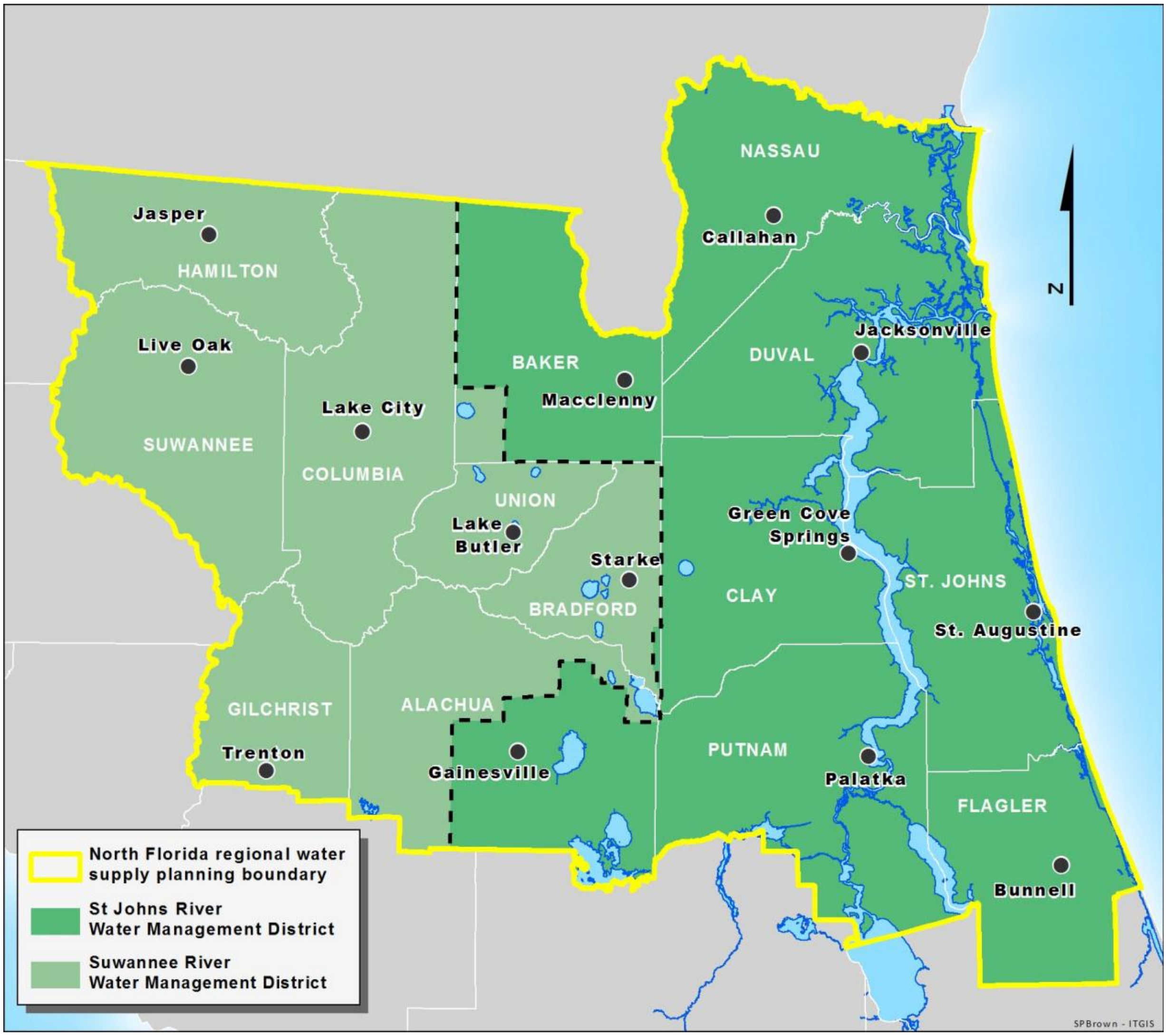

Figure 2: North Florida Regional Water Supply Planning Partnership

Plan Horizon

Subsection (ss.) 373.709(1), Florida Statutes (F.S.), requires that the Districts conduct water supply assessments to identify areas where sources of water are not adequate to supply water for all existing and future reasonable-beneficial uses and to sustain the water resources and related natural systems for the planning period. Water supply planning is then required for such areas. Water supply plans identify water needs, sources and project options for at least a 20-year timeframe (ss. 373.709(2), F.S). With a 2035 planning horizon, the NFRWSP includes projected water demands, potential water resource impacts, and a combination of project options, water conservation and water sources that may be utilized to meet future water needs through the planning horizon and avoid unacceptable water resource impacts in the NFRWSP area.

Additional NFRWSP Outreach

Beginning in early January 2016, District staff held over 50 focused meetings with local governments, civic groups, advocacy groups, regional organizations, agricultural entities, environmental groups, media and other interested parties in the NFRWSP area. The purpose of the meetings was to share an overview of the NFRWSP process, provide background information of interest to particular stakeholders and answer questions. Staff also solicited feedback and project concepts. This effort provided a valuable means for stakeholders not involved in the SAC to engage with the NFRWSP development and share their perspective with the Districts. The Districts found the expanded input received during these discussions to be beneficial to the NFRWSP development.

In addition to participation from the SAC and the outreach meetings, the Districts held public workshops on October 25 and November 3, 2016, consistent with ss. 373.709(1), F.S. The draft NFRWSP was posted for 60 days of public comment on October 4, 2016. Comments received during the public workshops and comment period were incorporated, as appropriate, into the NFRWSP (see Appendix A for details regarding comments received and responses).

Chapter 2: Introduction to Water Supply Planning

Introduction

Florida's five water management districts (WMDs) develop water supply plans to identify sustainable water supplies for all existing and anticipated water uses while protecting water resources and related natural systems. Water supply plans provide a view of projected future water needs, potential water supply sources and avoidable water resource impacts to help all water users make informed decisions regarding how to meet their future water needs. The elements of water supply planning are:

- Identify projected water demands for all use types through the planning horizon
- Identify the water resource impacts that could occur as a result of meeting the projected increase in water demand with traditional sources
- Identify technically and economically feasible water resource and water supply development project options that could be implemented to meet future water demands and avoid unacceptable water resource impacts

For the purpose of the NFRWSP, fresh groundwater with less than 500 milligrams per liter (mg/L) total dissolved solids (TDS) has been the primary water supply source in the Districts because of its proximity to the desired location of use and relatively low cost for treatment. The majority (94%) of public supply, domestic self-supply, agriculture and commercial/industrial/institutional water use in 2010 in the NFRWSP area was fresh groundwater (Appendix B, Table B-2). Given this consistent pattern of historical and current utilization of fresh groundwater, the Districts recognize fresh groundwater as the only traditional water supply source in the NFRWSP area and designate all other water sources to be nontraditional (i.e., alternative water supplies; (ss. 373.019(1), F.S.)).

Legislative Mandates

Section (s.) 373.709, F.S., provides that the WMDs shall conduct water supply planning when it is determined that existing sources of water are not adequate to supply water for all existing and future reasonable-beneficial uses and to sustain the water resources and related natural systems. The WMDs must conduct planning in an open public process, in coordination and cooperation with local governments, regional water supply authorities, water and wastewater utilities, multijurisdictional water supply entities, self-suppliers, FDEP, the Florida Department of Agriculture and Consumer Services (FDACS), and other affected and interested parties. In addition, each regional water supply plan must be based on at least a 20-year planning period and must include the following:

- Water supply and water resource development components

- Funding strategies for water resource development projects

- Consideration of how water supply development project options serve the public interest or save costs overall by preventing the loss of natural resources or avoiding greater future expenditures for water resource or water supply development projects

- The technical data and information applicable to each planning region which are necessary to support the regional water supply plan

- The minimum flows and minimum water levels (MFLs) established for water resources within each planning region

- Minimum flows and minimum water levels prevention and recovery strategies, if applicable

- Reservations of water adopted by rule pursuant to ss. 373.223(4), F.S., within each planning region

- Identification of surface waters or aquifers for which MFLs are scheduled to be adopted

- An analysis, developed in cooperation with FDEP, of areas or instances in which the variance provisions of ss. 378.212(1)(g), F.S., or ss. 378.404(9), F.S., may be used to create water supply development or water resource development projects

Relationship to SJRWMD and SRWMD Regulatory Programs

Subsection 373.709(7), F.S., states that nothing contained in the water supply development component of the NFRWSP shall be construed to require any entity to select and/or implement a water supply development project identified in the component merely because it is identified in the plan. Pursuant to ss. 373.709(7), F.S., the NFRWSP may not be used in the review of consumptive/water use permits (CUPs/WUPs), unless the plan or an applicable portion thereof has been adopted by rule, with one exception. The one exception is in evaluating an application for the consumptive use of water which proposes the use of a water supply development project as described in the NFRWSP and provides reasonable assurances of the applicant's capability to design, construct, operate, and maintain the project; then it is presumed that the alternative water supply (AWS) use is consistent with the public interest.

It is important to note that, while the NFRWSP may not be used in the review of CUPs/WUPs, the Districts are allowed to use data or other information used to establish the plan in reviewing CUPs/WUPs.

Approval Process

As noted previously, the Districts held public workshops on October 25 and November 3, 2016, consistent with ss. 373.709(1), F.S., to highlight the results of the NFRWSP. The draft plan was posted for 60 days of public comment on October 4, 2016. The Districts asked the SAC for recommendations on the NFRWSP and incorporated comments and/or changes, as appropriate. In addition, on November 2, 2016, the SAC voted 12 to 0 to support the Draft NFRWSP and recommended that the Districts' governing boards approve the Draft NFRWSP. The Districts also presented the Draft NFRWSP to their respective governing boards on September 13, 2016, to solicit comments and feedback. Comments received during the public workshops and comment period were incorporated, as appropriate, into the NFRWSP.

Upon completion of the updates to the NFRWSP, the Districts presented the NFRWSP to their governing boards in a joint meeting on January 17, 2017, for approval. The Districts' governing boards approved the NFRWSP on January 17, 2017.

Requirements after Plan Approval

The water supply planning process of the Districts is closely coordinated and linked to the water supply planning efforts of local governments and utilities. Therefore, significant coordination and collaboration throughout the development, approval and implementation of the NFRWSP is necessary among all water supply planning entities.

Subsection 373.709(8)(a), F.S., requires the Districts to notify water supply entities identified in the NFRWSP as the parties responsible for implementing the various project options listed in the NFRWSP. When the notice is received by the water supply entity, the water supplier must respond to the Districts within 12 months about their intentions to develop and implement the project options identified by the NFRWSP or provide a list of other projects or methods to meet the identified water demands (ss. 373.709(8)(a), F.S.).

In addition to the requirements above, local governments are required to adopt water supply facilities work plans and related amendments into their comprehensive plans within 18 months following the approval of the NFRWSP. The work plans contain information to update the comprehensive plan's capital improvements element, which provides specifics about the need for and location of public facilities, principles for construction, cost estimates, and a schedule of capital improvements.

Local governments in the NFRWSP area are required by ss. 163.3177(6)(c)3, F.S., to modify the potable water sub-elements of their comprehensive plan by:

- Incorporating the water supply project or projects selected by the local government from those projects identified in the NFRWSP or proposed by the local government

- Identifying water supply projects to meet the water needs identified in the NFRWSP within the local government's jurisdiction

- Including a work plan, covering at least a 10-year planning period, for building public, private and regional water supply facilities, including the development of AWS, which are identified in the potable water sub-element to meet the needs of existing and new development

Chapter 3: Water Demand, Reclaimed Water and Water Conservation Projections

Purpose

The Districts develop water demand projections to determine existing legal uses, anticipated future needs, and existing and reasonably anticipated sources of water and water conservation efforts. The Districts' goal in projecting water demands is to develop estimates of projected need that appear to be reasonable based on the best information available and that are mutually acceptable to the water users and the Districts. The projected increase in water demand is used in water resource assessments to determine the potential for unacceptable impacts to groundwater quality, springs and surface water bodies, as well as adverse change to wetland function.

Water use and projected water demand in the Districts is grouped into six water use categories for water supply planning.

- Public Supply
- Domestic Self-supply and Small Public Supply Systems (DSS)
- Agricultural Irrigation Self-supply
- Landscape/Recreational/Aesthetic Irrigation Self-supply (LRA)
- Commercial/Industrial/Institutional and Mining Dewatering Self-supply (CII/MD)
- Thermoelectric Power Generation Self-supply (PG)

In addition to the six categories listed above, the Districts project future reclaimed water flows that can potentially offset future water demand.

Total water demand in the NFRWSP area is anticipated to increase from 551 million gallons per day (mgd) in 2010 to 667 mgd in 2035 (21%). Public supply represents the largest demand in the NFRWSP area (38%), followed by agriculture (23%) and CII/MD (20%), (Figures 3 and 4). The Districts also calculated a 1-in-10 year drought water demand for 2035, which represents an event that would result in an increase in water demand of a magnitude that would have a 10 percent probability of occurring during any given year. It is estimated that water demand in 2035 could increase by an additional six percent if a 1-in-10 year drought event occurred.

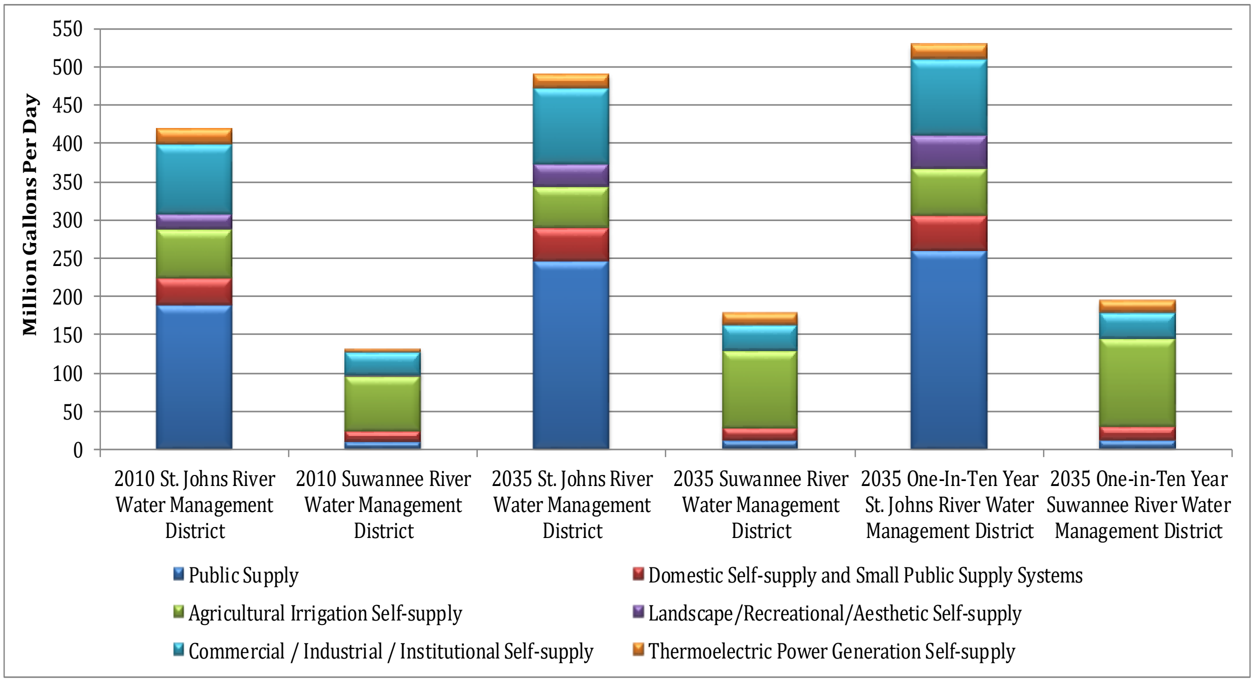

Figure 3: 2010 Water Use Estimates and 2035 Water Demand Projections in the NFRWSP by Category

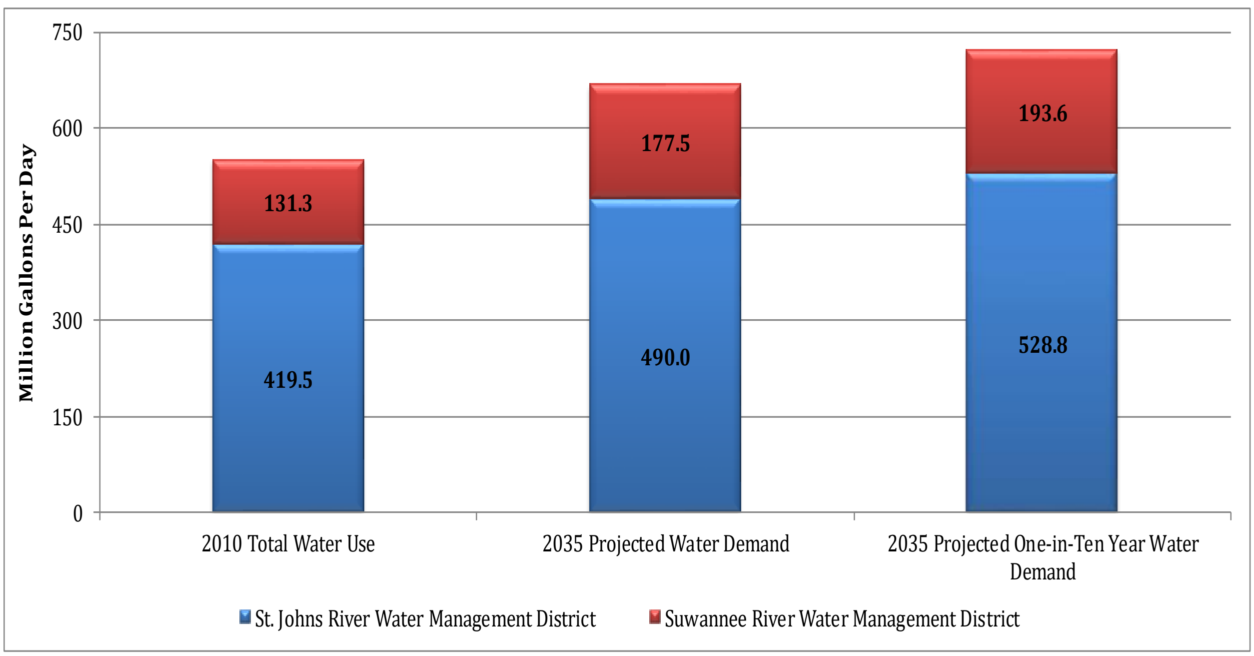

Figure 4: 2010 Total Water Use Estimates and 2035 Water Demand Projections in the NFRWSP

Future Water Demand Projections and Methodology

Assumptions

For the purposes of the NFRWSP, the Districts assume that projected increases in supply will come from the traditional source unless users have made a commitment to the development and use of other sources of supply. Public water supply utilities in Florida are in varying stages of transitioning exclusively from fresh groundwater sources to include alternative sources.

Guidance and minimum requirements for developing water demand and population projections are described in s. 373.709, F.S. Detailed methodology for all of the population and water demand projections, as well as spatial distribution, for the NFRWSP can be found in Appendix B.

Population Projections

Population projections yield the estimated population growth from 2010 to 2035 and the percent change. The Districts estimated the population projections for water supply utilities in two categories: public supply and small public supply systems. For these, the District used a standard percent share method, as described in Appendix B. For DSS, population projections were calculated as the difference between the Bureau of Economic and Business Research (BEBR) medium population projections for each county (Smith, 2015) and the public supply and small public supply systems population projections.

The Districts' total population for the NFRWSP area is expected to increase by 676,000 people (35% to approximately 2.63 million people) by 2035 (Figures 5 and 6). Public supply represents 75 percent of the 2035 total population projection, and domestic self-supply and small public supply systems represents the remaining 25 percent. The population served by public supply utilities in the NFRWSP area is expected to increase by 531,000 people (37% to approximately 2 million people) through 2035. Domestic self-supply and small public supply systems population in the NFRWSP area is expected to increase by 145,000 people (28% to approximately 660,000 people) through 2035.

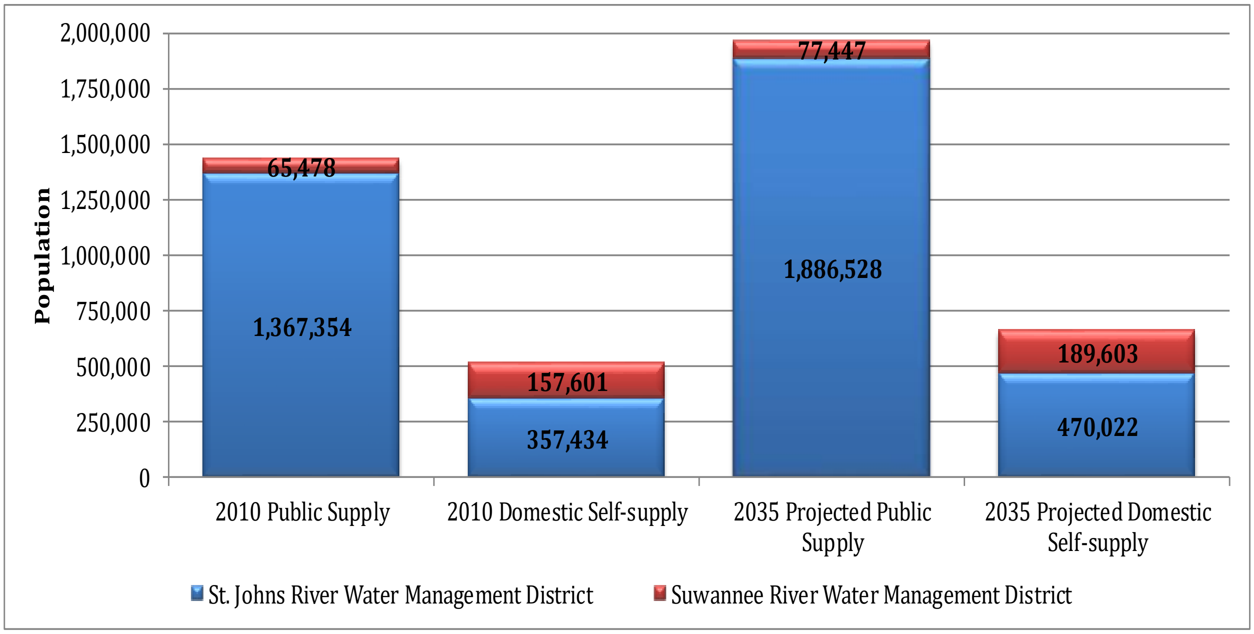

Figure 5: 2010 Population Estimates and 2035 Population Projections in the NFRWSP by Category

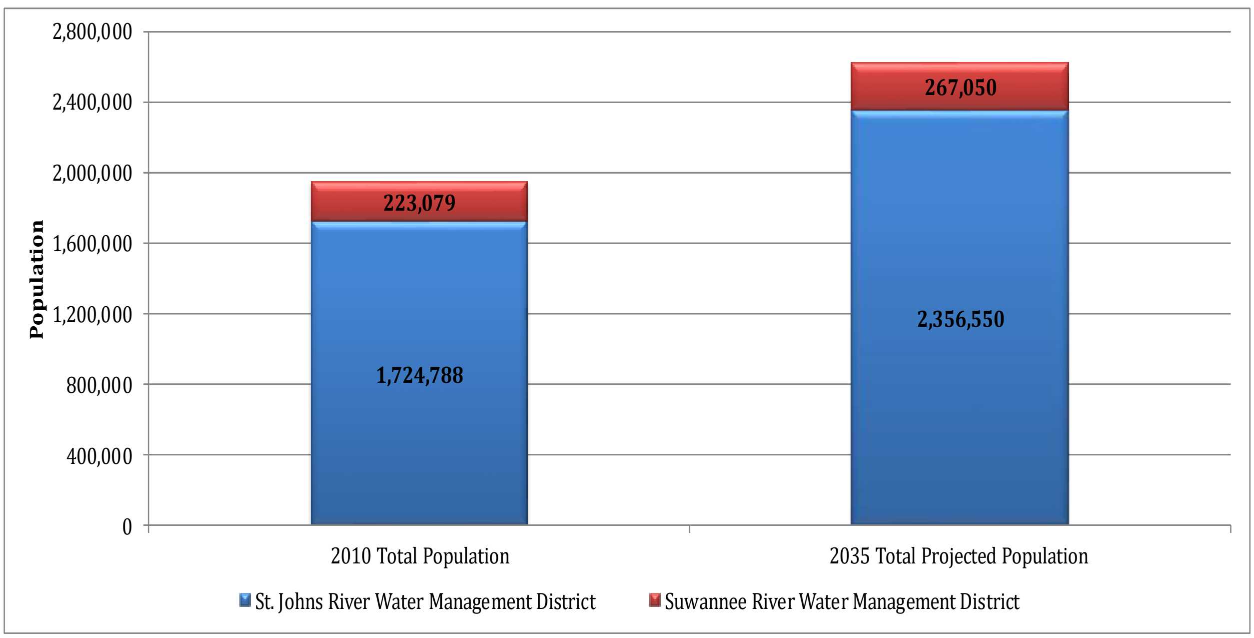

Figure 6: 2010 Total Population Estimates and 2035 Population Projections in the NFRWSP

Public Supply

The public supply category consists of residential and nonresidential uses supplied by public and private utilities that have permits to withdraw an annual average of 0.1 mgd or more.

The Districts calculated water demand for each public supply and small public supply system. The public supply category includes water use provided by any municipality, county, regional water supply authority, special district, public or privately owned water utility or multijurisdictional water supply authority for human consumption and other purposes.

Demand

For the NFRWSP, the Districts based the public supply and small public supply systems water demand projections on the most recent five-year average gross per capita rate (2010-2014). The gross per capita water use rate is the factor applied to projected population to determine future water demand. This rate represents on average how much water one person uses in a day. For public supply and small public supply systems, the gross per capita rate is defined as the total water use (including residential and non-residential uses) for each individual permittee divided by its respective residential population served expressed in average gallons per capita per day (gpcd). A five-year average is used to address annual variations in water use due to climate variations and implementation of water conservation programs. The Districts calculated five-year average gross per capita water use rates for each individual public supply and small public supply system.

The use of a gross per capita is recognized as a national standard methodology for water supply planning. However, this practice assumes that past water use is predictive of future water use and incorporates the current economic conditions and current rates of reclaimed water use and water conservation into the future projections. Factors such as conservation, less landscape irrigation with potable water and increases in multifamily housing occupancy can decrease the gross per capita rates. Conversely, expanded tourism and other commercial development, larger irrigated lots, and increases in single family housing can increase the gross per capita rates. Factors affecting gross per capita rates and public supply water demands will be captured during future water supply plan updates. Of note, from 2010 to 2015 in the NFRWSP Area, reclaimed water flow has increased by almost 20 mgd or 15 percent and the beneficial use of reclaimed water has increased by almost 5 mgd or 12 percent. In addition, while public supply population for the NFRWSP Area has increased by 1 percent during the 2010 to 2015 time period, public supply water use has decreased by 5 percent; resulting in a reduction of gross per capita from 138 gpcd to 130 gpcd.

The Districts' total public supply water demand for the NFRWSP area is expected to increase by 58 mgd (29% to approximately 257 mgd) by 2035 (Figure 7). The Districts aggregated the projected water demand for the small public supply systems for each county and summed those values to the total respective county demand for the DSS category, shown below. Public supply represents 38 percent of the 2035 projected water demand in the NFRWSP area. Of note, public supply also represents 50 percent of the total increase in water demand in the NFRWSP area.

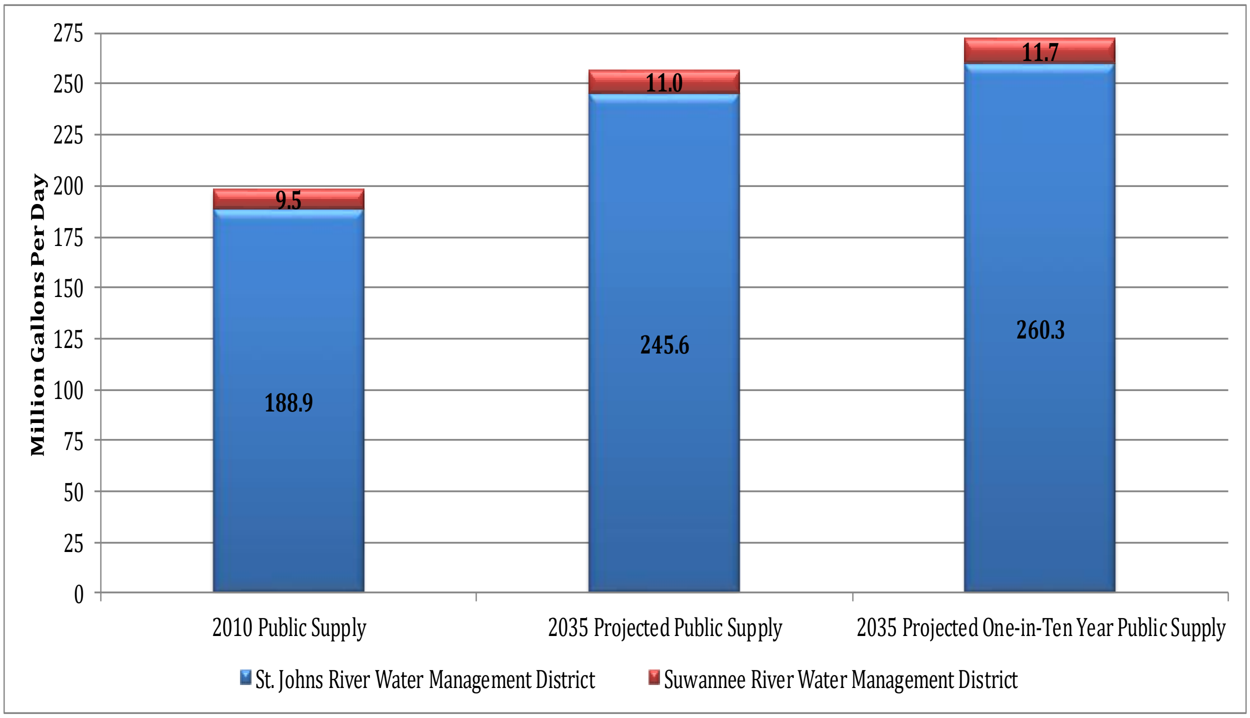

Figure 7: 2010 Public Supply Water Use Estimates and 2035 Water Demand Projections in the NFRWSP

Domestic Self-Supply

The DSS category consists of residential dwellings not served by a public supply or small public supply system (systems less than 0.1 mgd). Historic water use and population, and projected water demand and population for small public supply systems are calculated individually but are combined with the DSS category for reporting purposes at the county level.

Demand

For the NFRWSP, the Districts based the DSS water demand projections on the most recent five-year average residential per capita rate (2010-2014). For DSS, the residential per capita rate (also referred to as household use, both indoor and outdoor) is defined as the water used for solely residential purposes. Gross per capita is not used for this category as it includes more than just residential uses.

The Districts' total combined DSS water demand for the NFRWSP area is expected to increase by 12 mgd (24% to approximately 61 mgd) by 2035 (Figure 8). Of the 2035-combined DSS water demand, DSS wells represent 99 percent of the projected water demand.

The Districts also calculated a 1-in-10 year drought water demand for 2035 (shown in Figure 8). It is estimated that water demand in 2035 could increase by six percent if a 1-in-10 year drought event occurred.

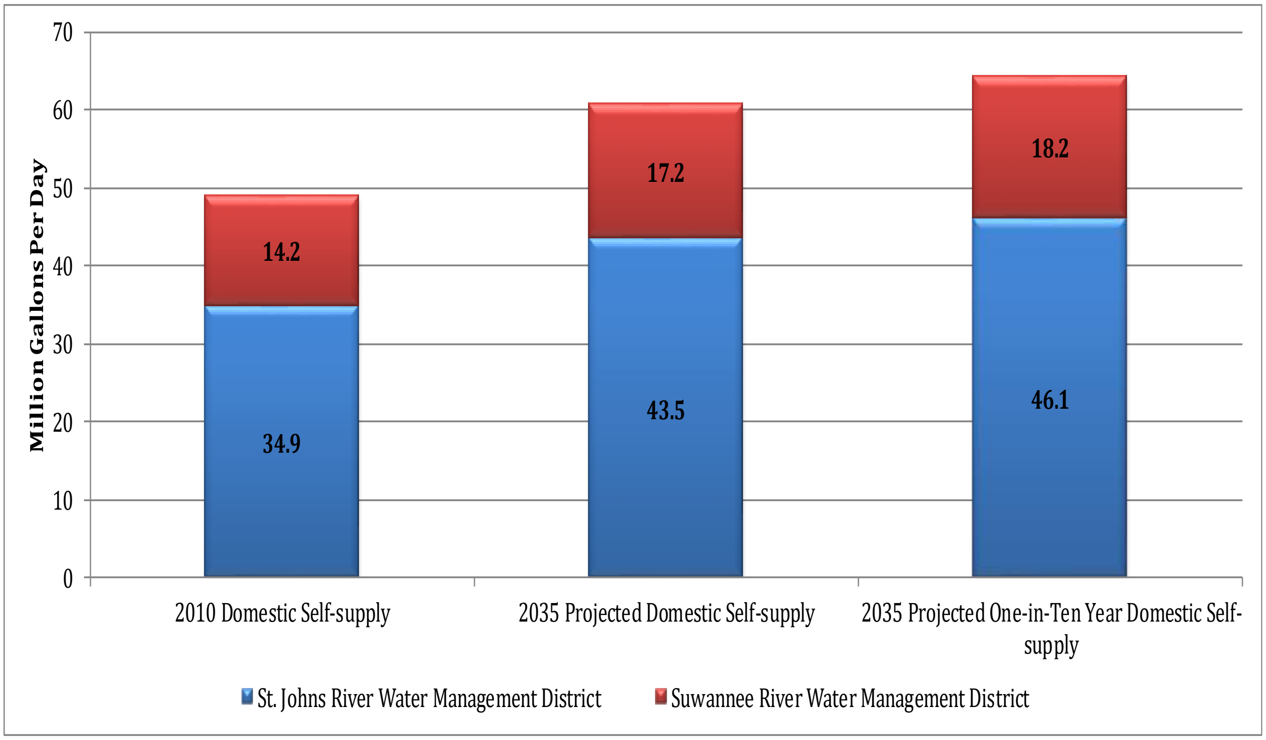

Figure 8: 2010 Domestic Self-supply Water Use Estimates and 2035 Water Demand Projections in the NFRWSP

Agriculture

The agricultural irrigation self-supply category includes the irrigation of crops and other miscellaneous water uses associated with agricultural production. Irrigated acreage and projected water demands were determined for a variety of crop categories, including citrus, vegetables, melons, berries, field crops, greenhouse/nursery, sod, and pasture. In addition, projected water demands associated with other agriculture uses were estimated and reported as miscellaneous type uses, such as aquaculture, dairy/cattle, poultry and swine.

In 2013, legislation was passed that required the Districts to consider agricultural demand projections provided by FDACS (ss. 373.709(2)(a)1b, F.S.) when developing Regional Water Supply Plans (RWSPs). FDACS developed future agricultural acreage and water demand projections in five-year increments for the State of Florida for the years 2015-2035, as well as a water demand for a 2035 1-in-10 drought year and delivered the final draft to the Districts on June 5, 2015 (FDACS, 2015). This product is known as the Florida Statewide Agricultural Irrigation Demand (FSAID) and the June 5, 2015 version is identified as FSAID II.

The Districts used the final draft FSAID II agricultural acreage and water demand projections (FDACS, 2015) for the NFRWSP. Detailed methodology can be found in the June 5, 2015 FSAID II Final Report (FDACS, 2015).

Acreage and Demand

The Districts' total agricultural water demand for the NFRWSP area is expected to increase by 19 mgd (14% to approximately 154 mgd) by 2035 and acreage is expected to increase by 34,000 acres (33% to approximately 138,000 acres) (Figures 9 and 10) by 2035.

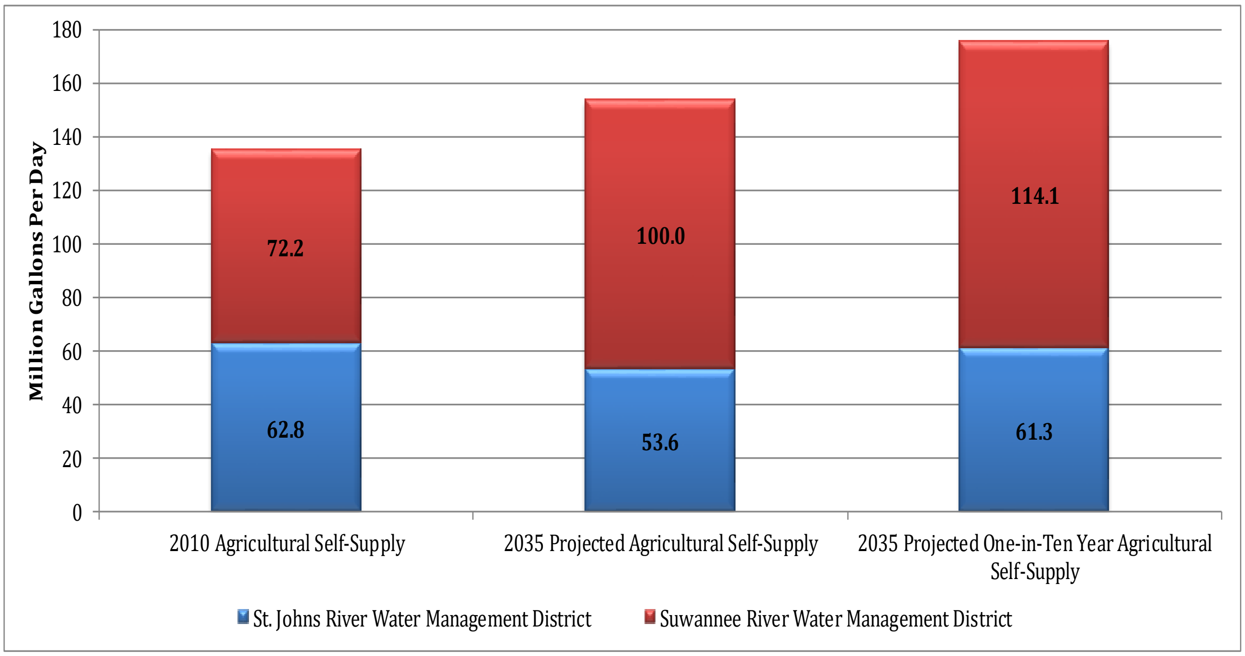

Figure 9: 2010 Agriculture Self-supply Water Use Estimates and 2035 Water Demand Projections in the NFRWSP

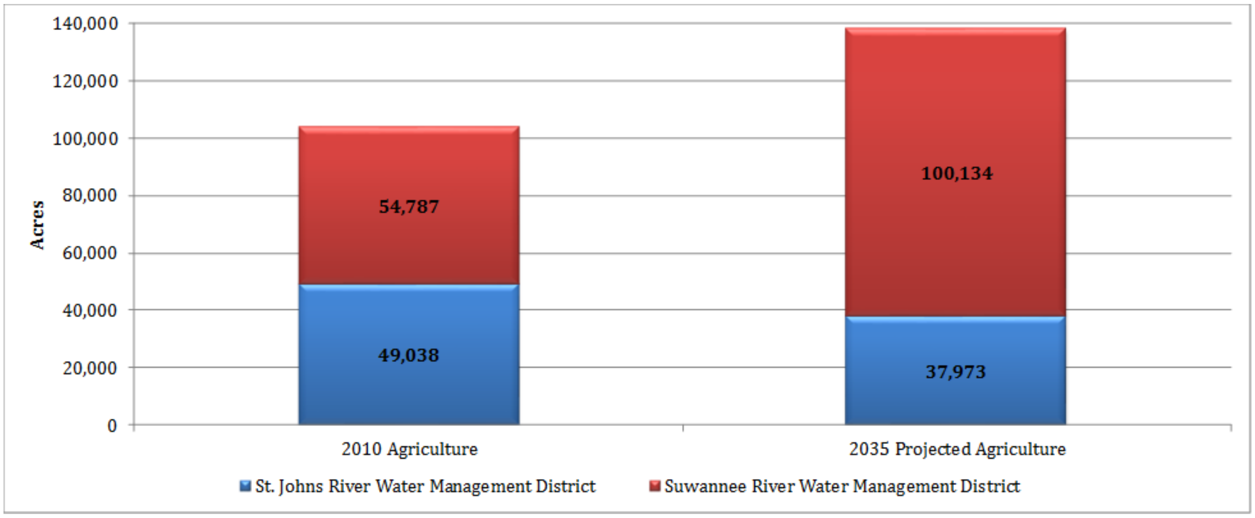

Figure 10: 2010 Agriculture Self-supply Acreage Estimates and 2035 Acreage Projections in the NFRWSP

Commercial/Industrial/Institutional and Mining/Dewatering

The CII category represents water use associated with the production of goods or provisions of services by CII establishments. Commercial uses include general businesses, office complexes, commercial cooling and heating, bottled water, food and beverage processing, restaurants, gas stations, hotels, car washes, laundromats, and water used in zoos, theme parks and other attractions. Industrial uses include manufacturing and chemical processing plants and other industrial facilities, spraying water for dust control, maintenance, cleaning, and washing of structures and mobile equipment and the washing of streets, driveways, sidewalks, and similar areas. Institutional use includes hospitals, group home/assisted living facilities, churches, prisons, schools, universities, military bases, etc. Mining uses include water associated with the extraction, transport and processing of subsurface materials and minerals. Dewatering uses includes the long-term removal of water to control surface or groundwater levels during construction or excavation activities.

Demand

Water demand for the CII/MD categories was projected at the county level using a respective CII/MD historic average gpcd. Commercial/Industrial/Institutional and Mining/Dewatering historic water use and projected water demand consists of only consumptive uses; recycled surface water or non-consumptive uses were removed. For the NFRWSP, the Districts use the loss of water in the mining operations due to evaporation and water removed in the product in calculating demand. The amount of water lost is represented by 5 percent of the total surface water withdrawals of the mine operation. The remaining surface water was assumed to be recirculated in the mining process and, therefore, is considered nonconsumptive. For further clarification, the Districts define consumptive use as any use of water that reduces the supply from which it is withdrawn or diverted. The CII/MD average gpcd was applied to the additional population projected by BEBR (Smith, 2015) for each five-year increment and the associated water demand was added to the base year, 2010 water use. Water demands for large commercial and industrial facilities (e.g., pulp and paper mills) that are not impacted by population growth were held constant.

The Districts' total combined CII/MD water demand for the NFRWSP area is expected to increase by 11 mgd (9% to approximately 132 mgd) by 2035 (Figure 11). The Districts determined that drought events (1-in-10 year) do not have significant impacts on water use in the CII/MD category. Water use for these categories are related primarily to processing and production needs.

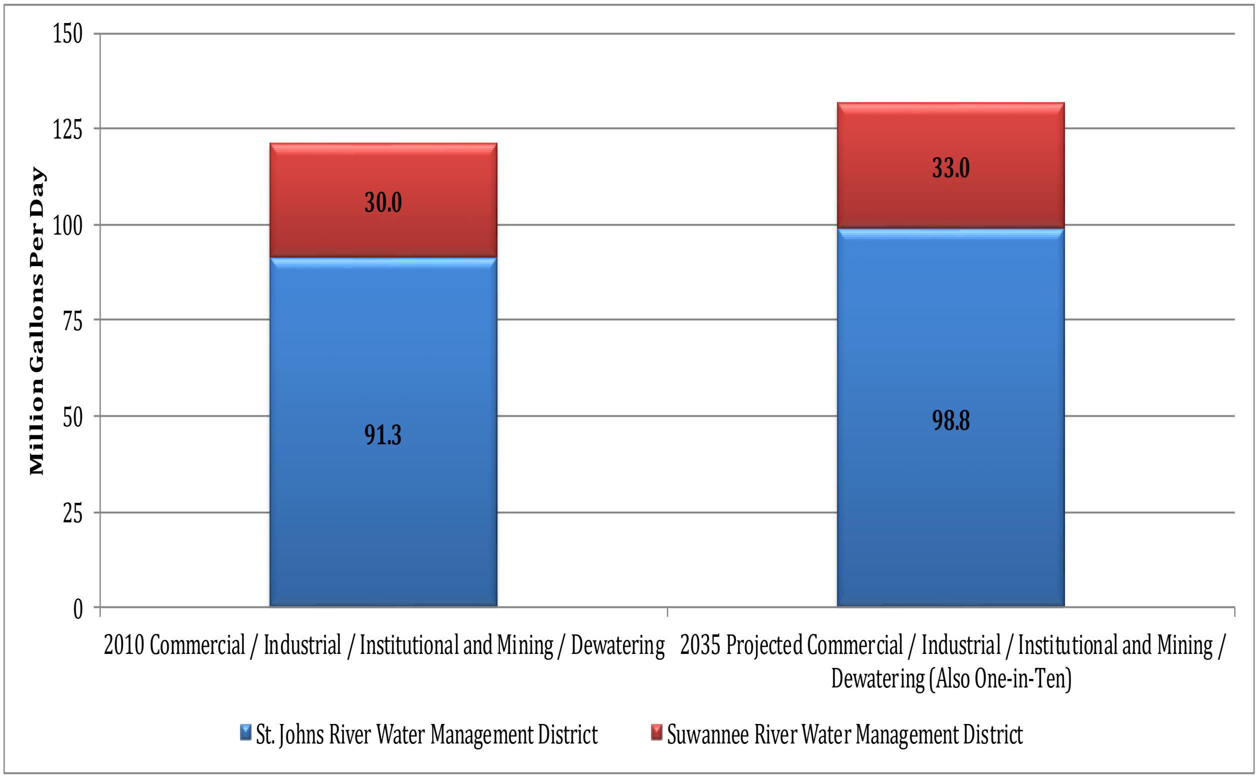

Figure 11: 2010 Commercial/Industrial/Institutional and Mining/Dewatering Self-supply Water Use Estimates and 2035 Water Demand Projections in the NFRWSP

Landscape/Recreation/Aesthetic

The LRA category represents water use associated with the irrigation, maintenance, and operation of golf courses, cemeteries, parks, medians, attractions and other large self-supplied green areas. Landscape use includes the outside watering of plants, shrubs, lawns, ground cover, trees and other flora in such diverse locations as the common areas of residential developments and industrial buildings, parks, recreational areas, cemeteries, public right-of-ways and medians. Recreational use includes the irrigation of recreational areas such as golf courses, soccer, baseball and football fields and playgrounds. Water-based recreation use is also included in this category, which includes public or private swimming and wading pools and other water-oriented recreation such as water slides. Aesthetic use includes fountains, waterfalls and landscape lakes and ponds where such uses are ornamental and decorative.

Acreage and Demand

Water demand for the LRA category was projected at the county level using a respective LRA historic average gpcd. The average LRA gpcd was applied to the additional population projected by BEBR (Smith, 2015) for each five-year increment and the associated water demand was added to the 2010 base-year water use. Future acreage estimates were interpolated from 2010 acreage and 2010 water use ratios.

The Districts' total LRA water demand for the NFRWSP area is expected to increase by 9 mgd (44% to approximately 31 mgd) by 2035 (Figure 12).

The Districts determined that historic data and net irrigation ratios are acceptable when calculating the 1-in-10 year LRA water demand projection. In addition, agricultural irrigation models have supplemental irrigation values for LRA that can also be used. A 1-in-10 year drought factor was developed for each county, using the highest year water use from 2006-2014 and the percent increase from the average 2006-2014 LRA water use. For example, if water use in 2007 was 5 percent higher than the 2006-2014 average, 5 percent was applied to the average 2035 water demand to project a 2035 1-in-10 year water demand.

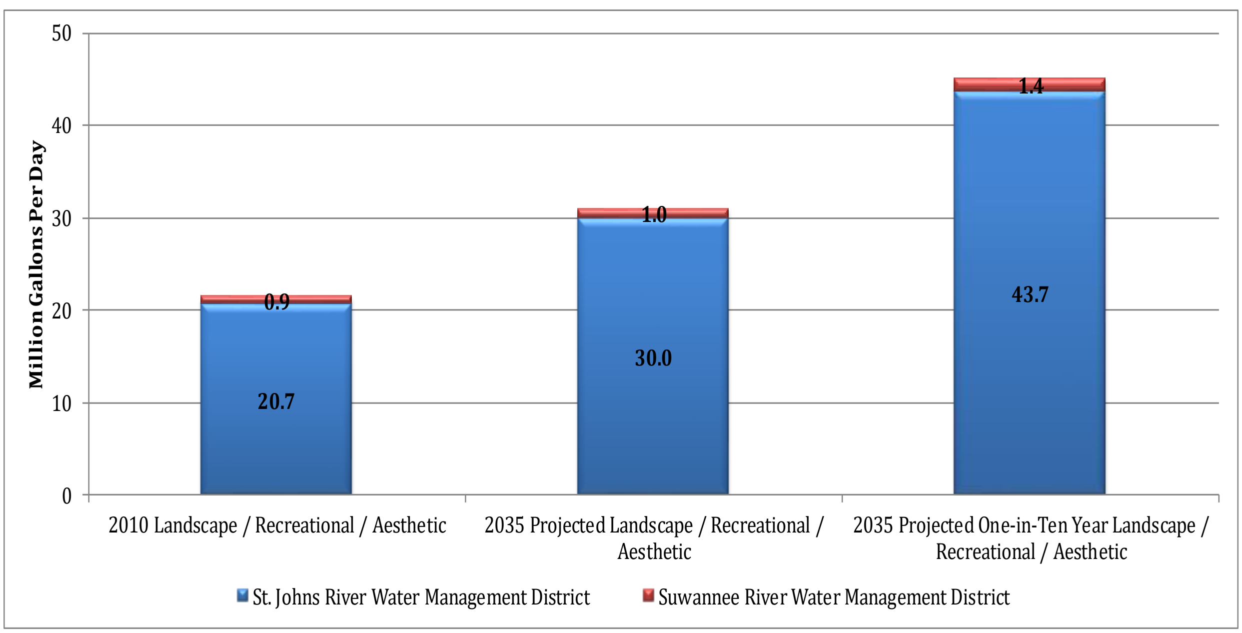

Figure 12: 2010 Landscape/Recreational/Aesthetic Self-supply Water Use Estimates and 2035 Water Demand Projections in the NFRWSP

Power Generation

The PG category represents the water use associated with power plant and power generation facilities. PG water use includes the consumptive use of water for steam generation, cooling and replenishment of cooling reservoirs.

Demand

Water demand was calculated for each PG facility and then summed to the county level for consumptive uses of water only; recycled surface water or non-consumptive uses were removed. For this NFRWSP, surface water use by PG facilities represents 2 percent of total surface water withdrawals, to account for the loss of water due to evaporation. An example of this nonconsumptive use is surface water used for once-through cooling for power plants, which is recycled.

The Florida Public Service Commission (PSC) requires that each PG entity produce detailed ten-year site plans for each of its facilities. These plans include planned facilities and generating capacity expansion, as well as decommission of facilities and reductions associated with more efficient processes. The 2015 ten-year site plans for each PG facility within the NFRWSP counties were downloaded from the PSC website (http://www.psc.state.fl.us/utilities/electricgas/10yrsiteplans.aspx) and were used in developing the PG water demand projections.

For each PG facility with a planned capacity expansion, PG consumptive use capacity projections were interpolated between the existing capacity and the planned capacity, as detailed in the ten-year site plans. The projection of PG consumptive water demand beyond the planned expansion in the ten-year site plans was calculated for each facility using a linear extrapolation of the existing and planned expansion dates and data and BEBR medium population projection rates (Smith, 2015). In addition, the average daily gallon per megawatt use was estimated for 2010-2014 and used as a proxy to project future water demand beyond the ten-year site plans and when projected water demand (for the ten-year site plan period) was not included.

The Districts' total PG water demand for the NFRWSP area is expected to increase by 8 mgd (33% to approximately 34 mgd) by 2035 (Figure 13).

The Districts determined that drought events do not have significant impacts on water use in PG category. Water use for these categories are related primarily to processing and production needs.

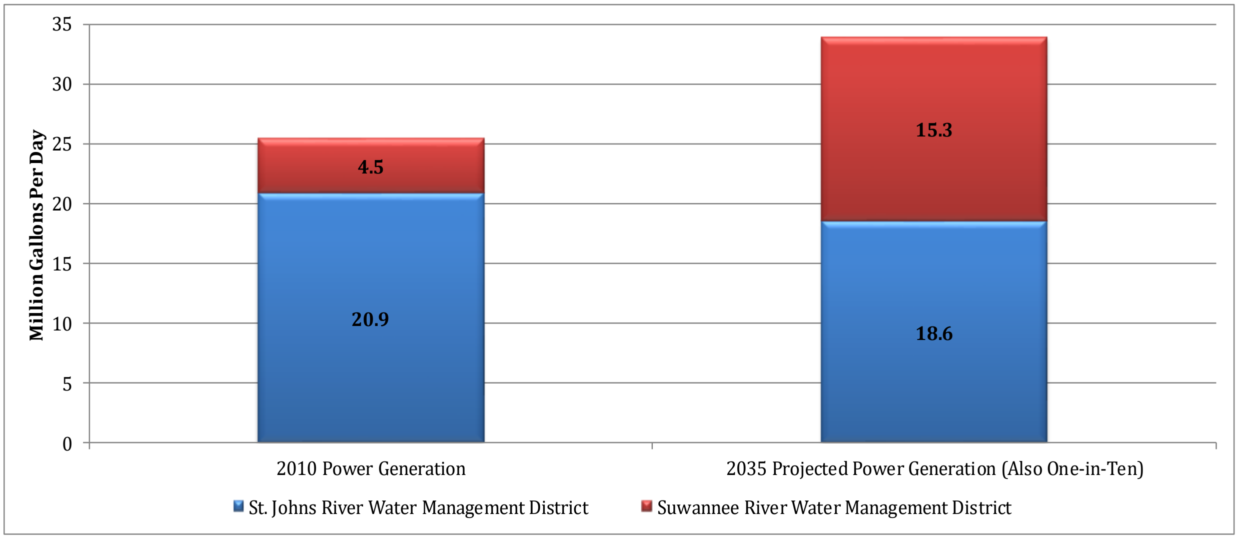

Figure 13: 2010 Power Generation Self-supply Water Use Estimates and 2035 Water Demand Projections in the NFRWSP

Reclaimed Water Projections

Projections were made for domestic wastewater treatment facilities (WWTF) with 2010 permitted wastewater treatment capacities equal to or greater than 0.1 mgd. Detailed methodology for reclaimed water projections can be found in Appendix B.

Existing Flows

The Districts considered existing 2010 reclaimed water flows for future use that were not considered to be used beneficially. The Districts consider beneficial reuse to be only those uses in which reclaimed water takes the place of a pre-existing or potential use of higher quality water for which reclaimed water is suitable, such as water used for landscape irrigation. Delivery of reclaimed water to sprayfields, absorption fields and rapid infiltration basins are not considered beneficial reuse, unless located in recharge areas.

The FDEP has a statewide reuse utilization goal of 75 percent (FDEP, 2003). The difference between the 2010 WWTF flow at 75 percent utilization and 2010 beneficial reuse was considered the potential existing additional reclaimed water that could be used for reuse. This method ensured existing flows would not exceed the 75 percent utilization goal. It is recognized that each WWTF is unique and items such as system upgrades and treatment, additional storage, system expansion, customer availability, etc., have to be taken into consideration.

Figure 14, below, reflects the most recent (2015) reclaimed water flows, both beneficial and disposal. The size of the pie charts represents the total flow. The yellow represents disposal and purple represents beneficial use of reclaimed water. Numbers in the graphic are related to Table B-18 in Appendix B. Arrows in the graphic show the location of the WWTF.

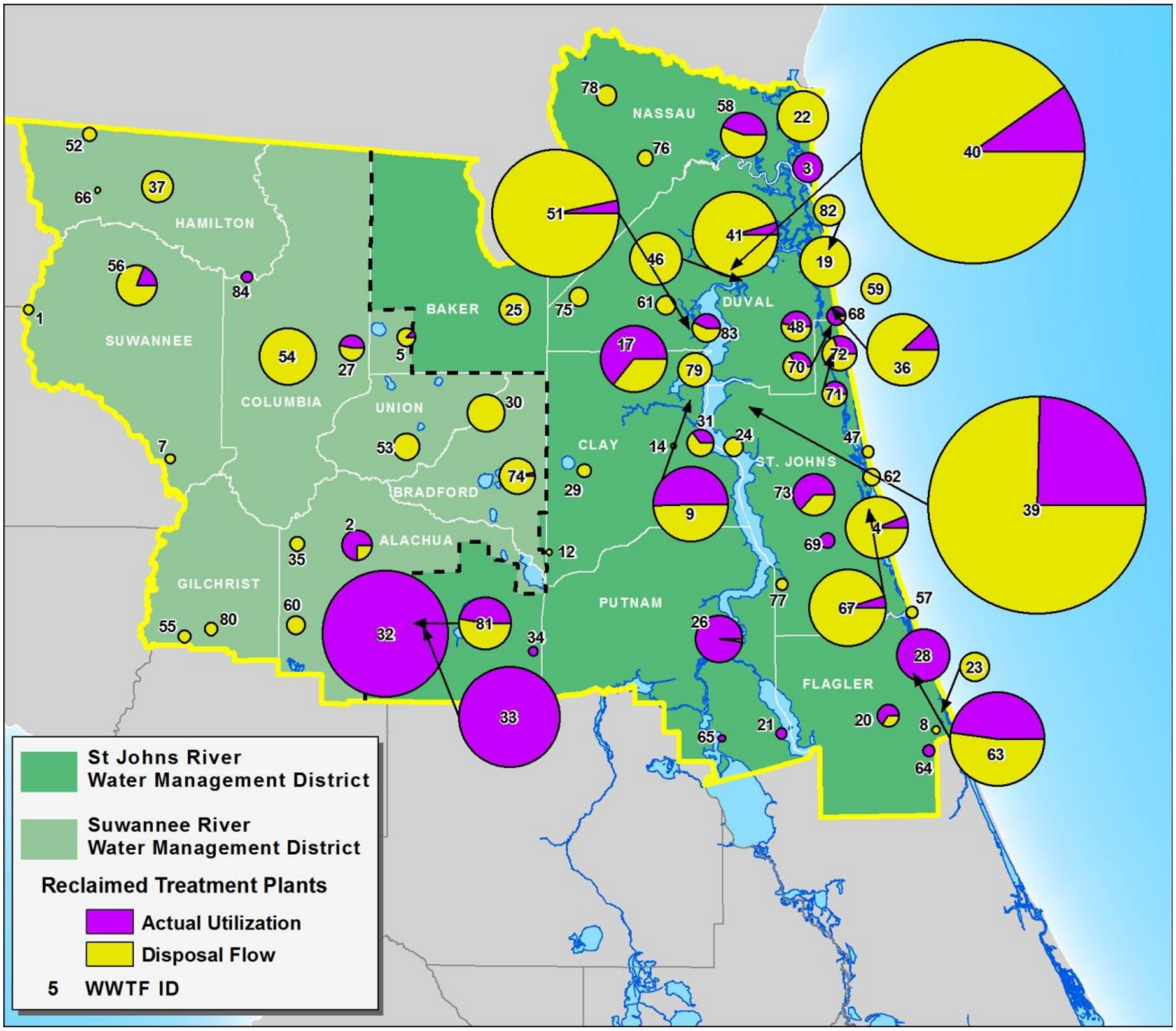

Figure 14: Summary of 2015 Reclaimed Water Flows in the NFRWSP

Future Flows

The Districts identified WWTFs that could potentially receive additional sewered flow as a result of population growth. It was assumed that 95 percent of the population increase identified will receive sewer service and thereby return wastewater for treatment. It is acknowledged that the percentage of sewered population growth and resulting wastewater flows will vary for individual service providers due to a number of factors.

It was further assumed that the increased sewered population will generate approximately 84 gpcd of wastewater to the local WWTF (sources are identified in

Appendix B). The estimated future flow was then multiplied by the FDEP utilization goal of 75 percent (FDEP, 2003) to generate a 2035 quantity of potential new additional reclaimed water available for reuse.

The Districts recognize that only a portion of the existing and future wastewater treated for reuse is actually utilized to offset demands that would otherwise require the use of fresh groundwater. The amount of potable-offset that is typically achieved utility-wide is approximately 65 percent to 75 percent, but can range from 50 percent to as much as 100 percent, depending on the type of use being replaced. The projected wastewater flows do not represent an amount equal to the demand reduction due to system losses, inefficiencies of its reuse customers and timing of availability relative to demand.

Reclaimed water systems are unique to each utility and the potential WWTF flow estimated for this NFRWSP may not necessarily represent the reclaimed water that could be used in projects. Current treatment processes, WWTF capacities, storage, and infrastructure have to be considered, which could potentially have a financial impact associated with utilization of additional or currently available reclaimed water. Likewise, the Districts realize that future and existing utilization may be higher than estimated if the WWTF provided reclaimed water for reuse to more efficient customers.

For the purposes of this NFRWSP, the Districts also created a future reclaimed water scenario using the 2010 percent beneficial reuse utilization for existing and future flows; which would assume that no changes to current treatment processes are made (e.g., WWTF upgrade). In addition, the Districts recognize potential future wastewater flow could be less if additional residential indoor water conservation is achieved. For example, the American Water Works Association has noted on their website (Drinktap.org) that if all residences installed more efficient water fixtures and regularly checked for leaks, daily indoor water use and associated wastewater flows could potentially be reduced to 45.2 gpcd (Vickers, 2001).

The Districts estimated that increased future reclaimed water flows between 27 mgd and 103 mgd, as described above, could be used for beneficial purposes, potentially offsetting withdrawals from traditional water sources and predicted impacts within the NFRWSP area.

Water Conservation and Irrigation Efficiency

Current water demand projections and the water conservation potential for the NFRWSP area were calculated in an effort to gauge the future impact of water conservation. It is important to note that reductions in water use resulting from current and historical water conservation efforts are reflected in the 2035 water demand projections that were calculated for this plan. Current water demand projections are lower than projections that were previously developed for this NFRWSP area, in part, because of the effects of existing water conservation.

For this NFRWSP, the Districts created two scenarios of potential water conservation for the public supply and DSS categories. Irrigation efficiency estimates for agriculture can be found in the FSAID II Final Report (FDACS, 2015). For the remaining water use categories, the Districts employed the methodology developed during the Central Florida Water Initiative (CFWI) RWSP process (CFWI, 2015).

For the first scenario for the public supply and DSS categories, as well as all other categories excluding agriculture, the Conserve Florida Water Clearinghouse conservation planning tool, the EZ Guide (Switt, 2011), was used to calculate water savings for specific best management practices (BMPs) and to summarize estimates of indoor residential, outdoor residential and publicly supplied CII water use. Using the EZ Guide analysis output and separate estimates of agricultural irrigation efficiency, it is estimated that approximately 41 mgd of the projected demand for 2035 can be eliminated by water conservation. Estimates of water conservation potential for DSS, CII, LRA and PG were based on various segments of the EZ Guide outputs for public supply.

For the second scenario for the public supply and DSS categories, the Districts analyzed the average 2010-2014 gross per capita rate for the entire NFRWSP area. If all public supply systems and DSS residents achieved the average 2010-2014 gross per capita rate for the NFRWSP area, water conservation could be increased by 13 mgd, potentially offsetting future demand.

Table 1: 2035 Water Conservation and Irrigation Efficiency Potential (in million gallons per day)

Category	2035 Low Conservation Potential	2035 High Conservation Potential
Public Supply	11	21
Domestic Self-supply	2	5
Agriculture	25	25
Landscape/Recreation/Aesthetic Self-supply	1	1
Commercial/Industrial/Institutional Self-supply	2	2
Power Generation Self-supply	0	0
Total	**41**	**54**

Chapter 4: Assessment of Groundwater Conditions Associated with Future Water Demand Projections (NFSEG Modeling Simulations)

Purpose

The North Florida-Southeast Georgia regional groundwater flow model (NFSEG) is a tool developed as a requirement of the Partnership. In order to develop consistency in planning and permitting decisions, the Districts agreed to develop a joint regional groundwater flow model. The Districts agreed that the use of one model would enhance efficiency and effectiveness for the NFRWSP process. Technical experts from the Districts and other key stakeholders worked collaboratively to develop the next generation regional-scale groundwater flow model for north Florida. The technical team's mandate was to ensure appropriate science is applied to the modeling and data analysis to support decision-making, and that the work completed is defensible, understood by the team, and collaboratively developed, as described in the Partnership's charter, available at northfloridawater.com.

NFSEG Overview

The NFSEG is a porous-equivalent, three-dimensional, steady-state, groundwater flow model covering approximately 60,000 square miles (Figure 15). The model is vertically discretized into seven layers representing, from top to bottom: (1) the surficial aquifer system, (2) the intermediate confining unit/aquifer system, where present; (3) the Upper Floridan aquifer (UFA); (4) the middle semi-confining unit, where present; (5) the Lower Floridan aquifer (LFA) where present; (6) the lower semi-confining unit; and (7) the Fernandina permeable zone of the LFA, where present. The model is horizontally discretized into uniform grid cells measuring 2,500 feet by 2,500 feet. Calibration of the NFSEG was based on hydrologic conditions occurring during calendar years 2001 and 2009 (Draft, SJRWMD 2016).

Prior to development of the NFSEG, the groundwater models of the Floridan Aquifer System (FAS) in north Florida and southeast Georgia used by staff focused on specific geographic regions relative to each WMD. The primary design objective of the NFSEG model was to develop a tool capable of making assessments that span WMD and state boundaries at required levels of accuracy and reliability. To this end, a considerable effort has been expended in the development and compilation of required data sets, in the model calibration, and in collaboration between affected WMDs and other stakeholders.

The following, which comes from USGS Scientific Investigations Report 2016-5116 (Kuniansky, 2016), is a general statement regarding modeling of the Floridan Aquifer System using porous-equivalent media models.

> The USGS, multiple State water management districts, and other agencies and consultants have frequently used porous-equivalent media models for water-

> management problems to simulate the Biscayne aquifer and the FAS in Florida. The Biscayne aquifer and FAS are composed of karstified carbonate rocks that can be characterized as dual porosity continua. As of 2015, more than 30 models developed by the USGS have used a single-continuum porous-equivalent (SCPE) model approach to meet necessary calibration criteria for the study objectives. Many of the water management districts in Florida use a SCPE model approach for groundwater management and resource evaluation. Most of these SCPE models are applied to water-supply studies and are regional or subregional in scale and water budgets are desired; this is an appropriate application of such models.

NFSEG version 1.0 meets the requirements to be used in water supply planning in the NFSEG domain. Version 1.0 of the model will not be utilized in regulatory evaluations or in the establishment of MFLs. However, the model may be used to determine the status of MFLs. NFSEG version 1.0 does not meet the requirements outlined in Rule 62-42.300(1)(e), Florida Administrative Code (F.A.C.), requiring the re-evaluation of the established Lower Santa Fe and Ichetucknee Rivers and associated priority springs (LSFI) MFLs that will occur prior to the end of 2019. It is anticipated that a future peer reviewed version of the model will be used in planning, regulatory and MFLs programs.

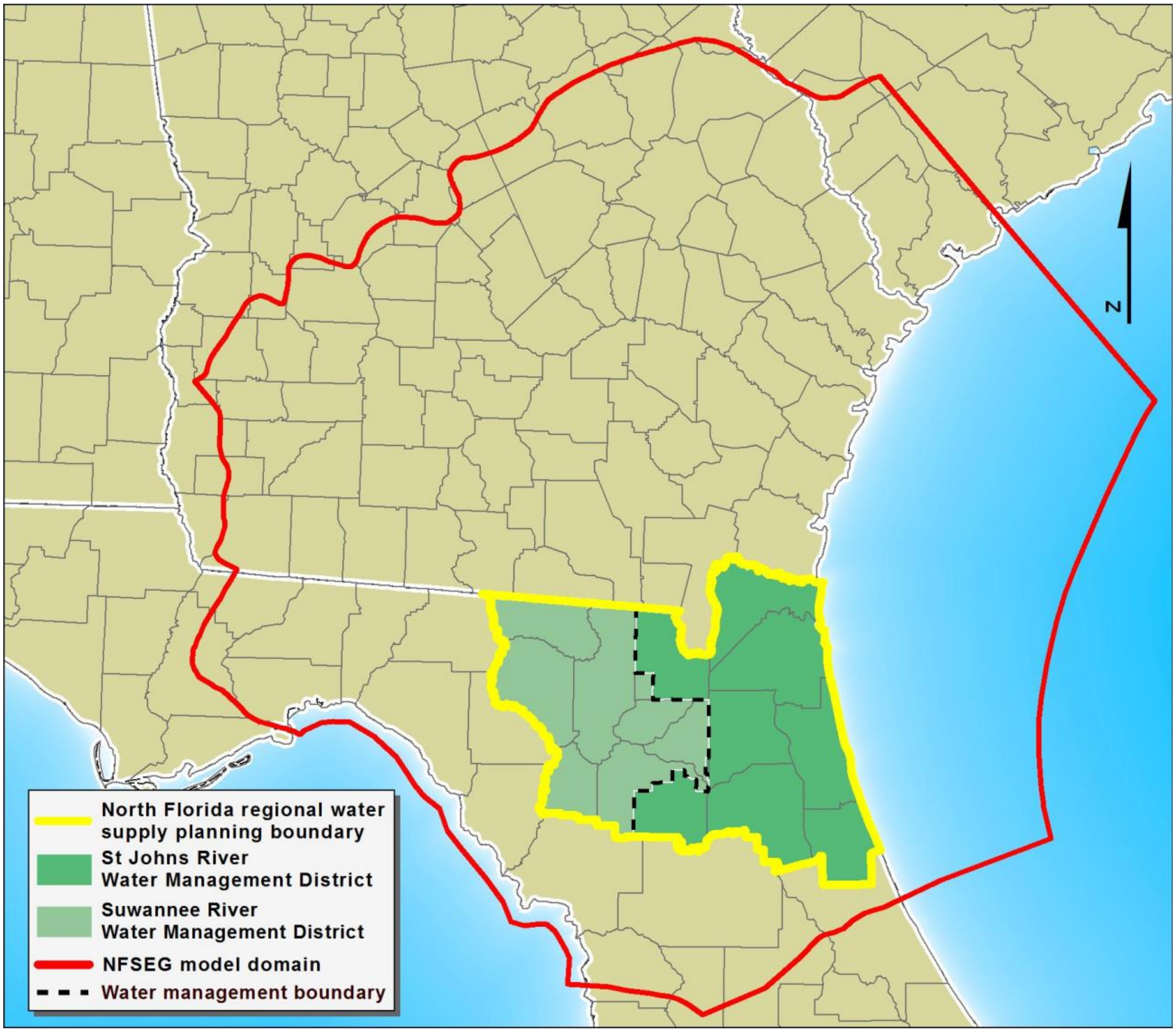

Figure 15: NFSEG Domain

Methodology

The Districts completed a water resource assessment using the NFSEG version 1.0 to estimate the potential impacts through the planning horizon. The assessments addressed the potential impacts of groundwater withdrawals with respect to wetlands, adopted MFLs including OFS and non-MFLs priority water bodies in the NFRWSP boundary and throughout the extent of the NFSEG domain.

Six modeling scenarios and four comparisons, listed below, were performed as part of the NFRWSP resource assessment and water resource development projects benefit. The pumps off simulation does not represent a historic or predevelopment condition. It was utilized as a reference condition for comparison with the 2035 projected water demands to estimate potential impacts to natural systems. It is an approximation of a no groundwater pumping condition.

Scenarios

- Scenario 1: 2009 estimated water use - calibrated baseline condition
- Scenario 2: 2035 projected water demand in the NFRWSP area only with pumping held at 2009 estimated water use outside NFRWSP area
- Scenario 3: Scenario 2 with water resource development projects included
- Scenario 4: Pumps off within the entire NFSEG domain
- Scenario 5: 2035 projected water demand within the entire NFSEG domain
- Scenario 6: Scenario 5 with water resource development projects included

Comparisons

Comparisons 1 and 2 were performed for the purpose of assessing impacts due to projected increases in groundwater withdrawals within the NFRWSP area.
Results of these comparisons are described in Chapter 5.

- Comparison 1: MFLs lakes, wetlands and the LSFI including OFS (Scenario 2 minus Scenario 1)
- Comparison 2: Upper Santa Fe River and non-MFLs priority water bodies (Scenario 2 minus Scenario 4)

Comparisons 3 and 4, listed below, were performed for the purpose of assessing the impacts of projected increases in groundwater withdrawals throughout the NFSEG domain. Results of this comparison are shown in Appendices C, F, H, and I.

- Comparison 3: MFLs lakes, wetlands and the LSFI (Scenario 5 minus Scenario 1)
- Comparison 4: Upper Santa Fe River and non-MFLs priority water bodies (Scenario 5 minus Scenario 4)

Chapter 5: Evaluation of Potential Effects of Projected Water Demand on Water Resources (Water Resource Assessment)

Purpose

The purpose of the NFRWSP water resource assessment is to evaluate the extent to which water resources and related natural systems may be impacted by projected increases in groundwater use within the NFRWSP area through 2035. Assessment components evaluated include groundwater quality, MFLs, non-MFLs priority waterbodies, wetlands, and water reservations. It should not be inferred from the results that these impacts would happen in the future. Actually, just the opposite is expected as the results from the evaluation were used to identify water resource development, water supply development and water conservation project options that can be implemented in order to avoid the impacts and delineate water resource caution areas (WRCA) within the NFRWSP area.

Water Resource Assessment Methods and Results

Groundwater Quality (Saline Water Intrusion)

An evaluation was conducted to assess the potential for saline water intrusion within the NFRWSP area resulting from withdrawals of groundwater. The purpose of this evaluation was to identify wells within the NFRWSP area where potential degradation of groundwater quality from saline water intrusion will constrain the availability of fresh groundwater. Saline water intrusion can affect productivity of existing infrastructure, resulting in increased treatment and infrastructure costs. Although saline water intrusion poses a challenge for all affected water users, the issue is particularly acute for small public supply systems and self-supply water users that may have fewer options for infrastructure modifications.

The Florida Safe Drinking Water Act (s. 403.850 - 403.864, F.S.) directs the FDEP to develop rules that reflect national drinking water standards. Chapter 62-550, F.A.C., lists quality standards for finished drinking water that include concentration limits for chloride (250 mg/L) and TDS (500 mg/L), both Secondary Drinking Water Standards (SDWS). Increasing trends in chloride and TDS concentrations can be indicators of saline water intrusion and, once concentrations exceed the SDWS, groundwater is no longer considered fresh.

The groundwater quality evaluation consisted of a statistical analysis of observed monitoring data through 2014. The Districts evaluated groundwater quality data from 406 monitored production wells located in the SJRWMD along with 23 monitoring wells in the SRWMD. Collectively, these 429 wells (Figure 16) provide information on groundwater quality in the Surficial Aquifer System (SAS) and FAS. Trends in chloride and TDS concentrations were quantified and interpreted using nonparametric statistical methods with statistically significant trends identified at a 95% significance level. For those wells exhibiting statistically significant increasing trends in chloride and TDS concentration, the Districts calculated the year in which the SDWS would be exceeded if current trends continue. The results identified locations where saline water intrusion may constrain groundwater availability within the 20-year planning horizon.

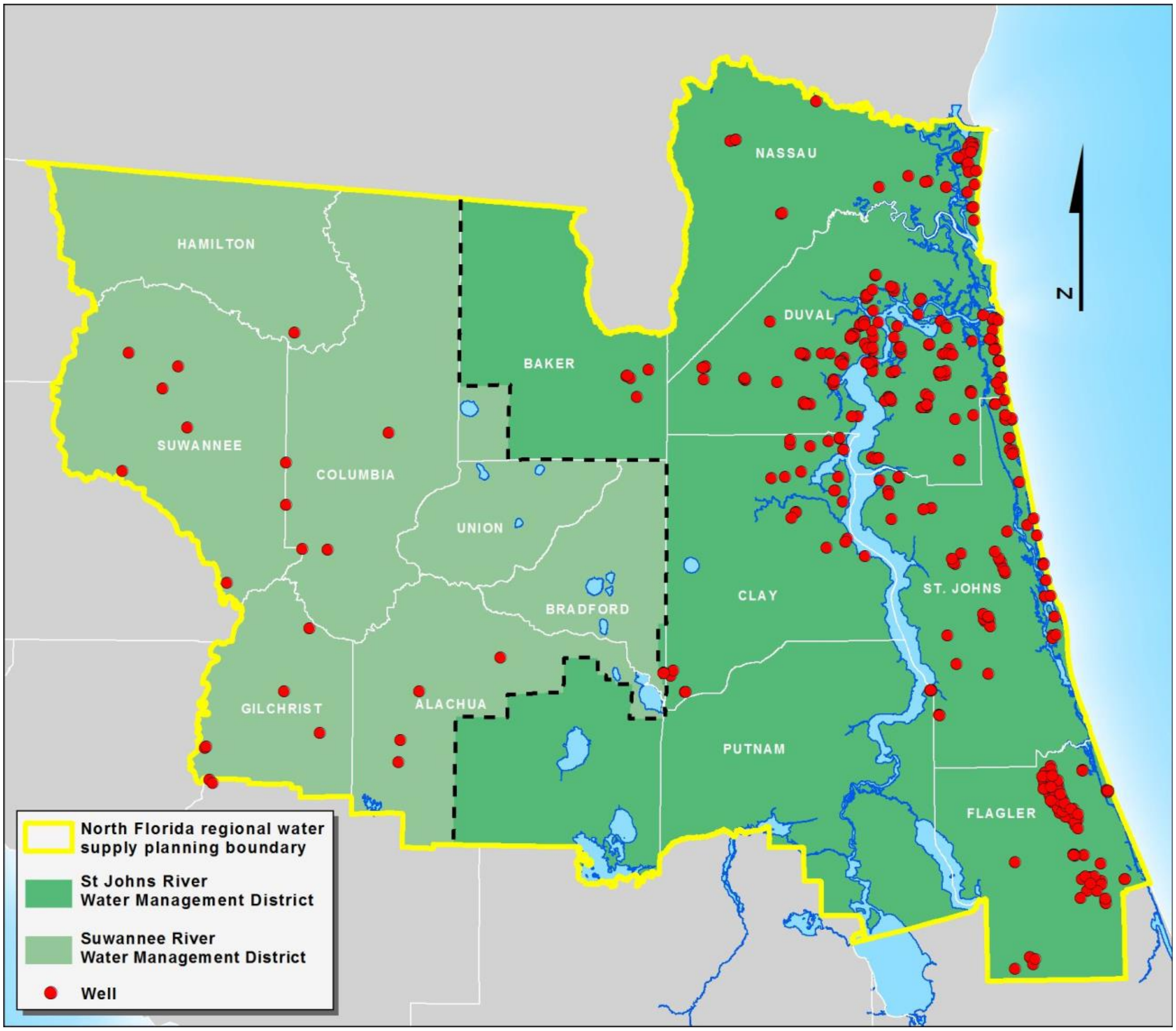

Figure 16: Wells Included in the NFRWSP Groundwater Quality Analysis

Thirty-three wells showed increasing chloride concentrations at rates ≥ 3 milligrams per liter per year (mg/L/yr) (high rate of change, Table 2), and 35 wells showed increasing chloride concentrations at rates within the range ≥ 1 and < 3 mg/L/yr (medium rate of change, Table 2). These 68 wells with high and medium rates of chloride change occurred within four counties in the SJRWMD portion of the NFRWSP area and were generally clustered along the St. Johns River and the Atlantic coastline. Sixty-five of these were FAS wells and three were SAS wells. Of these wells, 75%, or 51, were projected to still meet the chloride SDWS in 2035. For the remaining 25% (17 wells), groundwater quality could present a constraint on groundwater availability due to a current or projected exceedance of the SDWS (Figure 17). Statistically significant increasing trends of TDS were consistent with the results of the chloride trend analysis. The SDWS for TDS (500 mg/L) was projected to be exceeded at 24 wells by 2035 (see Appendix D for additional information).

Saline water intrusion appears to be localized due to upconing in response to withdrawals of groundwater from a single well and/or combined withdrawals from a wellfield. When viewed in total, the primary conclusion of this analysis is that groundwater quality may constrain the availability of fresh groundwater in a relatively limited area within Duval, Flagler, Nassau and St. Johns counties. However, these concerns can be managed through appropriate well construction, wellfield management or development of AWS.

Additional detailed information about individual wells, including detailed geochemistry analyses, is provided in Appendix D.

Table 2: Summary of NFRWSP Groundwater Quality Analysis – Chloride Trends

Chloride Trend Category	**Number of Wells that Currently Exceed 250 mg/L**		**Number of Additional Wells Projected to Exceed 250 mg/L by 2035**	
	# of wells	Location	# of wells	Location
High Rate of Change (33 wells)	5	St. Johns County	11	Duval, Flagler, Nassau and St. Johns counties
Medium Rate of Change (35 wells)	0	---	1	Duval County

Note: mg/L = milligrams per liter

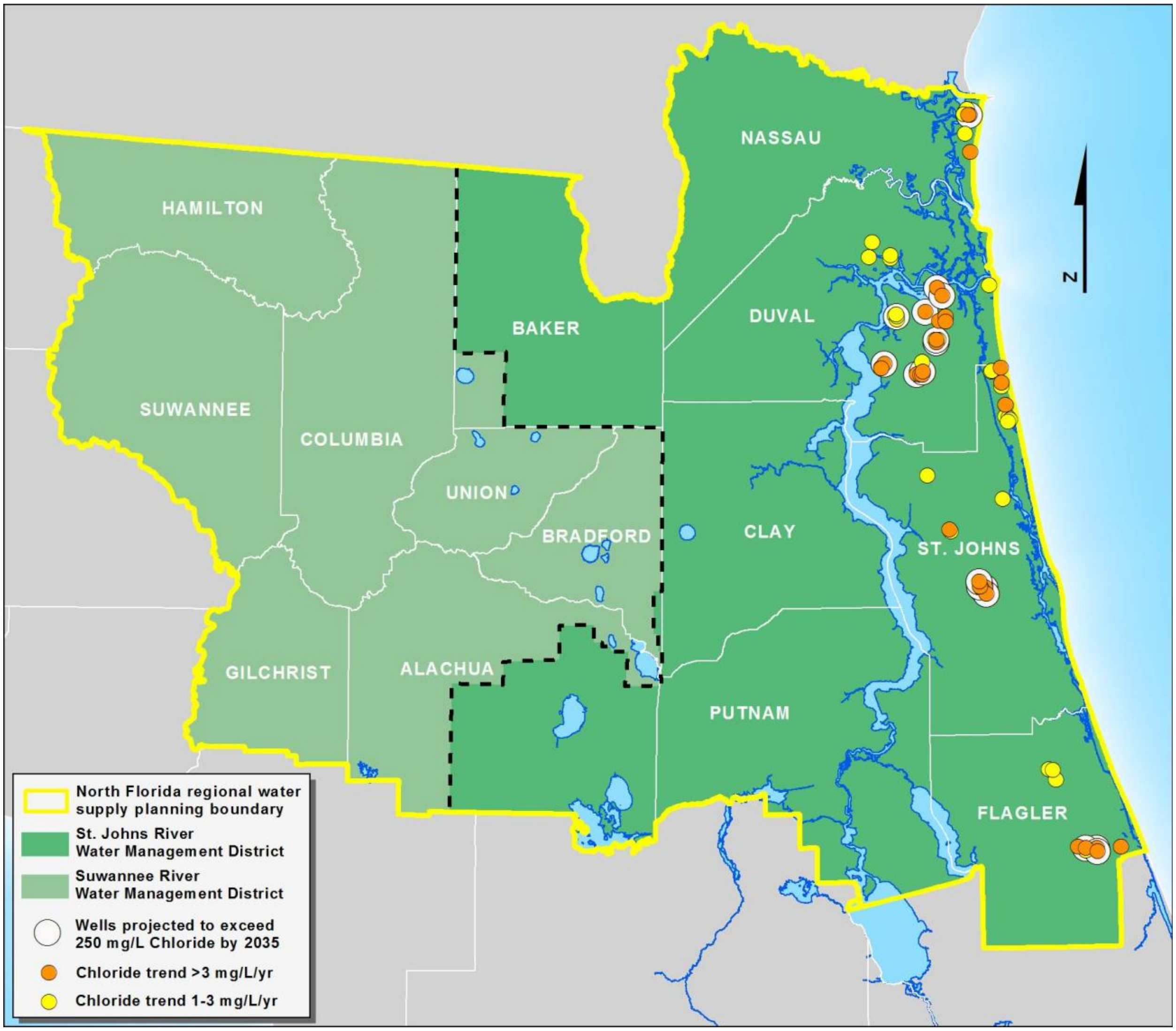

Figure 17: Wells with Increasing Trends in Chloride Concentration

Minimum Flows and Minimum Water Levels

Section 373.042, F.S., directs FDEP or the Districts to establish MFLs for lakes, rivers, springs, wetlands, and aquifers. Minimum flows and minimum water levels represent the flow(s) and/or level(s) at which further withdrawals would be significantly harmful to the water resources or ecology of the area. As such, MFLs provide quantitative metrics for water resource assessments and criteria for evaluating CUP/WUP applications. If analyses determine that a waterbody is not currently meeting its MFLs or is projected to fall below its MFLs during a 20-year planning horizon, that waterbody is said to be in recovery or prevention, respectively, with regards to its MFLs. In both cases, the Districts are required to formulate a strategy to ensure achievement of the MFLs throughout the planning horizon.

Each District is required to submit to FDEP an annual priority list and schedule for the establishment of MFLs. The priority list is based on the importance of waters to the state or region and the existence of, or potential for, significant harm to the water resources or ecology of the region. Appendix E includes a summary of the most recent priority lists for the Districts.

Information on all the adopted MFLs within the Districts can be found in chapters 40B-8, 40C-8 and Rule 62-42.300, F.A.C. Within the NFRWSP area, SJRWMD assessed the status of 19 lakes with MFLs and the SRWMD assessed the status of 19 MFLs for three rivers and 16 springs (see Appendix F for additional details).

Lakes with Minimum Flows and Minimum Water Levels

In order to determine whether the SJRWMD-adopted lake MFLs will be achieved through the 20-year planning horizon, the compliance status of the most constraining MFLs for each evaluated lake was determined using NFSEG-derived aquifer drawdown beneath the waterbody under existing and 2035 simulated withdrawal conditions within the NFRWSP area. Lake-specific surface water models were used to quantify the relationship between the change in aquifer level and water level within the lake. Projected aquifer levels were then compared to the aquifer levels needed to achieve the most constraining MFLs. Results of the analysis of the lake MFLs indicate that projected aquifer levels beneath the evaluated lakes were in excess of the levels needed to achieve the MFLs at 2035 conditions within the NFRWSP area (Table 3).

Analyses indicate that the adopted MFLs for lakes Brooklyn (Clay County), Cowpen (Putnam County) and Geneva (Clay County) are not met under existing conditions. However, MFLs for these waterbodies were developed and adopted in the 1990s using methods that current science indicates are not applicable to sandhill lakes with extremely high ranges of stage fluctuation. As such, re-evaluation of these MFLs is in progress so that the revised MFLs reflect current methods and the best available science. The Lake Cowpen Notice of Proposed Rule was approved for publication in December 2016; Lakes Brooklyn and Geneva are scheduled for 2017.

Rivers and Springs with Minimum Flows and Minimum Water levels

The Lower Santa Fe and Ichetucknee Rivers and associated priority springs are in recovery (Rule 62-42.300, F.A.C.). The flow deficit is estimated at 17 cubic feet per second (cfs) for the Lower Santa Fe River near Ft. White and 3 cfs for the Ichetucknee River at Highway 27 (SRWMD, 2014) under 2010 conditions. The impact of additional demand projections in the NFRWSP area through the 20-year planning horizon (2035) was evaluated using Comparison 1 (see Chapter 4). The additional predicted decrease in discharge was then added to the 2010 flow deficit. This planning evaluation is separate from the re-evaluation of the established MFLs that will occur prior to the end of 2019 (Rule 62-42.300(1)(e), F.A.C.). If all projected water demands are met using fresh groundwater, modeling results predict that an additional 21 cfs of flow reduction in the Lower Santa Fe River and 13 cfs in the Ichetucknee River will result from 2035 pumping conditions in the NFRWSP area. Therefore, the estimated total amount of recovery needed to achieve the Lower Santa Fe and Ichetucknee River MFLs at 2035 conditions is 38 cfs (17 cfs at 2010 and an additional 21 cfs by 2035) and 16 cfs (3 cfs at 2010 and an additional 13 cfs by 2035), respectively.

The Upper Santa Fe River MFLs were established in 2007 (Rule 40B-8.061, F.A.C., Minimum Surface Water Levels and Flows for the Santa Fe River). The predicted reductions in flow between the reference condition and the 20-year planning horizon (2035) at both MFLs reaches of the Upper Santa Fe River were evaluated using NFSEG scenario Comparison 2. These flow reductions were then compared to the available water as determined by the MFLs to determine whether the MFLs were achieved. The analysis indicates that the Upper Santa Fe River MFLs will be met at the 2035 planning horizon based on projected increase in demand within the NFRWSP area (Table 3).

Additional information regarding the MFLs analysis, including the impact of NFSEG domain-wide increases in pumping through 2035 (Scenario 5), is included in Appendix F.

Table 3: Status of Assessed MFLs within the NFRWSP Area

Type	Name	County/Basin	WMD	MFLs Status at 2035[1]
Lake	Banana	Putnam	SJR	Met
Lake	Bell	Putnam	SJR	Met
Lake	Brooklyn	Clay	SJR	Under Re-Evaluation
Lake	Broward	Putnam	SJR	Met
Lake	Como	Putnam	SJR	Met
Lake	Cowpen	Putnam	SJR	Under Re-Evaluation
Lake	Dream Pond	Putnam	SJR	Met
Lake	Geneva	Clay	SJR	Under Re-Evaluation
Lake	Georges	Putnam	SJR	Met
Lake	Gore	Flagler	SJR	Met
Lake	Grandin	Putnam	SJR	Met
Lake	Little Como	Putnam	SJR	Met
Lake	Orio	Putnam	SJR	Met
Lake	Silver	Putnam	SJR	Met

Table 3: Status of Assessed MFLs within the NFRWSP Area

Type	Name	County/Basin	WMD	MFLs Status at 2035[1]
Lake	Stella	Putnam	SJR	Met
Lake	Swan	Putnam	SJR	Met
Lake	Tarhoe	Putnam	SJR	Met
Lake	Trone	Putnam	SJR	Met
Lake	Tuscawilla	Alachua	SJR	Met
River	Upper Santa Fe	Santa Fe	SR	Met
River/Spring System	Ichetucknee River and Priority Springs (5)	Santa Fe	SR	Recovery
River/Spring System	Lower Santa Fe River and Priority Springs (11)	Santa Fe	SR	Recovery

[1] Refers to 2035 conditions within the NFRWSP area with the remainder of the NFSEG domain held at 2009 conditions

Minimum Flows and Minimum Water Levels Prevention and Recovery Strategies

Regional Water Supply Plans shall include prevention and recovery strategies which have been developed and approved pursuant to ss. 373.042(2), F.S. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy, which addresses MFLs for the LSFI, was accepted by the SRWMD Governing Board on March 11, 2014 and is included in Appendix G. Rule 62-42.300, F.A.C., proposed by FDEP on March 7, 2014, and subsequently ratified by the Legislature, in part, mirrors the regulatory components of the LSFRB Recovery Strategy, which apply to areas within both Districts, pursuant to ss. 373.042(4), F.S., and Rule 62-42.300(1)(e), F.A.C. The rule requires that FDEP and the Districts re-evaluate the minimum flows and minimum water levels, present status of the LSFI MFLs, and re-propose for adoption the LSFI MFLs and any associated recovery or prevention strategies "[n]o later than three years from the publication of the final peer review report on the North Florida Southeast Georgia Regional Groundwater Flow Model, or by December 31, 2019, whichever is earlier."

Recovery Strategy for the Lower Santa Fe River Basin

Since the formation of the Partnership, MFLs were set on the LSFI. A status assessment at the time of MFLs adoption determined these resources to be in recovery. Based on the potential for cross-boundary withdrawals to impact flow in the river basin, the MFLs and associated LSFRB Recovery Strategy (Appendix G) were adopted by FDEP with input from the Districts. The LSFRB Recovery Strategy was broken into two phases. Phase I included implementation of preliminary recovery strategy regulatory measures, development of the NFSEG, identification of water resource development and water supply development projects to contribute to resource recovery, and development of the NFRWSP. Phase II focuses on implementation of long-term regulatory measures to address regional water supply goals and will re-evaluate the magnitude of recovery needed to achieve the MFLs.

The LSFRB is in Phase I of the recovery strategy (Appendix G). Section 6.0 of the LSFRB Recovery Strategy was adopted by FDEP in Chapter 62-42, F.A.C. Water resource and water supply development projects have been identified and implementation of projects has begun. In addition, the NFSEG version 1.0 was used to assess resource constraints. In compliance with Chapter 62-42, F.A.C., the NFSEG version 1.0 will undergo peer review, and the LSFI MFLs will be re-evaluated using the best available scientific or technical data, methodologies and models. Phase II of the LSFRB Recovery Strategy will follow this re-evaluation and ensure long-term regulatory measures are in place to achieve the LSFI MFLs.

Priority Waterbodies without Minimum Flows and Minimum Water Levels

The purpose of this assessment is to provide water users with a sense of the potential for water resource impacts in portions of the planning area where MFLs have not yet been adopted. Within the NFRWSP area, there are two river reaches, eight springs and 13 lakes on the Districts' priority lists for future MFLs development. Of these priority waterbodies, only the river reaches and springs were evaluated in this analysis (Table 4) due to the current lack of a meaningful screening threshold available for the lakes. Upon MFLs adoption, the 13 lakes will be assessed in a subsequent RWSP.

Baseline conditions for the priority rivers and springs were calculated using Scenario 4. Flow under the baseline condition was compared to modeled flow using Scenario 2. Waterbodies that showed more than a 10 percent decrease in flow from a no-pumping condition were identified in this analysis. Note that a threshold of 10 percent reduction in flow does not necessarily correspond to an ecological threshold beyond which significant harm would occur. Conversely, waterbodies experiencing less than a 10 percent reduction in flow may still experience significant harm. The 10 percent threshold does, however, highlight areas where resource constraints may occur upon upcoming MFLs adoption. It is during MFLs development that the unique hydrologic and ecological conditions for individual waterbodies are accounted for with changes in flow linked to a quantitative significant harm threshold. Subsequent versions of the NFRWSP will incorporate any newly adopted or reevaluated MFLs in the water resource assessment in order to utilize the best available information gathered during MFLs development.

Both priority rivers and four priority springs showed flow reductions less than 10 percent at 2035 conditions within the NFRWSP area. The remaining four priority springs showed greater than 10 percent reduction in flow under these same conditions (Table 4). Per the SRWMD priority list, MFLs will be set on the Upper Suwannee River

Basin in 2017. The impact of NFSEG domain-wide increases in pumping through 2035 (Scenario 5) on the priority waterbodies without MFLs is included in Appendix H.

Table 4: Priority Waterbodies without MFLs Assessment Summary

Type	Name	County/Basin	WMD	MFLs Priority List Year	Reduction in Flow at 2035 >10%
River	Alapaha River	Alapaha	SR	2017	No
River	Upper Suwannee River at White Springs	Upper Suwannee	SR	2016	No
Spring	Alapaha Rise	Upper Suwannee	SR	2016	No
Spring	Holton Creek Rise	Upper Suwannee	SR	2016	Yes
Spring	SUW923973 (Stevenson)	Upper Suwannee	SR	2016	No
Spring	SUW1017972 (unnamed)	Upper Suwannee	SR	2016	Yes
Spring	Suwannee	Upper Suwannee	SR	2016	Yes
Spring	White	Upper Suwannee	SR	2016	Yes

Wetlands

Wetland vegetative communities can be affected by water level changes in the SAS due to unique combinations of soil type, vegetative species and hydrogeology. The wetlands assessment estimated the magnitude of potential adverse change to wetland function that may occur due to the projected increase in groundwater withdrawals through 2035. Many factors other than groundwater withdrawals (e.g. modification of surface water hydrology) can result in significant alterations of wetlands relative to predevelopment conditions. Therefore, this analysis focused exclusively on assessing the potential for additional adverse changes to existing wetlands from projected increases in groundwater withdrawals within the NFRWSP area. The potential for adverse change was assessed using the Kinser-Minno method (Kinser and Minno, 1995; Kinser et. al., 2003) in the portions of the NFRWSP area where the UFA is confined and the modified Kinser-Minno method (Dunn et. al., 2008) in portions of the NFRWSP area where the UFA is unconfined. Both methods utilize a geographic information system (GIS) matrix analysis of soil permeability, sensitivity of the existing plant species, and projected declines in aquifer level predicted from NFSEG simulations. The analysis yielded a spatial identification of areas with moderate and high potential for adverse change to wetland function.

The wetland assessment identified 20,175 acres at a moderate or high potential for adverse change based on 2035 conditions within the NFRWSP area. Changes to wetlands from groundwater pumping tend to be local issues and are primarily addressed via the Districts' regulatory programs and through the development of water supply and water resource development projects.

Additional detailed information regarding the wetlands assessment methodology and analysis results for NFSEG domain-wide increases in pumping through 2035 (Scenario 5) are included in Appendix I.

Table 5: Wetland Acreage Identified as Having a Moderate or High Potential for Adverse Change to Wetland Function

County	WMD	Potential Wetland Adverse Change at 2035[1] (acres)
Alachua	SJR	1,392
Alachua	SR	209
Baker	SJR	0
Baker	SR	0
Bradford	SJR	8
Bradford	SR	116
Clay	SJR	3,879
Columbia	SR	54
Duval	SJR	955
Flagler	SJR	3,532
Gilchrist	SR	798
Hamilton	SR	998
Nassau	SJR	389
Putnam	SJR	5,392
St. Johns	SJR	63
Suwannee	SR	13
Union	SR	2,377
Total		**20,175**

[1] Refers to 2035 conditions within the NFRWSP area with the remainder of the NFSEG domain at held at 2009 conditions

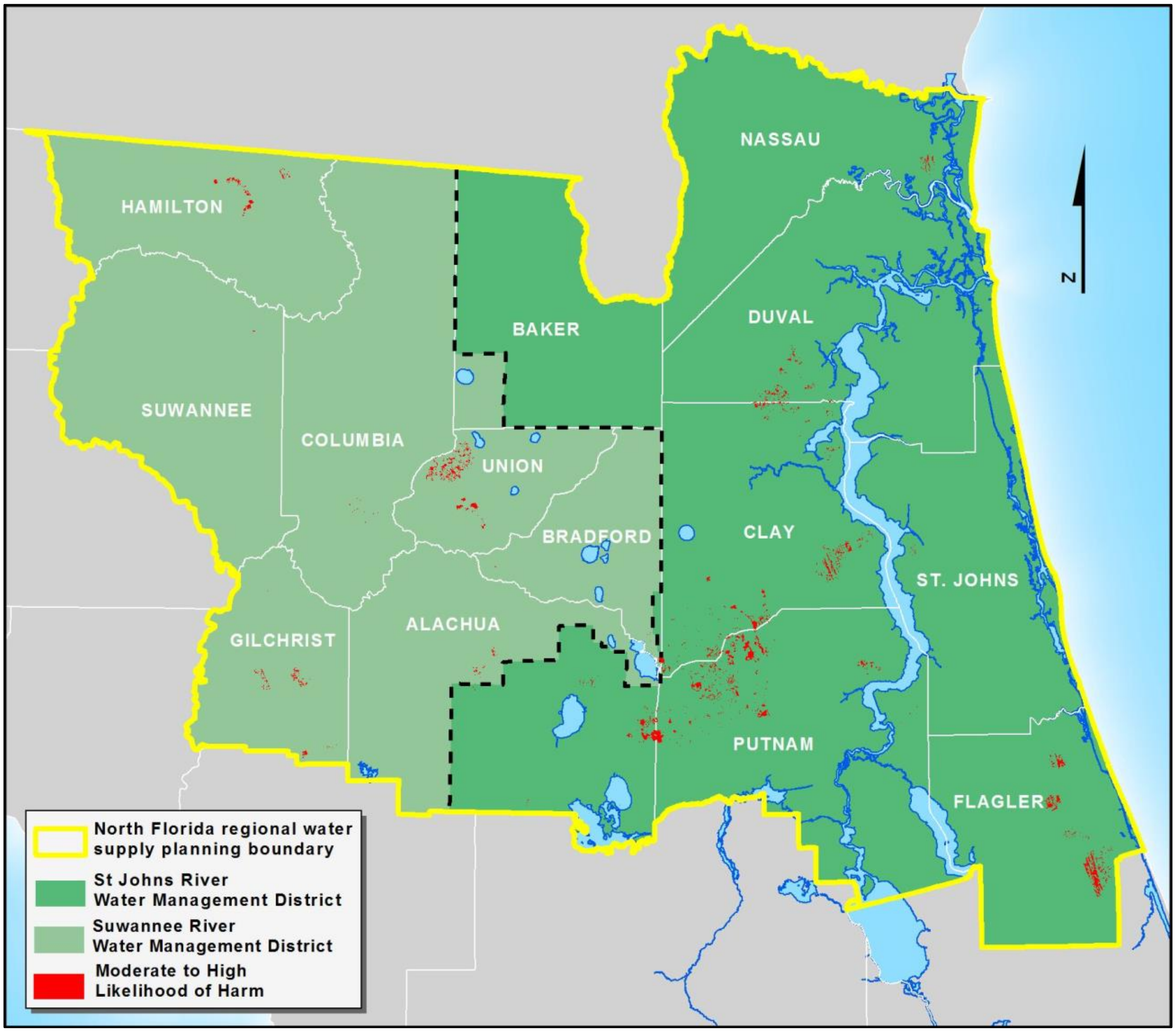

Figure 18. Wetlands at Risk of Adverse Change Due to 2035 Projected Withdrawals within the NFRWSP Area

Reservations

Subsection 373.223(4), F.S., authorizes the Districts and FDEP to reserve water from use by permit applicants for the protection of fish and wildlife or public health or safety. When a water reservation is in place, volume and timing of water quantities at specific locations are protected and maintained for the natural system ahead of new consumptive uses. The only water reservation in the NFRWSP area was adopted by the SJRWMD Governing Board in 1994 (Rule 40C-2.302, F.A.C.). A portion of flow in Prairie Creek was reserved in order to support fish and wildlife in Paynes Prairie. Historically, Prairie Creek discharged into Paynes Prairie. In the 1920s, however, flow into the Prairie was diverted through Camps Canal into Orange Lake to provide better conditions for grazing cattle. When the State of Florida purchased Paynes Prairie in the 1970s, the Camps Canal dike was breached to allow flow back into Paynes Prairie in

Alachua County. The water reservation was adopted to balance the need to restore flow to the Prairie while also retaining a portion of flow that was being artificially diverted to Orange Lake through Camps Canal. Approximately half of the flow from Prairie Creek is reserved for Paynes Prairie with the remainder allowed to divert to Orange Lake.

Climate Change

Uncertainties associated with climate change complicate the challenge of how to meet future water supply demands while avoiding unacceptable water resource impacts (Misra, 2011). Climate change affects both the availability of water supply and projected water demands. As noted previously in this chapter, localized saline water intrusion from upconing is already an issue for some coastal communities in North Florida. Existing water users along the coast will be further challenged should sea level rise exacerbate saline water intrusion, accelerating the timeframe and magnitude of enhanced management practices and/or infrastructure that will be needed to mitigate potential increased salinity. Although solutions are available to some water suppliers experiencing increased salinity, such actions can increase the cost associated with providing potable water to existing and future users. An increase in the intensity of rainfall events and the duration of drought are additional projected impacts of climate change that are of particular concern to water supply planning.

Despite these challenges, many of the same practices that are implemented to address water resource constraints also mitigate the impacts of climate change:

- Decrease groundwater demand (e.g., increase utilization of reclaimed water; water conservation)

- Improve efficiency (e.g., upgrade agricultural irrigation technology; replace aging public supply distribution systems to reduce losses)

- Improve infrastructure capacity and flexibility (e.g., interconnect water supply systems)

- Diversify water supply sources

Collaboration will also be necessary to meet the challenges posed by climate change and provide reliable water supply for all water users. The Florida Water and Climate Alliance (FWCA) provides a venue for collaboration to address water supply challenges associated with climate change. The FWCA is a "stakeholder-scientist partnership committed to increase the relevance of climate science data and tools at relevant time and space scales to support decision-making in water resource management, planning and supply operations in Florida (floridawca.org)." FWCA collaborators include public water supply utilities, WMDs, academic institutions, and other stakeholders from throughout Florida. Collaborators share information and ideas that inform local and regional decisions regarding integration of climate science in water supply management. Although climate change poses significant challenges to water supply availability, local management actions and regional collaborations will help mitigate the associated impacts and enhance the continued reliability of water supply in North Florida.

Chapter 6: Alternative Water Supply Needs Assessment and Delineation of Water Resource Caution Areas (Sufficiency Analysis)

Purpose

Pursuant to s. 373.709(2), F.S., a RWSP must include sufficient water resource and water supply development project options to meet projected water demands without causing unacceptable water resource impacts and must support MFLs recovery or prevention strategies. This chapter discusses the approach used to demonstrate sufficiency of the NFRWSP project options. In addition, this chapter discusses the technical basis used for delineation of WRCAs, identifies differences between the Districts' delineation methodologies and identifies existing and proposed WRCAs pertinent to the NFRWSP (Rule 62-40.520(2), F.A.C.).

Sufficiency Analysis

The Districts determination that the suite of project options was adequate to address the potential water resource impacts are based on the following; 1) that the 117 mgd of future demand identified in Chapter 3 can be addressed by over 200 mgd of projects that do not withdraw water from the Floridan Aquifer, thereby the future impacts identified in Chapter 5 would not occur, and 2) as required by Chapter 373.709, F.S., the Districts have included the LSFRB Recovery Strategy into the NFRWSP.

The LSFRB Recovery Strategy, as incorporated by Rule 62-42.300, F.A.C., has several important components that must be considered in the NFRWSP. These components are:

1. As required by Rule 62-42.300(1)(e), F.A.C., the re-evaluation and reassessment of the LSFI MFLs must occur no later than December 31, 2019. However, this re-evaluation and reassessment will not be complete prior to the approval of the NFRWSP.

2. Rule 62-42.300(1)(d), F.A.C., references supplemental regulatory measures for the LSFI MFLS and specifically states that "Existing permitted uses shall be considered consistent with the Recovery Strategy provided the permittee does not exceed its permitted quantity. Such permits shall not be subject to modification during the term of the permit due to potential impacts to the MFL water bodies unless otherwise provided for in rule revisions pursuant to Rule 62-42.300(1)(e), F.A.C."

The sufficiency analysis acknowledges these rule requirements while recognizing that the NFRWSP is a plan for the future.

The following approach is based on the technical work conducted for LSFRB Recovery Strategy and the associated water resource conditions are adequately comparable in order to demonstrate that the NFRWSP contains sufficient project options to meet future water needs and avoid unacceptable water resource impacts.

The NFRWSP recognizes that the specific analysis in the LSFRB Recovery Strategy (Appendix G) provides the framework for recovering the LSFI MFLs. The LSFRB Recovery Strategy identified 92.3 mgd of projects would provide the 31.9 cfs (20.6 mgd) flow required to recover the system and meet the 2030 demand. Implementation of projects identified in the recovery strategy is under way. Fourteen projects identified in the LSFRB Recovery Strategy are complete or in progress, with more projects under development. The NFRWSP identified an additional 124.1 mgd of projects beyond those detailed in the LSFRB Recovery Strategy to ensure project options are available to meet regional demands.

The Districts used the ratio of the mgd of projects required to produce the desired recovery flow documented in the LSFRB Recovery Strategy to evaluate whether sufficient projects were listed in the NFRWSP. The Districts estimated the quantity of water produced by projects to recover each projected cfs of recovery needed (92.3 mgd in water of projects identified ÷ 31.9 cfs[1] of recovery = 2.89 mgd of projects per cfs of recovery). As discussed in Chapter 5, and shown in the calculation below, results indicate that under 2035 projected pumping conditions within the NFRWSP area, the Lower Santa Fe River flow, as measured at the Ft. White gage, will need a recovery of 38.0 cfs.

> 2009 Lower Santa Fe River Flow (708.5 cfs) – 2035 Lower Santa Fe River Flow (687.5 cfs) + 2010 Lower Santa Fe River Flow Recovery (17.0 cfs) = Lower Santa Fe River Flow Starting Recovery Goal (38.0 cfs)

The Districts evaluated the benefits of using 59.7 mgd of water resource development projects using the NFSEG, which provided 8.4 cfs of potential recovery to the Lower Santa Fe River flow. This would reduce the projected recovery of the Lower Santa Fe River flow to 29.6 cfs. Using the conversion of cfs to mgd above, the Districts have estimated that 85.5 mgd of potential projects are needed to avoid unacceptable water resource impacts and support MFLs recovery strategies.

The Districts have identified a high water conservation range potential of 54.0 mgd, further reducing the quantity of water supply development projects needed to approximately 31.5 mgd. Of the projects identified in Table 6, there is 5 mgd of water resource development projects that were not used in the evaluation of project benefits. In addition, Table 7 identifies 97.2 mgd of water supply development projects. This amounts to 70.7 mgd more projects than are needed to recover the LSFI MFLs and meet future demands.

[1] The original draft of the plan was developed using 20.6 cfs instead of the 20.6 mgd listed in the LSFRB Recovery Strategy. When converted from mgd to cfs, the recovery for the Lower Santa Fe River at Fort White in the LSFRB Recovery strategy is 31.9 cfs.

The NFRWSP identifies 216.4 mgd of projects to meet the increased demand of 117 mgd in 2035. The majority of these projects meet the projected water demand and offset water resource impacts without using any additional water from the UFA.

Water Resource Caution Areas

Water Resource Caution Areas are geographic areas identified by a District as having existing water resource problems or areas in which water resource problems are projected to develop during the next twenty years. Water Resource Caution Areas are established pursuant to Rule 62-40.520(2), F.A.C., which provides "[w]ithin one year of the determination that a regional water supply plan is needed for a water supply planning region, the region shall also be designated as a water resource caution area." Once a planning region is designated as a WRCA, domestic wastewater treatment facilities which are located within, serve a population located within, or discharge within a water resource caution area, shall be subject to the reuse requirements of s. 403.064, F.S.

SRWMD 2010 Water Supply Assessment

In 2010, the SRWMD completed a Water Supply Assessment (WSA; SRWMD, 2010). Based on technical analyses in the 2010 WSA, which predicted unacceptable impacts to river and springs flows within the northeastern part of the SRWMD for the 2010 – 2030 planning period, the SRWMD Governing Board authorized designation of four WRCAs on October 11, 2011 (Figure 19): Alapaha River Basin, Upper Suwannee River Region, Upper Santa Fe River Basin, and the LSFRB. This action identified the need for SRWMD to develop a RWSP for the designated WRCAs. The NFRWSP is the RWSP for these designated WRCAs.

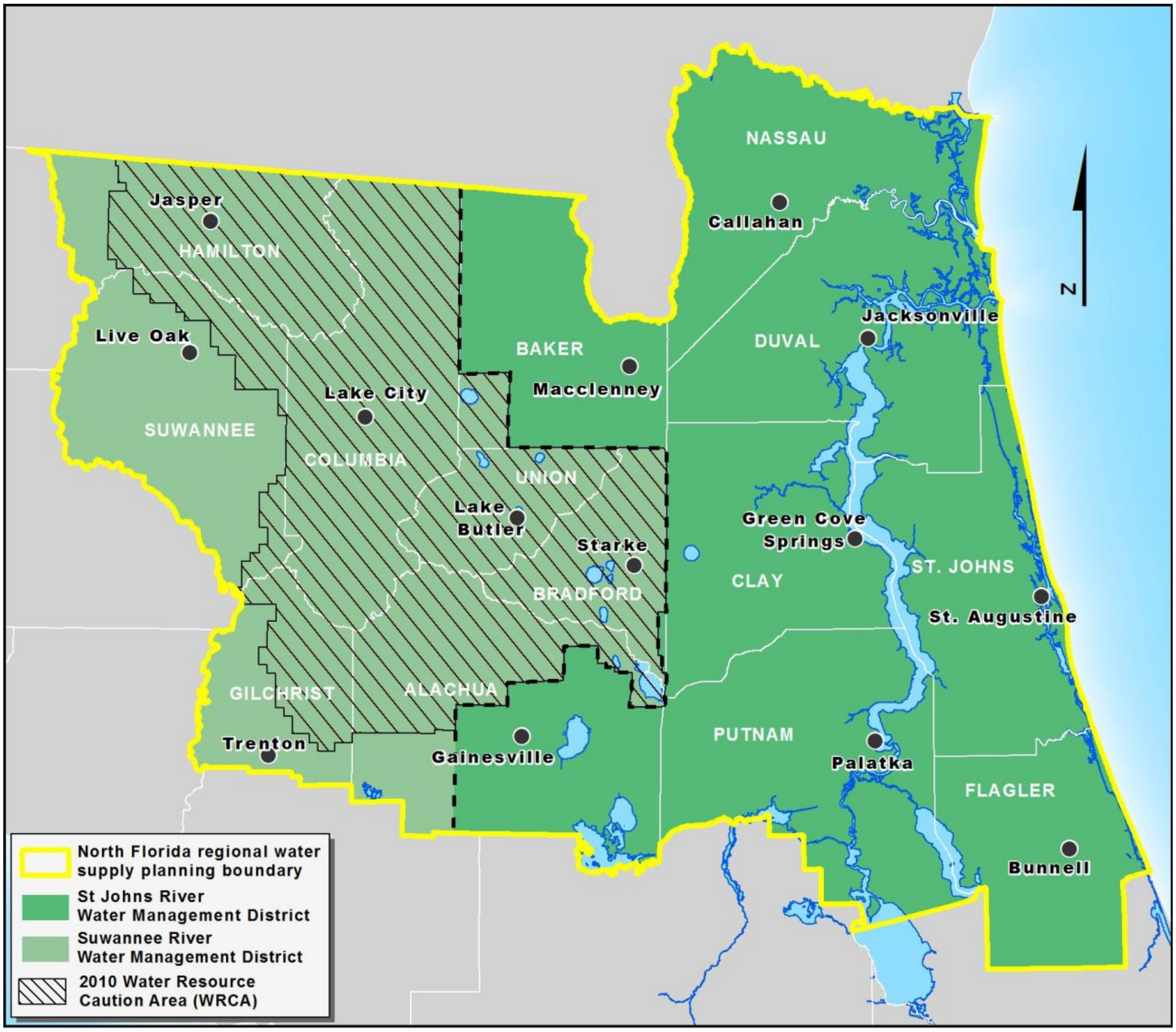

Figure 19: Existing Water Resource Caution Areas in the SRWMD

NFRWSP Water Resource Caution Area Delineation

The presence of a recovery strategy signifies MFLs are not being met and therefore water resource problems exist within a specific area. The LSFRB Recovery Strategy constrains the availability of groundwater throughout the NFRWSP area and provides a technical basis for the constraint. Because the regulatory components and associated technical analyses within the LSFRB Recovery Strategy are applicable to the entire planning area, the entire NFRWSP area is proposed for designation as a WRCA (Figure 20).

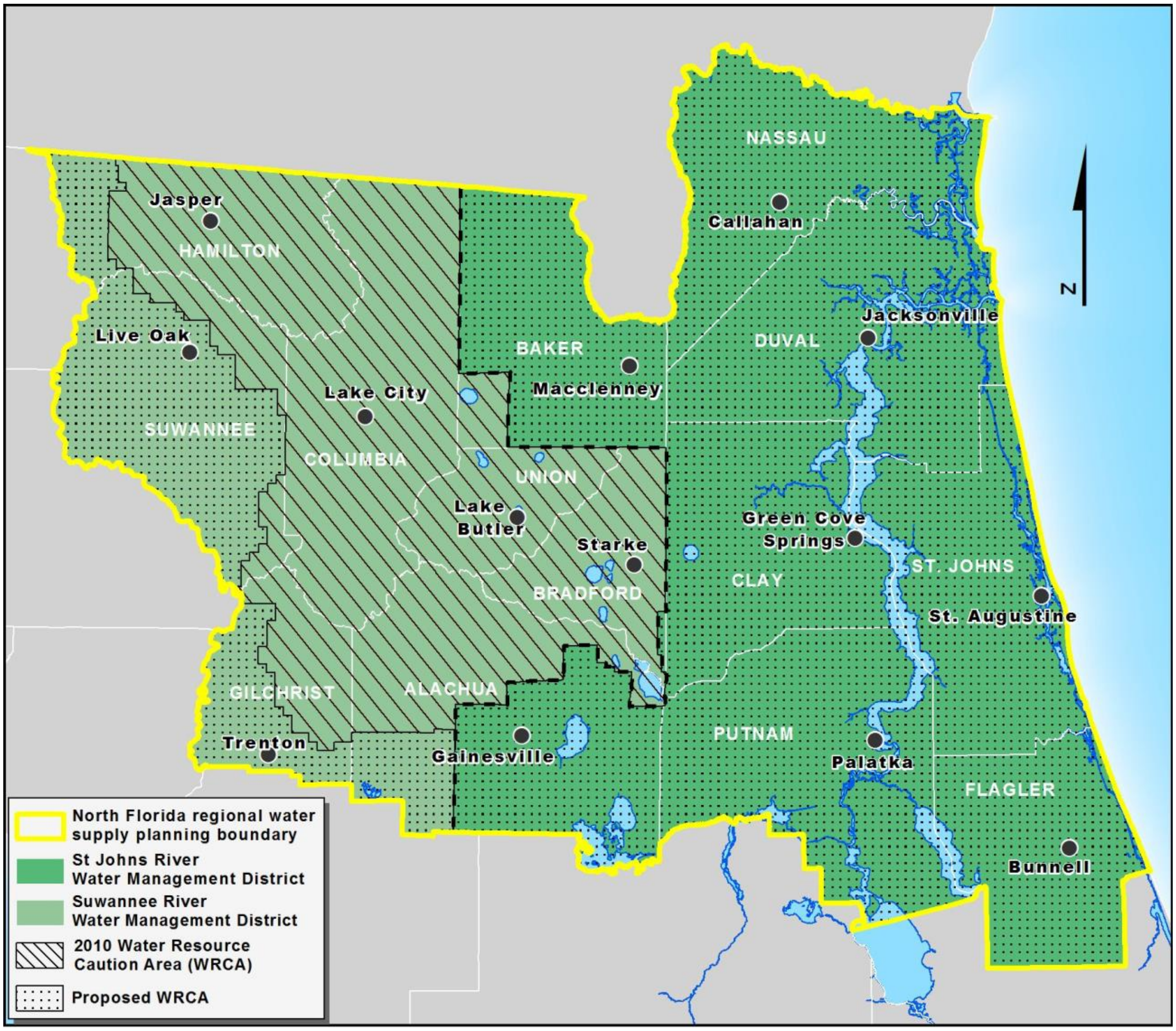

Figure 20: Proposed NFRWSP Water Resource Caution Area

The existing WRCA designation in SRWMD does not cover the entire SRWMD portion of the NFRWSP area as delineated in Figure 20. Formal modification of the WRCAs in the SRWMD portion of the NFRWSP area will be addressed in the SRWMD 2015 WSA, when completed. As such, the NFRWSP serves as the RWSP for only those areas designated in the SRWMD 2010 WSA; the Alapaha River Basin, Upper Suwannee River Region, Upper Santa Fe River Basin, and the LSFRB WRCAs.

The SJRWMD intends to utilize the NFRWSP as the WSA to designate that portion of the SJRWMD located in the NFRWSP area as a WRCA based on the constraints dictated by the LSFRB Recovery Strategy. The SJRWMD portion of the NFRWSP area identified in this plan shall be considered a WRCA for the purposes of s. 403.064, F.S., and affected parties may challenge the designation pursuant to s. 120.569, F.S.

Additional Analyses Supporting the WRCA Delineation

In addition to the presence of waterbodies with the NFRWSP area whose MFLs are currently violated, results from analyses of non-MFLs priority water bodies, groundwater quality, and wetland impact evaluations identify geographic areas that have additional existing or projected water resource problems. These analyses further support the WRCA designation of the planning region. Details regarding the groundwater quality and wetland analyses are provided in Chapter 5.

Impacts to Non-Minimum Flows and Minimum Water Levels Priority Waterbodies

The analysis of non-MFLs priority waterbodies identified four springs within the SRWMD portion of the NFRWSP area with projected declines greater than 10 percent due to 2035 projected demand. All of these springs are scheduled to have MFLs set in 2017. As MFLs are set on these and other priority water bodies within the NFRWSP area, achieving and/or maintaining MFLs could provide an additional constraint on resources within the planning region.

Groundwater Quality

The groundwater quality analysis for the NFRWSP indicated that groundwater quality may constrain the availability of fresh groundwater in portions of Duval, Flagler, Nassau, and St. Johns counties, east of the St. Johns River (Figure 17), based on water quality monitoring data from existing production wells. Although a number of coastal public supply utilities in the NFRWSP area currently implement management actions to mitigate increasing salinity in their production wells, management actions to address elevated salinity levels increase the cost of obtaining potable water. Such costs represent a challenge for public supply utilities and pose a significant constraint for smaller water users who have more limited financial resources. Groundwater quality is a current concern for coastal water users in particular and is projected to further degrade over the next twenty years. As such, the groundwater quality analyses support the designation of that portion of SJRWMD in the NFRWSP area as a WRCA.

Potential Adverse Change to Wetlands

The wetland analysis identified 20,175 acres within the NFRWSP area potentially at high or moderate risk of adverse change if the projected increase in water demand was met with fresh groundwater. As shown in Figure 18, many of these areas are located in the interior portions of the NFRWSP area. Although adverse change to wetland function can be mitigated through management actions such as wellfield optimization and system interconnections, such actions can increase the cost of obtaining potable water. Smaller water users may not have the financial resources or infrastructure that allow for implementation of such management actions. Thus, adverse changes to wetlands pose a potential constraint on the availability of fresh groundwater in the NFRWSP area. This analysis provides further support for the WRCA designation of that portion of SJRWMD in the NFRWSP area.

Chapter 7: Project Options

Purpose

This chapter provides an overview of the water source options available to water users located within the NFRWSP area as a means to avoid water resource constraints identified in chapters 5 and 6. Where possible, planning-level estimates of the potential available yield for each source are provided. These estimates address a number of factors including consideration of any established MFLs, potential impacts to water and environmental resources, the results of previous water resource evaluations, permittability, water source quality, consideration of existing legal uses, and known engineering limitations.

Fresh groundwater sources are considered traditional water sources whereas nontraditional or AWS include brackish groundwater, surface water/stormwater, seawater, reclaimed water, and water stored in Aquifer Storage and Recovery (ASR) systems and reservoirs. In addition, there are a number of management tools that can enhance the source of supply, sustain the water resources and related natural systems, or otherwise optimize supply yield. Examples of management tools include ASR, storage tanks and ponds/reservoirs, land-use transitions, wellfield optimization, water resource augmentation, and aquifer recharge.

Groundwater sources within the NFRWSP area include the fresh and brackish portions of the FAS, the Intermediate Aquifer System and the SAS. Groundwater from the UFA and some select zones in the LFA is the traditional source of water supply for all water use categories in the NFRWSP area. In 2010, an estimated 490 mgd of groundwater was used within the NFRWSP area to meet demands. Because future groundwater withdrawals were found to be constrained, the NFRWSP focused on water conservation and implementation of projects to meet future demand.

Project Cost and Volume Estimation Methodology

All projects submitted to, or proposed by, the Districts can be found in Appendices J, K, L, and M. Projects were evaluated and are summarized into four categories: water resource development projects (Appendix J), water supply development projects (Appendix K), potential water supply development, water resource development and water conservation projects (Appendix L), and water conservation projects (Appendix M). Development of these projects will serve the public interest or save costs by preventing the loss of natural resources or avoiding greater future expenditures for water resource or water supply development projects. The potential projects are included in order to provide a broader suite of potential project options. These projects may become feasible if they address environmental, technical or permit criteria. Examples include projects where:

- The source water was not available and/or there was an unmitigated impact

- The location of a project was not viable to the property owner or there were ownership or property control issues with the proposed project location
- There was not a defined water resource benefit
- There was not a fully developed cost estimate

Water Resource Development Project Options

Water resource development projects are typically implemented by the WMDs or by the WMDs in conjunction with other agencies or local governments (ss. 373.705(1)(a); F.S.). These include projects that increase the amount of water available for water supply, collect and analyze data for water supply planning, and study the feasibility and benefits of new techniques. This section provides an overview of these projects.

Brackish Groundwater

Brackish groundwater, for AWS planning purposes, is generally defined as water with a TDS concentration of greater than 500 mg/L. Brackish groundwater exists in the FAS in portions of the NFRWSP area, specifically in coastal areas and near the St. Johns River. Brackish groundwater can be utilized to meet water demands but may require treatment by methods such as low pressure reverse osmosis (RO) or electrodialysis reversal (EDR). Treatment generally requires disposal of concentrate or reject water. Both RO and EDR treatment costs are higher than the treatment costs of fresh water sources. Additionally, the hydrologic connection between the brackish and fresh portions of the local aquifer horizons requires evaluation and may not offer sufficient hydrologic confinement to protect overlying aquifer systems from possible drawdown and saline water intrusion.

Surface Water/Stormwater

Opportunities exist for the development of water supplies from the lakes and rivers in the NFRWSP area that could supplement traditional groundwater supplies. Smaller, local lakes are generally considered a limited resource and often provide the local landowners with water for irrigation purposes. The capture and storage of water from river/creek systems and runoff can supply significant quantities of water and could be a component of multi-source water supply development projects. Larger lakes may represent an opportunity for development of supplies, as they have larger, regional drainage basins to buffer the effects of withdrawals.

Seawater

The use of desalinated seawater from the Atlantic Ocean and Gulf of Mexico is an additional water source option in the NFRWSP area. Seawater is an essentially unlimited source of water. However, desalination is required before seawater can be used for water supply purposes and concentrate from the desalination process must be managed to meet regulatory and environmental criteria. In addition to treatment facilities, pump stations and pipelines would be required to transport finished water from the coast to the interior portions of the NFRWSP area.

The use of seawater to meet public supply demands requires advanced treatment of the water by desalination technologies, which include distillation, RO or EDR as options. Significant advances in treatment and efficiencies in seawater desalination have occurred over the past decade. While seawater treatment costs are decreasing and capital costs are becoming competitive with above ground reservoir options, operational costs remain moderately higher than other water supply options.

Reclaimed Water

Reclaimed water is wastewater that has received at a minimum secondary treatment and basic disinfection and is reused after leaving a domestic WWTF. Reuse is the deliberate application of reclaimed water, in compliance with FDEP and the Districts' rules, for beneficial purposes. Reclaimed water utilization is a key component of water resource management in the NFRWSP area. Reclaimed water is used for non-potable purposes such as landscape irrigation, agricultural irrigation (where applicable), aesthetic uses, groundwater recharge, industrial uses, environmental enhancement, and fire protection purposes. Reclaimed water is also being investigated for indirect potable reuse, which is the process of purifying reclaimed water to state and federal drinking water standards so that it can be utilized for recharge and water supply uses. Although direct potable reuse is not currently being implemented in the Districts, this method is being investigated in Florida and is being used in other states and countries to meet potable demands.

Storage Capacity – Aquifer Storage and Recovery and Reservoirs

Aquifer Storage and Recovery

Aquifer storage and recovery is the underground injection and storage of water into an acceptable aquifer (typically the FAS) and stored for withdrawal at a later date to meet demands when insufficient traditional supplies are available. The aquifer acts as an underground reservoir for the injected water. Aquifer storage and recovery provides for storage of large quantities of water for both seasonal and long-term storage and ultimate recovery that would otherwise be unavailable due to land limitations, loss to tides, or evaporation. While ASR is not in itself a new supply source, it provides for system reliability allowing for increased development of other sources of water. Some sources of supply, including many surface water supply options, can be intermittent and therefore unreliable. Other supply options such as reclaimed water have variable demand issues but have relatively consistent supply. In these instances, ASR systems play an important role to store large quantities of water for distribution in cases where the source or demand is variable.

Reservoirs

Surface water reservoirs provide storage of water, primarily during wet weather conditions, for use in the dry season. Water typically is captured, pumped from rivers or canals and stored in above or in-ground reservoirs. Small-scale (local) reservoirs/ponds that can hold several hundred thousand gallons or more are used by farms and golf courses to store recycled irrigation water or collect local stormwater runoff. These reservoirs may also provide water quality treatment before off-site discharge. Large-scale (regional) reservoirs may hold up to several billion gallons and are used for stormwater attenuation, water quality treatment in conjunction with stormwater treatment areas, and storage of seasonally available water for use during dry periods. The potential yield of such reservoirs is directly related to the size of the reservoir and the size of the surface water capture area.

A summary of water resource development project options are shown in Table 6.

Table 6: Summary of Water Resource Development Project Options

Type	Number of Projects	Quantity Water Produced (mgd)	Estimated Cost ($M)
Groundwater (LFA)	2	10.3	3.8
Surface Water	11	47.39	153.59
Seawater	0	N/A	N/A
Reclaimed Water	3	7.5	9.65
ASR and Reservoirs	0	N/A	N/A
Total	**16**	**65.19**	**167.04**

Water Supply Development Project Options

An important part of the NFRWSP process is identifying water supply development project options necessary to meet the anticipated water needs of the planning area through 2035 planning horizon. While water users are not limited to the projects listed in the NFRWSP plan, the list represents a set of projects that could supply a sufficient quantity of water to meet the projected water demands if implemented.

Water supply development is defined in ss. 373.019 (26), F.S. as the planning, design, construction, operation, and maintenance of public or private facilities for water collection, production, treatment, transmission, or distribution for sale, resale, or end use.

A list of water supply project options for the NFRWSP area was developed in coordination with water suppliers and users. In preparation of the NFRWSP, the Districts circulated a questionnaire to solicit information from public supply utilities, agricultural and other water users regarding the traditional and AWS projects planned to meet water needs through 2035. This process allowed water users to provide input on the proposed water supply project options included in the NFRWSP (Appendix K and L).

In compiling the list of water supply project options, there was a consideration of how the public interest is served by the project or how the project will save costs overall by preventing the loss of natural resources or avoiding greater future expenditures for water resource development or water supply development. The identified projects will serve the public interest by providing, in an affordable manner, water to meet basic public health, safety, and welfare needs, as well as, providing water for agricultural, CII, recreational, and other typical public supply system needs within the NFRWSP area.

Pursuant to ss. 373.709(7), F.S., nothing contained in the water supply component of a RWSP should be construed as a requirement for local governments, public or privately owned utilities, special districts, self-suppliers, multi-jurisdictional entities, and other water suppliers to select that identified project. If the projects identified in the NFRWSP are not selected by a water supplier, the entity may need to identify another source to meet its future needs and advise the Districts of the alternate project(s). In addition, the associated local government will need to include such information in its water supply facilities work plan (see Chapter 2).

To best manage the water resources in the NFRWSP area, the NFRWSP promotes the diversification of sources for the water supply projects. Proposed project options in this plan were evaluated for inclusion based on factors such as the potential to not adversely impact MFLs and the capability of the source water to supply the project.

Table 7, below, identifies 102 water supply development project options for the NFRWSP area. The quantity of water produced listed in the table expresses the project's ability to deliver "new" water as a result of project construction. For example, a pipeline constructed to deliver water to a new area would not generate water by itself and, therefore, would not be considered new water. Two projects consist of Upper FAS wellfield management strategies. Other project options include development of previously unused sources which would add new supplies to the water user.

For each water supply development project option identified, the following information is provided (and listed in Appendix K):

- An estimate of the amount of water made available by the project
- A timeframe for project implementation
- An estimate of planning-level costs for capital investment and operating and maintaining the project
- Identification of the likely entity responsible for implementing each project

Table 7: Summary of Water Supply Development Project Options

Type	Number of Projects	Quantity Water Produced (mgd)	Estimated Cost ($M low range)
Groundwater	4	3.00	5.43
Stormwater/Surface Water	5	5.37	50.68
Reuse of RO Concentrate	1	0.75	1.24
Seawater	0	N/A	N/A
Reclaimed Water	92	88.05	251.78
Total	**102**	**97.16**	**309.12**

Water Conservation Project Options

Effective water conservation efforts have been implemented in the NFRWSP area, the benefits of which are reflected in decreased historical per capita use (both gross and residential). Continued investment in water conservation is critical to help the NFRWSP area meet its future water needs and avoid unacceptable water resource impacts. Water conservation includes any action, which reduces the demand for water including those that prevent or reduce wasteful or unnecessary uses and those that improve efficiency of use. Achieving long-term improvements in water use efficiency will require a combination of advanced technologies, BMPs and behavioral changes. Education, outreach and public engagement are essential for accomplishing a measurable change in water conservation and maintaining a lasting commitment to efficient water use in north Florida. Conservation strategies and projects are recognized as being the most economically feasible. Implementing projects to meet the high conservation potential (an additional 13 mgd of savings) as described in Table 1, will likely be a more cost-effective option than implementing some of the water supply and water resource development projects discussed above. However, the Districts anticipate that a conservation only strategy will not completely offset the predicted shortfall in fresh groundwater supplies.

The following water conservation strategies have been, are or can be implemented within the NFRWSP area by non-agricultural water users:

- Tiered public supply billing rates: Tiered rates are an essential aspect of any successful program as they provide direct and clear feedback to individual water users who can then take action to improve efficiency. Analyses of historical billing rates and per capita use in north Florida demonstrate a reduction in gross and residential per capita use after implementation of tiered rate structures.

- Implementation of landscape irrigation restrictions: As of March 2016, thirty local governments in the NFRWSP area have adopted ordinances to enforce the irrigation restrictions contained in Chapter 40C-2, F.A.C. This local action encourages outdoor water conservation and provides for more consistent implementation of the rule.

- Landscape and irrigation design codes: Many jurisdictions in the NFRWSP area have land development codes with provisions that encourage efficient outdoor water use.

- Outreach and Education: Water conservation outreach is common throughout the NFRWSP area, regarding both indoor and outdoor water use. Water conservation outreach occurs via websites, utility bill stuffers, events, and other approaches implemented by local governments, utilities, the Districts, and other partners. Outreach messages include general recommendations for efficient water use as well as advertising for existing programs such as Florida Friendly Landscaping™, Florida Water Star℠ and the Florida Green Building Coalition.

- Water use audits for residential customers: This strategy has been very effective in this region when employed by a public supply utility because it provides customized recommendations, includes direct contact with landowners, and can be targeted to water users with the greatest potential for savings.

- Meter reading technology: Automatic Meter Reading and Advanced Metering Infrastructure are used by several utilities in the NFRWSP area to identify high water users or unusual increases in water use relative to historical patterns for individual customers. This technology provides a significant opportunity for water conservation savings when used to identify individual homeowners/businesses that public supply utility staff can then contact to provide technical assistance identifying and resolving the cause(s) of high water use and/or unusual increases.

- Water conservation rebate programs: This strategy offers customers either a reduced price or free replacement of a variety of indoor plumbing fixtures and outdoor irrigation devices (e.g., replacement rain sensors, soils moisture sensors, evapotranspiration controllers). Water savings is achieved one of two ways; either when the replacement fixtures and devices are more efficient than the older fixtures or when broken/malfunctioning fixtures and devices are replaced. Fixture replacement occurs in both residential households and commercial facilities.

- Innovative practices: Public supply utilities are also experimenting with utilization of new technology as well as data-driven approaches for targeted implementation of existing programs and technology to maximize their effectiveness.

In addition to the non-agricultural water conservation programs and practices highlighted above, savings can also be gained by improving agricultural irrigation efficiency. This includes rainwater harvesting, tailwater recovery, center pivot retrofits, and other irrigation efficiency practices and technologies. In recent years, the Districts have provided funding to more than 120 agricultural stakeholders in the NFRWSP area for implementation of agricultural BMPs. Many of these projects also provide water quality benefits. In addition, 1,059 agricultural operations (400,240 acres) throughout the NFRWSP area are currently enrolled in applicable FDACS BMP programs. In addition to water quality benefits, many BMPs implemented through the FDACS program also improve irrigation efficiency. For more information see freshfromflorida.com.

Phosphate Land Reclamation Variances

The FDEP provides guidelines for the reclamation of lands mined or disturbed by the severance of phosphate rock via rules, criteria and standards for reclamation that are mandatory for most mines. The FDEP rules and criteria provide for a variance of the criteria and standards in certain circumstances. One circumstance is when a variation would accommodate reclamation that provides water supply development or water resource development consistent with the applicable RWSP approved pursuant to s. 373.709, provided adverse impacts are not caused to the water resources of the basin (ss. 378.212(1)(g), F.S.).

Subsection 373.709(2)(j), F.S. requires WMDs to include an analysis, developed in cooperation with FDEP, of areas or instances in which the variance provisions of ss. 378.212(1)(g) or ss. 378.404(9), F.S., pertaining to reclamation of lands mined for phosphate, may be used to create water supply or water resource development projects. FDEP and SRWMD, through a public/private partnership with PotashCorp, the only phosphate mine currently in existence in the NFRWSP area, developed and implemented the Eagle Lake/Upper Suwannee River Springs Enhancement Project. However, this project did not require a variance in order to permit and construct the water quality improvement and water resource development project at the mine site. For the purpose of the NFRWSP, the Districts will continue to coordinate with FDEP regarding any requests to use such variances or of any future opportunities the Districts become aware of where such variance provisions may be used to create water supply or water resource development projects.

Chapter 8: Funding

Purpose

Subsection 373.709(2)(a)3.c., F.S., requires WMDs to include an analysis of the funding needs and to identify possible sources of funding for the projects in RWSPs. This chapter addresses potential funding sources for water supply and water resource development projects.

Florida water law identifies two types of projects to assist in ensuring an adequate water supply for reasonable and beneficial uses and to ensure that natural systems are protected. Water resource development projects are generally the responsibility of WMDs, while water supply development projects are generally the responsibility of the local entities and/or water suppliers. Currently, the WMDs provide funding for both water resource and water supply development projects. In addition, the WMDs also provide funding for conservation projects and strategies.

Water Utility Revenue Funding Sources

Increased water demand generally results from new customers that help to finance source development through impact fees and utility bills. The financial structure of utility fees can be highly variable and reflect the needs of each utility. Water utilities draw from a number of revenue sources such as connection fees, tap fees, impact fees, base and minimum charges, and volume charges. Connection and tap fees generally do not contribute to water supply development or treatment capital costs. Impact fees are generally devoted to the construction of source development, treatment and transmission facilities. Base charges generally contribute to fixed customer costs such as billing and meter replacement. However, a base charge or a minimum charge, which also covers the cost of the number of gallons of water used, may contribute to source development, treatment, and transmission construction cost debt service. Volume charges contribute to both source development/treatment/transmission debt service and operation and maintenance.

Community development districts and special water supply and/or sewer districts may also develop non-ad valorem assessments for system improvements to be paid at the same time as property taxes. Community development districts and special district utilities generally serve a planned development in areas not served by a government-run utility. In general, all utilities have the ability to issue and secure construction bonds backed by revenues from fees, rates, and charges.

Regional water supply authorities are wholesale water providers to utilities. An authority's facilities are funded through fixed and variable charges to the utilities they supply, which are in turn paid for by the retail customers of the utilities. Funding is also obtained through state appropriations, federal and state grants and funding from WMDs. Counties, municipalities and special districts have the legislative ability to create regional water supply authorities in a manner that is cost effective and reduces the environmental effects of concentrated groundwater withdrawals. Regional water supply authorities are granted multiple rights and privileges including the ability to levy taxes, issue bonds, and incur debt to develop water supplies. Authorities may also receive preferred funding assistance from the state and Districts for the capital costs of new alternative water supplies and regional infrastructure.

Water Management District Funding Options

The Districts provide financial assistance for water conservation, water supply and water resource development projects through cooperative (or cost-share) funding programs. Financial assistance is provided primarily to governmental entities, but private entities are also eligible to participate in these programs. Funding options and programs for the Districts are described below.

SRWMD Funding Options

The SRWMD promotes water conservation and the implementation of measures that produce significant water savings beyond those required in a CUP/WUP. The SRWMD provides cost share funding for projects that foster its core mission. The Regional Initiative Valuing Environmental Resources cost-share program provides funding assistance to government entities for projects that decrease water consumption, implement water savings programs, provide alternative water supplies, protect water supply, improve water quality, restore natural systems, and provide flood protection.

The SRWMD partners with other agencies and associations as part of the Suwannee River Partnership to provide cost share funding to agriculture producers to help implement BMPs that protect and conserve water. Cost-share funding is available to producers to maximize irrigation system efficiency, for tools to manage irrigation scheduling and for irrigation system remote monitoring and control. Also, the SRWMD provides funding along with FDACS to support mobile irrigation lab services that delivers technical assistance to producers for evaluating system efficiency and making recommendations for improvements.

Water Resource Development Work Program

The SRWMD will prepare and annually update a 5-year Water Resource Development Work Program following the approval of the 2017-2018 annual budget. This 5-year Water Resource Development Work Program will describe the implementation strategy and funding plan for water resource, water supply and AWS development components.

SJRWMD Funding Options

The SJRWMD primarily provides funding assistance through a competitive cost-share program, which is administered annually and supports AWS, water resource development, water conservation, and agricultural related projects. Water resource development projects may also be funded solely by the SJRWMD or in cooperative arrangement with a local partner. Additionally, the SJRWMD accepts water supply related funding from state sources for implementation through cost-share programs.

Water Resource Development Work Program

The SJRWMD annually updates its 5-year Water Resource Development Work Program, which describes the implementation strategy and funding plan for water resource, water supply and AWS development components. The following projects are identified for potential funding opportunities: artesian well plugging; investigation of the augmentation of public supply systems with local surface water/stormwater sources; RWSP; Upper St. Johns River Basin Project; water conservation programs; water resource development components of water supply development projects; water resource development; MFLs prevention/recovery strategy projects; and water resources information (formerly hydrologic data collection).

State Funding Options

Agricultural Conservation

The FDACS' Office of Agricultural Water Policy (OAWP) works with multiple partners, including the Natural Resources Conservation Services (NRCS), FDEP, the WMDs, and Soil and Water Conservation Districts, to provide funds that assist farmers in implementing BMPs. Cost-share programs through the FDACS OAWP vary regionally based upon the resource concerns and appropriate practices. Funds are provided to cost-share irrigation system efficiency improvements, and irrigation system management tools like soil moisture sensors.

Springs Protection

Over the past three years, the SJRWMD has partnered with the state of Florida via FDEP, local governments and public supply utilities to collectively invest approximately $100 million in over 50 springs protection and restoration projects. During this same time period, the SRWMD has received 17 springs grants from the FDEP totaling nearly $23 million for projects to protect and restore springs.

These projects address either water quality or water quantity, although many often provide dual benefits. Typical water quality projects include WWTF upgrades, conversion of septic systems to central sewer and enhanced stormwater treatment. Typical water quantity projects include water conservation, reclaimed water system enhancements or expansions, and AWS development. Recent innovative projects include use of biologically active media in rapid infiltration basins and indirect and direct potable reuse. This also includes springs protection funding from FDEP for crop, dairy and nursery irrigation system efficiency improvements and enhanced water recycling components for dairies.

The future of springs funding looks particularly bright given the passage of the 2016 Legacy Florida legislation that earmarks $50 million per year from the Land Acquisition Trust Fund for springs restoration for the next 20 years. It is anticipated that the Districts, local governments and public supply utilities will continue to partner with the state of Florida through FDEP to aggressively implement projects well into the future.

State of Florida Water Protection and Sustainability Program

The Water Protection and Sustainability Program (WPSP) was created by the Florida Legislature in 2005. The program funded several environmental programs including the AWS program. In the WPSP, AWS included reclaimed water, brackish water, seawater, and surface water captured during wet season flows. This program is not currently funded, however funding has been discussed by the legislature over past years. Contingent on future funding of this program, the State of Florida's WPSP could serve as a source of matching funds to assist in the development of AWS.

Drinking Water State Revolving Fund Program

The Drinking Water State Revolving Fund Program provides low interest loans to eligible entities for planning, designing and constructing public water facilities. Cities, counties, authorities, special districts, and other privately owned, investor-owned, or cooperatively held public water systems that are legally responsible for public water services are eligible for loans. Loan funding is based on a priority system, which takes into account public health considerations, compliance and affordability. Affordability includes the evaluation of median household income, population affected and consolidation of very small public water systems, which serve a population of 500 people or fewer.

Funds are made available for pre-construction loans to rate-based public water systems, constructions loans of a minimum of $75,000, and pre-construction grants and construction grants to small, financially disadvantaged communities. The loan terms include a 20-year (30-year for financially disadvantaged communities) amortization and low interest rates. Community assistance is available for small communities having populations less than 10,000. Fifteen percent of the annual funds are reserved exclusively for small communities. In addition, small communities may qualify for loans from the unreserved 85 percent of the funds.

Florida Forever Program

Florida Forever is Florida's conservation and recreation lands acquisition program. The Florida Forever Act, passed in 1999, was a 10-year statewide program. The Florida Forever Program was extended in 2008 for 10 more years. Eligible projects under the Florida Forever Program include land acquisition, land and water body restoration, ASR facilities, surface water reservoirs, and other capital improvements. Subject to annual appropriation, the Florida Forever Program could be a source of project funding.

Water and Land Conservation Amendment

In 2014, the Water and Land Conservation Amendment was passed by the Legislature. It could provide funding for land acquisition/management, springs and water resource protection.

Federal Funding

Environmental Quality Incentive Program

The United States Department of Agriculture's NRCS provides technical and financial assistance to agricultural producers through the Environmental Quality Incentive Program (EQIP) for the installation or implementation of structural and management practices to improve environmental quality on agricultural lands. Water supply and nutrient management through detention/retention or tailwater recovery ponds can also be implemented through this program.

State and Tribal Assistance Grants

Another partnership with states involves funding assistance through cooperative agreements, referred to as State and Tribal Assistance Grants. These funds are available through the Environmental Protection Agency, which historically required 45 percent in matching funds from local government cooperators.

Water Infrastructure Finance and Innovation Act

The Water Infrastructure Finance and Innovation Act (WIFIA) establishes a new financing mechanism to accelerate investment in our nation's water infrastructure. The WIFIA program will provide loans for up to 49 percent of eligible project costs for projects that will cost at least $20 million for large communities and $5 million for small communities (population of 25,000 or less).

Public-Private Partnerships, Cooperatives and other Private Investment

Another source of funding that is becoming more common, as well as a means to reduce financial burden for public entities are public-private partnerships. These partnerships can require technical expertise and financial risk beyond the expertise and risk tolerance of many utilities and water supply authorities. A range of public/private partnerships and risk options is available to provide this expertise. These options range from all-public ownership to all-private ownership of facility design, construction and operation.

Competition among private firms desiring to fund, build or operate water supply development projects with assistance from government entities could reduce project costs, potentially resulting in lower customer charges.

Summary of Funding Mechanisms

There are many potential institutions and sources of funding for water resource and water supply development, although some past sources are currently limited by economic conditions. Public supply utilities and water supply authorities will likely have the least difficulty in securing funding due to their large and readily identifiable customer bases and associated revenue streams to service any debt. Funding mechanisms are already established for many of the Districts' water supply and water resource development projects. A continuing challenge will be identifying cost-effective and economically efficient methods of meeting the needs of existing rural economic development initiative communities and new self-supplied users (whose ability to pay ranges widely) when the traditional, lower cost sources of water are no longer readily available.

Chapter 9: Conclusions

Summary

The NFRWSP was prepared by the Districts in coordination with stakeholders and is consistent with the water supply planning requirements of Chapter 373, F.S. The NFRWSP concludes that the current and future water demands of the NFRWSP area can be met through the 2035 planning horizon, while sustaining the water resources and related natural systems, through water conservation, implementation of management measures, and implementation of water resource and water supply development projects identified in the NFRWSP.

Challenges in water resource development and natural resource protection require concerted efforts to monitor, implement and characterize current hydrologic conditions and project future conditions. Successful implementation of the NFRWSP requires close coordination with regional and local governments, utilities, agriculture, commercial, industrial, and other water users. Collaboration among stakeholders is also essential for directing implementation of NFRWSP recommendations and guidance. Public and private partnerships can ensure that water resources in the NFRWSP area are prudently managed and available to meet future demands.

Total water demands by all water use categories are projected to increase from an estimated current use in 2010 of 551 mgd to approximately 667 mgd in 2035. The Districts determined that fresh groundwater alone cannot supply the projected 117 million gallons per day increase in water demand without causing unacceptable impacts to water resources. Under the 2010 hydrologic conditions, it was determined that the MFLs for the LSFI were in recovery, which indicates the current distribution of water use has already exceeded the fresh groundwater sustainable yield of the system. In addition, analysis of priority water bodies without MFLs, groundwater quality and wetlands identify potential constraints on increased groundwater withdrawals during the 20-year planning horizon.

Limited localized opportunities may exist for additional traditional groundwater withdrawals to meet future water demands through 2035. The few opportunities for increased traditional groundwater withdrawals generally include local areas where groundwater withdrawals have not been fully optimized. Options for obtaining new water supplies to meet existing and future water demands from both conventional and alternative sources must comply with applicable CUP/WUP rules and conditions. In addition, there may be limited opportunities to utilize traditional groundwater seasonally in conjunction with alternative supplies such as above ground and below ground storage ASR.

Primary solutions identified for meeting the future water demands while protecting the environment include enhanced water conservation, recharge, additional use and implementation of reclaimed water, surface water, seawater, and brackish groundwater projects. With all of these options, the Districts have identified between 203 and 216 mgd potentially available to offset the projected increase in water demand of approximately 117 mgd by 2035.

A Note About Uncertainty

Uncertainty is inherent in the resource analyses associated with the NFRWSP. The Districts have considered major sources of uncertainty including water use estimates and water demand projections, groundwater models, climate variability, and water resource constraints. At a regional level, the best strategy for dealing with this uncertainty is the implementation of water demand management strategies and a diversity of AWS development project options.

Uncertainty also exists regarding the degree to which the proposed solutions contained in the NFRWSP may be implemented. The variety of options used in the NFRWSP to address impacts and unmet water demands does not include agreements or commitments between users and the agencies. Current permits and laws limit the scope of regulatory actions that can be taken to impose specific solutions on users. Budgetary constraints and uncertainties of both users and agencies are challenges to assuring specific solutions will be economically feasible and affordable. Finally, there is uncertainty associated with the actual performance of many of the options in meeting the NFRWSP objectives. Examples include some aspects of water conservation where voluntary behavioral changes of large populations of end users are involved and the supplementation of reclaimed water with conventional water supply sources.

The projects provided in this water supply plan were developed as a planning level assessment to show that sufficient options are available to address potential water resource impacts in the NFRWSP area. These assessments were developed using available information and the NFSEG, which has yet to be peer reviewed, so limitations are inherent in the analysis as discussed in Chapter 4.

To overcome some of these limitations, and as required by the FDEP adopted LSFRB recovery strategy, the LSFI MFLs will be re-evaluated, the status presented and be reproposed for adoption prior to December 31, 2019. These re-evaluated MFLs will serve as the basis for development of updated recovery strategies, which will rely on updated tools, methods and data. These actions will be subject to statutory timelines and requirements.

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Appendix A

Workshop and Stakeholder Comments with Responses

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Appendix A-1

Workshop and Stakeholder Comments with Responses

Appendix A: Workshop and Stakeholder Comments with Responses

The Districts would like to to thank everyone for their comments. Continued public input was vital to the development of the NFRWSP.

NFRWSP Comment Number	Commenter and Associated Entity	Date Received and Manner of Submittal	Comment as Received*	NFRWSP Response
1	Paul Still	10/24/16 via Email, 10/25/16 and 11/3/16 at public workshops	The Statute requires at least 20-year planning period. The current plan when adopted will not cover 20-years. Similar comments stated at workshops.	Subsection 373.709(2), F.S., does not require the 20-year planning horizon to start from the date of plan approval. The NFRWSP has a base year of 2010 and projections were evaluated from 2015-2035. The projections made for the NFRWSP were developed using the best available information at the time developed. Planning projections are updated at least once every five years to take into account improved data and methodologies.
2	Paul Still	10/24/16 via Email and 10/25/16 public workshops	Self-suppliers were not represented on the SAC. The lack of representation for self-suppliers was repeatedly pointed out to the Water Management Districts during the early SAC meetings. *Similar comments made at workshop.*	Self-suppliers are considered as those entities that are not served by a public supply system. Domestic self-suppliers were represented by local government representatives on the SAC. Other self-suppliers include agriculture, commercial/power generation, environmental, and industrial/mining, all of which had two representatives on the SAC.
3	Paul Still	10/24/16 via Email and 10/25/16 public workshops	The Statute identifies flood protection as an item to be addressed in the Water Supply Plan. Flooding is not addressed in the NFRWSP. Flood protection is very important to Bradford County. *Similar comments made at workshop.*	Chapter 373, F.S., does not require the state's water management district's regional water supply plans to address flood protection. Rule 62-40.520, F.A.C., requires the state's water management district water management plans to address flood protection and flood plain management.
4	Paul Still	10/24/16 via Email, 10/25/16 and 11/3/16 public workshops	The plan fails to identify sufficient projects that have a total capacity of which will, in conjunction with water conservation and other demand management measures, exceed the needs identified. I would contend that item 4 is a fatal flaw in the plan. The methods used to calculate the water needed are flawed because they are for only one of the flows required in the Lower Santa Fe MFL. The draft document fails to provide sufficient detail to determine if the assumed amount of flow noted in Appendix G will achieve recovery of the flows at the Fort White gage. The results shown in Appendix C (Simulated Change in the Potentiometric Surface within the North Florida-Southeast Georgia Regional Groundwater Flow Model Area) would indicate the proposed projects will have no impact on the flow at Fort White gage. The projected potentiometric surface change at Fort White is the same with or without the proposed projects. The low flow at Fort White is driven by the potentiometric surface of the Floridan Aquifer.	Chapter 373, F.S., requires the state's water management districts in regional water supply plans to quantify sufficient projects to meet all existing and future reasonable beneficial uses in the planning horizon. The NFRWSP has identified between 203 and 216 mgd in projects to offset the projected increase in water demand of 117 mgd. The referenced results in Appendix C show how predicted drawdown in the Santa Fe River Basin is reduced as a result of WRD projects. Reduced drawdown in the basin reduces withdrawal impacts in the basin, therefore increasing the flows in the Santa Fe River.
5	Paul Still	10/27/16 via Email	An issue not related to statutory requirements is the designation of Water Resource Caution Areas (WRCA). I do not believe WRCAs were ever discussed by the SAC. The members should be aware of what WRCAs are and how they impact permitting. The data for the parts of Bradford County that are in the SRWMD do not seem to support the declaration of this part Bradford County as a WRCA. The plan indicated the Upper Santa Fe MFL is being met and will be met in 2035. Lakes and wetlands are not shown to be a constraint. No data is presented in the NFRWSP to demonstrate that water use in Bradford County will impact the Lower Santa MFL.	The 2010 SRWMD Water Supply Assessment designated the Upper and Lower Santa Fe River Basins, the Upper Suwannee River Region and the Alapaha River Basin as Water Supply Planning Regions. These planning regions, which include the SRWMD portion of Bradford County, were subsequently designated as WRCAs by the SRWMD Governing Board on October 11, 2011. The 2015 NFRWSP will not be used to modify WRCAs in the SRWMD.
6	Paul Still	10/27/16 via Email	I contend there is a technical issue with using the Groundwater model to predict changes in the potentiometric surface of less than 2.5 feet. The model calibration results seem to indicate the model is only able to match known data within 2.5 feet for about 50% of the target wells. The images in Appendix C depict changes at 1 foot or less. This is an issue the Model Technical Committee should address at their November 2 meeting.	All comments related to the model have been forwarded to the NFSEG Technical Team for consideration. Meeting times, dates and agendas for the NFSEG Technical Team are posted at www.northfloridawater.com. We suggest you attend the next meeting in order to discuss your concerns.
7	Paul Still	10/24/16 via Email and 10/25/16 workshop	There are clerical errors in the draft that should be corrected. The last paragraph on page 43 is difficult to understand and may have an incorrect statute citation. There are other statute citations that do not seem to match the information presented in the text. Appendix C Figure 2C has an incorrect heading. *Similar comments made at workshop.*	Grammatical errors will be addressed in the final draft.
8	Paul Still	10/25/16 public workshop	Draft does not provide any data to show how model was used. I want results from the model runs to evaluate either the projects or the major users.	Results of modeling can be found in chapter 5 of the NFRWSP and associated appendices. Members of the public can request the model files to perform independent analysis if desired.
9	Paul Still	10/25/16 public workshop	Questions whether JEA's withdrawals are having an impact on MFLs.	The NFRWSP evaluates regional withdrawals on a regional scale. Impacts from individual user withdrawals are evaluated during processing of consumptive use permit applications.

10	Jim Tatum, representing self, land owner on the Santa Fe River	11/03/16 public workshop	Ideas are not feasible at this point, but I think in years to come they will be. Need to increase reclaimed water and increase conservation, the management techniques on pages 51 and 52 are good and should be implemented. The Water Protection and Sustainability program of 2005 should be re-implemented. Additional stronger management techniques are needed to achieve sustainable usage rates. Tiered billing for all water users, not just agricultural. Regional Initiative Valuing Environmental Resources gives free water and pays user to use less, same with farmers and increasing irrigation efficiency, free water to users and given money to use less. Dollar incentives are good and make sense but only if we have billing for water, charging for water will limit development and population growth. Do not agree with "Current permits and laws limit the scope of regulatory actions that can be taken to impose specific solutions on users" pg 61. Others laws exist that which allow curtailment of new and existing consumptive use permits. District and DEP should not be afraid to utilize legal council. Must acquire new mindset and laws in order to sustain groundwater withdrawals. Need fewer withdrawals and reduce nitrates specifically from agriculture. Not confident that 20-year plan will ensure adequate protection of rivers and springs.	The NFRWSP identifies 41 to 54 mgd of increased water conservation potential and the use of reclaimed water to offset future demands. Implementation of water conserving rate structures for public supply suppliers is evaluated via the Districts regulatory programs and implemented by water suppliers. Monetary charging for water is outside the authority of the Districts. The NFRWSP is one of many mechanisms utilized by the Districts to ensure protection of water resources. The Districts utilizes permitting as appropriate to manage water supplies. The Districts address water nitrate issues as appropriate via the regulatory programs and are managed through the FDEP Total Maximum Daily Load (TMDL) program and development Basin Management Action Plans (BMAPs).
11	Jim Gross, MS, PG, CPG	11/03/16 public workshop	Compliment and congratulate on identifying the entire planning region as a water resource caution area. Urge WMDs to take closer look at sustainable limits of groundwater withdrawals. Suggest progressively reducing groundwater withdrawals in the model from calibration year of 2009, and bring the withdrawals down percent wise until you see what meets the criteria, this would be a good indicator on what the sustainable limits are. Water Resource Development projects all good in concept, some useful in planning region and some not so useful in the west part of the planning region. ASR is not going to address problems we are having in planning region. Have anxiety about capturing surface water to recharge groundwater to augment surface water. Thank you for calling out direct potable reuse in the plan. Lower Floridan Aquifer is not an alternative source, it spreads withdrawals over a wider area than if we use the UFA, and its all part of the same system. Brackish groundwater is not going to solve fundamental problems of this plan like meeting flows springs. Pumping brackish groundwater is hydraulically the same aquifer system.	The Districts consider sustainable limits to the use of traditional groundwater resources to identify the quantity of additional water needed to meet future water demands. The Districts realize that no single water supply option will suffice to meet future water demands. Options, including ASR, brackish ground water, surface water and water from the Lower Floridan aquifer, can all be utilized where appropriate to help meet future water demands.
12	Dr. Patrick Welsh, Ph.D.	11/08/16 via nfrwsp comment form	Florida Statute requires at least a 20-year planning periods and further indicates a 30-year planning horizon; if adopted, the current draft will not cover 20-years.	Subsection 373.709(2), F.S., does not require the 20-year planning horizon to start from the date of plan approval. The NFRWSP has a base year of 2010 and projections were evaluated from 2015-2035. The projections made for the NFRWSP were developed using the best available information at the time developed. Planning projections are updated at least once every five years to take into account improved data and methodologies.
13	Dr. Patrick Welsh, Ph.D.	11/08/16 via nfrwsp comment form	Florida Statute identifies Flood Protection to be addressed in the WSP, an important item especially for Alachua, Bradford, Clay, Columbia and Suwannee counties as a minimum.	Chapter 373, F.S., does not require the state's water management district's *regional water supply plans* to address flood protection. Rule 62-40.520, F.A.C., requires the state's water management district *water management plans* to address flood protection and flood plain management.
14	Dr. Patrick Welsh, Ph.D.	11/08/16 via nfrwsp comment form	Cumulatively, the WSP does not identify sufficient projects (let alone funding) which when added to conservation and RECHARGE or demand management additions have sufficient capacity to exceed the demands for those needs identified in the WSP. Specifically, the existing MFLs and Prevention and Recovery status RECHARGE projects for the Keystone Heights area lakes in Prevention and Recovery, and the new Lower Santa Fe MFL at the Ft White gauge, which are driven by declining Upper Floridan Aquifer levels in their respective areas without adequate projects or other measures required by for F.A.C. Statute and Utility Permits for Mitigation. This would appear to be a singular fatal Statutory flaw.	Chapter 373, F.S., requires the water management districts in regional water supply plans to quantify sufficient projects to meet all existing and future reasonable beneficial uses in the planning horizon. The NFRWSP has identified between 203 and 216 mgd in projects to offset the projected increase in water demand of 117 mgd. Chapter 8 of the NFRWSP sets forth possible funding sources that can be utilized to fund the project options.
15	Dr. Patrick Welsh, Ph.D.	11/08/16 via nfrwsp comment form	Additionally, several germane items were never presented to the SAC or addressed in the WSP. Among these are: Water Reservations in addition to MFLs for the Prevention and Recovery Lakes in the Keystone Heights area; Water Resource Caution Areas for all or parts of Alachua, Bradford, Clay, Columbia, Duval, Putnam and Union Counties and the supporting data both pro and con; Modern Water Recharge and Water Purification Wetland Basins design and examples; and finally the lack of sufficient Model accuracy to predict decadal impact near MFLs impacted areas (i.e. tenths of a foot estimates of decadal change) and less than 1 foot potentiometric error over the domain. Appendix C is germane; and Appendix C fig 2C heading is mislabeled. More real data is required rather than correlated GIS approximations, which can substitute for periods of missing data, but not replace additional data required, both effectively and in accuracy.	Your comment has been noted and grammatical errors will be addressed in the final draft.
16	Dr. Patrick Welsh, Ph.D.	11/08/16 via nfrwsp comment form	The requirements of self-supplied users were not represented at the SAC or WSP, thus giving the impression of a utility-driven, utility-serving process and product.	Self-suppliers are considered as those entities that are not served by a public supply system. Domestic self-suppliers were represented by local government representatives on the SAC. Other self-suppliers include agriculture, commercial/power generation, environmental, and industrial/mining, all of which had two representatives on the SAC.

17	Dr. Patrick Welsh, Ph.D.	11/08/16 via nfrwsp comment form	Allocated groundwater use in North and Central Florida is nearly double current estimated uses (Knight and Clarke 2016). It is understood that Agriculture needs considerable flexibility for drought protection, but utilities need only a small margin. High groundwater pumping rates are nearly a third of average annual recharge, impacting springflow across the Region.	The NFRWSP utilized agriculture projections developed by FDACS via their FSAID model. The FSAID model estimates future water demand based upon historical water use. In issuing water use permits, the Districts use allocation methodologies set forth in the respective Basis of Review.
18	Dennis Price, SE Environmental Geology	11/16/16 via nfrwsp comment form	Construct drainage wells at the discharge points of most major wetland systems in the North Florida Flatwoods. These would be passive systems that recharge the aquifer during winter and early spring when flow from these wetland systems are at their highest. Recharge would also occur after major rainstorm events. Amendment 1 money should be used to purchase these wetland systems. The premise is that since the late 1800's to probably in the 1970's, most wetlands systems were ditched to some extent, and many drastically, for logging purposes and for the establishment of pine plantations. Natural recharge in these flatwood areas are minimal to begin with but with the drainage that occurred, we have even less recharge. The wetland systems proposed are located in Hamilton, Columbia, Baker, Union and Alachua counties. Costs associated with the construction of the 20 or so wells proposed would be millions less than the single proposal of pumping Suwannee River Water to Falling Creek. The location of these wells would also recharge the Floridan in a broad area where most needed to reverse the loss of water in this strategic region that supplies water to The aforementioned counties and the northern part of the SJRWMD. If you are interested in a map, please e-mail me and I will send it along.	The Districts will continue to explore water resource development options as we proceed with future planning efforts and implementation strategies. The specific project referenced in the comment lacks planning level costs and estimated project capacity. The project has been forwarded to the SRWMD Agriculture and Environmental Projects Division to coordinate development of those parameters.
19	Jim Gross, MS, PG, CPG, on behalf of Our Santa Fe River	11/18/2016 via nfrwsp comment form	From a big picture perspective, the key issue is how much groundwater we are pumping out of the Floridan aquifer system. The draft plan fails to fully characterize the magnitude, regional extent, and cumulative impact of this key issue.	The NFSEG regional groundwater flow model was specifically developed to provide a tool that would allow for evaluation of future cumulative withdrawals in the planning region. The model runs performed as a part of the planning effort provide the most comprehensive accounting of regional water use and cumulative impact to groundwater resources that is available for this region. Water use was modeled throughout the model domain (Figure 15 of the NFRWSP) so that the magnitude, regional extent, and cumulative impact of groundwater pumping could be fully characterized using the NFSEG model.
20	Jim Gross, MS, PG, CPG, on behalf of Our Santa Fe River	11/18/2016 via nfrwsp comment form	The draft plan indicates that as of 2010, water use had already exceeded the sustainable yield of the fresh groundwater system. However, the draft plan fails to determine to what extent existing sources of water are adequate to supply water for all existing and future reasonable-beneficial sources of water and also sustain the water resources and related natural systems for the planning period. The magnitude of the problem has not been adequately assessed. If the magnitude of the problem is not known, the magnitude of the solution is not known. The districts should revisit the groundwater modeling analysis for the draft plan and incrementally reduce groundwater withdrawals until they demonstrate that all established and proposed minimum flows and levels can be achieved.	The Lower Santa Fe River Basin (LSFRB) Recovery Strategy is the tool that is used to address the 2010 water deficit for these systems. The Minimum Flows and Minimum Levels on priority water bodies is how the Districts determine to what extent existing sources of water are adequate to supply water. As described in Chapter 6 of the NFRWSP, the sufficiency analysis used to determine the amount of alternative water supply projects needed in the future took into account the flows of the Lower Santa Fe River. The NFRWSP identifies 41 to 54 mgd of water conservation potential, as described in Chapter 3, and water supply development projects to meet future water demands as well as water resource development projects to increase recharge and augment flows in surface water systems.
21	Jim Gross, MS, PG, CPG, on behalf of Our Santa Fe River	11/18/2016 via nfrwsp comment form	The draft plan takes a big detour around some key water supply constraints that were already identified in earlier planning efforts by St. Johns River Water Management District (SJRWMD) in its draft 2010 and draft 2013 regional water supply plans. Minimum flows and levels (MFLs) for Lake Brooklyn and Lake Geneva near Keystone Heights were key constraints in those two planning efforts. SJRWMD began to develop recovery strategies for those lakes as early as 2011. These MFLs need to be included in assessing the sustainable limit of groundwater withdrawals for the draft plan. Including them in the analysis could well demonstrate that the sustainable yield is even lower than excluding them.	MFLs for Lake Brooklyn and Lake Geneva are under re-evaluation to reflect current methodologies and are scheduled for completion in 2017. If, during this process, these systems are determined to not be meeting or are projected to not meet the proposed MFLs, a prevention or recovery strategy will be developed.
22	Jim Gross, MS, PG, CPG, on behalf of Our Santa Fe River	11/18/2016 via nfrwsp comment form	Some of the water resource development projects included in the draft plan are little better than smoke and mirrors and have little or no potential to alleviate water resource problems. For example: a. Diverting surface water to recharge groundwater so it can then discharge back to surface water. This is nothing more than a card trick. It does nothing to make more water available. b. Aquifer storage and recovery (or ASR) has little if any potential to address the key water supply constraint, cumulative withdrawals from the Floridan aquifer system. ASR is merely a management technique. It is typically used to store fresh surface water underground in an aquifer that does not contain fresh groundwater. Fresh surface water is stored underground when the supply is greater than the demand, and then recovered when the demand is greater than the supply. ASR is essentially a meaningless option over the western portions of the planning region.	Options such as surface water recharge and ASR provide water resource development benefits in specific cases and allow for the development of additional water supplies. It is appropriate, therefore, for them to be included as an option in the NFRWSP.
23	Jim Gross, MS, PG, CPG, on behalf of Our Santa Fe River	11/18/2016 via nfrwsp comment form	The Lower Floridan aquifer is identified as an alternative source of water supply. This is hooey and hydrologists know it. The Lower Floridan aquifer is simply part of the Floridan aquifer system as is the Upper Floridan aquifer. The two aquifers act as a single water-yielding unit. There is a very limited potential to strategically utilize the Lower Floridan aquifer to mitigate existing water resource problems, but that potential comes with a risk of creating new water resource problems.	While the Lower Floridan aquifer is part of the overall Floridan Aquifer System, it can be utilized as a source of water due to it's unique hydrogeology and because it is confined to varying extents from the Upper Floridan aquifer.

24	Jim Gross, MS, PG, CPG, on behalf of Our Santa Fe River	11/18/2016 via nfrwsp comment form	Brackish groundwater is identified in the draft plan as a water resource development option. However, it is more appropriately designated as an alternative water supply option. Regardless of how it is classified, the salinity of groundwater has little bearing upon the key constraint for this draft plan. If we are already pumping too much groundwater from the Floridan aquifer system, it really doesn't matter whether it's fresh or brackish.	Since brackish groundwater is not a traditional water resource, it is considered as either a water resource development option or a water supply development option for the purpose of the NFRWSP. Depending on its location, brackish groundwater resources may be developed without contributing to impacts in the planning region. Options such as the use of brackish groundwater provide sustainable water resource development benefits in specific cases and allow for the development of additional water supplies. It is appropriate, therefore, for them to be included as an option in the NFRWSP.
25	Jim Gross, MS, PG, CPG, on behalf of Our Santa Fe River	11/18/2016 via nfrwsp comment form	The draft plan identifies optimizing groundwater withdrawals as a potential option. SJRWMD looked extensively at optimizing groundwater withdrawals in previous planning efforts using optimization algorithms in conjunction with groundwater flow modeling. The results of the optimization analyses were informative and clear: a) optimization can only marginally increase sustainable yields, and b) the infrastructure and unit production costs for most of the optimization scenarios exceeded the costs for other alternatives.	While not implementable in all cases, optimization may provide water resource development benefits in specific cases and therefore should be considered as an option in the NFRWSP.
26	Jim Gross, MS, PG, CPG, on behalf of Our Santa Fe River	11/18/2016 via nfrwsp comment form	The draft plan states that the groundwater model is good enough for planning but not good enough for regulatory evaluations. That's a somewhat obtuse conclusion, but possibly irrelevant. The draft plan concludes that withdrawals already exceed sustainable limits. It's all one aquifer system. What further modeling is really needed for regulatory evaluations and decisions?	The NFSEG version 1.0, which was not peer reviewed, was used to evaluate regional impacts. It is anticipated that future peer reviewed NFSEG model versions will be used in processing water use permits.
27	Jim Gross, MS, PG, CPG, on behalf of Our Santa Fe River	11/18/2016 via nfrwsp comment form	The section on climate change discusses uncertainties but ignores significant work looking at likely outcomes of climate change with respect to water supply sustainability. A report by Tetra Tech concluded that large portions of Florida are at high or extreme risk of exceeding sustainable supplies even without climate change. With climate change, most of Florida was identified to be at high or extreme risk of exceeding sustainable water supplies.	As noted in the NFRWSP, many of the same practices that are implemented to address water resource constraints will also mitigate the impacts of climate change. Continued collaboration into the future will be necessary.
28	Jim Gross, MS, PG, CPG, on behalf of Our Santa Fe River	11/18/2016 via nfrwsp comment form	The Sufficiency Analysis in Chapter 6 of the draft plan is predicated only on the MFLs for the Lower Santa Fe and Ichetucknee rivers. As noted above, key constraints in the St. Johns River Water Management that have been ignored in this draft plan also need to be considered.	The sufficiency analysis for the Lower Santa Fe and Ichetucknee Rivers and associated priority springs was just one assessment of potential constraints. Chapter 5 contains analyses done concerning water quality, wetlands, MFLs, and priority water bodies.
29	Jim Gross, MS, PG, CPG, on behalf of Our Santa Fe River	11/18/2016 via nfrwsp comment form	The draft plan fails to consider other potential strategies to decrease groundwater withdrawals. For example, there does not appear to be any discussion of seeking legislative authorization to levy fees for the withdrawal of water. Such fees could: a) serve as an economic incentive for further water conservation, b) help maximize reasonable-beneficial use, and c) provide an equitable revenue stream for funding alternative water supply development projects and water resource development projects.	The NFRWSP did not include options related to monetary charges for water, since levying fees is outside the scope of authority provided to the Districts in Chapter 373, F.S., maximizing reasonable-beneficial uses of water is primarily dealt with in the Districts water use regulatory programs, but is also addressed in the NFRWSP by the estimation of 41 to 54 mgd of water conservation potential and the inclusion of water conservation project options.
30	Jim Gross, MS, PG, CPG, on behalf of Our Santa Fe River	11/18/2016 via nfrwsp comment form	There appears to be no consideration of coherent and credible regulatory strategies to balance reasonable-beneficial uses while sustaining water resources and related natural systems. In all cases, credible strategies must cap withdrawals at some defined level. Previous examples in Florida include: a) the water use caution areas in SWFWMD, b) the Central Florida Coordination Area rule that capped groundwater withdrawals at a defined withdrawal horizon, and c) the cap on withdrawals from the Biscayne aquifer in southeast Florida. While a regional water plan cannot implement such strategies, there should be some reasoned discussion of approaches that can be taken both on an interim and long-term basis.	The NFRWSP does not contain regulatory strategies. Such strategies are addressed by the Districts in their respective water use regulatory programs.
31	Jim Gross, MS, PG, CPG, on behalf of Our Santa Fe River	11/18/2016 via nfrwsp comment form	Language in Appendix G, the Recovery Strategy for the Lower Santa Fe River Basin, provides an example of a strategy element that is not credible: "Applications that do not demonstrate a potential impact to the MFL water bodies shall be issued provided the applicant meets the conditions for issuance." This language seems to indicate that it is incumbent upon the applicant to demonstrate an impact, and that in the absence of such demonstration it is presumed that there is no impact. A demonstration of impact is clearly not in the interest of the applicant. Rather, it should be incumbent upon the applicant to demonstrate that the proposed withdrawal of water will not cause a potential impact	The districts conduct detailed review of all applications for water use permits and conduct an independent analysis of whether the applications meets rule criteria for issuance.
32	Jim Gross, MS, PG, CPG, on behalf of Our Santa Fe River	11/18/2016 via nfrwsp comment form	The draft plan does not contain sufficient information, analyses, and recommendations to provide assurance to OSFR that the aquifer, springs, and rivers within the watershed of the Santa Fe River will be protected.	Please refer to Appendix G of the NFRWSP for the Recovery Strategy. In addition, Appendices J through M provide additional options to offset future water demands.

33	Douglas Adkins, Dayspring Village	11/29/2016 via nfrwsp comment form	The proposed local bill that will create the East Nassau Stewardship District in Nassau County includes special powers to create water control, wetland creation areas, mitigation powers and will provide power to issue about $100 million in bonds for a rapid build out of the infrastructure needed to build homes in a 24,000 sq mile area. It is expected this new government will serve 47,000 people. We are concerned with how this rapid build out will impact the water table in Nassau County and the availability of fresh drinking water considering how rapid the build out may be. We are unsure if there has been any studies of the hydrology or how the water table would be affected with the addition of this many new people. Further it is not know where the water withdrawals will come from, whether these are from a river, the acquifer or some other water source. Considering the proposal to designate all of Nassau County as a water resource caution area, we would like for you to include in your estimates or in your plan how you feel the proposed Stewardship district will impact the water supply and specifically the water table in Nassau County. I would also imagine that the number of acres of wetlands changed by 2035 would be substantially greater than the 389 acres now forecast. Finally, if the legislature approves this proposed local bill in Nassau County which would allow for a massive Stewardship district that is three times the size of Nocatee, what happens if the same land holder decides they want to use the same approach to convert timberlands into planned communities elsewhere in North Florida? How many Stewardship districts of this size could the water supply support before water quality and water supply is affected. There is a BOCC meeting tonight Nov 28th at 6pm and the legislative delegation will vote on Dec 1st. Thank you for considering my comments.	The NFRWSP evaluates regional groundwater withdrawals as projected through 2035 using BEBR medium projected growth rates. Evaluation of impacts associated with specific water withdrawals is performed during regulatory review of applications for water use. Once approved, future growth and potential water demand related to sector plans or stewardship districts will be evaluated as part of the water supply planning process to determine if additional alternative water supply project options are needed. Planning projections are updated at least once every five years to take into account improved data and methodologies.
34	Carlos Slay, Public Advocate	11/29/2016 via nfrwsp comment form	In reviewing your proposed plan I see that it does not include the impact of the East Nassau Stewardship District that has been proposed for a 24,000 acres or 1/3 of the total land mass in Nassau County. The proposed legislation will be taken up by the delegation on December 1st and will grant this new government special powers over water control, mitigation, wetland creation, drainage, etc. The impact on the wetlands will be substantial and I would expect that the impact on the water supply would also be equally significant as this new governmental entity will seek to provide water to 47,000 people in a short period of time. I would like to see you update your water supply plan to include estimates on how this Stewardship district will impact Nassau County water supply and the wetlands in the area. I also would like to know how many similar sized stewardship districts could the area sustain because once this one is approved it is likely the land holders will seek to duplicate the success and will want to create others in the area. It would be helpful to know whether the powers that the bill proposes to grant to the land holder encroach upon the jurisdictional powers of the St Johns River Water Management District or impact the district's work and if so how that work would be affected. The biggest concern for many people in Nassau County is how the water table will be affected and how that water quality will be impacted by the district.	The NFRWSP evaluates regional groundwater withdrawals as projected through 2035 using BEBR medium projected growth rates. Evaluation of impacts associated with specific water withdrawals is performed during regulatory review of applications for water use. Once approved, future growth and potential water demand related to sector plans or stewardship districts will be evaluated as part of the water supply planning process to determine if additional alternative water supply project options are needed. Planning projections are updated at least once every five years to take into account improved data and methodologies.
35	Mark Lyons	11/29/2016 via nfrwsp comment form	Things like this make my blood boil! I call BULLSHIT! BULLSHIT! BULLSHIT!!!! This plan is nothing but public relations feel good crap!! Really!!! You want to start conserving and protecting our water??? Well I can help you out with that in a tremendous way that will actually conserve & protect our water!! Shut Mosaic down, shut Dupont Chemours down, shut PCS in Hamilton County down! Shut all these noxious, water sucking industries down and then and only then can you tell me when I as an American citizen can water my grass, wash my car or flush my toilet!! If you are serious why was Sabal Trail Pipeline approved??? Sabal Trail has stripped thousands of acres of our land of trees and underbrush so it can dry out to a parchment and not to mention the surficial groundwater flows they are disrupting and the recharge areas & wetlands they are destroying...... Ummmmm hmmmmmm, just what I thought, you have plans to combat water crisis?? Yeah right! We're in this mess now because of the water districts and their mismanagement and destruction of our waters through their rubber stamping permits for noxious industries which have sucked us dry and left pollution & contamination in their wake!! You agencies better WAKE UP because the citizens are starting to and we have had enough of the mismanagement and destruction of our lands & waters!! And don't bother responding to me with one of your bullshit form letters, you want to respond do so by denying an upcoming CUP permit for the HPS Phosphate Mine proposed for Bradford & Union Counties, 20 million gallons a day! Now there's a good place for you to implement your little facade of a conservation, protection plan!!	Your comment has been noted.
36	Tim Peak	11/30/2016 via nfrwsp comment form	In Nassau County, Florida, what impact would there be in our water quality, water table, and general health of our water supply if a "Special District", commercial, industrial, residential development in an area of 24,000 acres were to be approved? Should the residents surrounding the District expect a negative impact on our current water supply with the potential of 47,000 additional residential interests being added to our aquifer? Thank You	The NFRWSP evaluates regional groundwater withdrawals as projected through 2035 using BEBR medium projected growth rates. Evaluation of impacts associated with specific water withdrawals is performed during regulatory review of applications for water use. Once approved, future growth and potential water demand related to sector plans or stewardship districts will be evaluated as part of the water supply planning process to determine if additional alternative water supply project options are needed.

37	Cynthia Noel	12/01/2016 via nfrwsp comment form	I do not feel this plan really addresses the serious deficit the river is in currently. Just saying MFL's are established doesn't show management or correction of the problems we face. We must have serious restrictions on commercial drawdowns, currently concerning me is the Sabal Trail Pipeline being allowed to take all they want, while we residents are told to cut back. Agricultural restrictions need to be in place also. Restrictions AND enforcement of these restrictions must be taken seriously is the word management is to be used in the description of this agency.	MFLs Prevention and Recovery strategies provide the in-depth evaluation and specific projects that are used to address MFLs that are in prevention or recovery. A water supply plan assesses what could happen in the future should current groundwater pumping occur at increased rates to meet future demands for the region. A water supply plan is a higher-level assessment of regional withdrawals not individual ones. Evaluation of impacts associated with specific water withdrawals is performed during regulatory review of applications for water use.
38	Dennis Price, SE Environmental Geology	12/02/2016 via nfrwsp comment form	Regarding the potential recharge well for Lake Harris in Columbia County. Two wells have been installed since the hurricanes in 2005. They have permanently reduced the hydroperiod of the surrounding, mature, mixed hardwood wetlands surrounding the lake to the east.	This project has been completed. Your comment has been forwarded to the SRWMD Agriculture and Environmental Projects Division for consideration.
39	Dennis Price, SE Environmental Geology	12/02/2016 via nfrwsp comment form	The Falling Creek recharge proposal of pumping water from the Suwannee River is complete Buffoonery, and I cannot think of a more professional way of saying it. Much of the year it would not be able to pump water from the river due to low river levels. At its peak it would have to pump massive amounts of water to reach the average MGD proposed. The whole construction and maintenance scenario is a nightmare. Its benefits would be to the Ichetucknee basin alone. Compare stage discharge measurements of Falling Creek and the Suwannee at White Springs or State road 6 and you would get a good idea of how often it would flow.	Options such as surface water recharge provide water resource development benefits in specific cases and allow for the development of additional water supplies. It is appropriate, therefore, for them to be included as an option in the NFRWSP.
40	Robert Knight, Ph. D., Executive Director, Howard T. Odum Florida Springs Institute	12/02/2016 via nfrwsp comment form	The fundamental responsibility of the WMDs proposing this plan is to effectively manage water resources in such a way that provides beneficial human uses within the allowable constraints of natural aquatic systems. Water resource management is based on understanding and quantifying the resource. This proposed WSP does not fully characterize or quantify the potential water sources subject to human extraction and management. Specifically, we request that you provide best available data/estimates for the following components of the water balance for the WSP planning area (14 counties and roughly 8,000 mi2 in the Suwannee and St. Johns River WMDs) with, at a minimum, annual means and extremes and 20-year probability distributions for each:(1) Precipitation (2) Evapotranspiration (3) Recharge to the Surficial Aquifer System (SAS) and to the Floridan Aquifer System (FAS) (4) Surface water levels, including lakes, wetlands, streams, rivers, and springs (5) Groundwater levels in both the SAS and the FAS (6) Surface water flows for streams, rivers, and springs (7) Surface and groundwater withdrawals and return flows	The purpose of regional water supply planning is to evaluate and identify water supply sources for all existing and future reasonable-beneficial uses and to sustain the water resources and related natural systems for the planning period. In order to make this evaluation the Districts developed a comprehensive groundwater flow model (the NFSEG model) for the region to evaluate the impact of groundwater withdrawals on the natural resources. The data you request are integral components to the development of the NFSEG model and supporting HSPF model. For example, a set of surface-water models simulating conditions during the period from 1992 and 2015 were developed to provide recharge and saturated evapotranspiration estimates for the NFSEG groundwater flow model used in the NFRWSP. This 24-year period included hydrologic conditions that ranged from extremely wet periods in years with multiple hurricanes and El Niño conditions, to periods with multi-year drought and La Niña conditions. These surface-water models ran at an hourly time step and were driven by historic precipitation and evapotranspiration data, and calibrated to historic streamflow data in a manner designed to capture features from the entire range of the historic streamflow hydrographs (from peak to low flows) at each calibration location. The groundwater flow model was calibrated to both drier than normal and approximately normal conditions. Surface-water levels from lakes, wetlands, streams, rivers, and springs were used to represent interactions between these surface features and the contiguous groundwater flow system simulated by the model. The groundwater flow model was calibrated to historic stream and spring flow data. An extensive effort was undertaken to compile and estimate withdrawal and return flow data that were also used as inputs to the surface and groundwater flow models. The historic data used to develop the surface and groundwater models were obtained from the best available sources, including NASA, the National Oceanographic and Atmospheric Administration, the U.S. Geological Survey, the Florida Department of Environmental Protection, the Florida Department of Agriculture and Consumer Services, and Florida Water Management Districts. These data and their incorporation into model development are documented in draft reports that have been reviewed by members of the NFSEG Stakeholder Technical Review Team and have been released to the public, along with the models themselves. The model runs performed as a part of the planning effort provide the most comprehensive accounting of regional water use and cumulative impacts to groundwater resources that is available for this region. The requested data sets can also be obtained by contacting the Bureau of Resource Evaluation and Modeling at the St. Johns River Water Management District. Many of the datasets can also be obtained and queried from databases and models that have been provided to the Technical Review Team for their review. This will enable you to conduct specific analyses as needed.
41	Robert Knight, Ph. D., Executive Director, Howard T. Odum Florida Springs Institute	12/02/2016 via nfrwsp comment form	Based on the above water resource data, it is critical that the WSP provide the most accurate estimate of the maximum mean and extreme human water withdrawals that will fully protect all natural systems from significant harm; both systems like lakes, springs, and rivers that have existing MFLs, and other aquatic systems such as regional wetlands that are not currently and won't soon be protected by site-specific MFLs. This assessment of water availability represents the actual sustainable yield for the planning area, and is the essential foundation for developing an effective and protective WSP.	The NFRWSP has assessed regional groundwater withdrawals as projected through 2035 using BEBR medium projected growth rates for all water use categories, except for agriculture which uses FDACS FSAID, in both the SJRWMD and SRWMD for both average year and drought year conditions, where applicable. The projections made for the RWSP were developed using the best available information at the time developed. Wetlands, and both MFL and non MFL waterbodies are protected through the Districts respective regulatory programs.

42	Robert Knight, Ph. D., Executive Director, Howard T. Odum Florida Springs Institute	12/02/2016 via nfrwsp comment form	Future water uses must be constrained within this quantifiable sustainable yield. Since FAS groundwater is the principal traditional water source in the planning area and since existing uses are already resulting in unacceptable degradation of natural systems and the resource itself, it is necessary that this plan show a corresponding reduction in groundwater pumping from the SAS and the FAS	The NFRWSP is structured to identify sources of water to meet all reasonable-beneficial water supply demands while protecting natural systems. The NFRWSP identifies over 200 mgd of projects to meet the 2035 increased demand of 117 mgd. Reductions in groundwater withdrawals are addressed in MFL recovery and prevention strategies and the Districts regulatory programs.
43	Robert Knight, Ph. D., Executive Director, Howard T. Odum Florida Springs Institute	12/02/2016 via nfrwsp comment form	The most direct and cost effective approach to reducing groundwater pumping while meeting reasonable beneficial future needs is cutting back on existing permitted uses. The WMD governing boards have full authority to reduce permitted pumping allocations when a water resource shortage order is declared. A reasonable approach to phase such a reduction into place is to establish water use metering on all uses, with tiered fees based on amount used. Neither of these practical options for meeting water supply needs while maintaining a sustainable water supply for future generations has any associated costs that cannot be paid by the users themselves.	Reductions in groundwater withdrawals are addressed in MFL recovery and prevention strategies and the Districts regulatory programs. Monetary charging for water is outside the authority of the Districts. Implementation of water conserving rate structures for public water suppliers is evaluated via the Districts regulatory programs and implemented by water suppliers. District rules mandate monitoring of most water use. Only very small and exempt uses are not required to monitor water use.
44	Robert Knight, Ph. D., Executive Director, Howard T. Odum Florida Springs Institute	12/02/2016 via nfrwsp comment form	The FSI has previously provided technical review comments on the Santa Fe and Ichetucknee River MFLs that documented the fact that the WMDs and the Florida Department of Environmental Protection (DEP) underestimated historic baseline flows, resulting in MFLs and a recovery plan that are not sufficient to protect those Outstanding Florida Waters and their ecological health from significant harm. With these comments, we request that when those MFLs are re-evaluated that your staff be directed to assess harm based on stream flows recorded before the 1950s when groundwater extractions were much less than current levels.	The Districts suggest that this comment be submitted during the appropriate public comment period during the upcoming re-evaluation of the Lower Santa Fe and Ichetucknee Rivers and Associated Priority Springs (LSFI) MFLs.
45	Robert Knight, Ph. D., Executive Director, Howard T. Odum Florida Springs Institute	12/02/2016 via nfrwsp comment form	Finally, FSI was repeatedly denied the requested opportunity to present relevant FAS and spring water balance data to the North Florida Regional Stakeholder Advisory Committee (SAC). Attendance at SAC meetings with a few minutes for providing oral comments was not sufficient for FSI scientists and other stakeholders to present and discuss issues of critical importance to the SAC. For these reasons the FSI respectfully requests that the WMDs and FDEP convene one or more opportunities for unlimited public comment and question/answers with agency staff concerning the defects of the proposed WSP before it is finalized	When this request was brought to the Stakeholder Advisory Committee, the requestor was advised that this information was best suited for the NFSEG Technical Team tasked with developing the regional-scale groundwater flow model for North Florida. The NFSEG Technical Team was responsible for ensuring that the most appropriate science was applied to the modeling and data analysis to support decision-making, and that the work completed was defensible. As a member of the NFSEG Technical Team the Howard T. Odum Florida Springs Institute had access to the Technical Team to present this data, but a presentation was not made to the NFSEG Technical Team.
46	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	The Plan is a regional water supply plan that must comply with Section 373.709(2), Florida Statutes. The Plan also will adopt the second phase of the recovery strategy for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs (LSFI) MFLs and must therefore comply with Section 373.0421(2), Florida Statutes. Several of the priority springs protected by the LSFI MFLs are first magnitude springs (e.g., Santa Fe Rise, Treehouse Spring, Columbia Spring, Devil's Ear Spring, July Spring, Ichetucknee Head Spring, and Blue Hole). Therefore, the Plan and Recovery Strategy must meet the requirements of Section 373.805(4), Florida Statutes as well.	The NFRWSP does not adopt the second phase of the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The implementation of the recommendations of the NFRWSP is one part of the second phase of the LSFRB Recovery Strategy. The other portions of the second phase will be addressed independent of the NFRWSP. The NFRWSP does not replace the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. Regarding section 373.805(4), F.S., as recovery or prevention strategies are developed or modified for Outstanding Florida Springs, they will include the requirements in this section and those prevention and recovery strategies will be included in the water supply planning process.
47	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	The Plan and Recovery Strategy fail to meet the requirements of Sections 373.709(2) and 373.0421(2) because the Plan fails to provide reasonable assurances that sufficient projects will be implemented to meet projected demand while providing the needed recovery of the LSFI MFLs. The Plan also fails to include important information Section 373.805(4) requires regarding priorities and funding for the recovery projects. The Plan and Recovery Strategy do not provide reasonable assurances that the LSFI MFLs will be recovered as required.	The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required. Regarding section 373.805(4), F.S., as recovery or prevention strategies are developed or modified for Outstanding Florida Springs, they will include the requirements in this section and those prevention and recovery strategies will be included in the water supply planning process.
48	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	The Plan provides insufficient motivations and incentives for conservation. This Plan was to include long-term regulatory strategies, but only proposes designation as a Water Resource Caution Area. This designation requires reuse of domestic wastewater in certain circumstances when it is determined to be feasible, but does not fund or require reuse of domestic effluent. The designation does not address recovery strategies other than reuse of domestic wastewater. At a minimum, FSC urges Florida's legislature and water management agencies to implement universal water fees as a strong inducement to conserve water.	Water conservation is considered an important part of the NFRWSP and is incorporated in assessing demands and as project options, as identified in Chapter 3 with a potential conservation range of 41 to 54 mgd. Implementation of water conserving rate structures for public water suppliers is evaluated via the Districts regulatory programs and implemented by water suppliers. The NFRWSP does not contain regulatory strategies. Regulatory strategies are set forth in District water use regulatory rules. The long-term regulatory strategy you are referring to is separate from the NFRWSP. It will be implemented as part of the second phase of the Lower Santa Fe River Basin Recovery Strategy of which the NFRWSP implementation is one part. The matter of monetary charging for water is outside the authority of the Districts.
49	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	The pumping of brackish water is unsustainable and self-destructive. It should be avoided. Rather, FSC advises that new demands be met through aquifer recharge using treated wastewater that has been cleansed by recycling through constructed wetlands.	Options such as the use of brackish groundwater provide sustainable water resource development benefits in specific cases and allow for the development of additional water supplies. It is appropriate, therefore, for them to be included as an option in the NFRWSP.

50	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	The Plan assumes each 4.48 mgd of implemented water resource development projects (WRDPs) and water supply development projects (WSDPs) will result in 1 cfs recovery for the LSFI MFLs. (p. 40) This assumption is used to convert listed WRDP and WSDP options (with impacts measured in million gallons per day) to projected LSFI MFL flow recovery (in cfs). Thus, this conversion factor is critical to an understanding of whether the Plan includes adequate project options to meet projected 2035 demand for water and to bring about recovery of the LSFI MFLs.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.
51	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	The Plan provides no discussion, explanation or analysis of the selection of the one-size-fits-all 4.48 mgd assumption regarding WRDP and WSDP benefit to flows and recovery of the LSFI MFLs. The impact of WRDPs and WSDPs is largely a function of the net change in groundwater pumping at a particular location attributable to the project, and the distance between the location where the net change would occur and the location of the MFL point of compliance. In general, the beneficial impact is directly proportional to the reduction in pumping, and inversely proportional to the square of the distance from the pumping location to the MFL point of compliance. So, in general, the further the project is from the gages used to monitor the LSFI MFLs, the less impact will be measured at the gages. A generic one-size-fits-all proportionality for calculating recovery attributable to projects is unscientific and not appropriate, even for planning-level analysis.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.
52	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	Indeed, using the NFSEG Model, the text at p.41 explains that 60.19 mgd of projects provided only 8.4 cfs of recovery. This is 7.165 mgd per cfs of recovery. It is possible the reference to 60.19 mgd is a typographical error that should read 65.19 mgd, the amount of the WRDPs shown in Table 6, Chapter 7. (p. 49) If 65.19 mgd was modeled and resulted in 8.4 cfs of recovery, then the ratio is 7.76 mgd of projects to 1 cfs of recovery. Either modeled ratio is widely divergent from the 4.48 mgd assumption.	The 65.19 mgd represents the potential water resource development projects that were identified during the development of the NFRWSP. Of this amount, 55.7 mgd was modeled in the NFSEG. The plan has been updated to reflect this number and explain the difference.
53	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	The Plan provides no analysis relevant to the huge discrepancy between assumed and modeled flow recovery. Using the 4.48 mgd assumption, there could be about 11 mgd surplus in the Plan after covering the 2035 demand, after conservation, and after the LSFI MFL flow recovery. If 7.76 mgd or 7.165 mgd is used instead of 4.48 mgd as the conversion factor, the Plan does not meet the requirements of Sections 373.709(2) and 373.0421(2), Florida Statutes. The Plan is much less than clear on this issue and errors in the text of page 41 regarding quantities and the two project option tables defy clarity. This discrepancy and textual errors must be explained and the sufficiency analysis of project benefit to LSFI MFL flows must be addressed properly.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.
54	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	The Plan should analyze and report on NFSEG modeling scenarios in which the WRDP and WSDP options are evaluated for their effect on flows at the LSFI MFL gages. Ultimately all projects in the Plan should be modeled to determine whether the Plan, including all projects, meets the sufficiency requirements of Sections 373.709(2) and 373.0421(2), Florida Statutes. Without more than a naked and unexplained assumption of 4.48 mgd per 1 cfs recovery, the Plan does not provide reasonable assurances of meeting these requirements.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.
55	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	The projects necessary to recover groundwater flows, by law, should be included in the Water Resource Development Project list. §373.709(2), Fla. Stat. In this Plan, the WRDP list is not sufficient to recover even the 2010 deficit condition of 17 cfs below the LSFI MFLs. The Plan should explain why the Plan must also rely upon projects on the WSDP list to restore the recovery deficit.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. Section 373.709(2), F.S. requires regional water supply plans to contain water resource development, water supply development and water conservation project options. The NFRWSP contains these options in Appendix J through M. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.
56	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	The Plan lacks the priority listing of each WRDP and WSDP required by Section 373.805(4)(b), Florida Statutes. The Plan also lacks required information for each project regarding the estimated cost of and the estimated date of completion; and "the source and amount of financial assistance to be made available by the water management district for each listed project, which may not be less than 25 percent of the total project cost unless a specific funding source or sources are identified which will provide more than 75 percent of the total project cost." §373.805(4)(c) and (d), Fla. Stat.	Section 373.805(4), F.S., as recovery or prevention strategies are developed or modified for Outstanding Florida Springs, they will include the requirements in this section and those prevention and recovery strategies will be included in the water supply planning process.

57	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	Failure to Adopt Further Regulatory Recovery Strategies. The LSFI Recovery Strategy, Appendix G, at p.36 explains: Phase II Regulatory Strategies. The development of long-term strategies to address the impacts of regional groundwater trends and water use patterns is critical to achieving the recovery of minimum flows in the Lower Santa Fe Basin. As such, the Department, SRWMD, and SJRWMD, will develop long-term recovery measures concurrently with the development of the North Florida Regional Water Supply Plan. This will assist the Districts and the Department in refining the Recovery Strategies and future regulatory measures to address regional groundwater impacts to the Lower Santa Fe and Ichetucknee Rivers. The LSFI Recovery Strategy at Page 20 adds that this: Phase II of the Recovery Strategy will focus on the implementation of the recommendations in the North Florida Regional Water Supply Plan, the adoption of long-term regulatory measures, and the identification and execution of any necessary water resource development and alternative water supply projects. This Plan was to include long-term regulatory strategies, but only proposes designation of the Plan area as a Water Resource Caution Area. This designation requires reuse of domestic wastewater in certain circumstances when it is determined to be feasible, but does not fund or require reuse of domestic effluent. The designation does not address recovery strategies other than reuse of domestic wastewater. No other regulatory recovery strategies are included in the Plan. Without further regulatory changes, there are few real legal compunctions on the implementing parties to implement the projects, and the Districts have limited leverage to bring about conservation. The Plan should analyze and explain why the implementation of further regulatory recovery strategies has been abandoned. For the foregoing reasons, the Plan does not demonstrate or provide reasonable assurances that the Lower Santa Fe and Ichetucknee River MFLs will be met within the planning horizon, nor whether recovery pursuant to the Plan will be "as soon as practicable." §373.0421(2), Fla. Stat.	The NFRWSP does not adopt the second phase of the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The implementation of the recommendations of the NFRWSP is one part of the second phase of the LSFRB Recovery Strategy. The other portions of the second phase will be addressed independent of the NFRWSP. The NFRWSP does not replace the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. Section 373.805(4), F.S., as recovery or prevention strategies are developed or modified for Outstanding Florida Springs, they will include the requirements in this section and those prevention and recovery strategies will be included in the water supply planning process.
58	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	FSC would also note that the Plan fails to address the reality that the amount of water permitted in the planning area currently far exceeds the amount that is actually used. The difference between permit allocations and pumping cannot be accurately determined directly because metering of water use is spotty in the planning area. However, it has been reported that in the SRWMD, the amount of water permitted may exceed the amount pumped by as much as a factor of 2. This excess availability of permitted water is an enormously important factor in 20-year water planning, and the Districts are remiss in ignoring it. What would be the value of this planning exercise if permittees decided, over the next 20-years, to pump all of their permitted quantities, or even three-quarters of their allocation? The Districts should have an aggressive program in place to meter water use and to take back unused allocations over time. Otherwise, surprises in water usage could pop up, rendering this planning exercise useless.	The NFRWSP has assessed regional groundwater withdrawals as projected through 2035 using BEBR medium projected growth rates for all water use categories, except for agriculture which uses FDACS FSAID, in both the SJRWMD and SRWMD for both average year and drought year conditions, where applicable. MFLs Prevention and Recovery strategies provide the in-depth evaluation and specific projects that are used to address MFLs that are in prevention or recovery. A water supply plan assesses what regional groundwater availability based on estimated actual and projected future groundwater pumping to meet future demands for the region. A water supply plan is a higher-level assessment of regional withdrawals not individual ones, therefore the focus is on estimated actual withdrawals versus permitted quantities. Ongoing initiatives seek to improve the data available for estimated actual and projected groundwater use. The projections made for the NFRWSP were developed using the best available information at the time developed. Planning projections are updated at least once every five years to take into account improved data and methodologies.
59	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	On balance, the Plan is to be commended for acknowledging the potential benefit of conservation, which has always been the first priority of FSC. Beginning on page 51, the Plan outlines eight "Water Conservation Project Options", and the first option to be noted is the successful implementation of tiered billing rates by some regional utilities. Tiered rates are a proven incentive to conserve, in contrast to the failure of consumptive use permits (CUPs) to remedy excessive pumping. Implementing universal water use monitoring and fees deserves far more emphasis than that given to them in the Plan. Conservation, as it now stands is almost entirely voluntary. Even CUPs are de-facto voluntary, because so many permitted wells are unmetered. This is an area in which further regulatory strategies are needed and sorely lacking in this Plan.	Water conservation is considered an important part of the NFRWSP and is incorporated in assessing demands and as project options, as identified in Chapter 3 with a potential range of 41 to 54 mgd. Implementation of water conserving rate structures for public water suppliers is evaluated via the Districts regulatory programs and implemented by water suppliers. Monetary charging for water is outside the authority of the Districts. District rules mandate monitoring of most water use. The NFRWSP does not contain regulatory strategies. Regulatory strategies are set forth in Districts' respective water use regulatory rules, which require economic and efficient use of water.
60	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	Because tiered water fees have proven to elicit greater conservation in the North Florida region, FSC strongly urges that they be extended to all users – domestic self-supply, agriculture and commercial/industrial/mining, as well as urban users. Such expansion will, of course, require significant changes in infrastructure, administration and legal status. Setting an effective schedule of fees will require first that a cap be estimated and placed on total withdrawals in each District. Afterwards the infrastructure to monitor all users must be implemented. Significant advances in the technologies of flow measurement, data reporting and recording render this task less expensive than it would have been in the past. A preliminary schedule of fees (which could be distinct for each class of users) must be established that will progressively tax users according to increasing use. FSC would recommend that the impacts of tiered water pricing should be carefully studied before such pricing is established, so that unintended consequences for smaller users, including small agricultural operations, can be avoided. This rate structure can subsequently be amended to optimize the distribution of water among users while not exceeding the regional cap.	Water conservation is considered an important part of the NFRWSP and is incorporated in assessing demands and as project options, as described in Chapter 3, 41 to 54 mgd of water conservation potential is identified. Implementation of water conserving rate structures for public water suppliers is evaluated via the Districts regulatory programs and implemented by water suppliers. Monetary charging for water is outside the authority of the Districts. District rules mandate monitoring of water use. The NFRWSP does not contain regulatory strategies. Regulatory strategies are set forth in Districts' respective water use regulatory rules, which require economic and efficient use of water.

61	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	The Plan Should Discourage Pumping Brackish Water. FSC objects to the prominence the Plan gives to the desalination of brackish water. For example, this source is listed first among the suggested Water Resource Development Project Options (p. 47). Pumping and reverse osmosis treatment of brackish groundwater should be avoided at all possible costs, for at least two reasons. First, saline intrusion is irreversible over any practical time frame. Once a well goes saline, the slow diffusion time among the less channelized regions of the karst substrate insures that it will be decades, if not centuries, before a saline well runs fresh again. Secondly, pumping a brackish well accelerates the rate of saline intrusion. That is, the well becomes progressively more saline and the water costlier to treat.	Options such as the use of brackish groundwater provide sustainable water resource development benefits in specific cases and allow for the development of additional water supplies. It is appropriate, therefore, for them to be included as an option in the NFRWSP.
62	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	The Plan portrays saline intrusion as a problem confined to the coastal and riverine portions of the North Florida region. This perspective is short-sighted, because saltwater underlies the entire Floridan aquifer, and excessive pumping will cause salt everywhere to migrate to higher levels in the karst substrate. Furthermore, a given drop in the potentiometric surface of the aquifer has the effect of raising the underlying salt water interface by a factor as much as 40 times greater than that drop. In particular, withdrawals from the Lower Floridan Aquifer must be reduced, because pumping from that depth will cause a disproportionate vertical rise in the proximate saline interface. Regarding the rate of saline intrusion, FSC finds the analysis of this problem (beginning on page 27) to be overly optimistic. The Plan assumes that salt concentrations will rise in linear fashion, but vertical saline profiles are usually sigmoidal in nature. That is, increase is slow and almost linear, but a “log-phase” ascent soon ensues as the saline “front” approaches. Hence, a linear analysis will significantly overestimate the time required for saline intrusion. The arrival of the front can at times be episodic, as happened during the drought of 2012 with the sudden intrusion into the well supplying Cedar Key.	For the NFRWSP, the Districts focused the evaluation of saline water intrusion on the potential for upconing to occur in existing wells since water quality degradation of water supplies is the primary concern. Saline water upconing is primarily a localized event affected by many factors including hydrogeological setting, location to saline water, well depth and rate of withdrawal. The evaluation utilized analysis of existing observed data to identify significant water quality trends. While the entire planning area was considered, the primary conclusion of this analysis is that groundwater quality may constrain the availability of fresh groundwater in a relatively limited area within Duval, Flagler, Nassau and St. Johns counties. However, these concerns can be managed through appropriate well construction, wellfield management and/or development of AWS.
63	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	These reservations against pumping brackish water do not necessarily pertain to the desalination of seawater, so long as the concentrate from the process is returned to the sea. But this remedy is extremely costly, both energetically and financially -- treatment of brackish water is some 10-fold more expensive than extraction from the Upper Floridan Aquifer. Although desalination of seawater might provide a few localities with water for drinking and bathing, it is economically infeasible to sustain agriculture or industry. If the entire Floridan Aquifer System were to turn brackish, Florida could evolve toward a dry-island Caribbean economy.	Options such as the use of brackish groundwater provide sustainable water resource development benefits in specific cases and allow for the development of additional water supplies. It is appropriate, therefore, for them to be included as an option in the NFRWSP.
64	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	The Plan emphasizes reclaimed water as a primary AWS. While it does mention aquifer recharge, it fails to accord that option the priority it deserves and thereby overlooks a potentially significant and highly economical AWS. Figure 14 (p. 21), for example, shows approximately 108 mgd of treated wastewater in the region that is simply “disposed”. Most of that water could be returned to the aquifer at low cost through treatment by constructed wetlands, as has been amply demonstrated at several sites in Florida (e.g., Sweetwater and Kanapaha in Gainesville and Green Cay in Boynton Beach). Treated wastewater is supplied at one end of an artificial wetland and allowed to percolate horizontally across the wetland. The water at the other end is low in nutrients and xenobiotics and can be re-injected into the aquifer. FSC has had discussions with JEA urging the utility to implement such treatment on the large amount of their treated wastewater that now flows into the ocean. Similar recharge is appropriate for other locations in the North Florida region and taken together could resupply a substantial fraction of the 117 mgd projected demand. FSC strongly recommends the adoption of this method of recharge throughout the North Florida region.	The NFRWSP considers the reuse of reclaimed water, aquifer recharge and all other AWS options equally as possible ways to meet future water demands. The best option for any given use will depend on a number of variables. While no one option will work in all cases, each option should be considered when evaluating how to meet future water demands.
65	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	The Plan fails to include critical information required for recovery strategies for Outstanding Florida Springs, including details regarding priorities and commitments regarding funding. Further, without any coercive and/or regulatory strategies, the Plan and particularly the funding plan do not meet statutory requirements.	Section 373.805(4), F.S., provides that as recovery or prevention strategies are developed or modified for Outstanding Florida Springs, they will include the requirements in this section. When approved, those prevention and recovery strategies will be include into the water supply planning process.
66	Dan Hilliard, Florida Springs Council	12/02/2016 via nfrwsp comment form	FSC does commend the NFRWSP for highlighting the severe problems facing water supply in the North Florida region and appreciates the re-focusing of attention away from increased pumping of the over-stressed Upper Floridan toward other alternative water supplies. This is an acknowledgement from the State that the Upper Floridan Aquifer is already over-pumped. In fact, we would like to see the NFRWSP go beyond its call to limit pumping to an active program to decrease current pumping rates.	Decisions regarding authorization of water withdrawals are addressed in the Districts' respective water use regulatory programs.
67	Jacqui Sulek, Chris Farrell, Audubon Florida	12/02/2016 via email	The large number of reclaimed water projects for future water supply is favorable compared to projects that further deplete aquifers or remove natural surface waters. However, water quality and storage concerns must be addressed to make these projects successful. Storage can reduce the “mandatory use” of reclaimed water at times when water use is not required, e.g., the imposed need to irrigate when rainfall is sufficient. Such water use reduces nutrient assimilation by the landscape and delivers high nutrient loads to stormwater and natural systems.	The Districts agree and support the increased use of reclaimed water in the NFRWSP. The plan does not rank project options since the best option for any given use will depend on a number of variables. As projects are implemented they will be individually evaluated against environmental constraints.

68	Jacqui Sulek, Chris Farrell, Audubon Florida	12/02/2016 via email	Water supply plans in general should do a more thorough job of describing water use to allow a wider audience to consider solutions, even if those solutions may not be part of the plan. For example, it would be helpful to the public and decision makers to understand the amount of current and future water demand that comes from outdoor irrigation. Public water supply represents 50% of the total increase in water demand by 2035 (p. 12), and using the estimate of 50% public water supply use for outdoor irrigation, this results in 25% of the predicted increase – or 29.25 mgd – being attributable to residential irrigation. When presented with this information, the public and regulators may be more willing to make changes to landscaping and irrigation practices rather than continue to fund expensive water development and supply projects.	District staff remain committed to working with local governments and other stakeholders to communicate the findings of the water supply plan, identify opportunities for conservation across all water types, and implement conservation projects. The Districts appreciate the efforts of stakeholders to promote conservation and will work to make information available to support conservation education. Chapter 7 describes the ongoing conservation efforts of the Districts. The Districts continue to promote water conservation and have identified 41 to 54 mgd of conservation potential in the NFRWSP.
69	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	The Plan is a regional water supply plan that must comply with Section 373.709(2), Florida Statutes. The Plan also will adopt the second phase of the recovery strategy for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs (LSFI) MFLs and must therefore comply with Section 373.0421(2), Florida Statutes. Several of the priority springs protected by the LSFI MFLs are first magnitude springs (e.g., Santa Fe Rise, Treehouse Spring, Columbia Spring, Devil's Ear Spring, July Spring, Ichetucknee Head Spring, and Blue Hole). Therefore, the Plan and Recovery Strategy must meet the requirements of Section 373.805(4), Florida Statutes as well.	The NFRWSP does not adopt the second phase of the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The implementation of the recommendations of the NFRWSP is one part of the second phase of the LSFRB Recovery Strategy. The other portions of the second phase will be addressed independent of the NFRWSP. The NFRWSP does not replace the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. Section 373.805(4), F.S., as recovery or prevention strategies are developed or modified for Outstanding Florida Springs, they will include the requirements in this section and those prevention and recovery strategies will be included in the water supply planning process.
70	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	The Plan and Recovery Strategy fail to meet the requirements of Sections 373.709(2) and 373.0421(2) because the Plan fails to provide reasonable assurances that sufficient projects will be implemented to meet projected demand while providing the needed recovery of the LSFI MFLs. The Plan also fails to include important information Section 373.805(4) requires regarding priorities and funding for the recovery projects. The Plan and Recovery Strategy do not provide reasonable assurances that the LSFI MFLs will be recovered as required.	The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. Section 373.709(2), F.S. requires regional water supply plans to contain water resource development, water supply development and water conservation project options. The NFRWSP contains these options in Appendix J through M. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.
71	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	This Plan was to include long-term regulatory strategies, but only proposes designation as a Water Resource Caution Area. This designation requires reuse of domestic wastewater in certain circumstances when it is determined to be feasible, but does not fund or require reuse of domestic effluent.	The NFRWSP does not contain regulatory strategies. Such strategies are addressed by the Districts in their respective water use regulatory programs.
72	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	At a minimum, IA urges Florida's legislature and water management agencies to implement universal water fees as a strong inducement to conserve water.	The NFRWSP identifies 41 to 54 mgd of increased effective water conservation measures as a means to reduce dependency on groundwater. Charging for water is outside the authority of the Districts. The water supply plan is one of many mechanisms utilized by the Districts to ensure protection of water resources. The Districts utilize water use permitting as appropriate to manage water supplies. Implementation of water conserving rate structures for public water suppliers is evaluated via the Districts regulatory programs and implemented by water suppliers.
73	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	The pumping of brackish water is unsustainable and self-destructive. It should be avoided. Rather, IA advises that new demands be met through aquifer recharge using treated wastewater that has been cleansed by recycling through constructed wetlands.	Options such as the use of brackish groundwater provide sustainable water resource development benefits in specific cases and allow for the development of additional water supplies. It is appropriate, therefore, for them to be included as an option in the NFRWSP.
74	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	The Plan's Critical Sufficiency Analysis Relies on a Non-Scientific Assumption and Suffers Fatal Textual Errors.The Plan includes a "Sufficiency Analysis" addressing whether the Plan and LSFI Recovery Strategy could meet the regional water supply planning requirements of Section 373.709(2), Florida Statutes by including sufficient water resource development projects (WRDPs) and water supply development projects (WSDPs) to meet projected demands without causing unacceptable water resource impacts. Plan pp. 40-41. In this case, such project options must, along with conservation, provide recovery of LSFI MFL flows as well. §373.0421(2), Fla. Stat. The Plan assumes each 4.48 mgd of implemented water resource development projects (WRDPs) and water supply development projects (WSDPs) will result in 1 cfs recovery for the LSFI MFLs. (p. 40) This assumption is used to convert listed WRDP and WSDP options (with impacts measured in million gallons per day) to projected LSFI MFL flow recovery (in cfs). Thus, this conversion factor is critical to an understanding of whether the Plan includes adequate project options to meet projected 2035 demand for water and to bring about recovery of the LSFI MFLs.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.

75	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	The Plan provides no discussion, explanation or analysis of the selection of the one-size-fits-all 4.48 mgd assumption regarding WRDP and WSDP benefit to flows and recovery of the LSFI MFLs. The impact of WRDPs and WSDPs is largely a function of the net change in groundwater pumping at a particular location attributable to the project, and the distance between the location where the net change would occur and the location of the MFL point of compliance. In general, the beneficial impact is directly proportional to the reduction in pumping, and inversely proportional to the square of the distance from the pumping location to the MFL point of compliance. So, in general, the further the project is from the gages used to monitor the LSFI MFLs, the less impact will be measured at the gages. A generic one-size-fits-all proportionality for calculating recovery attributable to projects is unscientific and not appropriate, even for planning-level analysis.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.
76	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	Indeed, using the NFSEG Model, the text at p.41 explains that 60.19 mgd of projects provided only 8.4 cfs of recovery. This is 7.165 mgd per cfs of recovery. It is possible the reference to 60.19 mgd is a typographical error that should read 65.19 mgd, the amount of the WRDPs shown in Table 6, Chapter 7. (p. 49) If 65.19 mgd was modeled and resulted in 8.4 cfs of recovery, then the ratio is 7.76 mgd of projects to 1 cfs of recovery. Either modeled ratio is widely divergent from the 4.48 mgd assumption.	The text has been updated to reflect 65.19 mgd of projects. The NFRWSP was updated to clarify the sufficiency analysis to determine that the suite of projects are adequate to address the potential water resource impacts.
77	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	The Plan provides no analysis relevant to the huge discrepancy between assumed and modeled flow recovery. Using the 4.48 mgd assumption, there could be about 11 mgd surplus in the Plan after covering the 2035 demand, after conservation, and after the LSFI MFL flow recovery. If 7.76 mgd or 7.165 mgd is used instead of 4.48 mgd as the conversion factor, the Plan does not meet the requirements of Sections 373.709(2) and 373.0421(2), Florida Statutes. The Plan is much less than clear on this issue and errors in the text of page 41 regarding quantities and the two project option tables defy clarity. This discrepancy and textual errors must be explained and the sufficiency analysis of project benefit to LSFI MFL flows must be addressed properly.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.
78	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	The Plan should analyze and report on NFSEG modeling scenarios in which the WRDP and WSDP options are evaluated for their effect on flows at the LSFI MFL gages. Ultimately all projects in the Plan should be modeled to determine whether the Plan, including all projects, meets the sufficiency requirements of Sections 373.709(2) and 373.0421(2), Florida Statutes. Without more than a naked and unexplained assumption of 4.48 mgd per 1 cfs recovery, the Plan does not provide reasonable assurances of meeting these requirements.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP does not supersede the existing LSFRB Recovery Strategy, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. Chapter 4 provides an explanation of the NFSEG regional groundwater model and the simulations that were utilized.
79	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	The projects necessary to recover groundwater flows, by law, should be included in the Water Resource Development Project list. §373.709(2), Fla. Stat. In this Plan, the WRDP list is not sufficient to recover even the 2010 deficit condition of 17 cfs below the LSFI MFLs. The Plan should explain why the Plan must also rely upon projects on the WSDP list to restore the recovery deficit.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.
80	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	The Plan lacks the priority listing of each WRDP and WSDP required by Section 373.805(4)(b), Florida Statutes. The Plan also lacks required information for each project regarding the estimated cost of and the estimated date of completion; and "the source and amount of financial assistance to be made available by the water management district for each listed project, which may not be less than 25 percent of the total project cost unless a specific funding source or sources are identified which will provide more than 75 percent of the total project cost." §373.805(4)(c) and (d), Fla. Stat.	Section 373.805, F.S., pertains to minimum flows and minimum water levels for Outstanding Florida Springs. Regarding section 373.805(4), F.S., as recovery or prevention strategies are developed or modified for Outstanding Florida Springs, they will include the requirements in this section and those prevention and recovery strategies will be included in the water supply planning process.
81	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	The Plan also lacks "An estimate of each listed project's benefit to an Outstanding Florida Spring;" and "An implementation plan designed with a target to achieve the adopted minimum flow or minimum water level no more than 20-years after the adoption of a recovery or prevention strategy." See §373.805(4)(e) and (f), Fla. Stat.	Section 373.805(4) F.S., as recovery or prevention strategies are developed or modified for Outstanding Florida Springs, they will include the requirements in this section and those prevention and recovery strategies will be included in the water supply planning process.
82	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	The Plan lacks "an assessment of how the regional water supply plan and the projects identified in the funding plans prepared pursuant to sub-subparagraphs [§373.709(2)] (a)3.c. and (b)2.c. support the recovery or prevention strategies for implementation of adopted minimum flows and minimum water levels. . . ." §373.709(2)(k), Fla. Stat. The Plan must specify which WSDPs support recovery of flows at LSFI MFL gages, and how they support flow recovery.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.

83	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	The Plan lacks an adequate funding strategy. The Plan includes only a catalog of potential funding options, not a “funding strategy for water resource development projects, which shall be reasonable and sufficient to pay the cost of constructing or implementing all of the listed projects.” §373.709(2)(d), Fla. Stat. Finally, the Plan lacks any analysis of whether the funding strategy is reasonable and sufficient for all projects. Id.	The NFRWSP identifies a broad list of funding sources to allow entities to utilize available funding from a variety of sources to implement their projects.
84	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	Failure to Adopt Further Regulatory Recovery Strategies.The LSFI Recovery Strategy, Appendix G, at p.36 explains: Phase II Regulatory Strategies.The development of long-term strategies to address the impacts of regional groundwater trends and water use patterns is critical to achieving the recovery of minimum flows in the Lower Santa Fe Basin. As such, the Department, SRWMD, and SJRWMD, will develop long-term recovery measures concurrently with the development of the North Florida Regional Water Supply Plan. This will assist the Districts and the Department in refining the Recovery Strategies and future regulatory measures to address regional groundwater impacts to the Lower Santa Fe and Ichetucknee Rivers.The LSFI Recovery Strategy at Page 20 adds that this:Phase II of the Recovery Strategy will focus on the implementation of the recommendations in the North Florida Regional Water Supply Plan, the adoption of long-term regulatory measures, and the identification and execution of any necessary water resource development and alternative water supply projects.	The NFRWSP does not adopt the second phase of the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The implementation of the recommendations of the NFRWSP is one part of the second phase of the LSFRB Recovery Strategy. The other portions of the second phase will be addressed independent of the NFRWSP. The NFRWSP does not replace the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP
85	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	This Plan was to include long-term regulatory strategies, but only proposes designation of the Plan area as a Water Resource Caution Area. This designation requires reuse of domestic wastewater in certain circumstances when it is determined to be feasible, but does not fund or require reuse of domestic effluent. The designation does not address recovery strategies other than reuse of domestic wastewater.	The NFRWSP does not contain regulatory strategies. Such strategies addressed by the Districts in their respective water use regulatory programs.
86	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	No other regulatory recovery strategies are included in the Plan. Without further regulatory changes, there are few real legal compunctions on the implementing parties to implement the projects, and the Districts have limited leverage to bring about conservation. The Plan should analyze and explain why the implementation of further regulatory recovery strategies has been abandoned.	The NFRWSP does not contain regulatory strategies and does not mandate any regulatory changes. Such strategies are addressed by the Districts in their respective water use regulatory programs.
87	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	For the foregoing reasons, the Plan does not demonstrate or provide reasonable assurances that the Lower Santa Fe and Ichetucknee River MFLs will be met within the planning horizon, nor whether recovery pursuant to the Plan will be “as soon as practicable.” §373.0421(2), Fla. Stat.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.
88	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	IA would also note that the Plan fails to address the reality that the amount of water permitted in the planning area currently far exceeds the amount that is actually used. The difference between permit allocations and pumping cannot be accurately determined directly because metering of water use is spotty in the planning area. However, it has been reported that in the SRWMD, the amount of water permitted may exceed the amount pumped by as much as a factor of 2. This excess availability of permitted water is an enormously important factor in 20-year water planning, and the Districts are remiss in ignoring it. What would be the value of this planning exercise if permittees decided, over the next 20-years, to pump all of their permitted quantities, or even three-quarters of their allocation? The Districts should have an aggressive program in place to meter water use and to take back unused allocations over time. Otherwise, surprises in water usage could pop up, rendering this planning exercise useless.	The NFRWSP has assessed regional groundwater withdrawals as projected through 2035 using BEBR medium projected growth rates for all water use categories, except for agriculture which uses FDACS FSAID, in both the SJRWMD and SRWMD for both average year and drought year conditions, where applicable. MFLs Prevention and Recovery strategies provide the in-depth evaluation and specific projects that are used to address MFLs that are in prevention or recovery. A water supply plan assesses what could happen in the future should current groundwater pumping occur at increased rates to meet future demands for the region. A water supply plan is a higher-level assessment of regional withdrawals not individual ones. Individual withdrawals are evaluated as part of the permitting process.
89	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	Greater Incentives for Conservation Are Needed	Water conservation is considered an important part of the NFRWSP and is incorporated in assessing demands and as project options. As described in Chapter 3, 41 to 54 mgd of water conservation potential is identified. In addition, the Districts' water use regulatory rules contain provisions that mandate implementation of comprehensive water conservation programs.
90	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	Tiered rates are a proven incentive to conserve, in contrast to the failure of consumptive use permits (CUPs) to remedy excessive pumping. Implementing universal water use monitoring and fees deserves far more emphasis than that given to them in the Plan. Conservation, as it now stands is almost entirely voluntary. Even CUPs are de-facto voluntary, because so many permitted wells are unmetered. This is an area in which further regulatory strategies are needed and sorely lacking in this Plan.	Water conservation is considered an important part of the NFRWSP and is incorporated in assessing demands and as project options. As described in Chapter 3, 41 to 54 mgd of water conservation potential is identified. Implementation of water conserving rate structures for public water suppliers is evaluated via the Districts regulatory programs and implemented by water suppliers. In addition, District rules mandate monitoring of water use. Finally, the NFRWSP does not contain regulatory strategies. Regulatory strategies are set forth in District rules, which require economic and efficient use of water.

91	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	The Plan Should Discourage Pumping Brackish Water.IA objects to the prominence the Plan gives to the desalination of brackish water. For example, this source is listed first among the suggested Water Resource Development Project Options (p. 47). Pumping and reverse osmosis treatment of brackish groundwater should be avoided at all possible costs, for at least two reasons. First, saline intrusion is irreversible over any practical time frame. Once a well goes saline, the slow diffusion time among the less channelized regions of the karst substrate insures that it will be decades, if not centuries, before a saline well runs fresh again. Secondly, pumping a brackish well accelerates the rate of saline intrusion. That is, the well becomes progressively more saline and the water costlier to treat.	Options such as the use of brackish groundwater provide sustainable water resource development benefits in specific cases and allow for the development of additional water supplies. It is appropriate, therefore, for them to be included as an option in the NFRWSP.
92	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	Regarding the rate of saline intrusion, IA finds the analysis of this problem (beginning on page 27) to be overly optimistic. The Plan assumes that salt concentrations will rise in linear fashion, but vertical saline profiles are usually sigmoidal in nature. That is, increase is slow and almost linear, but a "log-phase" ascent soon ensues as the saline "front" approaches. Hence, a linear analysis will significantly overestimate the time required for saline intrusion. The arrival of the front can at times be episodic, as happened during the drought of 2012 with the sudden intrusion into the well supplying Cedar Key.	For the NFRWSP, the Districts focused the evaluation of saline water intrusion on the potential for upconing to occur in existing wells since well degradation of existing water supplies is the primary concern. Saline water upconing is primarily a localized event affected by many factors including hydrogeological setting, location to saline water, well depth and rate of withdrawal. The evaluation utilized analysis of existing observed data to identify significant intrusion trends. While the entire planning area was considered, the primary conclusion of this analysis is that groundwater quality may constrain the availability of fresh groundwater in a relatively limited area within Duval, Flagler, Nassau and St. Johns counties. However, these concerns can be managed through appropriate well construction, pumping operations or development of AWS.
93	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	The Plan Should Emphasize Sustainable Recharge.	The NFRWSP considers the reuse of reclaimed water, aquifer recharge and all other AWS options equally as possible ways to meet future water demands. The best option for any given use will depend on a number of variables. While no one option will work in all cases, each option should be considered when evaluating how to meet future water demands.
94	Lucinda Merritt, Ichetucknee Alliance	12/03/2016 via nfrwsp comment form	The Plan emphasizes reclaimed water as a primary AWS. While it does mention aquifer recharge, it fails to accord that option the priority it deserves and thereby overlooks a potentially significant and highly economical AWS. Figure 14 (p. 21), for example, shows approximately 108 mgd of treated wastewater in the region that is simply "disposed". Most of that water could be returned to the aquifer at low cost through treatment by constructed wetlands, as has been amply demonstrated at several sites in Florida (e.g., Sweetwater and Kanapaha in Gainesville and Green Cay in Boynton Beach). Treated wastewater is supplied at one end of an artificial wetland and allowed to percolate horizontally across the wetland. The water at the other end is low in nutrients and xenobiotics and can be re-injected into the aquifer. FSC has had discussions with JEA urging the utility to implement such treatment on the large amount of their treated wastewater that now flows into the ocean. Similar recharge is appropriate for other locations in the North Florida region and taken together could resupply a substantial fraction of the 117 mgd projected demand. IA strongly recommends the adoption of this method of recharge throughout the North Florida region.	The NFRWSP considers the reuse of reclaimed water, aquifer recharge and all other AWS options equally as possible ways to meet future water demands. The best option for any given use will depend on a number of variables. While no one option will work in all cases, each option should be considered when evaluating how to meet future water demands.
95	Carolyn Thomas, SOLO	12/03/2016 via nfrwsp comment form	The issue of restoration and remediation for the Keystone lake area/ Etonia Creek flow has been inadequately addressed. ACTION is required to return this area to its legally mandated status. Please review plans that have been submitted to the board.	Lakes Brooklyn and Geneva are currently under reevaluation and are planned for adoption in December 2017, at which time any needed prevention or recovery strategies would also be developed.
96	Jim Tatum, representing self, land owner on the Santa Fe River	12/03/2016 via nfrwsp comment form	This report contains many good ideas to reduce groundwater use: the two most likely to work well are to increase reclaimed water use and increased conservation. The management techniques outlined on pages 51-52 are good and should be implemented, and The Water Protection and Sustainability Program of 2005 should be re-implemented (p.57).However, these techniques are not sufficient. I believe additional, stronger management techniques are needed to achieve a sustainable usage rate:	The NFRWSP identifies nearly 216 mgd of water resource development, water supply development and water conservation projects to meet the 2035 increased demand of 117 mgd. These projects include the use of reclaimed water and groundwater recharge. In addition, the Districts address usage in their respective water use regulatory programs.
97	Jim Tatum, representing self, land owner on the Santa Fe River	12/03/2016 via nfrwsp comment form	Page 51 suggest tiered billing for non-ag. We must have billing for all, agriculture and all. We must all work together to solve our water crisis. Agriculture will resist and say they cannot produce enough without irrigation. We must work this out, perhaps by growing crops which demand less water, and by the consumer paying more for the product. If something is free we value it less. If something is dear, we conserve. Higher costs for the farmer must be shared by the consumer who will pay more for his product. Everyone who uses water must pay for water. Sooner or later we will have this plan. If we go to it sooner, we will save some water resources.	The NFRWSP identifies increased water conservation as a critical component to ensuring adequate water supplies. As described in Chapter 3, 41 to 54 mgd of water conservation potential is identified. Monetary charging for water is outside the authority of the Districts. The NFRWSP is one of many mechanisms utilized by the Districts to ensure protection of water resources. The District utilizes permitting as appropriate to manage water supplies. Implementation of water conserving rate structures for public water suppliers is evaluated via the Districts regulatory programs and implemented by water suppliers. Cost share programs assist agricultural users and rural communities to implement newer technology that maximizes water use efficiency and are critical components in ensuring a sustainable water supply. In addition, these cost share programs encourage conservation measures that can be more cost effective than most alternative water supply development projects, and provide regional environmental benefits.

98	Jim Tatum, representing self, land owner on the Santa Fe River	12/03/2016 via nfrwsp comment form	The regional Initiative Valuing Environmental Resources cost-share program gives free water and then pays the user to use less. P.55. On p. 57 we see the Dept. of Ag. Pays farmers who implement BMPs to improve irrigation efficiency. This is the same thing. It gives free water and pays to use less. This is absurd. Don't give free water. Don't pay people to not use something that is not theirs to begin with. Dollar incentives are good, but they make sense only if we have billing for water. Implement this program but charge for the water. Billing for water will also limit development and population growth. We do not need growth. Another mindset that needs to be changed.	The NFRWSP identifies increased water conservation as a critical component to ensuring adequate water supplies. As described in Chapter 3, 41 to 54 mgd of water conservation potential is identified. Monetary charging for water is outside the authority of the Districts. The NFRWSP is one of many mechanisms utilized by the Districts to ensure protection of water resources. The District utilizes permitting as appropriate to manage water supplies. Implementation of water conserving rate structures for public water suppliers is evaluated via the Districts regulatory programs and implemented by water suppliers. Cost share programs assist agricultural users and rural communities to implement newer technology that maximizes water use efficiency and are critical components in ensuring a sustainable water supply. In addition, these cost share programs encourage conservation measures that can be more cost effective than most alternative water supply development projects, and provide regional environmental benefits.
99	Jim Tatum, representing self, land owner on the Santa Fe River	12/03/2016 via nfrwsp comment form	I do not have confidence in the District's water models, so important for everything. I am not trained to evaluate water models, but when multiple objective, respected and qualified scientists who are experts in Florida's geology emphatically say these models are inadequate, it makes me question the in-house objectivity. I strongly suggest that the District look further for its models.	From its conceptualization, the NFSEG Regional Groundwater Flow Model utilized both a Technical Team comprised of members with an understanding of models and the hydrogeology of the region and a Steering Team to provide stakeholder input on the models use. The result was the development of this new tool for use in regional water supply planning.
100	Jim Tatum, representing self, land owner on the Santa Fe River	12/03/2016 via nfrwsp comment form	In the report p 61. the Suwannee River Water Management District (District) states that "Current permits and laws limit the scope of regulatory actions that can be taken to impose specific solutions on users." I do not agree with this. Other laws exist which allow curtailment of new and existing CUPs. The District and the DEP should not be afraid to utilize its legal counsel. Litigation will surely ensue from some of these tough changes, but we must acquire a new mindset and new laws in order to sustain our groundwater withdrawals and admit increased population in Florida.	This document is a planning document. Regulatory actions are handled via the Districts' respective regulatory programs.
101	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	The Sufficiency Analysis found in Chapter 6 of the NFRWSP is flawed and does not meet the requirement of 373.709(2), F.S., that a RWSP must include sufficient water resource and water supply development project options to meet projected water demands without causing unacceptable water resource impacts.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.
102	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	There are three ways to address unactable water resource impacts 1) conservation activities that reduce withdrawals, 2) Water Resource Development Projects and 3) Water Supply Development Projects. In this review of the NFRWSP the use of the term project or all projects is referring to both Water Resource Development Projects and Water Supply Development Projects	Projects, as described in the NFRWSP, refer to water resource development projects, water supply development projects or water conservation projects.
103	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	The analysis provided is flawed for 2 reasons, 1) there is an error in the assumptions used to calculate conservation and project benefits, and 2) project and conservation benefits for MFLs (other than the the Lower Santa Fe River MFL at the Fort White gage), for wetlands and for water quality in the SJRWMD east of the Saint Johns River were not evaluated.	The NFRWSP identifies over 200 mgd of projects, which do not withdraw water from the Upper Floridan aquifer, to meet the 2035 increased demand of 117 mgd. As a majority of these demands are being met with sources not coming from the Upper Floridan, additional impacts to wetlands and water quality are not expected to occur. In addition, local scale analysis of impacts associated with water withdrawals are performed by the Districts via their respective regulatory programs.
104	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	There is an error in the assumptions and calculations found on page 40 of the NFRWSP which reads:The LSFI Recovery Strategy (Appendix G) identified that in 2030, if projected water demands were realized, the Lower Santa Fe River flow would have a needed recovery of 20.6 cfs and identified that the recovery of 20.6 cfs could be achieved if projects resulting in 92.3 mgd were implemented. Using this information, the Districts have estimated the quantity of water/projects needed to recover each projected cfs of recovery needed (92.3 mgd in water of projects identified ÷ 20.6 cfs of recovery needed in 2030 = 4.48 mgd of projects per cfs of recovery). The 4.48 mgd value is valid only for the projects listed in Tables A2 to A5 in Appendix A of the Recovery Strategy: Lower Santa Fe River Basin Lower Santa Fe and Ichetucknee Rivers and Priority Springs Minimum Flows and Levels which is Appendix G of the NFRWSP. The benefits to flow at the Fort White gage vary depending on the type of project and the location of the project. Projects that are located longer distances from Fort White will have less of an impact on Santa Fe River flows at the Fort White gage.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.

105	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	The information used in Appendix G does not use flow data for the Fort White gage collected between 2010 and 2015. The Appendix G document includes "APPENDIX C Annualized Flow Duration Curves: Methods for Assessing MFL Recovery". This methodology does not appear to have been used or referenced in the NFRWSP. Suggested change: Use the methods in "APPENDIX C Annualized Flow Duration Curves: Methods for Assessing MFL Recovery" and data updated through 2015 to determine the amount of flow needed at the Fort White gage in 2037. Page 41 of the NFRWSP states, "As part of the NFRWSP evaluation, the Districts evaluated a potential of 60.19 mgd from proposed water resource development projects using the NFSEG. These projects provide for 8.4 cfs of potential recovery to the Lower Santa Fe River flow,".	The NFRWSP was updated to clarify its role in the LSFI recovery strategy. The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFI MFLs recovery strategy into the NFRWSP. The NFRWSP has a base year of 2010.
106	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	The NFRSWP document fails to explain how the "evaluation" was done or why it was only done for 60.19 mgd of the 65.19 mgd of the NFRWSP's proposed water resource development projects.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.
107	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	If you divide 60.19 mgd of projects by the 8.4 cfs of recovery they provide for the Lower Santa Fe MFL you get 7.17 mgd of projects per cfs of recovery. The use of the 4.48 mgd of projects per cfs of recovery calculated using Appendix G information makes the projects more efficient than the 7.17 mgd of projects per cfs of recovery calculated from NFSWG model data. In other words, the Appendix G information requires fewer projects than there would be if the NFSEG model is used to evaluate benefits at the Fort White gage.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP does not supersede the existing recovery strategy for the LSFI MFLs, it incorporates the strategies identified in the LSFRB Recovery Strategy into the NFRWSP. The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.
108	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	The benefit per cfs of recovery for water resource development projects evaluated with the NFSEG clearly gives a very different result from the benefit per cfs of recovery for projects evaluated by the North Florida Model used in the Appendix G Recovery Strategy document.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFSEG Regional Groundwater Flow Model was utilized to determine changes should future demands be met through increased groundwater withdrawals. The approach used in the NFRWSP incorporated the specific spatial analysis performed for the LSFRB MFLs Recovery Strategy into the NFRWSP.
109	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	Water Management District staff have repeatedly stated that the NFSEG model is the best available model for water supply planning. To use information from the Appendix G Recovery Strategy document that used the North Florida Model would not be utilizing the best available information for water supply planning.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFSEG Regional Groundwater Flow Model was utilized to determine changes should future demands be met through increased groundwater withdrawals. The approach used in the NFRWSP incorporated the specific spatial analysis performed for the LSFRB MFLs Recovery Strategy into the NFRWSP.
110	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	The NFRWSP on page 41 states. As discussed in Chapter 3, the Districts have identified a low conservation range potential of 40.67 mgd, further reducing the quantity of water supply development projects needed to approximately 91.94 mgd. Table 6, Chapter 7, has identified 95.44 mgd in water supply development projects; thus meeting the projected water demand and offsetting water resource impacts. The 40.67 mgd from conservation and the 95.44 mgd in water supply development projects were not evaluated to determine what the benefit would be to the flow at the Fort White gage. If you use the 7.17 mgd of projects per cfs of recovery you get 5.67 cfs of recovery at the Fort White gage for conservation and 13.31 cfs of recovery at the Fort White gage for water supply development projects. If you add 8.4 cfs for water resource development projects, 5.67 cfs for conservation and 13.31 cfs for water supply development projects you get 27.38 cfs of recovery at the Fort White gage. The NFRWSP states that 38 cfs will be needed by 2035 at the Fort White gage. The shortfall in projects may even be greater than the 10.62 cfs noted above because almost 30 mgd of the 95.44 mgd in water supply development projects are in Nassau. St Johns, and Flagler Counties. Projects in these counties would not be expected to provide benefits to the flow at the Fort White gage. The use of 7.17 mgd per cfs of recovery may overestimate the recovery benefits from the listed water supply development projects.	The NFRWSP identifies over 200 mgd of projects, which do not withdraw water from the Upper Floridan aquifer, to meet the 2035 increased demand of 117 mgd. As the majority of these demands are being met with sources not coming from the Upper Floridan, there is no need to model them.
111	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	The above indicates that the NFRWSP fails to identify sufficient projects that have a total capacity of which will, in conjunction with water conservation and other demand management measures, exceed the needs identified.	The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required.
112	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	Suggested change: Evaluate conservation and all projects using the NFSEG model and add projects to meet the established need for recovery of the Lower Santa Fe MFL. Project Benefits on MFLs, Wetlands and Water Quality	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP identifies over 200 mgd of projects, which do not withdraw water from the Upper Floridan aquifer, to meet the 2035 increased demand of 117 mgd. As these demands are being met with most sources not coming from the Upper Floridan, there is no need to model them.

113	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	The NFRWSP appears to focus only on evaluating project impacts on the MFL set for the Fort White gage. The NFRWSP fails to demonstrate project impacts for the Keystone area lakes, the Ichetucknee River, water quality in the SJRWMD, and wetlands in both districts. Keystone Lakes MFLs. The NFRWSP states the MFLs for the Keystone area lakes are under review. Florida Statute does not offer the option of not assessing impacts on existing MFLs because they are under review. Suggested change: Use the NFSEG model to determine the impacts on the Keystone area lakes with existing MFLs. Evaluate conservation and all projects using the NFSEG model and add projects to meet the established need for recovery of Keystone Lakes.	Chapter 5 of the NFRWSP assesses impacts from future withdrawals on MFLs, Priority Waterbodies Without MFLs, and Wetlands, as well as changes in Groundwater Quality. Lakes Brooklyn and Geneva are currently under reevaluation and are currently planned for adoption in December 2017, at which time any needed prevention or recovery strategies would also be developed. This plan identifies over 200 mgd of projects, which do not withdraw water from the Upper Floridan aquifer, to meet the 2035 increased demand of 117 mgd. As these demands are being met with sources not coming from the Upper Floridan, there is no need to model them.
114	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	Ichetucknee River.Many of the projects listed are not likely to provide benefits for the Ichetucknee River MFL. Even though the amount of recovery needed for the Ichetucknee is smaller than for the Lower Santa Fe River, the benefits from the listed projects are likely to be much lower because the flow in the Ichetucknee River comes from a much smaller springshead than the Lower Santa Fe River at Fort White.Suggested change: Evaluate the impact of conservation and selected projects on flow at the Ichetucknee River gage used for the MFL.	The Lower Santa Fe River Basin (LSFRB) Recovery Strategy identified that 92.3 mgd of projects would achieve the LSFI MFLs for a 2030 water demand. In comparison, the NFRWSP identified nearly 216 mgd of projects to meet an estimated 2035 demand of 667.5 mgd, which is less demand than what was identified in the LSFRB Recovery Strategy. In addition, the NFRWSP has identified 124.1 mgd more projects than the LSFRB Recovery Strategy required. Modeled water resource development projects did increase the flow at the Ichetucknee River gage. Modeling additional water supply development or conservation projects is not a component of the NFRWSP. Modeling of project benefits can be performed as a part of project development.
115	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	Wetlands .The NFRWSP identifies wetland impacts in Appendix I but does not address how these impacts will be reduced by the selected projects or conservation. Suggested change: Evaluate the impact of conservation and selected projects on wetlands where impacts were identified in Appendix I.	Wetlands are protected through the Districts respective regulatory programs. This plan identifies over 200 mgd of projects, which do not withdraw water from the Upper Floridan aquifer, to meet the 2035 increased demand of 117 mgd. As these demands are being met with sources not coming from the Upper Floridan, there is no need to model them.
116	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	Water Quality SJRWMD. The NFRWSP identifies problems with water quality in the area of the planning region east of the Saint Johns River. How conservation or the selected projects will impact water quality is not addressed. Suggested change: Evaluate the impact of conservation and selected projects on wetlands were impacts were identified in Appendix I.	The NFRWSP evaluates the potential for saline water intrusion within the NFRWSP resulting from the withdrawals of groundwater. With the addition of projects and conservation that take less water out of the upper Floirdan aquifer, the impacts to water quality and wetland impacts should be have less potential for change.
117	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	Planning Period is not at Least 20-years. The Florida Statute that governs Regional Water Supply Planning states at 373.709(2) “Each regional water supply plan must be based on at least a 20-year planning period”. The data used in the NFRWSP only goes to 2035. The 2035 date provides a planning period of only 18 years. Suggested change: Extend the panning data to at least 2037 which would provide at least a 20-year planning period. Adding two years to the data is important not only to meet the statutory requirement but also to correctly evaluate the water needs of the region. Water use is expected to increase between 2035 and 2037 and this increase must be addressed in the NFRWSP	Subsection 373.709(2), F.S., does not require the 20-year planning horizon to start from the date of plan approval. The NFRWSP has a base year of 2010. Projections are evaluated from 2015-2035, which is 20 years. The projections made for the NFRWSP were developed using the best available information at the time developed. Planning projections are updated at least once every five years to take into account improved data and methodologies.
118	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	Duval, Flagler, Nassau, and St. Johns counties east of the St. Johns River. On page 44 the NFRWSP states, “As such, the groundwater quality analyses support the designation of that portion of SJRWMD in the NFRWSP area as a WRCA.” The NFRWSP fails to explain what actions are required once an area is designated a WRCA in the SJRWMD and how that action will reduce water quality impacts from withdrawals. Suggested change: Add an explanation of what additional requirement are imposed on water users in a WRCA in the SJRWMD. The text in Appendix D refers to Tables D4, D5, D6 and D7 but these tables do not appear in Appendix D. Suggested change: Add any missing tables. I did not find any data that indicates the proposed projects would be adequate to address water quality concerns raised in the NFRWSP. Suggested change: Evaluate the impact of the WRCA on the identified constraints.	An explanation of what additional requirements for water resource caution areas was added to the text.
119	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	The text in Appendix D refers to Tables D4, D5, D6 and D7 but these tables do not appear in Appendix D. Suggested change: Add any missing tables. I did not find any data that indicates the proposed projects would be adequate to address water quality concerns raised in the NFRWSP. Suggested change: Evaluate the impact of the WRCA on the identified constraints.	The appropriate tables will be added Appendix D.
120	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	I did not find any data that indicates the proposed projects would be adequate to address water quality concerns raised in the NFRWSP. Suggested change: Evaluate the impact of the WRCA on the identified constraints.	For the NFRWSP, the Districts focused the evaluation of saline water intrusion on the potential for upconing to occur in existing wells since well degradation of existing water supplies is the primary concern. Saline water upconing is primarily a localized event affected by many factors including hydrogeological setting, location to saline water, well depth and rate of withdrawal. Saline water upconing is typically addressed through well construction design and wellfield management strategies so no specific projects are specified for it.
121	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	Page 1 of the NFRWSP does not list Santa Fe Spring is not listed as an Outstanding Florida Spring. Suggested change: Add Santa Fe Spring and a note if the spring is being reevaluated.	Santa Fe Spring is not a current or historic first magnitude spring. Available data support classification of Santa Fe spring as a second magnitude spring based on both historical (prior to 2003) and current data sets.

122	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	Failure to Provide for Stakeholder Input. While the districts held meetings before the draft was produced there was limited opportunity to comment on the plan itself. While the workshops will meet the letter of the law the process failed to provide an opportunity for stakeholders to provide input into the plan. The SAC process limited public comments to 3 to 5 minutes. Questions and concerns raised in writing and at SAC meetings were not addressed or answered by Water Management District staff. There appears to have been no mechanism established to collect input that stakeholders may have submitted to members of the SAC.It is not clear if the questions and concerns raised as part of the SAC process will be included in Appendix A of the NFRWSP. The sentence in the last paragraph on page 4 would seem to indicate the SAC comments will not be included. Comments received during the public workshops and comment period were incorporated, as appropriate, into the NFRWSP (see Appendix A for details regarding comments received and responses). Suggested change: Add all the comments received during the SAC process to the NFRWSP. Collect all public record correspondence submitted to individual SAC members and make it a part of the NFRWSP.	Public involvement has been core to the development of the NFRWSP and venues for public comment were provided at all of the following meetings. The Stakeholder Advisory Committee (SAC) was created to provide guidance to the Districts on the development of the NFRWSP, The SAC held 36 meetings since 2012. In 2016, the Districts conducted over 50 outreach meetings to local governments, environmental groups, citizen groups, and other stakeholders concerning the NFRWSP. Throughout the past year, the Districts briefed their Governing Boards on the status of the plan on several occasions. The Districts also held two public workshops on the NFRWSP on October 25, 2016, at the University of North Florida in Jacksonville, FL and on November 3, 2016, at SRWMD offices in Live Oak, FL. Furthermore, comments from the public on the NFRWSP were solicited from October 4, 2016 through December 5, 2016. Finally the joint SJRWMD/SRWMD Governing Board meeting provided a final venue for public comment on the NFRWSP. Water supply planning is a collaborative, ongoing process that will continue after approval of the NFRWSP.
123	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	Self-suppliers were not represented on the SAC. This lack of representation for self-suppliers was repeatedly pointed out to the Water Management Districts during the early SAC meetings.Suggested change: Hold a workshop to receive input from self-suppliers.	Self-suppliers are considered as those entities that are not served by a public supply system. Domestic self-suppliers were represented by local government representatives on the SAC. Other self-suppliers include agriculture, commercial/power generation, environmental, and industrial/mining, all of which had two representatives on the SAC.
124	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	The NFRWSP states on page 7, "The Districts also presented the draft plan to their respective governing boards on September 13, 2016 to solicit comments and feedback." How was a draft plan with a date of 10/4/16 presented to the boards on September 13, 2016?Suggested change: Correct date if it is an error or clarify what was presented on September 13, 2016.	The draft version of the NFRWSP that existed at that time was the one presented to the Governing Boards.
125	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	On page 49 the NFRWSP states, "Table 5 identifies 16 water resource development project options for the NFRWSP area, costs are shown in million (M) dollars." Table 5 is about wetlands. Table 6 has 16 projects but does not identify the projects.Suggested change: Correct table numbers.	This has been revised.
126	Paul Still, Bradford Soil and Water Conservation District	12/04/2016 via nfrwsp comment form	On page 50 in the section about Water Supply Development Project Options that starts on page 49, the text states, "For each project option identified, the following information is provided (and listed in Appendix J):" Appendix J addresses Water Resource Development Project Options not Water Supply Development Project Options. Suggested change: Correct appendix reference.	This has been revised.
127	Kate Ellison	12/05/2016 via nfrwsp comment form	You mention the Water Protection and Sustainability Program created by the legislature in 2005, unfunded for years. Please demand that they fund it. We need new answers to our water crisis -- innovation, not stagnation. It costs money to develop new, sustainable water sources and we must be willing to invest in this type of public infrastructure.	The NFRWSP identifies a broad list of funding sources to allow entities to utilize available funding from a variety of sources to implement their projects.
128	Kate Ellison	12/05/2016 via nfrwsp comment form	I urge you to evaluate conservation and all resource development projects using the NFSEG model and add projects to meet the established need for recovery of the Lower Santa Fe MFL. Additional meaningful local analysis is needed for several other areas, such has Keystone lakes, water quality east of the St. Johns, and wetland impacts in Appendix I, for which analysis and recommendations are not presented.	The NFRWSP was updated to clarify its role in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The NFRWSP identifies over 200 mgd of projects, which do not withdraw water from the Upper Floridan aquifer, to meet the 2035 increased demand of 117 mgd. Local scale analysis of impacts associated with water withdrawals are performed by the Districts via their respective regulatory programs.
129	Kate Ellison	12/05/2016 via nfrwsp comment form	Also, much of your data does not include the available measurements taken after 2010, and including the most recent data will give a much clearer picture of current trends, recovery efforts, and projected needs. If the report comes out in 2017, it needs to extend to 2037, and be based on the most current data.	Subsection 373.709(2), F.S., does not require the 20-year planning horizon to start from the date of plan approval. The NFRWSP has a base year of 2010. Projections are evaluated from 2015-2035, which is 20 years. The projections made for the NFRWSP were developed using the best available information at the time developed. Planning projections are updated at least once every five years to take into account improved data and methodologies.
130	Kate Ellison	12/05/2016 via nfrwsp comment form	Water quality is a crucial issue, not limited to salt-water intrusion, phosphorous and nitrates. These are the very minimum pollutants to mitigate, but lead in the public water supply is also critical, as well as other heavy metals. Your report does not give enough details of a plan to control water quality. As water sources are broadened and traditional sources strained, water quality is more and more important. I respectfully request greater elaboration of plans to improve water quality. Evaluate water quality (or state how it will be evaluated/maintained) in all water resources suggested to meet growing needs.	The purpose of this plan is to address limitations to water quantity over the 20 year planning horizon. The water quality assessment included in this plan focuses on the extent to which groundwater withdrawals will be constrained due to a water quality issue. Saline water intrusion was found to be the primary water quality limitation on groundwater withdrawals. Groundwater quality is critical to water supply, but is managed separately through FDEP Groundwater Management and Aquifer Protection programs. Surface water quality is managed through the FDEP Total Maximum Daily Load (TMDL) program and development of Basin Management Action Plans (BMAPs).

131	Kate Ellison	12/05/2016 via nfrwsp comment form	Finally, I request more stakeholder input. This plan is crucial, and it needs the support of water experts, conservationists, and the general public. Maybe you have met the letter of the law, but not the spirit. Our water crisis needs all of us working together. We are not there yet.	Public involvement has been core to the development of the NFRWSP and venues for public comment were provided at all of the following meetings. The Stakeholder Advisory Committee (SAC) was created to provide guidance to the Districts on the development of the NFRWSP, The SAC held 36 meetings since 2012. In 2016, the Districts conducted over 50 outreach meetings to local governments, environmental groups, citizen groups, and other stakeholders concerning the NFRWSP. Throughout the past year, the Districts briefed their Governing Boards on the status of the plan several times The Districts also held two public workshops on the plan on October 25, 2016, at the University of North Florida in Jacksonville, FL and on November 3, 2016, at SRWMD offices in Live Oak, FL. Furthermore comments from the public on the plan were solicited from October 4, 2016 through December 5, 2016. Finally the joint SJRWMD/SRWMD Governing Board meeting provided a final venue for public comment on the NFRWSP. Water supply planning is a collaborative, ongoing process that will continue after approval of the NFRWSP.
132	Robin Lamb, Mayor Lenny Curry's office, Jacksonville, FL	12/05/2016 via nfrwsp comment form	On behalf of the City of Jacksonville, I would like to thank the St. Johns River Water Management District and its technical staff for their work developing the recently released draft of the North Florida Regional Water Supply Plan. As you know, the St. Johns and Suwanee River water management districts, along with the Florida Department of Environmental Protection, have worked together over the course of 4 years to produce a 20-year water supply plan for the 14-county planning area that comprises the North Florida Regional Water Supply Partnership. While additional work remains, the results of this effort are encouraging. By identifying a range of options capable of augmenting the region's water supply, the plan offers the promise of a balanced approach; one that couples common sense water conservation with the water resource and water supply projects necessary to ensure that North Florida has reliable and sustainable sources of water in the years ahead. The citizens of Duval County look forward to the implementation of cost-effective solutions that will protect water supplies throughout region in an equitable manner based on sound science; a key to which will be the completion of a reliable groundwater model. We encourage the two water management districts to continue working with all stakeholders, including our water utility, JEA, in implementing the plan and developing future updates that are fair, financially prudent and scientifically sound. Water is vital to economic growth and the wellbeing of our communities. That's why the North Florida Regional Water Supply Partnership must work to manage this resource wisely for the benefit of future generations.	Water supply planning is a collaborative, ongoing process that will continue after approval of the NFRWSP. The Districts are committed to continuing to work with stakeholders.
133	Tom Morris, Executive Director, Clay County Utility Authority, On Behalf of the North Florida Utility Coordination Group	12/05/2016 via email	The Plan correctly recognizes the public water suppliers expect to achieve even greater water conservation and greater reuse of reclaimed water over the 20-year planning period. However, we believe the Plan should also recognize the significant achievements that the Districts and public water suppliers have already realized in both conservation and reclaimed water use.	Language was added to the NFRWSP reflecting water conservation efforts to date, as well as reclaimed water implementation.
134	Tom Morris, Executive Director, Clay County Utility Authority, On Behalf of the North Florida Utility Coordination Group	12/05/2016 via email	As reflected in the following figure, since 2006, the population served by the NFUCG members has increased by almost 150,000 people, from approximately 1.09 to 1.23 million. However, in that same time period, actual water use by the NFUCG members has declined from 192 million gallons per day to 157 million gallons per day. Per capita water use rates have fallen 28%. This water savings can be directly linked to water conservation efforts undertaken by NFUCG members, our customers, and the Districts, as well as increased level of public awareness. We believe it is important for the Plan to recognize these past success, since the ongoing emphasis and investment in conservation have significantly reduced the amounts of water necessary to meet future demands.	Language was added to the NFRWSP reflecting water conservation efforts to date, as well as reclaimed water implementation.
135	Tom Morris, Executive Director, Clay County Utility Authority, On Behalf of the North Florida Utility Coordination Group	12/05/2016 via email	We have also made significant investments in increasing reclaimed water use. Since 2000, NFUCG members have invested over $150 million in beneficial reuse projects, resulting in an 100% increase in both reclaimed water use and reclaimed water capacity. This commitment to reuse has already provided significant regional benefits, by allowing public suppliers and other users to reduce or eliminate the use of potable water for irrigation purposes and providing direct environmental benefits. As recognized in the Plan, we remain committed to expanding feasible reclaimed water use, however the Plan should also recognize the significant achievements that have already been realized by the Districts, public suppliers, and other water users.	Language was added to the NFRWSP reflecting water conservation efforts to date, as well as reclaimed water implementation.
136	Tom Morris, Executive Director, Clay County Utility Authority, On Behalf of the North Florida Utility Coordination Group	12/05/2016 via email	We understand that for the Plan, the "pumps off" approach was used as a rough screening tool to identify water bodies which may merit further evaluation. We do not feet this approach is appropriate for future uses of the model because the recharge assumptions do not represent real conditions. The Plan chapter describing these modeling scenarios should clearly stat that this "pumps off" approach does not represent historical condition. The results of "pumps off" model scenarios, if presented without the proper context, have the potential to be misinterpreted by the public.	As described in the NFRWSP, the pumps off simulation does not represent a historic or predevelopment condition. It was utilized as a reference condition for comparison with the 2035 projected groundwater use simulation to estimate impacts to water resources in the region (lakes, rivers, and springs). It is an approximation of a no-pumping condition, with the caveat that recharge and boundary conditions within the model domain represent our best understanding of average 2009 conditions.

137	Rob Dennis, PE, D.WRE, Liquid Solutions Group	12/05/2016 via email	The updates on these 38 water supply development projects include the addition of a calculated water supply benefit which accounts for each project's ability to meet peak demands. In addition, the annual operations and maintenance (O&M) cost associated with each project was calculated consistent with the methodologies used in the NFRWSP.As a result of this additional information, each of these 38 water supply development projects meet the criteria required for inclusion in the NFRWSP as a "Water Supply Development Project Option" and should be included in Appendix K (and removed from Appendix L) of the NFRWSP. Attached you will find an updated Appendix K and Appendix L reflecting our proposed changes (shown in red text.)	The projects have been updated accordingly.
138	Lisa Rinaman, St. Johns Riverkeeper	12/05/2016 via email	NFRWSP fails to make conservation a priority.	Water conservation is considered an important part of the NFRWSP and is incorporated in assessing demands and as project options. As described in Chapter 3, 41 to 54 mgd of water conservation potential is identified.
139	WWALS Watershed Coalition	12/05/2016 via email	The Falling Creek project has very large up-front expense, involves environmental risk in running a large-diameter pipe through wetlands, and has high maintenance cost. In addition it only benefits the Ichetucknee Springs watershed. It is seasonal, for instance at the water levels now in the Suwannee, there is no water to pump to Falling Creek	Aquifer recharge projects, such as Falling Creek, can provide sustainable water resource development benefits and allow for the development of additional water supplies. It is appropriate, therefore, for them to be included as an option in the NFRWSP.
140	WWALS Watershed Coalition	12/05/2016 via email	The maps in the plan, including Figure C3 on page 3 of Appendix C: Simulated Change in the Potentiometric Surface within the North Florida-Southeast Georgia Regional Groundwater Flow Model Area, show that the area that is losing water to the Atlantic coast of south Georgia and north Florida has lost 20 or more feet of aquifer levels. None of the projects address that problem in any significant way. Much of the area in Florida that has lost that water in the Floridan is below Columbia, Hamilton, and Baker Counties. Overpumping is not the only reason for this loss: silviculture management has something to do with it as well, for example. WWALS recommends the much more practical and cost-effective plan Dennis J. Price P.G. has already submitted to SRWMD and NFRWSP.	The maps in Appendix C represent the estimated change in the potentiometric surface from the estimated pumping in 2009 to the estimated pumping condition in 2035 under various scenarios. They estimate changes if future demands are met with fresh groundwater. This plan identifies over 200 mgd of projects, which do not withdraw water from the Upper Floridan aquifer, to meet the 2035 increased demand of 117 mgd. The specific project referenced in the comment lacks planning level costs and estimated project capacity. The project has been forwarded to the SRWMD Agriculture and Environmental Projects Division to coordinate development of those parameters. The Districts will continue to explore strategies to meet our future demands in cooperation with local governments and stakeholders.
141	WWALS Watershed Coalition	12/05/2016 via email	Yet there is no mention of pipelines as threats to the Rivers and to the Floridan Aquifer, nor of similar threats such as fracking. These omissions need to be remedied.	These activities are not part of a regional water supply plan.
142	WWALS Watershed Coalition	12/05/2016 via email	Please clarify the text on page 24 to say that peer review has not been done yet and to invite peer reviewers, as well as public comment, beyond the present public comment deadline.	Language was added to the NFRWSP. Please note that the NFSEG Regional Groundwater Flow Model development is a separate process from the NFRWSP. More information on its development can be found at http://northfloridawater.com/groundwaterflowmodel.html.
143	WWALS Watershed Coalition	12/05/2016 via email	The Floridan aquifer is a karst aquifer. Therefore, it is heterogeneous and anisotropic with turbulent groundwater flow unlike conventional aquifers that could be assumed homogeneous and isotropic with laminar flow. That means standard groundwater models based on Darcian flow of homogeneous and isotropic conditions are not realistic in karst environments. The NFRWSP does not seem to include any specific information as to the groundwater models used. If they are standard Darcian groundwater flow models liked they have always used, it very unlikely that their forecasts vis a vis MFL would be accurate.	The NFSEG Regional Groundwater Flow Model development is a separate process from the NFRWSP. The appropriate approach for modeling karst systems depends on a variety of factors, including hydrogeological nature of the karst aquifer, the types of predictions required, scale issues, and data availability. Groundwater models include some degree of uncertainties in hydraulic properties of the subsurface and system stresses. The NFSEG model does account for heterogeneity and anisotropy caused by differences in horizontal and vertical hydraulic conductivity; however, it does not account for turbulent flow or anisotropy associated with karst features, such as conduits. Explicitly representing conduit features in the model requires that their locations and hydraulic characteristics be known with sufficient accuracy to warrant inclusion in the model. Although the Floridan aquifer is a karst aquifer, porous-media models (like the NFSEG model) are suitable for predicting changes in UFA groundwater levels and flows on a regional scale due to the high degree of ubiquitous primary and secondary porosity and high permeability of the aquifer. As such, the Floridan aquifer can be modeled as a porous-media aquifer on a regional scale. More information on its development can be found at http://northfloridawater.com/groundwaterflowmodel.html.
144	WWALS Watershed Coalition	12/05/2016 via email	Modeling is important for future developments, especially for issuing agriculture water use permits. Please add in the NFRWSP or in a further document an explanation on how drawdown when a new water user applies for a permit will be modeled, especially the most common scenario of every agricultural user turning on their pumps at the same time for months on end during the growing season during a drought.	The Districts' regional water supply plans do not contain regulatory provisions. Such provisions are addressed by the Districts in their respective water use regulatory programs.

145	WWALS Watershed Coalition	12/05/2016 via email	Modeling can and should involve "Monte Carlo" simulations where each of the model parameters is evaluated across their distributional range. These are big tasks, but essential, especially for the NFSEG. No doubt SRWMD and SJRWMD are aware of the political difficulties of using a Monte Carlo model, due to the recent use of one in the Florida Environmental Regulation Commission (ERC) decision to raise toxicity levels for Florida waters. WWALS is a co-signatory of a letter from all the Waterkeepers of Florida criticising that ERC Monte Carlo modeling for leaving native Floridians who eat a lot of fish as outliers especially susceptible to cancer and other ill effects of water contaminants. Thus any use of a Monte Carlo model (or any other model) must be done so as to not leave such outliers and must be clearly defended against such a possibility. Such defense should include robust peer review, especially by critics of the ERC's decision, including WWALS and other Florida (and Georgia) Waterkeepers.	The Districts have passed your comment onto our modeling staff for their consideration on the use of the NFSEG regional groundwater model. Please note that the NFSEG Regional Groundwater Flow Model development is a separate process from the NFRWSP. More information on its development can be found at http://northfloridawater.com/groundwaterflowmodel.html.
146	WWALS Watershed Coalition	12/05/2016 via email	The area mapped in Figure 2: North Florida Regional Water Supply Planning Partnership on page 3 is far too constrained. The potentiometric simulations in Appendix C go all the way to the Gulf and South Carolina and show most pronounced effects not only around Jacksonville, but also as far away as Savannah. Many of the projects items in Appendix J: Water Resource Development Project Options, including some in progress or completed, are outside the nominal Partnership area, to the west of the Suwannee and Withlacoochee Rivers, in Madison, Lafayette, and Dixie Counties, Florida. Peer review and public comment need to extend at least as far as those simulations go, which would be at least as far as NFSEG Domain of Figure 15 on page 25.	Delineation of the NFRWSP area was a result of the SRWMD 2010 Water Supply Assessment and the Stakeholder Advisory Committee recommendations. The NFSEG model was used to assess changes in water levels and flow resulting from pumping. Appendixes F, H, and I of the NFRWSP discuss changes in water levels and flow from projected increases in pumping within the Partnership area and pumping throughout the NFSEG model domain.
147	WWALS Watershed Coalition	12/05/2016 via email	There is no mention in the draft plan of the Georgia Suwannee-Satilla Regional Water Council, which is currently finalizing a similar plan for the Georgia watersheds (Suwannee, Satilla, and St Marys) north of the nominal Partnership area. Nor is there any mention of the other Georgia Regional Water Councils, such as the ones for the Atlantic coast watersheds, which all recently held two joint meetings with Suwannee-Satilla. Better cross-state-line coordination is needed.	The Districts have been coordinating with the State of Georgia on the development of the NFRWSP for several years. In particular the State of Georgia EPD has been involved in the development of the NFSEG regional groundwater model and is a member of the NFSEG Technical Team.
148	WWALS Watershed Coalition	12/05/2016 via email	Yet there are springs on the Alapaha River, including some in Georgia, and there are springs upstream on the Withlacoochee River, including three second-magnitude springs between Valdosta and the GA-FL line: Wade (Blue) Spring just south of US 84, and McIntyre and Arnold Springs closer to the state line. 8 9 McIntyre Spring has been explored by cave divers for 4,610 feet underground. There appears to be no mention of any of those three second magnitude Withlacoochee River springs in the NFRWSP. Nor for that matter, any mention of springs not directly on rivers, such as Adams Spring in Hamilton County. The NFRWSP will affect all these other springs, and they should be taken into account.	The water bodies specifically identified in the NFRWSP are priority water bodies within the planning region. The list of priority water bodies for each district is updated annually in compliance with 303.042, F.S. and approved by the FDEP. Wade (Blue) Spring, McIntyre Spring, and Arnold Spring are not in the planning region and therefore not identified in the NFRWSP. Adams Spring, in Southwestern Hamilton county, is one of hundreds of springs located in the planning region that is not identified as a priority water body. Actions taken to protect priority springs in this region will provide regional protection to area springs. Where available, data on spring flow and water levels for water bodies throughout the planning region and throughout the NFSEG model domain were used to evaluate and improve the model used to estimate the regional impact of groundwater withdrawals.
149	WWALS Watershed Coalition	12/05/2016 via email	The NFRWSP does not seem to mention the recent massive consolidation of agricultural lands into the hands of a few owners, on both sides of the state line. SRWMD has told WWALS they are talking to the landowners about possible agricultural runoff issues. This topic of water quality as well as quantity should be addressed in the plan.	The Florida Department of Agriculture and Consumer Affairs develops agricultural water demand projections for use in water supply planning and those projections do show increase in demand agriculture for the SRWMD. The purpose of the NFRWSP water resource assessment is to evaluate the extent to which water resources and related natural systems may be impacted by projected increase in groundwater withdrawals within the NFRWSP area. The water quality issues described in your comment are managed through the DEP Total Maximum Daily Load (TMDL) program and development Basin Management Action Plans (BMAPs).
150	WWALS Watershed Coalition	12/05/2016 via email	In addition to the water quality monitoring using wells mentioned on pages 1, 3, and 7, there needs to be regular, frequent river water quality monitoring on the Withlacoochee, Alapaha, and Suwannee Rivers in both Florida and Georgia. Such monitoring will help distinguish sources of contamination, such as the chronic Valdosta wastewater overflows now mostly solved, excretions of wild, farmed, or domestic animals or humans, or agricultural fertilizer or pesticides. Such contaminants of river water affect surface water and aquifer water, and should be used in the modeling and calibration. The NFRWSP should advocate for adequate funding for and its agency participants should implement such regular, frequent river water quality monitoring	The purpose of the NFRWSP water resource assessment is to evaluate the extent to which water resources and related natural systems may be impacted by projected increase in groundwater withdrawals within the NFRWSP area. The water quality issues described in your comment are managed through the FDEP Total Maximum Daily Load (TMDL) program and development Basin Management Action Plans (BMAPs).

151	Anne Harvey Holbrook, JD, MS, Save the Manatee Club	12/05/2016 via email	The minimum flows and levels rulemaking process for the lower Santa Fe and Ichetucknee Rivers and associated springs found that these water bodies are already experiencing consumptive use beyond that which they can sustain without incurring significant harm. As such, recovery efforts must be fully accounted for in the NFRWSP. Although prevention and recovery strategies are mentioned for these water bodies and the total estimated recovery needed to achieve the MFL under anticipated 2035 conditions are given, the Draft RWSP does not clearly discuss the alternative water sources or conservation measures anticipated or available to make up that difference with a specific regional focus on alleviating impacts to those waterways.	The Lower Santa Fe and Ichetucknee Rivers and associated priority springs (LSFI) are in recovery. The NFRWSP has been updated to clarify the role of the NFRWSP in the Lower Santa Fe River Basin (LSFRB) Recovery Strategy. Projects are already under way to improve the quantity and quality of water in the region. The strategy to recover these resources included implementing the Recovery Strategy for the Lower Santa Fe River Basin in April 2014 (Appendix G of the NFRWSP), committing resources to the development of a robust groundwater model to understand how regional withdrawals impact priority water bodies (the NFSEG model), and initiation of regional planning to understand how growth could alter demand and identify projects to offset current and future demands (the NFRWSP). In addition, a strategy to achieve the long-term recovery of the LSFI must be implemented. Upon completion of peer review of the NFSEG groundwater flow model, and in compliance with 62-42, F.A.C. the Districts will re-evaluate the Minimum Flows and Minimum Levels and the present status of the Lower Santa Fe and Ichetucknee Rivers and Associated Priority Springs pursuant to Section 373.0421(3), F.S., using the best available scientific or technical data, methodologies, and models. The associated recovery strategy will be revised to reflect this updated data and address long-term recovery of the resource. Project identification and implementation to protect and enhance water quantity and quality in the region will continue in parallel with model peer review and MFL status re-evaluation.
152	Anne Harvey Holbrook, JD, MS, Save the Manatee Club	12/05/2016 via email	Similarly, the Draft plan notes that four priority springs will show reductions greater than ten percent under 2035 conditions, and that the remaining four priority springs and both priority rivers also show flow reductions, though less than ten percent. The draft RWSP should therefore anticipate that the MFL process may require prevention and recovery strategies (or at least impose certain water withdrawal limits so as not to exceed significant harm), and should identify alternative water sources or conservation reuse opportunities within those watersheds as well.	The NFRWSP has identified between 203 and 216 mgd in projects to offset the projected increase in water demand of 117 mgd. MFL status is evaluated as MFLs are adopted. If needed, recovery or prevention strategies are written and adopted simultaneously with the MFLs, and could further constrain available traditional groundwater in the district. This potential for additional future resource constraints was identified in the plan, and was one of the reasons that the NFRWSP recommended the designation of the entire region as a WRCA.
153	Anne Harvey Holbrook, JD, MS, Save the Manatee Club	12/05/2016 via email	SMC recognizes the need to identify additional and alternative sources of water as well as to identify opportunities for water conservation. However, the use of alternative water supplies (AWS) as a general term in regional water supply planning is misleading, and specific types of AWS should be discussed with a view toward determining what types of projects might be appropriate to offset use of groundwater in a particular area. The use of alternative water supplies generically is further complicated because of the interconnected nature of surface water, groundwater, recharge, and brackish groundwater. Despite the fact that AWS are statutorily authorized sources for the Districts' consideration in water supply planning, some assessment and modeling of the relationship among these sources should be accounted for in water supply planning efforts that rely on use of AWS to supplement traditional groundwater. The incorporation of MFLs touches on this but does not explicitly or fully address the issues involved because the water budget inappropriately distinguishes between groundwater and surface water in recovering systems. For the NFRWSP to be an effective tool for both local government and state permitting agencies, these reductions and offsets should be analyzed regionally with appropriate conservation and AWS projects outlined and clear funding opportunities identified.	Specific projects identified to meet water demands can be found in Appendixes J-M of the NFRWSP. The plan does not rank project options since the best option for any given use will depend on a number of variables. As projects are implemented they will be individually evaluated against environmental constraints.
154	Anne Harvey Holbrook, JD, MS, Save the Manatee Club	12/05/2016 via email	The uncertainties and complications associated with climate change are discussed late in the document, but should be addressed earlier in its sections discussing demand calculations, drought, and saltwater intrusion. The NFRWSP includes in its demand calculations a 1-in-10 year drought water demand figure to represent an event that would increase water demand that has a ten percent probability of occurring in any given year. In the final draft, SMC asks the Districts to clarify how they determined the likelihood of drought occurrence, and how modeling accounts for the potential impacts of climate change. Already areas of North Florida are experiencing rising temperatures and altered rainfall patterns. The Draft should also take into account seasonal changes in rainfall fluctuations as a result of changing climate and weather patterns. If, as stated in the Draft plan, a single one-in-ten year drought event can increase demand an additional 6%, it seems that demand estimates may be too low given the potential for previously rare drought events to occur with increasing frequency and intensity as the climate changes. Moreover, the impacts of drought should also be discussed in the plan's section on saline water intrusion. A small drop in aquifer levels can result in substantial saltwater intrusion; thus groundwater pumping combined with drought could have a serious deleterious impact on fresh groundwater availability, and that possibility and calculations should be incorporated into the RWSP assessment.	The SJRWMD and SRWMD have deferred to FDACS regarding the potential irrigation efficiency for agricultural practices. Currently, FDACS FSAID does not provide a range for agricultural and potential irrigation efficiency. The projections made for the NFRWSP were developed using the best available information at the time developed. As noted in the NFRWSP, many of the same practices that are implemented to address water resource constraints will also mitigate the impacts of climate change.
155	Anne Harvey Holbrook, JD, MS, Save the Manatee Club	12/05/2016 via email	Conversely, substantially less investment should be encouraged for water supply development projects that tap "new" sources of water; use of brackish groundwater and Lower Floridan Aquifer withdrawals are detrimental to the long-term sustainability of North Florida's water supply and should be discouraged.	Options such as the use of brackish groundwater provide sustainable water resource development benefits in specific cases and allow for the development of additional water supplies. It is appropriate, therefore, for them to be included as an option in the NFRWSP.

156	Kerry Kates, Florida Fruit & Vegetable Association	12/05/2016 via nfrwsp comment form	Water Conservation and Irrigation Efficiency, Table 1: “2035 Water Conservation and Irrigation Efficiency Potential” (pg 23). In the draft supply plan, both the proposed Low and High Conservation Potentials for agriculture are listed at 25 million gallons per day (mgd). The total agricultural demand for 2035 is projected at 154 mgd, meaning that over the course of the next 20-years the expectation is that agriculture will initiate a conservation effort resulting in a 16% reduction of water use, equating to 25 mgd conserved. The way it is presented in Table 1, as both the low and high conservation potential, could lead the reader to mistakenly interpret the 25 mgd as an infallible and unquestionable reduction goal that the agricultural community is then obligated to obtain. It is much more realistic to provide a range of values, such as was done with the conservation projection for public supply (11 mgd-21mgd). The table should be amended to include a low conservation potential other than 25 mgd to better reflect variable, real-world conditions and to thwart unrealistic and/or unobtainable expectations.	The SJRWMD and SRWMD have deferred to FDACS regarding the potential irrigation efficiency for agricultural practices. Currently, FDACS FSAID does not provide a range for agricultural and potential irrigation efficiency. The projections made for the NFRWSP were developed using the best available information at the time developed.
157	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email	As indicated in Appendix B, the projected demand from different types of supply sources, i.e. public water supply, small public supply and "domestic self supply", is based on the assumption that the % share from each of these in 2035 will generally* be the same as it is currently.This constant "percent-share method" for projections very likely understates the demand from public water supply sources in 2035 in areas such as Alachua County (and probably in other urbanizing counties in the region) where the trend has been significantly higher proportions of new development being approved in urban areas connected to public water supply sources; this trend along with Comprehensive Plan policies promoting such development in urban areas served by public water supply systems will result in increasing shares of population utilizing public water supply systems rather than small public systems or DSS. (*According to discussion in Appendix B, " a 1 percent per conversion of domestic-self-supply to public supply systems was added to viable public supply systems by proportion in" seven counties in the region. There are other counties in the region, including but probably not limited to Alachua County, where recognition of such a shift in the share of demand to public supply systems would also be appropriate.)	Your comment has been noted and is discussed in Appendix B. Of importance, the NFRWSP Stakeholder Advisory Committee (SAC) voted 12-0 on December 15, 2014 to approve the methodology and associated projections for the public supply and small public supply systems, DSS, L/R/A, C/I/I & M/D categories. The NFRWSP SAC also voted 11-1 on February 17, 2015 to approve the methodology and associated projections for the reclaimed water category. The projections made for the NFRWSP were developed using the best available information at the time developed. Planning projections are updated at least once every five years to take into account improved data and methodologies.
158	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email	The projected increases discussed in the text and shown in Figures 5,7, and 8 in demands from Domestic Self Supply in this section are likely overstated, and, conversely the projected increases in demand from Public Water Supply are likely understated, because the use of the constant "percent-share method' for projections doesn't correspond with shifts of population to urban areas with Public Water Supply systems,as detailed in the comment above on Appendix B.	Your comment has been noted and is discussed in Appendix B. Of importance, the NFRWSP Stakeholder Advisory Committee (SAC) voted 12-0 on December 15, 2014 to approve the methodology and associated projections for the public supply and small public supply systems, DSS, L/R/A, C/I/I & M/D categories. The NFRWSP SAC also voted 11-1 on February 17, 2015 to approve the methodology and associated projections for the reclaimed water category. The projections made for the NFRWSP were developed using the best available information at the time developed. Planning projections are updated at least once every five years to take into account improved data and methodologies.
159	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email	Appendix L. Missing units for Estimated Water Supply	This has been revised.
160	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email	Appendix M. Missing units for Estimated Water Supply Benefit	This has been revised.
161	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email	Appendix M. Project # 16 should be listed under Levy County not City of Archer	The name has been changed accordingly.
162	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email	Chapter 2 - Introduction to Water Supply Planning. """It is important to note that, while the NFRWSP may not be used in the review of CUPs/WUPs, the Districts are allowed to use data or other information used to establish the plan in reviewing CUPs/WUPs"". This statement seem in conflict with the requirements of Subsection 373.709(7), F.S."	While water management districts cannot use regional water supply plans directly in the review of water use permits, the districts can use information and data developed to support the regional water supply plans in reviewing permits.

163	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email	Executive Summary.Comment: Water policies that promote reclaimed water credits for landscape irrigation, in particular for new development, have the unintended consequences of perpetuating and promoting water and fertilizer dependent landscapes, increasing nutrient loadings in impaired watersheds, decreasing aquifer recharge, and increasing water loss due to evapotranspiration. Water policies that give credit for reclaimed water credits for industrial uses, such as cooling water for power plants, reflects a "highest and best use" credit hierarchy. Alachua County Recommends: The draft water supply plan be revised so that reclaimed water credit policy discourages credits for residential and commercial landscape irrigation for new development. The policy should clearly encourage only uses of reclaimed water uses that do not involve landscape irrigation such as agricultural, industrial or commercial uses. Regarding residential and commercial landscaping, partial credit should only be considered for retrofitting existing landscape irrigation with reclaimed water, not for new development landscape irrigation. With regards to water credits for landscape irrigation, the utility other responsible party will need to establish a framework such as deed restrictions to ensure that low/no irrigated landscaping is not replaced with high irrigation landscaping at later date or establish a trigger that requires additional water offsets to compensate for changes to water intensive landscaping.	Where allowed, the Districts rely on Section 373.250, F.S., for implementing substitution credits for reclaimed water. Furthermore this section clearly states that "... a water management district may neither specify any user to whom the reuse utility must provide reclaimed water nor restrict the use of reclaimed water provided by a reuse utility to a customer in a permit or, unless requested by the reuse utility, in a water shortage order or water shortage emergency order."
164	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email	"Identifying water supply projects to meet the water needs identified in the NFRWSP within the local government's jurisdiction". The demand projections in Appendix B are aggregated to the County level. It is difficult to estimate the specific local government's water need from the information supplied in the plan; especially for local governments without a utility.	Appendix B of the NFRWSP does contain detailed projections at the permit level for both Public Supply and Power Generation. Of note, groundwater demands for other water use categories were spatially distributed and can be aggregated to any boundary upon request.
165	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email	Relationship to SJRWMD and SRWMD Regulatory Programs. The plan should include a discussion of all the tools avilable to the Districts, including permit reductions, denials and more stringent water use restrictions as part of a water shortage declaration.	Implementation of regulatory requirements are outside the scope of a regional water supply plan. However, these programs are implemented as part of the Districts' respective permitting programs and during a District declared Water Shortage.
166	Lauren Staples	12/05/2016 via nfrwsp comment form	1a) Appendix B technical memorandum states "the PSC requires each Power Generation facility produce detailed ten-year site plans for each of its facilities." Where is this specific, enforceable type plan in the body of the plan? This plan merely suggests ideas and mentions some projects that have been submitted for helping the problem. It needs to be a strong, clear and enforceable plan with quantifiable mandates to users in the body of the plan, not the appendix. 1b) There needs to be a plan to audit the water use on a schedule between now and 2035; and to amend if the use grows at a faster rate than projected. Accountability and roles and responsibilities need to be clearly delegated and the audits should be published on an established frequency to the public. 2) Amendment 1 moneys are already being divided by the legislature and we need to remind them that those funds were intended for land acquisition and protection of our water resources. This plan should clearly stake a claim on this money! 3) This plan does not mention any current dam issues and arguments/resolutions such as the Rodman Dam. 4) The methodology used in this plan assumes the neighboring water districts will be at 2009 levels and only looks at the 2035 project increase within our boundaries. I think the plan should reach out to the neighboring water districts and get a more realistic projected use from those outside our boundary.	The ten-year site plans are a requirement of the Public Service Commission, not the water management district. The Districts use information contained in the respective plans to assist in water supply planning. The NFRWSP assessed regional groundwater withdrawals as projected through 2035 using BEBR medium projected growth rates for all water use categories, except for agriculture which utilized FDACS FSAID. The projections made for the NFRWSP were developed using the best available information at the time developed. Planning projections are updated at least once every five years to take into account improved data and methodologies.
167	Phillip Scanlan	12/05/2016 via nfrwsp comment form	Clearly we are using up our aquifer (Traditional) water supply as a result of continued growth. In addition the aquifer water supply is at risk of salinization in key growth areas like Fernandina Beach, Florida. Therefore, there should be a plan to reduce reliance on Aquifer (Traditional) water supply and move to other water supplies. One way would be to rank order Aquifer water supply uses and limit lower level uses. For example drinking water would be a high level use and perhaps Agriculture a Mid-range use and Industrial use a low level use.An alternative to limiting low level uses of the aquifer would be to use a market based technique to deter low level uses. Aquifer withdrawals are free today for a limited and valuable community resource. Put a price on aquifer withdrawals, perhaps when permits are issued. For example a permit could have a fixed fee and an annual fee per gallon of annual withdrawal permitted. This would encourage users to look for conservation methods and alternative sources of water. A price on water withdrawals would also enable building of a Capital Fund for desalinization plants that appear to be needed in the future -- due to the continued and unlimited growth in Florida. All existing users should be asked to develop a plan to reduce their current water usage by 21% by 2035, to offset the 21% growth projected. An incentive could be provided to do this by providing a discount on the aquifer water withdrawal charges for meeting this goal. Money drives everything, we need an economic driver to control usage of our limited water supply. We need a user charge for the amount of water being withdrawn to drive the right user behavior. It is either charge me now or charge me more later. If we do not control the water usage we will need desalinization plants later and high costs to build and operate those plants will be charged to users. I believe we have to admit the current approach to permitting free water usage for all growth is not a workable to sustain our limited water supply. Therefore, we need to introduce a new economic driver as an incentive to manage use of this limited resource, before it is too late to save a resource that is depleted or ruined by salinizaiton.	In developing the NFRWSP, the Districts estimated future water demand for the planning horizon, then identified water sources that could be developed to meet the demand in a sustainable manner. Available sources include the continued use of traditional fresh groundwater where such use is sustainable. However, since traditional fresh groundwater cannot supply all the anticipated demand through 2035, the plan identifies other sources that can be developed. The plan does not rank the water supply development project options since the best option for any given use will depend on a number of variables. It is up to each applicant to decide what project options work best for them. Monetary charging for water is outside the authority of the water management districts. Implementation of water conserving rate structures for public water suppliers is evaluated via the Districts regulatory programs and implemented by water suppliers.

168	Phillip Scanlan	12/13/2016 vial email	My comment on the draft Plan is that it lacks a recommended "Sustainable" Goal, Strategy and Plan for use of available water supply. The draft plan seems to simply provide options on how to meet all projected demand without a Goal, Strategy, or Plan to maintain a Sustainable water supply. The draft plan states that 94% of the current water supply demand is met from our fresh groundwater and that is expected to be the major source of our water supply in the future. However, the draft report identifies that our groundwater supply is being contaminated with chloride due to some wells withdrawing too much water and pulling salt water into the aquifer from below the aquifer. The draft report also states the current use of our fresh groundwater supply already exceeds the sustainable yield of the fresh groundwater system and the projected increase in water supply cannot be met from the fresh groundwater supply without causing unacceptable impacts on water resources. However, there is no Goal to prevent the contamination of our freshwater supply (94% of our water supply) from continued contamination with salt water. There is no Strategy or Plan to protect our groundwater supply from contamination. The current draft Plan allows for continuation of the over withdrawal that causes the saltwater contamination of our fresh groundwater system. I believe we should have a Goal, Strategy and Plan to prevent the contamination of our fresh groundwater supply. That Plan would at a minimum require reducing the withdrawals that are causing the saltwater contamination; but apparently limiting the current withdrawals that are causing this contamination is not an "option" in the draft plan. We are blessed with a very large and wonderful fresh groundwater supply that provides 94% of our water. Protection of that supply from saltwater contamination should be a major Goal of our Water Supply Plan and we should have a Strategy and Plan to achieve that goal. Continuing to contaminate our fresh groundwater supply now with saltwater and then assuming desalinization plants will be built later at great costs to replace our groundwater supply is not a rational or economical Water Supply long term Plan. Expecting the next generation to build desalinization plants at great cost so we can destroy the wonderful groundwater supply we have by allowing continued free over-withdrawals today is not a sustainable plan Everyone knows Florida will have great difficulty in meeting the water supply for Florida's continued growth strategy. Allowing continued saltwater contamination of our major groundwater supply is particularly a bad idea for the future of our water supply. My guess this is allowed to continue because St. Johns River Water Management District (and the state of Florida) has a Goal to meet all demands for fresh groundwater at the lowest possible cost "today". That is quite different from a Goal to maintain a Sustainable and reasonable cost Water Supply for the future.	Chapter 373, F.S., requires the state's water management districts in regional water supply plans to quantify sufficient projects to meet all existing and future reasonable beneficial uses in the planning horizon. The NFRWSP has identified between 203 and 216 mgd in projects to offset the projected increase in water demand of 117 mgd. The referenced results in Appendix C show how predicted drawdown in the Santa Fe River Basin is reduced as a result of WRD projects. Reduced drawdown in the basin reduces withdrawal impacts in the basin, therefore increasing the flows in the Santa Fe River.
169	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email (This comment was inadvertently left off Appendix A and was added on 1/13/2017)	Local governments are required to modify the potable water sub-elements of their comp plan by incorporating water supply projects. What if the local government is not a utility?	The requirement pertains to local governments and not utilities. Per subsection 163.3177(6)(c), 18 months after governing board approval of a water supply plan, a local government must amend their compressive plan to include alternative water supply projects. These projects can come from the NFRWSP or local governments can propose their own projects. This provision applies regardless of whether they operate their own utility or not.
170	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email (This comment was inadvertently left off Appendix A and was added on 1/13/2017)	Is freeze protection inclued in agriculture water use projections?	The FDACS FSAID II projections utilized historic water use by crop type, which in some years included water use for freeze protection. In water supply planning the Districts are required to project for average and one in 10 drought conditions. Freeze protection quantities are included as permitting scenarios in the Districts regulatory programs.
171	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email (This comment was inadvertently left off Appendix A and was added on 1/13/2017)	Agriculture acreage is expected to increase. What land use is expected to be converted to ag? Silvaculture?	The projected increase in agricultural acreage detailed in the report represents the growth in irrigated agricultural acreage through the planning horizon. The FDACS FSAID2 model converts unirrigated agricultural land to irrigated agricultural land to meet the projected growth in irrigated acreage.

172	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email (This comment was inadvertently left off Appendix A and was added on 1/13/2017)	It should be clarified that the CCI water use only includes CCI uses that are self supplied, not those supplied with public supply as the water source.	Page 7 of Appendix B of the NFRWSP defines self supply categories as follows: "Self supply categories obtain water from a dedicated, on-site well and are not connected to a central utility." The Commercial/Industrial/Institutional and Mining Dewatering (CII/MD) category is described as a self supply category both in Chapter 3 and Appendix B.
173	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email (This comment was inadvertently left off Appendix A and was added on 1/13/2017)	It should be clarified that the Landscape/Recreational/Aesthetic category does not include most residential and commercial landscape irrigation, as that is included in DSS or Public Supply. I have seen these numbers misinterpreted by readers assuming that this category includes all landscape irrigation.	Page 7 of Appendix B of the NFRWSP defines self supply categories as follows: "Self supply categories obtain water from a dedicated, on-site well and are not connected to a central utility." Chapter 3 and Appendix B define the L/R/A category as follows: "The LRA category represents water use associated with the irrigation, maintenance, and operation of golf courses, cemeteries, parks, medians, attractions and other large self-supplied green areas. Landscape use includes the outside watering of plants, shrubs, lawns, ground cover, trees and other flora in such diverse locations as the common areas of residential developments and industrial buildings, parks, recreational areas, cemeteries, public right-of-ways and medians. Recreational use includes the irrigation of recreational areas such as golf courses, soccer, baseball and football fields and playgrounds. Water-based recreation use is also included in this category, which includes public or private swimming and wading pools and other water-oriented recreation such as water slides. Aesthetic use includes fountains, waterfalls and landscape lakes and ponds where such uses are ornamental and decorative.
174	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email (This comment was inadvertently left off Appendix A and was added on 1/13/2017)	It is likely that many of the projects overestimate water savings.	Until projects are implemented, potential water benefits are estimates. Project benefits could be greater or smaller than anticipated. The potential mgd identified in Chapter 7 is reflective of the most accurate estimates available, and reflect utility and stakeholder input for these projects.
175	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email (This comment was inadvertently left off Appendix A and was added on 1/13/2017)	Tiered rates are a great tool, but to be most effective the WMDs need to prohibit new wells where public supply is available. This would avoid the alarming trend of property owners shifting outdoor use to a private well that is then not accounted for in water use estimates. At the very least, the WMDs could delegate this authority to local governments.	Regulation of private irrigation wells is addressed by the Districts' water use regulatory programs and not in the Districts' regional water supply plans. This comment has been forwarded the Districts regulatory staff and they will contact you.
176	Gus Olmos, Alachua County Environmental Protection Department	12/05/2016 via email (This comment was inadvertently left off Appendix A and was added on 1/13/2017)	Current USGS water use estimates do not include the water used for outdoor uses from private irrigation wells for properties that are also served by public supply. There is concern that total water use may be grossly underestimated and that per capita water use may be artifically decreased by omitting this use from the equation.	As noted in Appendix B under the L/R/A section, there are current data limitations and it is recognized that demand supplied from residential irrigation wells (for those residencies that are connected a public supply utility) are not included in the District's projections. We do not believe that the omission of these wells represents a gross underestimate of water use based on the scale of irrigation in the Districts, however we look forward to working with stakeholders on future planning efforts. Future planning efforts will investigate options to include demands for these wells.

*Comments received in writing have been stated as provided by the commenter. Comments received orally in the public workshops may be paraphrased.

Appendix A-2

Written Public Comments Received

From: Ann Shortelle
To: nfrwsp-comments
Cc: John Fitzgerald
Subject: FW: NFRWSP
Date: Monday, October 24, 2016 4:58:02 PM

Ann B. Shortelle, Ph.D.
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St. Johns River Water Management District
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-

www.sjrwmd.com/epermitting

From: Paul Still [mailto:stillpe@aol.com]
Sent: Monday, October 24, 2016 2:41 PM
To: ndv@srwmd.org; Ann Shortelle <ashortelle@sjrwmd.com>
Subject: NFRWSP

I am still working on a detailed review and response of/for the North Florida Regional Water Supply Plan (NFRWSP), but on the initial review I have several concerns about the current draft.

The current draft of the NFRWSP does not meet several key elements required by the Florida Statute addresses water supply planning.

1. The Statute requires a least 20 year planning period. The current plan when adopted will not cover 20 years.

2. Self-suppliers were not represented on the SAC. The lack of representation for self-suppliers was repeatedly pointed out to the Water Management Districts during the early SAC meetings.

3. The plan fails to identify sufficient projects that have a total capacity of which will, in conjunction with water conservation and other demand management measures, exceed the needs identified.

I would contend that item 3 is a fatal flaw in the plan. The methods used to calculate the water needed are flawed because they are for only one of the flows required in the Lower Santa Fe MFL. The draft document fails to provide sufficient detail to determine if the assumed amount of flow noted in Appendix G will achieve recovery of the flows at the Fort White gage.

The results shown in Appendix C (Simulated Change in the Potentiometric Surface within the North Florida-Southeast Georgia Regional Groundwater Flow Model Area) would indicate the proposed projects will have no impact on the flow at Fort White gage. The projected potentiometric surface change at Fort White is the same with or without the proposed projects. The low flow at Fort White is driven by the potentiometric surface.

An issue not related to statutory requirements is the designation of Water Resource Caution Areas (WRCA). The data for the parts of Bradford County that are in the SRWMD do not seem to support the declaration of this part Bradford County as a WRCA. The plan indicated the Upper Santa Fe MFL is being meet and will be met in 2035. Lakes and wetlands are not shown to be a constraint. No data is presented in the NFRWSP to demonstrate that water use in Bradford County will impact the Lower Santa MFL.

I contend there is a technical issue with using the Groundwater model to predict changes in the potentiometric surface changes less than 2.5 feet. The model calibration results seem to indicate that at 2.5 feet the model results are only able to match known data within 2.5 feet about 50% of the target wells. The images in Appendix C depict changes at 1 foot or less.

Paul Still
904 368-0291

From:	noreply@formstack.com
To:	Jerry Carter; nfrwsp-comments
Subject:	northfloridawater-draftreview
Date:	Wednesday, November 16, 2016 8:20:46 AM

Formstack Submission for form northfloridawater-draftreview

Submitted at 11/16/16 8:16 AM

Name:	Dennis Price
Organization:	SE Environmental Geology
Email:	den1@windstream.net
Phone number:	(386) 362-8189
Comments:	I presented committee members my thoughts, and a map, to construct drainage wells at the discharge points of most major wetland systems in the North Florida Flatwoods. These would be passive systems that recharge the aquifer during winter and early spring when flow from these wetland systems are at their highest. Recharge would also occur after major rainstorm events. Amendment 1 money should be used to purchase these wetland systems. The premise is that since the late 1800's to probably in the 1970's, most wetlands systems were ditched to some extent, and many drastically, for logging purposes and for the establishment of pine plantations. Natural recharge in these flatwood areas are minimal to begin with but with the drainage that occurred, we have even less recharge. The wetland systems proposed are located in Hamilton, Columbia, Baker, Union and Alachua counties. Costs associated with the construction of the 20 or so wells proposed would be millions less than the single proposal of pumping Suwannee River Water to Falling Creek. The location of these wells would also recharge the Floridan in a broad area where most needed to reverse the loss of water in this strategic region that supplies water to The aforementioned counties and the northern part of the SJRWMD. If you are interested in a map, please e-mail me and I will send it along. Sincerely

Indianapolis, IN 46250

From:	noreply@formstack.com
To:	Jerry Carter; nfrwsp-comments
Subject:	northfloridawater-draftreview
Date:	Tuesday, November 08, 2016 6:15:33 PM

Formstack Submission for form northfloridawater-draftreview

Submitted at 11/08/16 6:15 PM

Name:	Dr. Patrick Welsh
Organization:	Stakeholder Advisory Group, SJRWMD Environmental Interests Representative
Email:	patwelsh@me.com
Phone number:	(904) 705-5241

Comments:

This report is submitted to the Water Supply Plan as agreed upon during the SAC formation process which included the right of each SAC member (or members) to submit a minority report to represent their minority view.
Overall the SAC did not serve its purpose; that is the incorporation of stakeholder input into the Regional Water Supply Plan (WSP). Little of the important stakeholder input made it to the final WSP, and both the process and end product were not without serious flaws as listed below. The Committee moderators (FSU-based contractors) did a comprehensive and effective job at their tasking.
Specifically, the newly developed (and as of yet not scientifically peer-reviewed) North Florida Regional Water Model (the Model) is out-of-date by at least ten years of published scientific USGS Guidelines (Reilly and Harbaugh 2004) which requires a transient model for our declining drinking water source the Upper Floridan Aquifer; and the nearly one-year late Regional Water Supply Plan (WSP) is being derived from that model's results which consistently underestimate drawdown (loss of aquifer water level) given excessive withdrawal such has been shown to exist in North Florida by recent published science (Knight and Clarke 2016). During SAC briefings and discussion over the last two years, this point was made several times, including handing a presentation speaker a copy of the published guidelines (i.e. Reilly and Harbaugh 2004 Adopted as U.S. Geological Survey Scientific Investigations Report 2004-5038).
Thus the Water Supply Plan (WSP) is inadequate (if not invalid due to the Model) for its purpose-which is to guide the cities, communities and counties of North Florida in their development planning for the coming decades, but also due to several egregious flaws in its draft form. Among these flaws are the following problems:
1. Florida Statute requires at least a 20-year planning periods and further indicates a 30-year planning horizon; if adopted, the current draft will not

cover 20 years.
2. Florida Statute identifies Flood Protection to be addressed in the WSP, an important item especially for Alachua, Bradford, Clay, Columbia and Suwannee counties as a minimum.
3. Cumulatively, the WSP does not identify sufficient projects (let alone funding) which when added to conservation and RECHARGE or demand management additions have sufficient capacity to exceed the demands for those needs identified in the WSP. Specifically, the existing MFLs and Prevention and Recovery status RECHARGE projects for the Keystone Heights area lakes in Prevention and Recovery, and the new Lower Santa Fe MFL at the Ft White gauge, which are driven by declining Upper Floridan Aquifer levels in their respective areas without adequate projects or other measures required by for F.A.C. Statute and Utility Permits for Mitigation. This would appear to be a singular fatal Statutory flaw.
4. Additionally, several germane items were never presented to the SAC or addressed in the WSP. Among these are: Water Reservations in addition to MFLs for the Prevention and Recovery Lakes in the Keystone Heights area; Water Resource Caution Areas for all or parts of Alachua, Bradford, Clay, Columbia, Duval, Putnam and Union Counties and the supporting data both pro and con; Modern Water Recharge and Water Purification Wetland Basins design and examples; and finally the lack of sufficient Model accuracy to predict decadal impact near MFLs impacted areas (i.e. tenths of a foot estimates of decadal change) and less than 1 foot potentiometric error over the domain. Appendix C is germane; and Appendix C fig 2C heading is mislabeled. More real data is required rather than correlated GIS approximations, which can substitute for periods of missing data, but not replace additional data required, both effectively and in accuracy.
5. The requirements of self-supplied users were not represented at the SAC or WSP,
thus giving the impression of a utility-driven, utility-serving process and product.
6. Allocated groundwater use in North and Central Florida is nearly double current estimated uses (Knight and Clarke 2016). It is understood that Agriculture needs considerable flexibility for drought protection, but utilities need only a small margin. High groundwater pumping rates are nearly a third of average annual recharge, impacting springflow across the Region.

These items obviously need correction as soon as possible.

My Personal View

Overall, I gladly served on the SAC and appreciated the public service of the other members, especially those who served unpaid by their employers or travelled considerable distances to participate. In my opinion Florida’s Water is being wasted by bad policy, poor management and utility greed, and these need to stop; because water is a finite resource which the Florida public and Florida’s leaders have come to take for granted.
As one who grew up and did graduate study in California, the public, press, and Florida leadership need to be involved now, and change that attitude. I can tell you, that attitude and path leads to a lifetime of troubles, and was part of my personal decision to spend the last 25 years in Florida and retire here. I have spent my lifetime of work on issues involving the world’s oceans and atmosphere, and most recently the St John’s River (SJR) system (including work as a University Research Professor and lead co-

author of the original St Johns River Report).
I cherish the SJR's unique nature among our nation's resources. I now add a focus on the Upper Floridan Aquifer and springs to my highest priority list. Florida's Water has my personal commitment as a high priority, and I intend to make a difference in its allocation, use and preservation statewide. Upper Floridan Aquifer Recharge was the goal of my participation in this process, and those whom I represented (Environmental interests) on the SAC. My inability to impact the resulting Water Supply Plan in protecting that resource (or engender any RECHARGE mindset change) with these two WMDs fuels the motivation I have to write this Minority Report.

The Importance of Elevated Direct Upper Floridan Aquifer Recharge (EDUFAR)

The following section specifically addresses the unique and vastly important resource and role of the Etoniah Chain-of-Lakes in the direct and elevated Upper Floridan Aquifer recharge which has been squandered to the level of over 40 BILLION gallons of drinking water. This area is crucial for our future drinking water in North and Central Florida as well as North Florida's future development. It has problems which must be corrected by restoring stream flow out of the Trail Ridge to the Etoniah Chain-of-Lakes which provide elevated recharge directly to the Upper Florida Aquifer.

A review of the Etoniah Chain-of-Lakes in the context of Upper Floridan Aquifer Recharge

Keystone Heights was founded by Pennsylvania natives (the Keystone State) in the late 19th century. Keystone Heights is located on and between both Lake Brooklyn (officially known as Brooklyn Lake) and Lake Geneva, which also contains small Lake Keystone and Alligator Creek South within its boundaries. As you can easily imagine, the dehydration of these water bodies has had a devastating impact economically on this community, but that pales in comparison to the impact on the Aquifer and our State. The last time any of these water bodies was at its original level and fully recharging the Upper Floridan Aquifer (UFA) was 1998, when due to an El Nino winter, nearly all of North Florida's streams, rivers and water bodies were at extreme flood stages. However, in Keystone Heights, only Lake Brooklyn was full. Lake Brooklyn, for the first time in at least a decade, was starting to provide water to both Lake Keystone and Lake Geneva via Alligator Creek South, as well as reaching full recharge potential. Lake Geneva did not recover substantially during this El Nino period in spite of record floods elsewhere in the surrounding counties. The onetime spike in UFA recharge is very evident in the record of Upper Floridan Aquifer Well C-120 near Lake Brooklyn, but declines sharply and immediately as Lake Brooklyn's level declines dramatically in the next two years. Longstanding local residents know the Keystone Lakes recharge value to North and Central Florida from local history.
Local residents have a long history of going to their local and state governments asking for help to restore their water bodies, predating the Water Management District's creation. In fact, because of this history, these lakes have one of the most lengthy and carefully studied and documented scientific base datasets in the state, done 50 years ago during a period when the scientific community was blossoming with new capabilities,

instruments and cheap graduate student labor. It was then that the vast volume of Upper Floridan Aquifer recharge provided by these lakes, and therefore the importance of these unique lakes to the ecosystem and citizens of North and Central Florida was scientifically documented.
Studies were initiated in response to the disastrous drought of the mid-1950s which lasted several consecutive years. Brooklyn Lake was extensively studied by both the Florida and U.S. Geological Surveys (Clark et al. 1963), and the surrounding counties hydrology (including Lake Geneva) was concurrently studied due to the extensive drought during 1955 to 1958 timeframe (Clark et al. 1964). Lake Brooklyn receded markedly and the report ultimately concluded that the “lack of rainfall upset the hydrologic balance that normally keeps the lakes from falling” (Clark et al. 1963), Brooklyn Lake levels dropped 20 feet by 1958, but by the fall of 1957 the premier hydrologists and geologists of the state of Florida and U.S. Geological Surveys were on the scene, and taking data on the inputs, levels and outputs of Brooklyn Lake (Clark et al. 1963).
Imagine the urgency that engendered that scientific mobilization in that timeframe, and the perceived need to understand what was happening. It was like the coordinated response to major Hurricane Matthew, which just recently occurred. The Local, State and Federal authorities all recognized the urgency and threat, and responded to it rapidly. The response at that time was not for two weeks, but lasted more than three years. We could not afford to replicate these studies at current cost levels. Imagine a pair of three-year duration field studies of Hurricane Matthew’s impact on Florida. Such a study to be led by current prominent hydrogeologists and engineers, using current technologies and teams of graduate student labor; one study focused solely on the unique hydrology and geology of the St Johns River response, and the second focused on the context of the Hurricane Matthew multi-county impact, would require a huge budget and probably Congressional approval.
Yet two such studies were funded and did occur in response to the Mid-50s drought. The first focused on the specific and unique overall hydrology of Brooklyn Lake and the second focused on the overall hydrology of the Trail Ridge and the surrounding counties; including how it functions to provide high quality water to the Upper Floridan Aquifer and North and Central Florida citizens. They have left us a clear and unique vision of the importance of Brooklyn Lake and the surrounding hydrogeology and how it works to recharge the Upper Floridan Aquifer providing our drinking water in North and Central Florida, and simultaneously helps pressurize North Florida’s world-renowned springs.

Evolution of this Upper Floridan Aquifer Recharge System

In a single sentence summary, ancient rain falling on the Trail Ridge highlands and entering the clean sands of the Trail Ridge surficial aquifer, is filtered and purified by natural processes and passed to a Chain-of-Lakes and Alligator Creek which flows south. The resulting water quality was remarkable. This too, is well documented in the scientific literature, both for chemical purity and very high water clarity of water stored in the Upper Floridan Aquifer over geologic time, and the clarity of the deep Keystone Lakes of the 1960s era. But, nature was not done before the Keystone Lakes even existed; it was just starting to refine the design for the underlying Aquifer filtration system in North and Central Florida.
The ancient sea formed a bay over and around the south end of the Trail

Ridge long before the (then submerged) St Johns River basin even existed. Geologically, this old formation lacks uniformity as you can imagine from active stormy coastline along the Trail Ridge to the north and mixed debris of sand, clay, and dolomitic limestone swept by storms into the embayment on the south end and extending further to the south of the Trail Ridge. Geologic time and Trail Ridge erosion took their toll in shaping the regional uplands, and falling sea levels during glacial ice ages exposed new lower coastal plains and a longer Florida Peninsula to add to the Trail Ridge, and thus the St Johns River system evolved from an intercoastal waterway to its current inland form. Meanwhile water flowing from the Trail Ridge eroded some of the clay laden layer which acted as a water boundary above the thick dissolvable limestone layer below, now known as the Upper Floridan Aquifer. In some spots the erosion focused in small areas and formed stream channels, eventually including some exposed limestone and later, sinkholes and underground water channels developed.

The geological nature and uniqueness of the area and its signature lakes and their Elevated Direct Upper Floridan Aquifer Recharge (EDUFAR) predates human habitation by many thousands to millions of years. Both Brooklyn Lake and its partner-in-recharge, Lake Geneva, have lake beds formed by multiple contiguous sinkholes, each collapsing through the thinning edge of the mixed clay and dolomite layers deposited in the bed of the ancient arm of the sea, and dissolving their way into the thick limestone beds forming the multi layered water-bearing limestone and dolomite aquifer strata below.

Brooklyn Lake and Lake Geneva are built of a chain of connected sinkholes collapsed into the Upper Floridan Aquifer and filled by their feeding streams which were also carrying the clean sand of the Trail Ridge washed downstream and into the sinkholes, creating a final sand filter to further polish the natural water purification process.

To be fair, these USGS and Florida Geological Survey reports (Clark et al, 1963 and 1964) were written by expert field geologists who did not use detailed, expansive prose. They were experts, but told it like it was, in short declarative sentences. Their readers have to understand they wrote for their peers in science, and did not repeat non-essential background. It requires significant effort to read, study, and analyze their writing. When such analysis is completed, then one must, as a minimum, re-read it. I have read one paper five times in the last 5 years.

For example, those who cite “it is just rainfall” as the reason for these lakes decline clearly failed to read the second paragraph of the conclusion which states “The lake’s source of replenishment is rain that falls directly on the lake surface and surface inflow from Magnolia Lake.…(But goes on to say later)…The lake received almost twice as much water from the surface inflow as it did from rain…”(page 43). That inflow is known as Alligator Creek South. The Clark 1963 study was an extensive one that lasted three years until Brooklyn Lake recovered its full volume in spite of its extremely high recharge rate, referred to by the authors as “seepage” in geologic terms. Due to the confining layer above the UFA in most areas of elevated recharge, recharge of the aquifer is a slow process. It is normally just that, water seeping slowly through sediment capping layers into the aquifer layers below, powered by weak gravitational dripping. Normally in the recharge world, recharge flow is a slow drip.

Conversely, it is not a slow dripping recharge in the Keystone Lakes region. Clark and colleagues further described the water balance of Brooklyn Lake in their conclusions as:

“Water leaves the lake through evaporation, surface outflow and seepage. From October 1957 to September 1960, seepage was by far the greatest loss, accounting for 55 percent of all losses, or an average of 3 MGD. Evaporation took 35 percent and surface outflow took 10 percent of the total loss.”

In other words, during the period of intensive study, the RECOVERING Lake Brooklyn with lowered lake levels and consequent low pressure forcing water into the directly connected Upper Floridan Aquifer “seeped” an AVERAGE of over a billion gallons of recharge into the drinking water aquifer of North Florida each year for three years. Seepage was roughly twice evaporation and five times outflow. Again, the first year the lake was down over 20 feet, the second year at mid-recovery, and finally less than year at a full lake level and full recharge.
That is some very serious “seepage” indeed. Other estimates have put the recharge of Brooklyn Lake much higher when the lake is full, which is entirely consistent with an additional 10 pounds of water pressure per square inch of lake bottom. While it is a low pressure hose feeding the aquifer, it is a very huge diameter hose, and when full, is also an excellent water-quality source for our North and Central Florida drinking water. Many have referred to Lakes Brooklyn and Geneva as the “Water Towers of North Florida” as they serve much the same function as a town’s steel water tower-pressurizing the water and its attached distribution system. Lake Geneva is the larger lake, and by most estimates the much larger contributor of water to the UFA when full, but much less studied than Brooklyn Lake, and has not been near full for decades-certainly not for any extended period since the MFLs for it were created.
Certainly, the vastly degraded Lake Geneva cannot provide even adequate modern measurements or estimates of its potential recharge. These Lakes provide billions of gallons of clean water to the Upper Floridan Aquifer when full, and they need to be restored to that state and function to provide future fresh water for North and Central Florida’s future needs. Rough and conservative estimates show we have lost well over 40 BILLION gallons of drinking water during their drawdown caused by over-pumping. SJRWMD model studies show over 10 feet of drawdown on Lake Brooklyn from over-pumping with a steady-state model that USGS evaluations clearly show that the steady state Model understates the drawdown effect of over-pumping. Twenty-two years of MFLs violation on these Keystone Lakes and their decreased recharge must cease, and multiple real and effective “Recovery” and “recharge” projects should commence immediately to restore the elevated recharge feeding drinking water to North and Central Florida.

Alligator Creek South

The name Alligator Creek is the source of considerable confusion both among the public and local government in Clay and Bradford Counties. There are two distinct water bodies with the same name within about 5 miles of each other, both originating on the Trail Ridge but draining in different directions and of differing character.
The older of the two streams geologically is the Alligator Creek which drains the south end of the Trail Ridge through the Etoniah Chain–of-Lakes which includes and connects several large (billion gallon) lakes. Those lakes are

namely: Lake Lowry (or Lowry Lake) and smaller Lake Magnolia on the Camp Blanding property, and further downhill are Lake Brooklyn and Lake Geneva which straddle the town of Keystone Heights. This paper will refer to this stream as Alligator Creek South, as it drains the south end of the Trail Ridge toward the St Johns River.

The other stream drains the Trail Ridge west through a 1939 Civil Conservation Corps (CCC) reinforced ditch toward the city of Starke, and will be referred to as Alligator Creek West. Both originate quite close to one another along Camp Blanding's western boundary, probably less than a mile apart, though anthropogenic changes to the terrain (in this previously mined area) make current and past flow paths irrelevant today. That boundary is roughly shared by the Clay and Bradford County line. Alligator Creek South is fed by the Southwest Quadrant Lake in the Old Mined Area (OMA) on Camp Blanding thru control structures loosely connected to Blue Pond and the rest of the Etoniah Chain of Lakes where over half the supplied water becomes elevated direct recharge to the Upper Floridan Aquifer in Brooklyn Lake and Lake Geneva, and is capable vast Upper Floridan Aquifer Recharge.

Alligator Creek West is fed (nearby but a short distance to the North of its similar stream) by control structures and flows to the West towards Starke and ultimately feeds the Santa Fe River System well downstream of the Santa Fe Lakes, and carries the water to the Gulf of Mexico rather than storing it in recharge.

Man-made changes to the region have changed the drainage over the last century; and these changes have decreased the volume of water flowing to Alligator Creek South dramatically. Photographs of Alligator Creek South exist which show a stream flow with multi-person rafts and occupants flowing swiftly into Lake Brooklyn with enough width and depth to estimate its flow in the tens of cubic feet per second. Reputable individuals from the area report that the stream was navigable in their lifetime by canoe or small boat upstream from Lake Brooklyn to the Camp Blanding boundary fence. It is also clear from Clark et al 1963, that the refilling of the Lake Brooklyn from October 1957 to September 1960 required net flow rates at the same or similar magnitude, at least 5 MGD, disregarding the substantial losses. Clark et al. 1963 actually measured these factors and provided data; such as the measured minimum 3 MGD recharge to the UFA and 2 MGD to evaporation and roughly 1 MGD surface outflow toward Lake Geneva. It should be remembered that these figures were three year averages during recovery and outflow only occurred during part of year three, thus the real recharge was greater than 3 MGD and the outflow rate was closer to 3 MGD, after Lake Brooklyn's recovery to outflow levels.

SOLO has documentation of other changes which have further impacted Alligator Creek South. Such as the Governor of Florida in 1973 ordering the National Guard to stop flooding of State Road 100 by increasing the berm height on Lake Magnolia (and possibly Lowry Lake) at Camp Blanding. Other changes involved bridge and culvert size changes.

Getting It Done

How can we accomplish Keystone Lakes "Recovery" today? Again we can start with Clark and his collegues conclusions in the 1963 paper:

"To prevent Brooklyn Lake from falling below a desirable stage during

prolonged
periods of deficient rainfall it will be necessary to divert water into the lake from other sources."

That statement is as true today as it was 53 years ago, and not just as necessary, but even more necessary today in order to restore pressure-elevated Upper Floridan Aquifer recharge for our drinking water and provide its head pressure to help feed Florida's world famous springs. Some have referred to our proposals as either unprecedented or radical, but yet again, Clark and colleagues provide a clue in the following comment in their conclusions":

"Three possible ways to divert water into the lake are: (1) by pumping from the
Floridan Aquifer; (2) by increasing storage in the three upper lakes during periods
of excess rainfall and releasing it Brooklyn Lake when needed; and (3) by diversion form Santa Fe Lake."

That was truly radical for the time it was written!
SOLO has submitted 13 Projects, which were the only Projects submitted under the Guidelines of the 22 July 2015 SAC Memorandum titled: Regional Water Supply Plan Project Options Presentation Procedures, and met all memorandum deadlines. Current proposals include the 13 SOLO projects for the short and near-term, which "plug–into" the longer term Schreuder Inc. solution to this problem (which was funded by SOLO members) and was briefed to the SAC in early winter (2016) at the same meeting that SOLO presented its 13 Projects.
Since that time multiple extensions of the Memorandum deadlines have been granted to utilities to increase the total number of Projects to greater than 100 Projects, many of which were never briefed to the SAC or submitted through it; even though four utilities Representatives have seats on the SAC.
The formal report of the Schreuder Inc. solution is entitled:

"Approach for the Integrated Regional Water Management to Prevent Flooding in Bradford County, Increase Surface Water Flows in the Upper Santa Fe River, Restore Lake Levels and Enhance Recharge to the Upper Floridan Aquifer"

It was delivered in both draft form (contemporaneously with the SAC briefing) and in its final form directly to the St Johns River Water Management District by SOLO staff in April 2016, and briefed to Local and State representatives by Schreuder Inc. at Keystone Heights City Hall on 18 October 2016. This is a concise cost-effective overall plan for restoring the direct UFA elevated recharge through the Etoniah Chain-of-Lakes.

Schreuder (2016) points out that the "quality of the water is not a limiting constraint" as the Trail Ridge "Old Mined Area" can serve (as it does now for Alligator Creek South) to polish the natural purification process for treated water to make it suitable for lake, wetland and aquifer augmentation. The report figures 6-10 and 6-14 provide an overview of this cost-effective approach to restoring Regional Water Management, and direct elevated recharge to the Upper Floridan Aquifer while decreasing flooding potential along Alligator Creek West into Starke, and rehydrating Bradford county wetlands and augmenting the Upper Santa Fe River system.

This is not necessarily a low cost option, but a reasonable expenditure to restore high quality recharge to the drinking water supply. It is certainly a more meaningful and effective way to spend funding reserves than to spend equivalent dollars than to clean up Lake Apopka in Central Florida. There are those who say no action is required. In fact, Action is required by Florida Administrative Code 40C-2.381 Limiting Conditions (2) (a) (5-13) which includes items:

6. The permittee's consumptive use of water as authorized by this permit shall not have significant adverse hydrologic impacts to off-site land uses existing at the time of permit application. If significant adverse hydrologic 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.

9. 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.

All of the foregoing is both feasible and doable in my judgement as a retired Research Professor of Environmental Engineering, and I encourage and request that the SRWMD and the SJRWMD endorse and actively execute this effort as a very highest priority part of their approach to Regional Water Management and UFA recharge recovery. It is vital to North and Central Florida's natural system "Recovery". The Schreuder Report and SOLO "Plug-in" Projects provide the framework for UFA recovery. The first step in the process of this change would be moving forward with immediate funding requests to their Boards of Directors and expedited initial engineering studies in cooperation with all parties and landholders. I will be glad to assist.

Again, it is formally requested that this Minority Report be attached to the Final SAC Report as an Appendix.

REFERENCES:

Clark, W. E. et al 1963: Report of Investigation # 33 Clark, W. E., et.al. HYDROLOGY OF BROOKLYN LAKE NEAR KEYSTONE HEIGHTS, FLORIDA, Tallahassee, 1963, cl, 43 pages, 26 figs., 2 tables. Available at: booksgeology.com (online nationally)

Clark,W. E., Musgrove, R. H., Menke, C. G. and Cagle, J. W., Jr. 1964, Water Resources of Alachua, Bradford, Clay and Union Counties, Florida. Florida Geological Survey, report Inv. #35.

Knight, R.L. and Clarke, R.A. 2016: Florida Springs – A Water Budget Approach to Estimating Water Availability. Howard T. Odum Florida Springs

Institute, Gainesville, Fl 20 pp.

Reilly T.E. and Harbaugh A. W. 2004: Guidelines for Evaluating Ground-Water Flow Models U.S. Geological Survey Scientific Investigations Report 2004-5038 30 pp.
Available at: pubs.usgs,gov (online nationally)

Schreuder, P. 2016: Approach for the Integrated Regional Water Management to Prevent Flooding in Bradford County, Increase Surface Water Flows in the Upper Santa Fe River, Restore Lake Levels and Enhance Recharge to the Upper Floridan Aquifer Schreuder Inc, Tampa Fl . 53 pages.

This Report is submitted under the provision of the Stakeholder Advisory Committee (SAC) initial rules and procedures which guarantee each member of the SAC the right to submit a Minority Report.

Dr. Patrick T. Welsh Ph.D.
Environmental Representative, SJRWMD
Stakeholder Advisory Committee

From:	John Fitzgerald
To:	nfrwsp-comments; nfrwsp-comments@srwmd.org
Subject:	FW: North Florida Regional Water Supply Plan draft of October 4, 2016 - Comments Attached
Date:	Friday, November 18, 2016 1:15:17 PM
Attachments:	Water Plan Comments - OSFR.pdf image002.png image001.png image003.png

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Respectfully,

John Fitzgerald
Regional Water Supply Planning Coordinator
St. Johns River Water Management District
P.O. Box 1429 ● Palatka, FL 32178-1429
Office: (386) 329-4876
Email: jfitzgerald@sjrwmd.com
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From: Herd, Carlos [mailto:Carlos.Herd@srwmd.org]
Sent: Friday, November 18, 2016 1:12 PM
To: Brown, Amy <Amy.Brown@srwmd.org>; John Fitzgerald <JFitzgerald@sjrwmd.com>
Subject: FW: North Florida Regional Water Supply Plan draft of October 4, 2016 - Comments Attached

More comments.

Carlos D. Herd, P.G.
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Suwannee River Water Management District
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Let us know how we're doing: Contact Us

From: Pam Smith [mailto:pam.smith@oursantaferiver.org]
Sent: Friday, November 18, 2016 12:55 PM
To: Valenstein, Noah <Noah.Valenstein@srwmd.org>; Ann Shortelle <ashortelle@sjrwmd.com>
Cc: Herd, Carlos <Carlos.Herd@srwmd.org>; Scott Laidlaw <slaidlaw@sjrwmd.org>; OSFR Board <board@oursantaferiver.org>
Subject: North Florida Regional Water Supply Plan draft of October 4, 2016 - Comments Attached

Dear Mr. Valenstein and Ms. Shortelle,

Our Santa Fe River, Inc. (OSFR) is a nonprofit organization with a mission to protect the aquifer, springs, and rivers within the watershed of the Santa Fe River. OSFR requested Mr. Jim Gross (professional geologist and OSFR Advisor) to review the subject draft plan as it relates the mission of OSFR. Mr. Gross reviewed the draft plan and prepared a brief technical memorandum addressing specific issues concerning the draft plan. Mr. Gross concluded that the draft plan does not contain sufficient information, analyses, and recommendations to provide assurance to OSFR that the aquifer, springs, and rivers within the watershed of the Santa Fe River will be protected.

I am attaching a copy of the technical memorandum prepared by Mr. Gross. Please accept this document as comments on the draft plan on behalf of OSFR. OSFR requests that the Suwannee River Water Management District and the St. Johns River Water Management District collaborate to address the shortcomings we have identified in the draft plan before bringing the plan to your boards for approval.

Please feel free to contact me if you have any questions.

Sincerely,

Pamela I. Smith
President 2016-2017
Our Santa Fe River Inc.
Ph. 386-454-8823

"Giving Our River A Voice"

www.oursantaferiver.org

Technical Memorandum

To: Pamela Smith, Our Santa Fe River

From: Jim Gross, MS, PG, CPG

Date: November 18, 2016

Subject: Review of North Florida Regional Water Supply Plan, draft of October 4, 2016.

Purpose

The mission of Our Santa Fe River, Inc. (OSFR) is to protect the aquifer, springs, and rivers within the watershed of the Santa Fe River. OSFR requested the author of this memorandum to review the draft North Florida Regional Water Supply Plan dated October 4, 2016 (draft plan), and to identify key issues that are of interest to OSFR in fulfilling its mission.

Comments on the draft plan

<u>What's good in the draft plan</u>

1. The draft plan recommends that the entire planning region be designated as a Water Resource Caution Area.
2. Some of the water supply options identified in the draft plan are good, particularly those that reduce groundwater withdrawals. Conservation measures and use of reclaimed water are good ways to reduce groundwater withdrawals.

<u>What's not so good in the draft plan</u>

1. From a big picture perspective, the key issue is how much groundwater we are pumping out of the Floridan aquifer system. The draft plan fails to fully characterize the magnitude, regional extent, and cumulative impact of this key issue.
2. The draft plan indicates that as of 2010, water use had already exceeded the sustainable yield of the fresh groundwater system. However, the draft plan fails to determine to what extent existing sources of water are adequate to supply water for all existing and future reasonable-beneficial sources of water

and also sustain the water resources and related natural systems for the planning period.[1] The magnitude of the problem has not been adequately assessed. If the magnitude of the problem is not known, the magnitude of the solution is not known. The districts should revisit the groundwater modeling analysis for the draft plan and incrementally reduce groundwater withdrawals until they demonstrate that all established and proposed minimum flows and levels can be achieved.

3. The draft plan takes a big detour around some key water supply constraints that were already identified in earlier planning efforts by St. Johns River Water Management District (SJRWMD) in its draft 2010 and draft 2013 regional water supply plans. Minimum flows and levels (MFLs) for Lake Brooklyn and Lake Geneva near Keystone Heights were key constraints in those two planning efforts. SJRWMD began to develop recovery strategies for those lakes as early as 2011. These MFLs need to be included in assessing the sustainable limit of groundwater withdrawals for the draft plan. Including them in the analysis could well demonstrate that the sustainable yield is even lower than excluding them.
4. Some of the water resource development projects included in the draft plan are little better than smoke and mirrors and have little or no potential to alleviate water resource problems. For example:
    a. Diverting surface water to recharge groundwater so it can then discharge back to surface water. This is nothing more than a card trick. It does nothing to make more water available.
    b. Aquifer storage and recovery (or ASR) has little if any potential to address the key water supply constraint, cumulative withdrawals from the Floridan aquifer system. ASR is merely a management technique. It is typically used to store fresh surface water underground in an aquifer that does not contain fresh groundwater. Fresh surface water is stored underground when the supply is greater than the demand, and then recovered when the demand is greater than the supply. ASR is essentially a meaningless option over the western portions of the planning region. There are several reasons why ASR will not be an effective strategy for the western portions of the planning region: i) likely fresh surface water sources are already constrained by MFLs, ii) groundwater in the aquifer is already fresh water, and iii) any water injected underground would not be "stored". It would simply increase discharge of groundwater back to surface water.
5. The Lower Floridan aquifer is identified as an alternative source of water supply. This is hooey and hydrologists know it. The Lower Floridan aquifer is

[1] 373.709(1), FS

simply part of the Floridan aquifer system as is the Upper Floridan aquifer. The two aquifers act as a single water-yielding unit.[2] There is a very limited potential to strategically utilize the Lower Floridan aquifer to mitigate existing water resource problems, but that potential comes with a risk of creating new water resource problems.

6. Brackish groundwater is identified in the draft plan as a water resource development option. However, it is more appropriately designated as an alternative water supply option. Regardless of how it is classified, the salinity of groundwater has little bearing upon the key constraint for this draft plan. If we are already pumping too much groundwater from the Floridan aquifer system, it really doesn't matter whether it's fresh or brackish.
7. The draft plan identifies optimizing groundwater withdrawals as a potential option. SJRWMD looked extensively at optimizing groundwater withdrawals in previous planning efforts using optimization algorithms in conjunction with groundwater flow modeling. The results of the optimization analyses were informative and clear: a) optimization can only marginally increase sustainable yields, and b) the infrastructure and unit production costs for most of the optimization scenarios exceeded the costs for other alternatives.
8. The draft plan states that the groundwater model is good enough for planning but not good enough for regulatory evaluations.[3] That's a somewhat obtuse conclusion, but possibly irrelevant. The draft plan concludes that withdrawals already exceed sustainable limits. It's all one aquifer system. What further modeling is really needed for regulatory evaluations and decisions?
9. The section on climate change discusses uncertainties but ignores significant work looking at likely outcomes of climate change with respect to water supply sustainability. A report by Tetra Tech[4] concluded that large portions of Florida are at high or extreme risk of exceeding sustainable supplies even without climate change. With climate change, most of Florida was identified to be at high or extreme risk of exceeding sustainable water supplies.
10. The Sufficiency Analysis in Chapter 6 of the draft plan is predicated only on the MFLs for the Lower Santa Fe and Ichetucknee rivers. As noted above, key constraints in the St. Johns River Water Management that have been ignored in this draft plan also need to be considered.

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[2] Williams, L. J., and Kuniansky, E.L, 2015, Revised hydrogeologic framework of the Floridan aquifer system in Florida and parts of Georgia, Alabama, and South Carolina: U.S. Geological Survey Professional Paper 1807, 140 p., 23 pls. http://pubs.usgs.gov/pp/1807/index.html

[3] "NFSEG version 1.0 meets the requirements to be used in water supply planning in the NFSEG domain. Version 1.0 of the model will not be utilized in regulatory evaluations or in the establishment of MFLs. However, the model may be used to determine the status of MFLs."

[4] Sujoy B. Roy, Limin Chen, Evan Girvetz, Edwin P. Maurer, William B. Mills, and Thomas Grieb, 2010, Evaluating Sustainability of Projected Water Demands under Future Climate Change Scenarios; prepared by Tetra Tech Inc. for the Natural Resources Defense Council.

11. The draft plan fails to consider other potential strategies to decrease groundwater withdrawals. For example, there does not appear to be any discussion of seeking legislative authorization to levy fees for the withdrawal of water. Such fees could: a) serve as an economic incentive for further water conservation, b) help maximize reasonable-beneficial use, and c) provide an equitable revenue stream for funding alternative water supply development projects and water resource development projects.
12. There appears to be no consideration of coherent and credible regulatory strategies to balance reasonable-beneficial uses while sustaining water resources and related natural systems. In all cases, credible strategies must cap withdrawals at some defined level. Previous examples in Florida include: a) the water use caution areas in SWFWMD, b) the Central Florida Coordination Area rule that capped groundwater withdrawals at a defined withdrawal horizon, and c) the cap on withdrawals from the Biscayne aquifer in southeast Florida. While a regional water plan cannot implement such strategies, there should be some reasoned discussion of approaches that can be taken both on an interim and long-term basis.
13. Language in Appendix G, the Recovery Strategy for the Lower Santa Fe River Basin, provides an example of a strategy element that is not credible: "Applications that do not demonstrate a potential impact to the MFL water bodies shall be issued provided the applicant meets the conditions for issuance." This language seems to indicate that it is incumbent upon the applicant to demonstrate an impact, and that in the absence of such demonstration it is presumed that there is no impact. A demonstration of impact is clearly not in the interest of the applicant. Rather, it should be incumbent upon the applicant to demonstrate that the proposed withdrawal of water will not cause a potential impact.

Conclusion

The draft plan does not contain sufficient information, analyses, and recommendations to provide assurance to OSFR that the aquifer, springs, and rivers within the watershed of the Santa Fe River will be protected.

From:	noreply@formstack.com
To:	Jerry Carter; nfrwsp-comments
Subject:	northfloridawater-draftreview
Date:	Monday, November 28, 2016 8:41:05 AM

Formstack Submission for form northfloridawater-draftreview

Submitted at 11/28/16 8:40 AM

Name:	Douglas Adkins
Organization:	Dayspring Village
Email:	doug@dayspringvillage.org
Phone number:	(904) 845-2362
Comments:	The proposed local bill that will create the East Nassau Stewardship District in Nassau County includes special powers to create water control, wetland creation areas, mitigation powers and will provide power to issue about $100 million in bonds for a rapid build out of the infrastructure needed to build homes in a 24,000 sq mile area. It is expected this new government will serve 47,000 people. We are concerned with how this rapid build out will impact the water table in Nassau County and the availability of fresh drinking water considering how rapid the build out may be. We are unsure if there has been any studies of the hydrology or how the water table would be affected with the addition of this many new people. Further it is not know where the water withdrawals will come from, whether these are from a river, the acquifer or some other water source. Considering the proposal to designate all of Nassau County as a water resource caution area, we would like for you to include in your estimates or in your plan how you feel the proposed Stewardship district will impact the water supply and specifically the water table in Nassau County. I would also imagine that the number of acres of wetlands changed by 2035 would be substantially greater than the 389 acres now forecast. Finally, if the legislature approves this proposed local bill in Nassau County which would allow for a massive Stewardship district that is three times the size of Nocatee, what happens if the same land holder decides they want to use the same approach to convert timberlands into planned communities elsewhere in North Florida? How many Stewardship districts of this size could the water supply support before water quality and water supply is affected. There is a BOCC meeting tonight Nov 28th at 6pm and the legislative delegation will vote on Dec 1st. Thank you for considering my comments.

From:	noreply@formstack.com
To:	Jerry Carter; nfrwsp-comments
Subject:	northfloridawater-draftreview
Date:	Monday, November 28, 2016 9:43:38 AM

Formstack Submission for form northfloridawater-draftreview

Submitted at 11/28/16 9:43 AM

Name:	Carlos Slay
Organization:	Public Advocate
Email:	carslay@aol.com
Phone number:	(904) 716-2091
Comments:	In reviewing your proposed plan I see that it does not include the impact of the East Nassau Stewardship District that has been proposed for a 24,000 acres or 1/3 of the total land mass in Nassau County. The proposed legislation will be taken up by the delegation on December 1st and will grant this new government special powers over water control, mitigation, wetland creation, drainage, etc. The impact on the wetlands will be substantial and I would expect that the impact on the water supply would also be equally significant as this new governmental entity will seek to provide water to 47,000 people in a short period of time. I would like to see you update your water supply plan to include estimates on how this Stewardship district will impact Nassau County water supply and the wetlands in the area. I also would like to know how many similar sized stewardship districts could the area sustain because once this one is approved it is likely the land holders will seek to duplicate the success and will want to create others in the area. It would be helpful to know whether the powers that the bill proposes to grant to the land holder encroach upon the jurisdictional powers of the St Johns River Water Management District or impact the district's work and if so how that work would be affected. The biggest concern for many people in Nassau County is how the water table will be affected and how that water quality will be impacted by the district.

From:	noreply@formstack.com
To:	Jerry Carter; nfrwsp-comments
Subject:	northfloridawater-draftreview
Date:	Monday, November 28, 2016 7:25:35 PM

Formstack Submission for form northfloridawater-draftreview

Submitted at 11/28/16 7:25 PM

Name:	Mark Lyons
Organization:	
Email:	mlyons318@yahoo.com
Phone number:	(386) 647-3168
Comments:	Things like this make my blood boil! I call BULLSHIT! BULLSHIT! BULLSHIT!!!! This plan is nothing but public relations feel good crap!! Really!!! You want to start conserving and protecting our water??? Well I can help you out with that in a tremendous way that will actually conserve & protect our water!! Shut Mosaic down, shut Dupont Chemours down, shut PCS in Hamilton County down! Shut all these noxious, water sucking industries down and then and only then can you tell me when I as an American citizen can water my grass, wash my car or flush my toilet!! If you are serious why was Sabal Trail Pipeline approved??? Sabal Trail has stripped thousands of acres of our land of trees and underbrush so it can dry out to a parchment and not to mention the surficial groundwater flows they are disrupting and the recharge areas & wetlands they are destroying...... Ummmmm hmmmmmm, just what I thought, you have plans to combat water crisis?? Yeah right! We're in this mess now because of the water districts and their mismanagement and destruction of our waters through their rubber stamping permits for noxious industries which have sucked us dry and left pollution & contamination in their wake!! You agencies better WAKE UP because the citizens are starting to and we have had enough of the mismanagement and destruction of our lands & waters!! And don't bother responding to me with one of your bullshit form letters, you want to respond do so by denying an upcoming CUP permit for the HPS Phosphate Mine proposed for Bradford & Union Counties, 20 million gallons a day! Now there's a good place for you to implement your little facade of a conservation, protection plan!!

Formstack, LLC
8604 Allisonville Rd.
Suite 300
Indianapolis, IN 46250

From: noreply@formstack.com
To: Jerry Carter; nfrwsp-comments
Subject: northfloridawater-draftreview
Date: Wednesday, November 30, 2016 9:07:54 PM

Formstack Submission for form northfloridawater-draftreview

Submitted at 11/30/16 9:07 PM

Name:	Tim Peak
Organization:	
Email:	tpeak@comcast.net
Phone number:	(904) 491-5683
Comments:	In Nassau County, Florida, what impact would there be in our water quality, water table, and general health of our water supply if a "Special District", commercial, industrial, residential development in an area of 24,000 acres were to be approved? Should the residents surrounding the District expect a negative impact on our current water supply with the potential of 47,000 additional residential interests being added to our aquifer? Thank You

From:	noreply@formstack.com
To:	Jerry Carter; nfrwsp-comments
Subject:	northfloridawater-draftreview
Date:	Thursday, December 01, 2016 7:47:35 AM

Formstack Submission for form northfloridawater-draftreview

Submitted at 12/01/16 7:47 AM

Name:	Cynthia Noel
Organization:	
Email:	cnoel45@gmail.com
Phone number:	(352) 316-3687
Comments:	I do not feel this plan really addresses the serious deficit the river is in currently. Just saying MFL's are established doesn't show management or correction of the problems we face. We must have serious restrictions on commercial drawdowns, currently concerning me is the Sabal Trail Pipeline being allowed to take all they want, while we residents are told to cut back. Agricultural restrictions need to be in place also. Restrictions AND enforcement of these restrictions must be taken seriously is the word management is to be used in the description of this agency.

Indianapolis, IN 46250

From: noreply@formstack.com
To: Jerry Carter; nfrwsp-comments
Subject: northfloridawater-draftreview
Date: Friday, December 02, 2016 8:55:17 AM

Formstack Submission for form northfloridawater-draftreview

Submitted at 12/02/16 8:55 AM

Name:	Dennis Price
Organization:	SE Environmental Geology
Email:	den1@windstream.net
Phone number:	(386) 362-8189
Comments:	Regarding the potential recharge well for Lake Harris in Columbia County. Two wells have been installed since the hurricanes in 2005. They have permanently reduced the hydroperiod of the surrounding, mature, mixed hardwood wetlands surrounding the lake to the east.

From:	noreply@formstack.com
To:	Jerry Carter; nfrwsp-comments
Subject:	northfloridawater-draftreview
Date:	Friday, December 02, 2016 9:04:31 AM

Formstack Submission for form northfloridawater-draftreview

Submitted at 12/02/16 9:04 AM

Name:	Dennis Price
Organization:	SE Environmental Geology
Email:	den1@windstream.net
Phone number:	(386) 362-8189
Comments:	The Falling Creek recharge proposal of pumping water from the Suwannee River is complete Buffoonery, and I cannot think of a more professional way of saying it. Much of the year it would not be able to pump water from the river due to low river levels. At its peak it would have to pump massive amounts of water to reach the average MGD proposed. The whole construction and maintenance scenario is a nightmare. Its benefits would be to the Ichetucknee basin alone. Compare stage discharge measurements of Falling Creek and the Suwannee at White Springs or State road 6 and you would get a good idea of how often it would flow.

From:	hobara@floridaspringsinstitute.org
To:	nfrwsp-comments
Cc:	Heather Obara; Bob Knight; NDV@srwmd.org; RRL@srwmd.org; Ann Shortelle; John Miklos; Fred N. Roberts; Chuck Drake; Ronald Howse; Douglas C. Bournique; Board E-mails; Douglas Burnett; Maryam Ghyabi; Carla Yetter; bocc@alachuacounty.us; byerly@alachuacounty.us; lpinkoson@alachuacounty.us; rhutchinson@alachuacounty.us; kcornell@alachuacounty.us; cchestnut@alachuacounty.us; james.bennett@bakercountyfl.org; james.croft@bakercountyfl.org; jimmy.anderson@bakercountyfl.org; cathy.roden@bakercountyfl.org; bobby.steele@bakercountyfl.org; bocc@bradfordcountyfl.gov; Commissioners@claycountygov.com; mike.cella@claycountygov.com; wayne.bolla@claycountygov.com; diane.hutchings@claycountygov.com; buck.burney@claycountygov.com; gayward.hendry@claycountygov.com; sward@columbiacountyfla.com; penny_stanley@columbiacountyfla.com; rusty_depratter@columbiacountyfla.com; bucky_nash@columbiacountyfla.com; ephillips@columbiacountyfla.com; tmurphy@columbiacountyfla.com; JoyceMorgan@coj.net; Ferraro@coj.net; Abowman@coj.net; Swilson@coj.net; Lboyer@coj.net; MattS@coj.net; Rgaffney@coj.net; Kbrown@coj.net; GarrettD@coj.net; Rbrown@coj.net; Dbecton@coj.net; DoyleC@coj.net; Gulliford@coj.net; JimLove@coj.net; nmclaughlin@flaglercounty.org; cericksen@flaglercounty.org; dsullivan@flaglercounty.org; dobrien@flaglercounty.org; sharonlangford@gilchrist.fl.us; drayharrisonjr@gilchrist.fl.us; tgray@gilchrist.fl.us; mpoitevint@gilchrist.fl.us; kenrickthomas@gilchrist.fl.us; district1@hamiltonbocc.org; district2@hamiltonbocc.org; district3@hamiltonbocc.org; district4@hamiltonbocc.org; district5@hamiltonbocc.org; dleeper@nassaucounty.fl.com; skelley@nassaucounty.fl.com; pedwards@nassaucounty.fl.com; gspicer@nassaucounty.fl.com; jtaylor@nassaucounty.fl.com; buddyg1313@gmail.com; Bill_Pickens@yahoo.com; tommystilwell58@gmail.com; chip.Laibl@putnam-fl.com; larry.harvey@putnam-fl.com; bcc2jsmith@sjcfl.us; bcc1jjohns@sjcfl.us; Ray A Quinn; Phillip Mays, PA; Joseph "Ken" Bryan; commissioner1@suwgov.org; commissioner2@suwgov.org; commissioner3@suwgov.org; commissioner4@suwgov.org; commissioner5@suwgov.org; ucbocc@windstream.net; jon.steverson@dep.state.fl.us
Subject:	FSI North Florida Regional Water Supply Plan (October 4, 2016 Draft) Review Comments
Date:	Friday, December 02, 2016 3:16:41 PM
Attachments:	2016.12-02 FINAL NFRWSP Review Comments_FSI.PDF
Importance:	High

Good afternoon Mr. Fitzgerald,

Please find the Howard T. Odum Florida Springs Institute's comments on the North Florida Regional Water Supply Plan attached. These comments were also submitted via the online form at http://northfloridawater.com/watersupplyplan/draft.html. Thank you for your consideration.

Heather Obara, Esq.
Associate Director, Howard T. Odum Florida Springs Institute
hobara@floridaspringsinstitute.org
Office: (386) 454-2427
Fax: (386) 454-9369
Website Facebook Twitter

Please consider the environment before printing this email.

Howard T. Odum
FLORIDA SPRINGS INSTITUTE

23695 W US HWY 27
HIGH SPRINGS, FL 32643
386.454.2427
386.454.9369 (FAX)

December 2, 2016

Mr. John Fitzgerald, Coordinator
Regional Water Supply Planning
St. Johns River Water Management District
4049 Reid Street
Palatka, FL 32177

Subject: North Florida Regional Water Supply Plan (October 4, 2016 Draft) Review Comments

Dear Mr. Fitzgerald:

The Howard T. Odum Florida Springs Institute (FSI) respectfully submits the following comments concerning the North Florida Regional Water Supply Plan (WSP) for your consideration. We request a detailed response to all issues raised in this letter and modification of the final WSP as needed to incorporate all identified corrections and omissions.

The fundamental responsibility of the WMDs proposing this plan is to effectively manage water resources in such a way that provides beneficial human uses within the allowable constraints of natural aquatic systems. Water resource management is based on understanding and quantifying the resource. This proposed WSP does not fully characterize or quantify the potential water sources subject to human extraction and management.

Specifically, we request that you provide best available data/estimates for the following components of the water balance for the WSP planning area (14 counties and roughly 8,000 mi^2 in the Suwannee and St. Johns River WMDs) with, at a minimum, annual means and extremes and 20-year probability distributions for each:

- Precipitation
- Evapotranspiration
- Recharge to the Surficial Aquifer System (SAS) and to the Floridan Aquifer System (FAS)
- Surface water levels, including lakes, wetlands, streams, rivers, and springs

- Groundwater levels in both the SAS and the FAS
- Surface water flows for streams, rivers, and springs
- Surface and groundwater withdrawals and return flows

This requested water resource inventory should also include a detailed accounting of all permitted and unpermitted human water uses by category.

Based on the above water resource data, it is critical that the WSP provide the most accurate estimate of the maximum mean and extreme human water withdrawals that will fully protect all natural systems from significant harm; both systems like lakes, springs, and rivers that have existing MFLs, and other aquatic systems such as regional wetlands that are not currently and won't soon be protected by site-specific MFLs. This assessment of water availability represents the actual sustainable yield for the planning area, and is the essential foundation for developing an effective and protective WSP.

Future water uses must be constrained within this quantifiable sustainable yield. Since FAS groundwater is the principal traditional water source in the planning area and since existing uses are already resulting in unacceptable degradation of natural systems[1] and the resource itself[2], it is necessary that this plan show a corresponding reduction in groundwater pumping from the SAS and the FAS.

The most direct and cost effective approach to reducing groundwater pumping while meeting reasonable beneficial future needs is cutting back on existing permitted uses. The WMD governing boards have full authority to reduce permitted pumping allocations when a water resource shortage order is declared[3].

[1] This plan documents existing and future recovery needs for the springs along the Santa Fe and Ichetucknee Rivers; for the springs and rivers with significant, observable flow reductions not currently protected by MFLs; for the lakes in Keystone Heights; and for the thousands of acres of dehydrated wetlands with existing and expected impacts throughout the planning area.

[2] This plan presents convincing evidence of saline water intrusion and rising chloride concentrations in existing water supply wells over a large portion of the planning area (31% of the tested wells had rising concentrations of total dissolved solids). Additional data illustrating a similar detrimental trend in groundwater and spring chloride levels throughout the springs' region of north and central Florida have been convincingly summarized by the FDEP (2010) Florida Springs Initiative Monitoring Network Report and Recognized Sources of Nitrate. *Prepared by Debra Harrington, Gary Maddox, P.G., and Richard Hicks, P.G.* Florida Department of Environmental Protection Division of Environmental Assessment and Restoration Bureau of Watershed Restoration Ground Water Protection Section.

[3] Existing rules and Florida Statutes § 373.175 allow the Districts' Governing Boards to declare a water shortage for the affected source class, if the District determines there is a possibility that "insufficient ground or surface water is available to meet the needs of the users or when conditions are such as to require temporary reduction in total use within the area to protect water resources from serious harm." As necessitated by local climatic patterns and hydrologic conditions, the District may utilize Water Shortage Orders to implement water conservation and management practices to prevent or reduce impacts to the Lower Santa Fe and Ichetucknee Rivers and priority springs during periods of drought. The Districts, as a part of the joint regional water supply planning effort, may develop hydrologic thresholds for declaration of water shortage orders.

A reasonable approach to phase such a reduction into place is to establish water use metering on all uses, with tiered fees based on amount used. Neither of these practical options for meeting water supply needs while maintaining a sustainable water supply for future generations has any associated costs that cannot be paid by the users themselves.

The FSI has previously provided technical review comments on the Santa Fe and Ichetucknee River MFLs that documented the fact that the WMDs and the Florida Department of Environmental Protection (DEP) underestimated historic baseline flows, resulting in MFLs and a recovery plan that are not sufficient to protect those Outstanding Florida Waters and their ecological health from significant harm. With these comments, we request that when those MFLs are re-evaluated that your staff be directed to assess harm based on stream flows recorded before the 1950s when groundwater extractions were much less than current levels.

Finally, FSI was repeatedly denied the requested opportunity to present relevant FAS and spring water balance data to the North Florida Regional Stakeholder Advisory Committee (SAC). Attendance at SAC meetings with a few minutes for providing oral comments was not sufficient for FSI scientists and other stakeholders to present and discuss issues of critical importance to the SAC. For these reasons the FSI respectfully requests that the WMDs and FDEP convene one or more opportunities for unlimited public comment and question/answers with agency staff concerning the defects of the proposed WSP before it is finalized.

Sincerely,

Robert L. Knight, Ph.D., Executive Director
Howard T. Odum Florida Springs Institute
(352) 538-6620
bknight@floridaspringsinstitute.org

CC: Governor Rick Scott
Jon Steverson, Secretary, FDEP

Water Management Districts

Noah Valenstein, Executive Director, SRWMD
Donald Quincy, Jr., Governing Board Chairman, SRWMD
Alphonas Alexander, Governing Board Vice Chairman, SRWMD
Virginia Johns, Governing Board Secretary/Treasurer, SRWMD
Kevin Brown, Governing Board Member, SRWMD
Gary Jones, Governing Board Member, SRWMD
Virginia Sanchez, Governing Board Member, SRWMD
Richard Schwab, Governing Board Member, SRWMD

Bradley Williams, Governing Board Member, SRWMD
Charles Keith, Governing Board Member, SRWMD
Dr. Ann Shortell, Executive Director, SJRWMD
John Miklos, Governing Board Chairman, SJRWMD
Fred Roberts Jr., Governing Board Vice Chairman, SJRWMD
Charles "Chuck" Drake, Governing Secretary, SJRWMD
Ron Howse, Governing Board Treasurer, SJRWMD
Douglas Bournique, Governing Board Member, SJRWMD
John Browning Jr., Governing Board Member, SJRWMD
Douglas Burnett, Governing Board Member, SJRWMD
Maryam Ghyabi, Governing Board Member, SJRWMD
Carla Yetter, Governing Board Member, SJRWMD

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Nassau County BOCC
Putnam County BOCC
St. Johns County BOCC
Suwannee County BOCC
Union County BOCC

From:	hobara@floridaspringsinstitute.org
To:	nfrwsp-comments
Cc:	Heather Obara; Dan Hilliard
Subject:	North Florida Regional Water Supply Plan (NFRWSP) Review Comments by FSC
Date:	Friday, December 02, 2016 7:03:28 PM
Attachments:	2016.12-02 FINAL NFRWSP Review Comments_FSC.pdf
Importance:	High

Good evening,

Please find the Florida Springs Council's comments on the North Florida Regional Water Supply Plan attached. These comments were also submitted via the online form at http://northfloridawater.com/watersupplyplan/draft.html. Thank you for your consideration.

Heather Obara, Esq.
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North Florida Regional Water Supply Plan (NFRWSP) Review Comments

Reviewed by the Florida Springs Council (FSC)

The Florida Springs Council is a consortium of thirty-nine springs-focused organizations that represent over 155,000 Floridians. The mission of the FSC is to ensure the regional, state, and federal conservation, preservation, protection, and restoration for future generations of Florida's springs, spring runs, and groundwater in the Floridan aquifer that sustains those natural systems and provides our drinking water.

The following organizations are members of the Council:

1,000 Friends of Florida
Alachua Audubon Society
Audubon Florida
Center for Biological Diversity
Center for Earth Jurisprudence
Chassahowitzka Civic Association, Inc.
Florida Clean Water Network
Florida Defenders of the Environment
Florida Federation of Garden Clubs, Inc.
Florida Paddling Trails Association
Florida Wildlife Federation
Friends of Lake Apopka
Friends of the Wekiva River
Friends of Warm Mineral Springs
Hernando Environmental Land Protectors
Homosassa River Alliance

Howard T. Odum Florida Springs Institute
Ichetucknee Alliance
Kings Bay Springs Alliance
Nature Coast Unitarian Universalist Fellowship Water Task Force
Oklawaha Valley Audubon Society
Orange Audubon Society
Our Santa Fe River
Paddle Florida
Putnam County Environmental Council
Rainbow River Conservation
Santa Fe Lake Dwellers Association
Save the Manatee Club
Sea to Shore Alliance
Sierra Club Florida
Silver Springs Alliance
Springs Eternal Project
St. Johns Riverkeeper
Suwannee/St. Johns Sierra Club
Villages Environmental Discussion
Volusia Blue Spring Alliance
Wakulla Springs Alliance
Withlacoochee Aquatic Restoration
WWALS Watershed Coalition

The following comments are submitted by the Council on behalf of its member organizations.

Executive Summary

The Plan is a regional water supply plan that must comply with Section 373.709(2), Florida Statutes. The Plan also will adopt the second phase of the recovery strategy for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs (LSFI) MFLs and must therefore comply with Section 373.0421(2), Florida Statutes. Several of the priority springs protected by the LSFI MFLs are first magnitude springs (e.g., Santa Fe Rise, Treehouse Spring, Columbia Spring, Devil's Ear Spring, July Spring, Ichetucknee Head Spring, and Blue Hole). Therefore, the Plan and Recovery Strategy must meet the requirements of Section 373.805(4), Florida Statutes as well.

The Plan and Recovery Strategy fail to meet the requirements of Sections 373.709(2) and 373.0421(2) because the Plan fails to provide reasonable assurances that sufficient projects will be implemented to meet projected demand while providing the needed recovery of the LSFI MFLs. The Plan also fails to include important information Section 373.805(4) requires regarding priorities and funding for the recovery projects. The Plan and Recovery Strategy do not provide reasonable assurances that the LSFI MFLs will be recovered as required.

The Plan provides insufficient motivations and incentives for conservation. This Plan was to include long-term regulatory strategies, but only proposes designation as a Water Resource Caution Area. This designation requires reuse of domestic wastewater in certain circumstances when it is determined to be feasible, but does not fund or require reuse of domestic effluent. The designation does not address recovery strategies other than reuse of domestic wastewater. At a minimum, FSC urges Florida's legislature and water management agencies to implement universal water fees as a strong inducement to conserve water.

The pumping of brackish water is unsustainable and self-destructive. It should be avoided. Rather, FSC advises that new demands be met through aquifer recharge using treated wastewater that has been cleansed by recycling through constructed wetlands.

The Plan's Critical Sufficiency Analysis Relies on a Non-Scientific Assumption and Suffers Fatal Textual Errors

The Plan includes a "Sufficiency Analysis" addressing whether the Plan and LSFI Recovery Strategy could meet the regional water supply planning requirements of Section 373.709(2), Florida Statutes by including sufficient water resource development projects (WRDPs) and water supply development projects (WSDPs) to meet projected demands without causing unacceptable water resource impacts. Plan pp. 40-41. In this case, such project options must, along with conservation, provide recovery of LSFI MFL flows as well. §373.0421(2), Fla. Stat.

The Plan assumes each 4.48 mgd of implemented water resource development projects (WRDPs) and water supply development projects (WSDPs) will result in 1 cfs recovery for the LSFI MFLs. (p. 40) This assumption is used to convert listed WRDP and WSDP options (with impacts measured in million gallons per day) to projected LSFI MFL flow recovery (in cfs). Thus, this conversion factor is critical to an understanding of whether the Plan includes adequate project options to meet projected 2035 demand for water and to bring about recovery of the LSFI MFLs.

The Plan provides no discussion, explanation or analysis of the selection of the one-size-fits-all 4.48 mgd assumption regarding WRDP and WSDP benefit to flows and recovery of the LSFI MFLs. The impact of WRDPs and WSDPs is largely a function of the net change in groundwater pumping at a particular location attributable to the project, and the distance between the location where the net change would occur and the location of the MFL point of compliance. In general, the beneficial impact is directly proportional to the reduction in pumping, and inversely proportional to the square of the distance from the pumping location to the MFL point of compliance. So, in general, the further the project is from the gages used to monitor the LSFI MFLs, the less impact will be measured at the gages. A generic one-size-fits-all proportionality for calculating recovery attributable to projects is unscientific and not appropriate, even for planning-level analysis.

Indeed, using the NFSEG Model, the text at p.41 explains that 60.19 mgd of projects provided only 8.4 cfs of recovery. This is 7.165 mgd per cfs of recovery. It is possible the reference to 60.19 mgd is a typographical error that should read 65.19 mgd, the amount of the WRDPs shown in Table 6, Chapter 7. (p. 49) If 65.19 mgd was modeled and resulted in 8.4 cfs of recovery, then the ratio is 7.76 mgd of projects to 1 cfs of recovery. Either modeled ratio is widely divergent from the 4.48 mgd assumption.

The Plan provides no analysis relevant to the huge discrepancy between assumed and modeled flow recovery. Using the 4.48 mgd assumption, there could be about 11 mgd surplus in the Plan after covering the 2035 demand, after conservation, and after the LSFI MFL flow recovery. If 7.76 mgd or 7.165 mgd is used instead of 4.48 mgd as the conversion factor, the Plan does not meet the requirements of Sections 373.709(2) and 373.0421(2), Florida Statutes. The Plan is much less than clear on this issue and errors in the text of page 41 regarding quantities and the two project option tables defy clarity. This discrepancy and textual errors must be explained and the sufficiency analysis of project benefit to LSFI MFL flows must be addressed properly.

The Plan should analyze and report on NFSEG modeling scenarios in which the WRDP and WSDP options are evaluated for their effect on flows at the LSFI MFL gages. Ultimately all projects in the Plan should be modeled to determine whether the Plan, including all projects, meets the sufficiency requirements of Sections 373.709(2) and 373.0421(2), Florida Statutes. Without more than a naked and unexplained assumption of 4.48 mgd per 1 cfs recovery, the Plan does not provide reasonable assurances of meeting these requirements.

Additional Plan Deficiencies

The projects necessary to recover groundwater flows, by law, should be included in the Water Resource Development Project list. §373.709(2), Fla. Stat. In this Plan, the WRDP list is not sufficient to recover even the 2010 deficit condition of 17 cfs below the LSFI MFLs. The Plan should explain why the Plan must also rely upon projects on the WSDP list to restore the recovery deficit.

The Plan lacks the priority listing of each WRDP and WSDP required by Section 373.805(4)(b), Florida Statutes. The Plan also lacks required information for each project regarding the estimated cost of and the estimated date of completion; and “the source and amount of financial assistance to be made available by the water management district for each listed project, which may not be less than 25 percent of the total project cost unless a specific funding source or sources are identified which will provide more than 75 percent of the total project cost.” §373.805(4)(c) and (d), Fla. Stat.

The Plan also lacks "An estimate of each listed project's benefit to an Outstanding Florida Spring;" and "An implementation plan designed with a target to achieve the adopted minimum flow or minimum water level no more than 20 years after the adoption of a recovery or prevention strategy." *See* §373.805(4)(e) and (f), Fla. Stat.

The Plan lacks "an assessment of how the regional water supply plan and the projects identified in the funding plans prepared pursuant to sub-subparagraphs [§373.709(2)] (a)3.c. and (b)2.c. support the recovery or prevention strategies for implementation of adopted minimum flows and minimum water levels. . . ." §373.709(2)(k), Fla. Stat. The Plan must specify which WSDPs support recovery of flows at LSFI MFL gages, and how they support flow recovery.

The Plan lacks an adequate funding strategy. The Plan includes only a catalog of potential funding options, not a "funding strategy for water resource development projects, which shall be reasonable and sufficient to pay the cost of constructing or implementing all of the listed projects." §373.709(2)(d), Fla. Stat. Finally, the Plan lacks any analysis of whether the funding strategy is reasonable and sufficient for all projects. *Id.*

Failure to Adopt Further Regulatory Recovery Strategies

The LSFI Recovery Strategy, Appendix G, at p.36 explains:

Phase II Regulatory Strategies

The development of long-term strategies to address the impacts of regional groundwater trends and water use patterns is critical to achieving the recovery of minimum flows in the Lower Santa Fe Basin. As such, <u>the Department, SRWMD, and SJRWMD, will develop long-term recovery measures concurrently with the development of the North Florida Regional Water Supply Plan</u>. This will assist the Districts and the Department in refining the Recovery Strategies and future regulatory measures to address regional groundwater impacts to the Lower Santa Fe and Ichetucknee Rivers. (underline added)

The LSFI Recovery Strategy at Page 20 adds that this:

Phase II of the Recovery Strategy will focus on the implementation of the recommendations in the North Florida Regional Water Supply Plan, <u>the adoption of long-term regulatory measures</u>, and the identification and execution of any necessary water resource development and alternative water supply projects. (underline added)

This Plan was to include long-term regulatory strategies, but only proposes designation of the Plan area as a Water Resource Caution Area. This designation requires reuse of domestic wastewater in certain circumstances when it is determined to be feasible, but does not fund or require reuse of domestic effluent. The designation does not address recovery strategies other than reuse of domestic wastewater.

No other regulatory recovery strategies are included in the Plan. Without further regulatory changes, there are few real legal compunctions on the implementing parties to implement the projects, and the Districts have limited leverage to bring about conservation. The Plan should analyze and explain why the implementation of further regulatory recovery strategies has been abandoned.

For the foregoing reasons, the Plan does not demonstrate or provide reasonable assurances that the Lower Santa Fe and Ichetucknee River MFLs will be met within the planning horizon, nor whether recovery pursuant to the Plan will be "as soon as practicable." §373.0421(2), Fla. Stat.

FSC would also note that the Plan fails to address the reality that the amount of water permitted in the planning area currently far exceeds the amount that is actually used. The difference between permit allocations and pumping cannot be accurately determined directly because metering of water use is spotty in the planning area. However, it has been reported that in the SRWMD, the amount of water permitted may exceed the amount pumped by as much as a factor of 2. This excess availability of permitted water is an enormously important factor in 20-year water planning, and the Districts are remiss in ignoring it. What would be the value of this planning exercise if permittees decided, over the next 20 years, to pump all of their permitted quantities, or even three-quarters of their allocation? The Districts should have an aggressive program in place to meter water use and to take back unused allocations over time. Otherwise, surprises in water usage could pop up, rendering this planning exercise useless.

Greater Incentives for Conservation Are Needed

On balance, the Plan is to be commended for acknowledging the potential benefit of conservation, which has always been the first priority of FSC. Beginning on page 51, the Plan outlines eight "Water Conservation Project Options", and the first option to be noted is the successful implementation of tiered billing rates by some regional utilities. Tiered rates are a proven incentive to conserve, in contrast to the failure of consumptive use permits (CUPs) to remedy excessive pumping. Implementing universal water use monitoring and fees deserves far more emphasis than that given to them in the Plan. Conservation, as it now stands is almost entirely voluntary. Even CUPs are de-facto voluntary, because so many permitted wells are unmetered. This is an area in which further regulatory strategies are needed and sorely lacking in this Plan.

Because tiered water fees have proven to elicit greater conservation in the North Florida region, FSC strongly urges that they be extended to all users – domestic self-supply, agriculture and commercial/industrial/mining, as well as urban users. Such expansion will, of course, require significant changes in infrastructure, administration and legal status. Setting an effective schedule of fees will require first that a cap be estimated and placed on total withdrawals in each District. Afterwards the infrastructure to monitor all users must be implemented. Significant advances in the technologies of flow measurement, data reporting and recording render this task less expensive than it would have been in the past. A preliminary schedule of fees (which could be distinct for each class of users) must be established that will progressively tax users according to increasing use. FSC would recommend that the impacts of tiered water pricing should be carefully studied before such pricing is established, so that unintended consequences for smaller users, including small agricultural operations, can be avoided. This rate structure can subsequently be amended to optimize the distribution of water among users while not exceeding the regional cap.

Many may object to the imposition of fees as a new form of taxation. It should be pointed out, however, that ad-valorem taxes are already being collected to support the Districts. The task of setting fees, monitoring usage and collecting charges could be assigned to the Districts, which could be partly or wholly supported by the collected fees, while any excess could go to funding water conservation and aquifer/spring restoration projects.

FSC wishes to stress that water fees enjoy a proven record of success, whereas CUPs, BMPs and even minimum flows and levels (MFLs) have failed to halt the progressive degradation of Florida's water resources. While the costs and effort necessary to institute universal water fees are not insignificant, neither do they proportionately exceed efforts elsewhere in the United States to create reliable future supplies of water; and Florida, more than most of these other areas, is critically dependent on secure supplies of water.

The Plan Should Discourage Pumping Brackish Water

FSC objects to the prominence the Plan gives to the desalination of brackish water. For example, this source is listed first among the suggested Water Resource Development Project Options (p. 47). Pumping and reverse osmosis treatment of brackish groundwater should be avoided at all possible costs, for at least two reasons. First, saline intrusion is irreversible over any practical time frame. Once a well goes saline, the slow diffusion time among the less channelized regions of the karst substrate insures that it will be decades, if not centuries, before a saline well runs fresh again. Secondly, pumping a brackish well accelerates the rate of saline intrusion. That is, the well becomes progressively more saline and the water costlier to treat.

The Plan portrays saline intrusion as a problem confined to the coastal and riverine portions of the North Florida region. This perspective is short-sighted, because saltwater underlies the entire Floridan aquifer, and excessive pumping will cause salt everywhere to migrate to higher levels in the karst substrate. Furthermore, a given drop in the potentiometric surface of the aquifer has the effect of raising the underlying salt water interface by a factor as much as 40 times greater than that drop. In particular, withdrawals from the Lower Floridan Aquifer must be reduced, because pumping from that depth will cause a disproportionate vertical rise in the proximate saline interface.

Regarding the rate of saline intrusion, FSC finds the analysis of this problem (beginning on page 27) to be overly optimistic. The Plan assumes that salt concentrations will rise in linear fashion, but vertical saline profiles are usually sigmoidal in nature. That is, increase is slow and almost linear, but a “log-phase” ascent soon ensues as the saline “front” approaches. Hence, a linear analysis will significantly overestimate the time required for saline intrusion. The arrival of the front can at times be episodic, as happened during the drought of 2012 with the sudden intrusion into the well supplying Cedar Key.

These reservations against pumping brackish water do not necessarily pertain to the desalination of seawater, so long as the concentrate from the process is returned to the sea. But this remedy is extremely costly, both energetically and financially -- treatment of brackish water is some 10-fold more expensive than extraction from the Upper Floridan Aquifer. Although desalination of seawater might provide a few localities with water for drinking and bathing, it is economically infeasible to sustain agriculture or industry. If the entire Floridan Aquifer System were to turn brackish, Florida could evolve toward a dry-island Caribbean economy.

The Plan Should Emphasize Sustainable Recharge

The Plan emphasizes reclaimed water as a primary AWS. While it does mention aquifer recharge, it fails to accord that option the priority it deserves and thereby overlooks a potentially significant and highly economical AWS. Figure 14 (p. 21), for example, shows approximately 108 mgd of treated wastewater in the region that is simply “disposed”. Most of that water could be returned to the aquifer at low cost through treatment by constructed wetlands, as has been amply demonstrated at several sites in Florida (e.g., Sweetwater and Kanapaha in Gainesville and Green Cay in Boynton Beach). Treated wastewater is supplied at one end of an artificial wetland and allowed to percolate horizontally across the wetland. The water at the other end is low in nutrients and xenobiotics and can be re-injected into the aquifer. FSC has had discussions with JEA urging the utility to implement such treatment on the large amount of their treated wastewater that now flows into the ocean. Similar recharge is appropriate for other locations in the North Florida region and taken together could resupply a substantial fraction of the 117 mgd projected demand. FSC strongly recommends the adoption of this method of recharge throughout the North Florida region.

Conclusions

FSC submits that the Plan is not sufficient to meet the requirements of Sections 373.709(2) and 373.0421(2), Florida Statutes. Most critically, the Plan depends upon an unscientific and highly questionable assumption regarding the recovery to be derived from the projects listed in the Plan. The basis of the assumption and its selection instead of a modeling analysis is not substantiated. Because of the stated discrepancy between modeled and assumed recovery benefits of listed projects, the Plan does not provide reasonable assurances that sufficient projects are listed in the Plan.

The Plan fails to include critical information required for recovery strategies for Outstanding Florida Springs, including details regarding priorities and commitments regarding funding. Further, without any coercive and/or regulatory strategies, the Plan and particularly the funding plan do not meet statutory requirements.

FSC does commend the NFRWSP for highlighting the severe problems facing water supply in the North Florida region and appreciates the re-focusing of attention away from increased pumping of the over-stressed Upper Floridan toward other alternative water supplies. This is an acknowledgement from the State that the Upper Floridan Aquifer is already over-pumped. In fact, we would like to see the NFRWSP go beyond its call to limit pumping to an active program to decrease current pumping rates.

FSC supports the Plan's call for further water conservation, although we would recommend use of different mechanisms, especially the implementation of tiered water fees. This method deserves far more emphasis than it has been given in the Plan. It has proven to be effective in the public-supply sector (JEA, GRU) and holds great promise for becoming the major tool for conserving water throughout the State. The Plan should include a regulatory strategy to move conservation from a voluntary aspiration to a regulatory compunction.

FSC recommends against any pumping of brackish water, as this option only accelerates the decline of Florida's vital water resources. FSC also advocates, as the primary method for meeting the region's increasing water resource demands over the next 20 years, the polishing and subsequent recharge of cleansed wastewater to the Upper Floridan Aquifer by constructed wetlands.

Audubon FLORIDA

Dec. 2, 2016

John Fitzgerald
Regional Water Supply Planning Coordinator
St. Johns River Water Management District
4049 Reid Street
Palatka, FL 32177

Carlos D. Herd, PG
Director, Division of Water Supply
Suwanee River Water Management District
9225 CR 49
Live Oak, FL 32060

RE: Comments in response to the *Draft North Florida Regional Water Supply Plan*

Dear Mr. Fitzgerald and Mr. Herd:

Audubon Florida appreciates the opportunity to comment on the *Draft North Florida Regional Water Supply Plan* (NFRWSP) dated October 4, 2016. The cooperation between water management districts to form the North Florida Regional Water Supply Partnership is an important step that allows us to focus on the resource rather than political boundaries. Groundwater in such a highly transmissive area is best managed using this regional approach.

One of the most important aspects of water supply planning in the region is ensuring the health of our natural systems. Florida's environment not only supports our daily lives as Floridians, but is a necessary component of our recreational and tourism-based economy. Audubon Florida supports water supply plans that are sustainable, i.e., those that provide for our needs while maintaining or restoring ecosystem function. With this in mind, please review our comments on the draft plan below.

1. **The plan does a good job of describing the growing water crisis we face throughout Florida.**

The plan projects an additional 117 million gallons per day (mgd) of water will be needed in the region by 2035. It also mentions the Lower Santa Fe and Ichetucknee Rivers and associated priority springs are already in recovery according to their minimum flows and levels (MFLs). Projections for 2035 show many other potential problems, including:

- increasing chlorides at 92 wells, 24 that may require remediation or reduced pumping due to high Total Dissolved Solids (TDS),
- over 20,000 acres of wetlands at moderate to high likelihood of harm, and
- 4 springs that face declines in flow greater than 10%.

This information serves as a necessary backdrop for the considerable amount of work that needs to be accomplished within the region.

2. **The information in the plan supports the need for increased conservation and the appropriate treatment, storage, and use of reclaimed water and stormwater. Any additional withdrawal of groundwater or natural surface waters should be avoided.**

Given that the current level of use is causing harm to natural systems, and future increases in pumping will cause additional problems, the plan clearly demonstrates the need to prioritize conservation. Additionally, water management districts should work with partners to promote alternative water supply (AWS) projects that use reclaimed water or stormwater accompanied with appropriate treatment and storage features. Water resource development projects that use brackish or salt water treatment should be avoided because they are energy intensive and may impact ground and surface waters levels.

3. The plan is a good starting point for future work to better identify potential resource impacts.

An impressive amount of information was used to develop the plan. Like many similar efforts, the process identified several areas where additional data are necessary for a more complete picture. In particular, additional work needs to be done to understand the impacts on the many MFLs that were not evaluated due to insufficient data. Further improvements of the North Florida-Southeast Georgia (NFSEG) regional groundwater model, including transition to a transient model, will help improve impact analysis on both local and regional scales. It should be noted that data were not always available for the regions of Georgia included in the NFSEG model.

4. We agree with determination that the entire NFRWSP area should be designated a Water Resource Caution Area.

5. Further work is needed to find the optimal suite of measures and projects to meet the water needs of the region, especially given the limited details accompanying the list of projects in the plan. It should be emphasized the projects in the plan are possible considerations for meeting future needs.

The large number of reclaimed water projects for future water supply is favorable compared to projects that further deplete aquifers or remove natural surface waters. However, water quality and storage concerns must be addressed to make these projects successful. Storage can reduce the “mandatory use” of reclaimed water at times when water use is not required, e.g., the imposed need to irrigate when rainfall is sufficient. Such water use reduces nutrient assimilation by the landscape and delivers high nutrient loads to stormwater and natural systems.

6. The plan should examine the water savings possible from reductions in residential outdoor irrigation.

Water supply plans in general should do a more thorough job of describing water use to allow a wider audience to consider solutions, even if those solutions may not be part of the plan. For example, it would be helpful to the public and decision makers to understand the amount of current and future water demand that comes from outdoor irrigation. Public water supply represents 50% of the total increase in water demand by 2035 (p. 12), and using the estimate of 50% public water supply use for outdoor irrigation, this results in 25% of the predicted increase – or 29.25 mgd – being attributable to residential irrigation. When presented with this information, the public and regulators may be more willing to make changes to landscaping and irrigation practices rather than continue to fund expensive water development and supply projects.

7. Continued focus on working with the agricultural community to adopt Best Management Practices is critical.

While projected increases in water consumption for the eastern part of the region are residential, projections indicate that agricultural water use will grow substantially in the SRWMD. Implementation of BMPs (that include water conservation) is still voluntary in most cases.

Thank you for considering our comments. The extensive work put into this plan is a necessary step as government and stakeholders work together to achieve a sustainable water supply in North Florida. Please contact us if you have any questions.

Sincerely,

Jacqui Sulek
Chapter Conservation Manager
Stakeholder Advisory Committee SRWMD Environmental Representative
(850) 251 1297
jsulek@audubon.org

Chris Farrell
Northeast Florida Policy Associate
904-325-9940
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From:	Lucinda Merritt
To:	nfrwsp-comments
Cc:	Merrillee Malwitz-Jipson; Jill Lingard; John D. Jopling; Kristi Gregory; Eric Flagg; Bob Palmer; Jim Stevenson; Bob Ulanowicz; Heather Obara; Scott Jantz; Jasmine Hagan; Cathy Street; Bob Knight; Charles Maxwell
Subject:	ICHETUCKNEE ALLIANCE/comments on draft NFRWSP
Date:	Saturday, December 03, 2016 10:11:48 AM
Attachments:	IA_Ltr_2016.12-02 FINAL NFRWSP Review Comments_FSC.pdf

NOTE: These same comments (here attached as a pdf file), minus the Alliance's letterhead, were also submitted today (12/3/2016) via the online comment form.

Lu Merritt for the
Ichetucknee Alliance

Lucinda Faulkner Merritt
wordwitch@windstream.net
386-454-0415
@ Rum Island @ Santa Fe River @ Suwannee River @ Gulf of Mexico

When you drink water, remember the spring. -Chinese Proverb

P. O. Box 945 • High Springs, Florida 32655-0945 • 386-454-0415

December 3, 2016

Comments from the Ichetucknee Alliance on the Draft North Florida Regional Water Supply Plan

The Ichetucknee Alliance (IA) is a federally recognized 501(c)(3) educational nonprofit organization. Guided by the vision of a healthy Ichetucknee River System that is preserved and protected for future generations, the Alliance works to ensure the restoration, preservation and protection of the ecosystems along the full 5.5-mile length of the Ichetucknee River, including all its associated springs. Because the Alliance recognizes that the groundwater supply of the Ichetucknee River basin is finite and vulnerable, it is also a goal of the Alliance to ensure the security of the Floridan aquifer, the primary source of water that nourishes the Ichetucknee River and provides drinking water for millions of people throughout Florida.

N.B.: Members of the Board of Directors of the Ichetucknee Alliance have reviewed the following comments on the draft North Florida Regional Water Supply Plan made by the Florida Springs Council and have unanimously approved adoption of these comments as our own.

<u>Executive Summary</u>

The Plan is a regional water supply plan that must comply with Section 373.709(2), Florida Statutes. The Plan also will adopt the second phase of the recovery strategy for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs (LSFI) MFLs and must therefore comply with Section 373.0421(2), Florida Statutes. Several of the priority springs protected by the LSFI MFLs are first magnitude springs (e.g., Santa Fe Rise, Treehouse Spring, Columbia Spring, Devil's Ear Spring, July Spring, Ichetucknee Head Spring, and Blue Hole). Therefore, the Plan and Recovery Strategy must meet the requirements of Section 373.805(4), Florida Statutes as well.

The Plan and Recovery Strategy fail to meet the requirements of Sections 373.709(2) and 373.0421(2) because the Plan fails to provide reasonable assurances that sufficient projects will be implemented to meet projected demand while providing the needed recovery of the LSFI MFLs. The Plan also fails to include important information Section 373.805(4) requires regarding priorities and funding for the recovery projects. The Plan and Recovery Strategy do not provide reasonable assurances that the LSFI MFLs will be recovered as required.

The Plan provides insufficient motivations and incentives for conservation. This Plan was to include long-term regulatory strategies, but only proposes designation as a Water Resource Caution Area. This designation requires reuse of domestic wastewater in certain circumstances when it is determined to be feasible, but does not fund or require reuse of domestic effluent. The designation does not address recovery strategies other than reuse of domestic wastewater. At a minimum, IA urges Florida's legislature and water management agencies to implement universal water fees as a strong inducement to conserve water.

The pumping of brackish water is unsustainable and self-destructive. It should be avoided. Rather, IA advises that new demands be met through aquifer recharge using treated wastewater that has been cleansed by recycling through constructed wetlands.

The Plan's Critical Sufficiency Analysis Relies on a Non-Scientific Assumption and Suffers Fatal Textual Errors

The Plan includes a "Sufficiency Analysis" addressing whether the Plan and LSFI Recovery Strategy could meet the regional water supply planning requirements of Section 373.709(2), Florida Statutes by including sufficient water resource development projects (WRDPs) and water supply development projects (WSDPs) to meet projected demands without causing unacceptable water resource impacts. Plan pp. 40-41. In this case, such project options must, along with conservation, provide recovery of LSFI MFL flows as well. §373.0421(2), Fla. Stat.

The Plan assumes each 4.48 mgd of implemented water resource development projects (WRDPs) and water supply development projects (WSDPs) will result in 1 cfs recovery for the LSFI MFLs. (p. 40) This assumption is used to convert listed WRDP and WSDP options (with impacts measured in million gallons per day) to projected LSFI MFL flow recovery (in cfs). Thus, this conversion factor is critical to an understanding of whether the Plan includes adequate project options to meet projected 2035 demand for water and to bring about recovery of the LSFI MFLs.

The Plan provides no discussion, explanation or analysis of the selection of the one-size-fits-all 4.48 mgd assumption regarding WRDP and WSDP benefit to flows and recovery of the LSFI MFLs. The impact of WRDPs and WSDPs is largely a function of the net change in groundwater pumping at a particular location attributable to the project, and the distance between the location where the net change would occur and the location of the MFL point of compliance. In general, the beneficial impact is directly proportional to the reduction in pumping, and inversely proportional to the square of the distance from the pumping location to the MFL point of compliance. So, in general, the further the project is from the gages used to monitor the LSFI MFLs, the less impact will be measured at the gages. A generic one-size-fits-all proportionality for calculating recovery attributable to projects is unscientific and not appropriate, even for planning-level analysis.

Indeed, using the NFSEG Model, the text at p.41 explains that 60.19 mgd of projects provided only 8.4 cfs of recovery. This is 7.165 mgd per cfs of recovery. It is possible the reference to 60.19 mgd is a typographical error that should read 65.19 mgd, the amount of the WRDPs shown in Table 6, Chapter 7. (p. 49) If 65.19 mgd was modeled and resulted in 8.4 cfs of recovery, then the ratio is 7.76 mgd of projects to 1 cfs of recovery. Either modeled ratio is widely divergent from the 4.48 mgd assumption.

The Plan provides no analysis relevant to the huge discrepancy between assumed and modeled flow recovery. Using the 4.48 mgd assumption, there could be about 11 mgd surplus in the Plan after covering the 2035 demand, after conservation, and after the LSFI MFL flow recovery. If 7.76 mgd or 7.165 mgd is used instead of 4.48 mgd as the conversion factor, the Plan does not meet the requirements of Sections 373.709(2) and 373.0421(2), Florida Statutes. The Plan is much less than clear on this issue and errors in the text of page 41 regarding quantities and the two project option tables defy clarity. This discrepancy and textual errors must be explained and the sufficiency analysis of project benefit to LSFI MFL flows must be addressed properly.

The Plan should analyze and report on NFSEG modeling scenarios in which the WRDP and WSDP options are evaluated for their effect on flows at the LSFI MFL gages. Ultimately all projects in the Plan should be modeled to determine whether the Plan, including all projects, meets the sufficiency requirements of Sections 373.709(2) and 373.0421(2), Florida Statutes. Without more than a naked and unexplained assumption of 4.48 mgd per 1 cfs recovery, the Plan does not provide reasonable assurances of meeting these requirements.

Additional Plan Deficiencies

The projects necessary to recover groundwater flows, by law, should be included in the Water Resource Development Project list. §373.709(2), Fla. Stat. In this Plan, the WRDP list is not sufficient to recover even the 2010 deficit condition of 17 cfs below the LSFI MFLs. The Plan should explain why the Plan must also rely upon projects on the WSDP list to restore the recovery deficit.

The Plan lacks the priority listing of each WRDP and WSDP required by Section 373.805(4)(b), Florida Statutes. The Plan also lacks required information for each project regarding the estimated cost of and the estimated date of completion; and "the source and amount of financial assistance to be made available by the water management district for each listed project, which may not be less than 25 percent of the total project cost unless a specific funding source or sources are identified which will provide more than 75 percent of the total project cost." §373.805(4)(c) and (d), Fla. Stat.

The Plan also lacks "An estimate of each listed project's benefit to an Outstanding Florida Spring;" and "An implementation plan designed with a target to achieve the adopted minimum flow or minimum water level no more than 20 years after the adoption of a recovery or prevention strategy." See §373.805(4)(e) and (f), Fla. Stat.

The Plan lacks "an assessment of how the regional water supply plan and the projects identified in the funding plans prepared pursuant to sub-subparagraphs [§373.709(2)] (a)3.c. and (b)2.c. support the recovery or prevention strategies for implementation of adopted minimum flows and minimum water levels. . . ." §373.709(2)(k), Fla. Stat. The Plan must specify which WSDPs support recovery of flows at LSFI MFL gages, and how they support flow recovery.

The Plan lacks an adequate funding strategy. The Plan includes only a catalog of potential funding options, not a "funding strategy for water resource development projects, which shall be reasonable and sufficient to pay the cost of constructing or implementing all of the listed projects." §373.709(2)(d), Fla. Stat. Finally, the Plan lacks any analysis of whether the funding strategy is reasonable and sufficient for all projects. Id.

Failure to Adopt Further Regulatory Recovery Strategies

The LSFI Recovery Strategy, Appendix G, at p.36 explains:

Phase II Regulatory Strategies

The development of long-term strategies to address the impacts of regional groundwater trends and water use patterns is critical to achieving the recovery of minimum flows in the Lower Santa Fe Basin. As such, the Department, SRWMD, and SJRWMD, will develop long-term recovery measures concurrently with the development of the North Florida Regional Water Supply Plan. This will assist the Districts and the Department in refining the Recovery Strategies and future regulatory measures to address regional groundwater impacts to the Lower Santa Fe and Ichetucknee Rivers.

The LSFI Recovery Strategy at Page 20 adds that this:

Phase II of the Recovery Strategy will focus on the implementation of the recommendations in the North Florida Regional Water Supply Plan, the adoption of long-term regulatory measures, and the identification and execution of any necessary water resource development and alternative water supply projects.

This Plan was to include long-term regulatory strategies, but only proposes designation of the Plan area as a Water Resource Caution Area. This designation requires reuse of domestic wastewater in certain circumstances when it is determined to be feasible, but does not fund or require reuse of domestic effluent. The designation does not address recovery strategies other than reuse of domestic wastewater.

No other regulatory recovery strategies are included in the Plan. Without further regulatory changes, there are few real legal compunctions on the implementing parties to implement the projects, and the Districts have limited leverage to bring about conservation. The Plan should analyze and explain why the implementation of further regulatory recovery strategies has been abandoned.

For the foregoing reasons, the Plan does not demonstrate or provide reasonable assurances that the Lower Santa Fe and Ichetucknee River MFLs will be met within the planning horizon, nor whether recovery pursuant to the Plan will be "as soon as practicable." §373.0421(2), Fla. Stat.

IA would also note that the Plan fails to address the reality that the amount of water permitted in the planning area currently far exceeds the amount that is actually used. The difference between permit allocations and pumping cannot be accurately determined directly because metering of water use is spotty in the planning area. However, it has been reported that in the SRWMD, the amount of water permitted may exceed the amount pumped by as much as a factor of 2. This excess availability of permitted water is an enormously important factor in 20-year water planning, and the Districts are remiss in ignoring it. What would be the value of this planning exercise if permittees decided, over the next 20 years, to pump all of their permitted quantities, or even three-quarters of their allocation? The Districts should have an aggressive program in place to meter water use and to take back unused allocations over time. Otherwise, surprises in water usage could pop up, rendering this planning exercise useless.

<u>Greater Incentives for Conservation Are Needed</u>

On balance, the Plan is to be commended for acknowledging the potential benefit of conservation, which has always been the first priority of IA. Beginning on page 51, the Plan outlines eight "Water Conservation Project Options", and the first option to be noted is the successful implementation of tiered billing rates by some regional utilities. Tiered rates are a proven incentive to conserve, in contrast to the failure of consumptive use permits (CUPs) to remedy excessive pumping. Implementing universal water use monitoring and fees deserves far more emphasis than that given to them in the Plan. Conservation, as it now stands is almost entirely voluntary. Even CUPs are de-facto voluntary, because so many permitted wells are unmetered. This is an area in which further regulatory strategies are needed and sorely lacking in this Plan.

Because tiered water fees have proven to elicit greater conservation in the North Florida region, IA strongly urges that they be extended to all users – domestic self-supply, agriculture and commercial/industrial/mining, as well as urban users. Such expansion will, of course, require significant changes in infrastructure, administration and legal status. Setting an effective schedule of fees will require first that a cap be estimated and placed on total withdrawals in each District. Afterwards the infrastructure to monitor all users must be implemented. Significant advances in the technologies of flow measurement, data reporting and recording render this task less expensive than it would have been in the past. A preliminary schedule of fees (which could be distinct for each class of users) must be established that will progressively tax users according to increasing use. IA would recommend that the impacts of tiered water pricing should be carefully studied before such pricing is established, so that unintended consequences for smaller users, including small agricultural operations, can be avoided. This rate structure can subsequently be amended to optimize the distribution of water among users while not exceeding the regional cap.

Many may object to the imposition of fees as a new form of taxation. It should be pointed out, however, that ad-valorem taxes are already being collected to support the Districts. The task of setting fees, monitoring usage and collecting charges could be assigned to the Districts, which could be partly or wholly supported by the collected fees, while any excess could go to funding water conservation and aquifer/spring restoration projects.

IA wishes to stress that water fees enjoy a proven record of success, whereas CUPs, BMPs and even minimum flows and levels (MFLs) have failed to halt the progressive degradation of Florida's water resources. While the costs and effort necessary to institute universal water fees are not insignificant, neither do they proportionately exceed efforts elsewhere in the United States to create reliable future supplies of water; and Florida, more than most of these other areas, is critically dependent on secure supplies of water.

The Plan Should Discourage Pumping Brackish Water

IA objects to the prominence the Plan gives to the desalination of brackish water. For example, this source is listed first among the suggested Water Resource Development Project Options (p. 47). Pumping and reverse osmosis treatment of brackish groundwater should be avoided at all possible costs, for at least two reasons. First, saline intrusion is irreversible over any practical time frame. Once a well goes saline, the slow diffusion time among the less channelized regions of the karst substrate insures that it will be decades, if not centuries, before a saline well runs fresh again. Secondly, pumping a brackish well accelerates the rate of saline intrusion. That is, the well becomes progressively more saline and the water costlier to treat.

The Plan portrays saline intrusion as a problem confined to the coastal and riverine portions of the North Florida region. This perspective is short-sighted, because saltwater underlies the entire Floridan aquifer, and excessive pumping will cause salt everywhere to migrate to higher levels in the karst substrate. Furthermore, a given drop in the potentiometric surface of the aquifer has the effect of raising the underlying salt water interface by a factor as much as 40 times greater than that drop. In particular, withdrawals from the Lower Floridan Aquifer must be reduced, because pumping from that depth will cause a disproportionate vertical rise in the proximate saline interface.

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Aquifer. Although desalination of seawater might provide a few localities with water for drinking and bathing, it is economically infeasible to sustain agriculture or industry. If the entire Floridan Aquifer System were to turn brackish, Florida could evolve toward a dry-island Caribbean economy.

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IA supports the Plan's call for further water conservation, although we would recommend use of different mechanisms, especially the implementation of tiered water fees. This method deserves far more emphasis than it has been given in the Plan. It has proven to be effective in the public-supply sector (JEA, GRU) and holds great promise for becoming the major tool for conserving water throughout the State. The Plan should include a regulatory strategy to move conservation from a voluntary aspiration to a regulatory compunction.

IA recommends against any pumping of brackish water, as this option only accelerates the decline of Florida's vital water resources. IA also advocates, as the primary method for meeting the region's increasing water resource demands over the next 20 years, the polishing and subsequent recharge of cleansed wastewater to the Upper Floridan Aquifer by constructed wetlands.

Submitted on behalf of the Board of Directors of the Ichetucknee Alliance, Inc., by:

Lucinda Faulkner Merritt
Secretary
wordwitch@windstream.net
386-454-0415

From:	noreply@formstack.com
To:	Jerry Carter; nfrwsp-comments
Subject:	northfloridawater-draftreview
Date:	Saturday, December 03, 2016 4:58:45 PM

Formstack Submission for form northfloridawater-draftreview

Submitted at 12/03/16 4:58 PM

Name:	Carolyn Thomas
Organization:	SOLO
Email:	cjmoody2010@hotmail.com
Phone number:	(352) 473-4840
Comments:	The issue of restoration and remediation for the Keystone lake area/ Etonia Creek flow has been inadequately addressed. ACTION is required to return this area to its legally mandated status. Please review plans that have been submitted to the board.

Terms | Privacy

From:	noreply@formstack.com
To:	Jerry Carter; nfrwsp-comments
Subject:	northfloridawater-draftreview
Date:	Saturday, December 03, 2016 8:04:26 PM

Formstack Submission for form northfloridawater-draftreview

Submitted at 12/03/16 8:04 PM

Name:	Jim Tatum
Organization:	these are my own comments
Email:	jim@jimtatum.net
Phone number:	(386) 454-1916
Comments:	Comments on the North Florida Regional Water Supply Plan My name is Jim Tatum, I represent only myself here. This report contains many good ideas to reduce groundwater use: the two most likely to work well are to increase reclaimed water use and increased conservation. The management techniques outlined on pages 51-52 are good and should be implemented, and The Water Protection and Sustainability Program of 2005 should be re-implemented (p.57) However, these techniques are not sufficient. I believe additional, stronger management techniques are needed to achieve a sustainable usage rate: Page 51 suggest tiered billing for non-ag. We must have billing for all, agriculture and all. We must all work together to solve our water crisis. Agriculture will resist and say they cannot produce enough without irrigation. We must work this out, perhaps by growing crops which demand less water, and by the consumer paying more for the product. If something is free we value it less. If something is dear, we conserve. Higher costs for the farmer must be shared by the consumer who will pay more for his product. Everyone who uses water must pay for water. Sooner or later we will have this plan. If we go to it sooner, we will save some water resources. The regional Initiative Valuing Environmental Resources cost-share program gives free water and then pays the user to use less. P.55. On p. 57 we see the Dept. of Ag. Pays farmers who implement BMPs to improve irrigation efficiency. This is the same thing. It gives free water and pays to use less. This is absurd. Don’t give free water. Don’t pay people to not use something that is not theirs to begin with. Dollar incentives are good, but they make sense only if we have billing for water. Implement this program but charge for the water. Billing for water will also limit development and population growth. We do not need growth. Another mindset that needs to be changed. I do not have confidence in the District’s water models, so important for everything. I am not trained to evaluate water models, but when multiple

objective, respected and qualified scientists who are experts in Florida's geology emphatically say these models are inadequate, it makes me question the in-house objectivity. I strongly suggest that the District look further for its models.
I also am concerned about the review and re-evaluation of the MFLs at future dates. When there is no other alternative, I fear they may be weakened to accommodate increased demands, under the heading of "flexibility." We must not let this happen.
In the report p 61. the Suwannee River Water Management District (District) states that "Current permits and laws limit the scope of regulatory actions that can be taken to impose specific solutions on users." I do not agree with this. Other laws exist which allow curtailment of new and existing CUPs. The District and the DEP should not be afraid to utilize its legal counsel. Litigation will surely ensue from some of these tough changes, but we must acquire a new mindset and new laws in order to sustain our groundwater withdrawals and admit increased population in Florida.

Most of page 61 is a disclaimer. I appreciate the great amount of work that went into the report, and reality and truth here, but it basically leaves the entire study dangling in a void of uncertainty.

We all know the answer to our crisis is fewer withdrawals and reduced nitrates, principally from agriculture and septic tanks. We have the remedy but not the will to implement it. We prefer money over clean water and bubbling springs.

I believe that Florida's sustained water availability in the future will be ensured only by new leadership in Tallahassee, where currently there is none, and by litigation. I do not believe this 20-yr plan will ensure protection of our rivers and springs.

It is apparent that we rely far too heavily on groundwater withdrawals, and we are currently sinking deeper and deeper into deficit. We are not currently at sustainability, so I have no confidence that we will reach it when there are greater demands. The proposals here are not enough, we must reduce groundwater withdrawals.

From: noreply@formstack.com
To: Jerry Carter; nfrwsp-comments
Subject: northfloridawater-draftreview
Date: Sunday, December 04, 2016 8:32:29 PM

Formstack Submission for form northfloridawater-draftreview

Submitted at 12/04/16 8:32 PM

Name: Paul Still

Organization: Bradford Soil and Water Conservation District

Email: stillpe@aol.com

Phone number: (904) 368-0291

Comments:

I believe the Water Supply Planning process established by Florida Statute has the potential to provide a guidance document to protect our area's water resources. However, the Suwannee River Water Management District (SRWMD) and the Saint Johns River Water Management District (SJRWMD) put in place a process that failed to produce a Water Supply Plan that meets the needs of our area or the requirements set out in Florida Statute.
The North Florida Regional Water Supply Plan (NFRWSP) has two major flaws the 1) the Sufficiency Analysis and 2) the Planning Period. In addition, the NFRWSP has several other areas of concern and several clerical errors

Sufficiency Analysis
.
The Sufficiency Analysis found in Chapter 6 of the NFRWSP is flawed and does not meet the requirement of 373.709(2), F.S., that a RWSP must include sufficient water resource and water supply development project options to meet projected water demands without causing unacceptable water resource impacts.

There are three ways to address unactable water resource impacts 1) conservation activities that reduce withdrawals, 2) Water Resource Development Projects and 3) Water Supply Development Projects. In this review of the NFRWSP the use of the term project or all projects is referring to both Water Resource Development Projects and Water Supply Development Projects.

The analysis provided is flawed for 2 reasons, 1) there is an error in the assumptions used to calculate conservation and project benefits, and 2) project and conservation benefits for MFLs (other than the the Lower Santa Fe River MFL at the Fort White gage), for wetlands and for water quality in the SJRWMD east of the Saint Johns River were not evaluated.

Error in Calculating Benefits

There is an error in the assumptions and calculations found on page 40 of the NFRWSP which reads:
The LSFI Recovery Strategy (Appendix G) identified that in 2030, if projected water
demands were realized, the Lower Santa Fe River flow would have a needed recovery of 20.6 cfs and identified that the recovery of 20.6 cfs could be achieved if projects resulting in 92.3 mgd were implemented. Using this information, the Districts have estimated the quantity of water/projects needed to recover each projected cfs of recovery needed (92.3 mgd in water of projects identified ÷ 20.6 cfs of recovery needed in 2030 = 4.48 mgd of projects per cfs of recovery).

The 4.48 mgd value is valid only for the projects listed in Tables A2 to A5 in Appendix A
of the Recovery Strategy: Lower Santa Fe River Basin Lower Santa Fe and Ichetucknee Rivers and Priority Springs Minimum Flows and Levels which is Appendix G of the NFRWSP. The benefits to flow at the Fort White gage vary depending on the type of project and the location of the project. Projects that are located longer distances from Fort White will have less of an impact on Santa Fe River flows at the Fort White gage.

The information used in Appendix G does not use flow data for the Fort White gage collected between 2010 and 2015. The Appendix G document includes “APPENDIX C Annualized Flow Duration Curves: Methods for Assessing MFL Recovery”. This methodology does not appear to have been used or referenced in the NFRWSP.
Suggested change: Use the methods in “APPENDIX C Annualized Flow Duration Curves: Methods for Assessing MFL Recovery” and data updated through 2015 to determine the amount of flow needed at the Fort White gage in 2037.
Page 41 of the NFRWSP states, “As part of the NFRWSP evaluation, the Districts evaluated a potential of 60.19 mgd from proposed water resource development projects using the NFSEG. These projects provide for 8.4 cfs of potential recovery to the Lower Santa Fe River flow,”.

The NFRSWP document fails to explain how the “evaluation” was done or why it was only done for 60.19 mgd of the 65.19 mgd of the NFRWSP’s proposed water resource development projects.

If you divide 60.19 mgd of projects by the 8.4 cfs of recovery they provide for the Lower Santa Fe MFL you get 7.17 mgd of projects per cfs of recovery. The use of the 4.48 mgd of projects per cfs of recovery calculated using Appendix G information makes the projects more efficient than the 7.17 mgd of projects per cfs of recovery calculated from NFSWG model data. In other words, the Appendix G information requires fewer projects than there would be if the NFSEG model is used to evaluate benefits at the Fort White gage.

The benefit per cfs of recovery for water resource development projects evaluated with the NFSEG clearly gives a very different result from the benefit per cfs of recovery for projects evaluated by the North Florida Model used in the Appendix G Recovery Strategy document.

Water Management District staff have repeatedly stated that the NFSEG model is the best available model for water supply planning. To use information from the Appendix G Recovery Strategy document that used the North Florida Model would not be utilizing the best available information for water supply planning.

The NFRWSP on page 41 states.
As discussed in Chapter 3, the Districts have identified a low conservation range potential of 40.67 mgd, further reducing the quantity of water supply development projects needed to approximately 91.94 mgd. Table 6, Chapter 7, has identified 95.44 mgd in water supply development projects; thus meeting the projected water demand and offsetting water resource impacts.

The 40.67 mgd from conservation and the 95.44 mgd in water supply development projects were not evaluated to determine what the benefit would be to the flow at the Fort White gage. If you use the 7.17 mgd of projects per cfs of recovery you get 5.67 cfs of recovery at the Fort White gage for conservation and 13.31 cfs of recovery at the Fort White gage for water supply development projects.

If you add 8.4 cfs for water resource development projects, 5.67 cfs for conservation and 13.31 cfs for water supply development projects you get 27.38 cfs of recovery at the Fort White gage. The NFRWSP states that 38 cfs will be needed by 2035 at the Fort White gage.

The shortfall in projects may even be greater than the 10.62 cfs noted above because almost 30 mgd of the 95.44 mgd in water supply development projects are in Nassau. St Johns, and Flagler Counties. Projects in these counties would not be expected to provide benefits to the flow at the Fort White gage. The use of 7.17 mgd per cfs of recovery may overestimate the recovery benefits from the listed water supply development projects.

The above indicates that the NFRWSP fails to identify sufficient projects that have a total capacity of which will, in conjunction with water conservation and other demand management measures, exceed the needs identified.
Suggested change: Evaluate conservation and all projects using the NFSEG model and add projects to meet the established need for recovery of the Lower Santa Fe MFL.
Project Benefits on MFLs, Wetlands and Water Quality
The NFRWSP appears to focus only on evaluating project impacts on the MFL set for the Fort White gage. The NFRWSP fails to demonstrate project impacts for the Keystone area lakes, the Ichetucknee River, water quality in the SJRWMD, and wetlands in both districts.
Keystone Lakes MFLs
The NFRWSP states the MFLs for the Keystone area lakes are under review. Florida Statute does not offer the option of not assessing impacts on existing MFLs because they are under review.
Suggested change: Use the NFSEG model to determine the impacts on the Keystone area lakes with existing MFLs. Evaluate conservation and all projects using the NFSEG model and add projects to meet the established need for recovery of Keystone Lakes.

Ichetucknee River
Many of the projects listed are not likely to provide benefits for the Ichetucknee River MFL. Even though the amount of recovery needed for the Ichetucknee is smaller than for the Lower Santa Fe River, the benefits from the listed projects are likely to be much lower because the flow in the Ichetucknee River comes from a much smaller springshead than the Lower Santa Fe River at Fort White.
Suggested change: Evaluate the impact of conservation and selected projects on flow at the Ichetucknee River gage used for the MFL.
Wetlands
The NFRWSP identifies wetland impacts in Appendix I but does not address how these impacts will be reduced by the selected projects or conservation.
Suggested change: Evaluate the impact of conservation and selected projects on wetlands where impacts were identified in Appendix I.

Water Quality SJRWMD
The NFRWSP identifies problems with water quality in the area of the planning region east of the Saint Johns River. How conservation or the selected projects will impact water quality is not addressed.
Suggested change: Evaluate the impact of conservation and selected projects on wetlands were impacts were identified in Appendix I.
Planning Period is not at Least 20 Years
The Florida Statute that governs Regional Water Supply Planning states at 373.709(2)
"Each regional water supply plan must be based on at least a 20-year planning period". The data used in the NFRWSP only goes to 2035. The 2035 date provides a planning period of only 18 years.

Suggested change: Extend the panning data to at least 2037 which would provide at least a 20-year planning period. Adding two years to the data is important not only to meet the statutory requirement but also to correctly evaluate the water needs of the region. Water use is expected to increase between 2035 and 2037 and this increase must be addressed in the NFRWSP.

Other Issues
Water Resource Caution Areas and Water Quality

Water quality concerns (groundwater chloride concentration) are addressed on pages 27 to 31 and 44 and in Appendix D of the NFRWSP. The area of concern is in a relatively limited geographic area within the NFRWSP area in portions of Duval, Flagler, Nassau, and St. Johns counties east of the St. Johns River.

On page 44 the NFRWSP states, "As such, the groundwater quality analyses support the designation of that portion of SJRWMD in the NFRWSP area as a WRCA."

The NFRWSP fails to explain what actions are required once an area is designated a WRCA in the SJRWMD and how that action will reduce water quality impacts from withdrawals.

Suggested change: Add an explanation of what additional requirement are imposed on water users in a WRCA in the SJRWMD.

The text in Appendix D refers to Tables D4, D5, D6 and D7 but these tables do not appear in Appendix D.

Suggested change: Add any missing tables.

I did not find any data that indicates the proposed projects would be adequate to address water quality concerns raised in the NFRWSP.

Suggested change: Evaluate the impact of the WRCA on the identified constraints.

Santa Fe Spring

Page 1 of the NFRWSP does not list Santa Fe Spring is not listed as an Outstanding Florida Spring.
Suggested change: Add Santa Fe Spring and a note if the spring is being reevaluated.
Failure to Provide for Stakeholder Input
While the districts held meetings before the draft was produced there was limited opportunity to comment on the plan itself. While the workshops will meet the letter of the law the process failed to provide an opportunity for stakeholders to provide input into the plan. The SAC process limited public comments to 3 to 5 minutes. Questions and concerns raised in writing and at SAC meetings were not addressed or answered by Water Management District staff. There appears to have been no mechanism established to collect input that stakeholders may have submitted to members of the SAC.

It is not clear if the questions and concerns raised as part of the SAC process will be included in Appendix A of the NFRWSP. The sentence in the last paragraph on page 4 would seem to indicate the SAC comments will not be included.

“Comments received during the public workshops and comment period were incorporated, as appropriate, into the NFRWSP (see Appendix A for details regarding
comments received and responses).

Suggested change: Add all the comments received during the SAC process to the NFRWSP. Collect all public record correspondence submitted to individual SAC members and make it a part of the NFRWSP.

Self-suppliers
Self-suppliers were not represented on the SAC. This lack of representation for self-suppliers was repeatedly pointed out to the Water Management Districts during the early SAC meetings.
Suggested change: Hold a workshop to receive input from self-suppliers.
Clerical Errors

The NFRWSP states on page 7, “The Districts also presented the draft plan

to their respective governing boards on September 13, 2016 to solicit comments and feedback."
How was a draft plan with a date of 10/4/16 presented to the boards on September 13, 2016?

Suggested change: Correct date if it is an error or clarify what was presented on September 13, 2016.

On page 49 the NFRWSP states, "Table 5 identifies 16 water resource development project options for the NFRWSP area, costs are shown in million (M) dollars." Table 5 is about wetlands. Table 6 has 16 projects but does not identify the projects.

Suggested change: Correct table numbers.

On page 50 in the section about Water Supply Development Project Options that starts on page 49, the text states, "For each project option identified, the following information is provided (and listed in Appendix J):" Appendix J addresses Water Resource Development Project Options not Water Supply Development Project Options.

Suggested change: Correct appendix reference.

Paul Still
14167 SW 101st Ave
Starke, FL 32091

904 368-0291

stillpe@aol.com

From: noreply@formstack.com
To: Jerry Carter; nfrwsp-comments
Subject: northfloridawater-draftreview
Date: Monday, December 05, 2016 8:17:32 AM

Formstack Submission for form northfloridawater-draftreview

Submitted at 12/05/16 8:17 AM

Name:	Kate Ellison
Organization:	
Email:	kateclarity@gmail.com
Phone number:	(352) 283-5536
Comments:	This has been a comprehensive undertaking, and represents the efforts of a great many individuals. I thank you for your work. I have a sense of urgency in developing a plan that might really solve the water quality and quantity problems we are facing, and getting more serious with growth and greater demands. Our region has a water crisis, and we must respond effectively. You have a mandate to make the most effective, most comprehensive recommendations you can find. You have access to experts with deep knowledge of Florida's water and water use issues. Yes, there is uncertainty, but we rely on you to reduce that uncertainty as much as you can. As a citizen and resident of Florida, I urge you to recognize the need we all have for you to act responsibly. Private businesses and individual land-owners look out for their own self-interest. Who looks out for all of us, who looks out for our children? It is your job to see the big picture, and represent us, citizens as a whole, on the issue of making a sustainable clean water supply available for the next twenty years. That means requiring conservation and water quality improvement, not making suggestions. We need you to assert your authority to the full extent of the law, to ask the legislators for additional enforcement mechanisms, and convince them of the urgency here. People do not generally conserve or pay more unless they are required to do so. All of us must be required to do so, in fairness. You have explained how more water can be found, as demand increases, relying heavily on groundwater, the least costly solution. Yet groundwater withdrawal is already a problem, and it will continue to contribute to lower water levels in our wells, springs and lakes. This will concentrate pollutants in less water. We all know the answer to our crisis is fewer withdrawals and reduced pollutants, principally from agriculture and septic tanks. CUPs must be curtailed until the crisis is over. Nitrate and phosphorus levels must be lowered, and that may mean making some people unhappy. Your agency

can both enforce and educate. Perhaps your agency can even assist those in need with expenses (using the WPSP for example).

There is a pending permit in Bradford County for a new Phosphate mine adjacent to the New River. They expect to use less water than a mine like that usually uses, yet their requested water usage is quite high. The New River is relatively pristine, and it flows directly into the Santa Fe River, which is in a fragile state of recovery. This mine would threaten to the quantity and quality of water in both rivers, as well as to the economic development of our area as a tourist destination, market farming, and residential land value. This permit should be denied.

Much of your work and recommendations are based on the MFLs that were established in recent years. These minimums are too low. Many well-trained, well-respected scientists, experts in Florida’s geology, insist that these models are inadequate. I strongly suggest that the District adopt more accurate models. We have not arrived at sustainable water use levels yet, and we will be losing ground in the future. It alarms me that MFLs might be reevaluated downward in order to create the appearance of successful regulation. The MFLs need to be raised.

The water crisis means that water will have to be restricted, new sustainable sources developed, and citizens will have to pay more. This has to be the beginning of any water discussion. All water users, including agricultural usage, will have to share this burden. The economic incentive to conserve and to increase efficiency will push us all toward sustainability. Suggestions and requests are not sufficient. Rebates for water use reductions are not enough. Our small farmers are crucial to North Florida’s economy and their needs must be supported. It is up to you, in concert with experts, to figure out how to include them, and all ag industry, in water conservation and toxin reduction, without causing economic damage. This is complicated, but it is not rocket science.

You mention the Water Protection and Sustainability Program created by the legislature in 2005, unfunded for years. Please demand that they fund it. We need new answers to our water crisis -- innovation, not stagnation. It costs money to develop new, sustainable water sources and we must be willing to invest in this type of public infrastructure.

I urge you to evaluate conservation and all resource development projects using the NFSEG model and add projects to meet the established need for recovery of the Lower Santa Fe MFL. Additional meaningful local analysis is needed for several other areas, such has Keystone lakes, water quality east of the St. Johns, and wetland impacts in Appendix I, for which analysis and recommendations are not presented.

Also, much of your data does not include the available measurements taken after 2010, and including the most recent data will give a much clearer picture of current trends, recovery efforts, and projected needs. If the report comes out in 2017, it needs to extend to 2037, and be based on the most current data.
Water quality is a crucial issue, not limited to salt-water intrusion, phosphorous and nitrates. These are the very minimum pollutants to mitigate, but lead in the public water supply is also critical, as well as other

heavy metals. Your report does not give enough details of a plan to control water quality. As water sources are broadened and traditional sources strained, water quality is more and more important. I respectfully request greater elaboration of plans to improve water quality. Evaluate water quality (or state how it will be evaluated/maintained) in all water resources suggested to meet growing needs.

Finally, I request more stakeholder input. This plan is crucial, and it needs the support of water experts, conservationists, and the general public. Maybe you have met the letter of the law, but not the spirit. Our water crisis needs all of us working together. We are not there yet.

From:	noreply@formstack.com
To:	Jerry Carter; nfrwsp-comments
Subject:	northfloridawater-draftreview
Date:	Monday, December 05, 2016 2:10:34 PM

Formstack Submission for form northfloridawater-draftreview

Submitted at 12/05/16 2:10 PM

Name:	Robin Lumb
Organization:	City of Jacksonville
Email:	lumbr@coj.net
Phone number:	(904) 630-1873

Comments:

On behalf of Mayor Lenny Curry, the letter below is posted as the city's official comment on the North Florida Regional Water Supply Plan:

December 5, 2016

Ann Shortelle, Executive Director
St. Johns River Water Management District
4049 Reid Street
Palatka, FL 32177

Dear Dr. Shortelle:

On behalf of the City of Jacksonville, I would like to thank the St. Johns River Water Management District and its technical staff for their work developing the recently released draft of the North Florida Regional Water Supply Plan.

As you know, the St. Johns and Suwanee River water management districts, along with the Florida Department of Environmental Protection, have worked together over the course of 4 years to produce a 20-year water supply plan for the 14-county planning area that comprises the North Florida Regional Water Supply Partnership. While additional work remains, the results of this effort are encouraging.

By identifying a range of options capable of augmenting the region's water supply, the plan offers the promise of a balanced approach; one that couples common sense water conservation with the water resource and water supply projects necessary to ensure that North Florida has reliable and sustainable sources of water in the years ahead.

The citizens of Duval County look forward to the implementation of cost-effective solutions that will protect water supplies throughout region in an equitable manner based on sound science; a key to which will be the completion of a reliable groundwater model. We encourage the two water management districts to continue working with all stakeholders, including our water utility, JEA, in implementing the plan and developing future updates that are fair, financially prudent and scientifically sound.

Water is vital to economic growth and the wellbeing of our communities. That's why the North Florida Regional Water Supply Partnership must work to manage this resource wisely for the benefit of future generations.

Sincerely,

Lenny Curry, Mayor
City of Jacksonville

From:	Susan Alexander
To:	Amy Brown ; John Fitzgerald; nfrwsp-comments
Cc:	Brian Megic; Chuck Pavlos; Doug Layton; Edward de la Parte Jr.; Gordon Smith ; "Hutton, Richard H"; Jeremy Johnston; Kayle Moore; Ken Fraser; Larry Miller ; Mark Greenwood; Mike Kelter; Nicolas Porter; Rob Zammataro; Roberto Denis; Roger Rich; SteiPK ; Thomas Bartol; Ty Edwards
Subject:	Sent on behalf of Tom Morris - North Florida Utility Coordinating Group Comments on the Draft North Florida Regional Water Supply Plan
Date:	Monday, December 05, 2016 3:14:48 PM
Attachments:	image001.gif Commnets on the Draft North Florida Regional Water Supply Plan 12.5.16.pdf

Please find the attached on the above referenced.

Thank you,

Susan L. Alexander
Office Administrator
Clay County Utility Authority
3176 Old Jennings Road
Middleburg, Florida 32068
Office Phone: (904) 213-2482
http://www.clayutility.org

Clay County Utility Authority
3176 Old Jennings Road
Middleburg, Florida 32068-3907
Telephone (904) 272-5999
Facsimile (904) 213-2498
www.clayutility.org

Working together to protect public health, conserve our natural resources, and create long-term value for our ratepayers.

December 5, 2016

VIA EMAIL nfrwsp-comments@sjrwmd.com

Amy Brown
Senior Hydrogeologist
Suwannee River Water Management District

John Fitzgerald
Regional Water Supply Planning Coordinator
St. Johns River Water Management District

Subject: **North Florida Utility Coordinating Group (NFUCG) Comments on the Draft North Florida Regional Water Supply Plan**

Dear Ms. Brown and Mr. Fitzgerald:

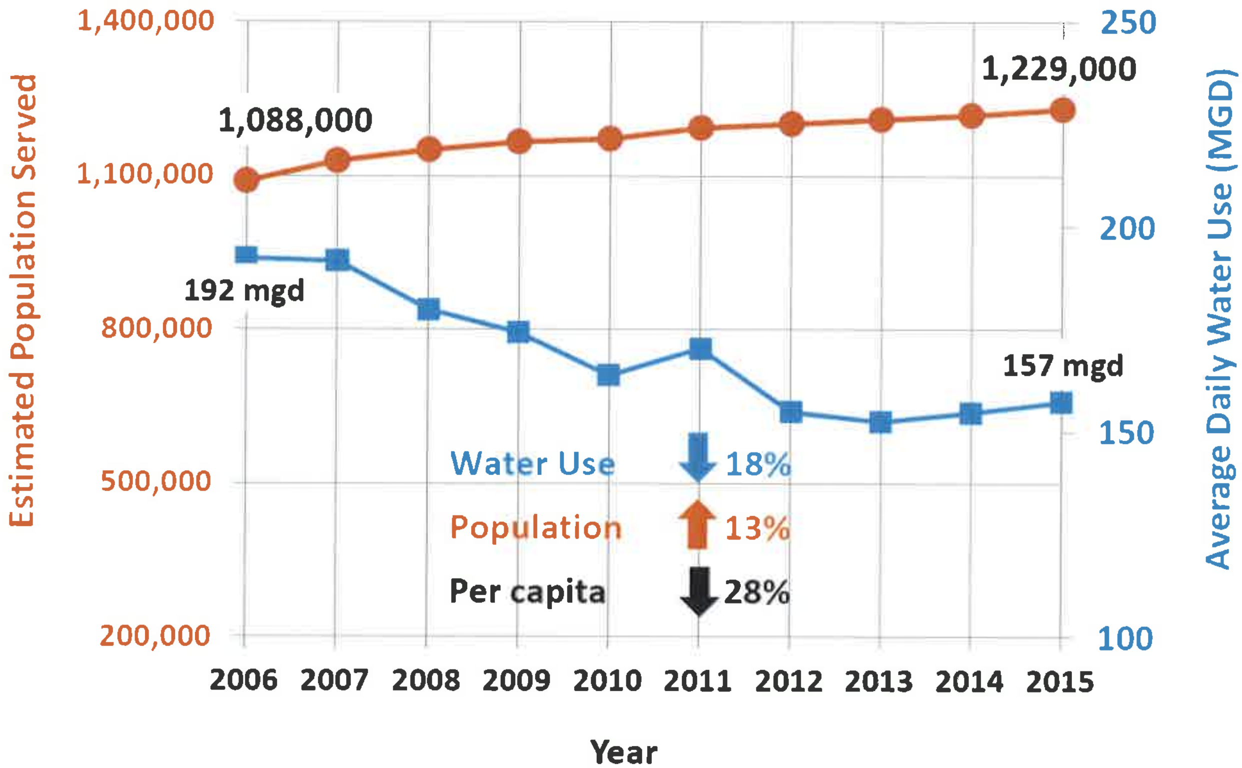
Please accept these comments on behalf of the North Florida Utilities Coordinating Group (NFUCG) and its members[1] regarding the draft North Florida Regional Water Supply Plan (the Plan). NFUCG and its members have been active participants and contributors throughout the Water Management Districts' Plan development process. We have appreciated the opportunity to collaborate with District staff and stakeholders regarding this important aspect of achieving our shared goals of protecting water resources and assuring sufficient water supplies exist for our region. NFUCG supports the joint approval of the Plan by the Suwannee and St. Johns River Water Management Districts.

Significant Achievements in Conservation and Reuse

NFUCG and its members commend both Districts for their commitment to encouraging the sustainability of our water resources. As the draft Plan recognizes, two critical components of this sustainability are a continued commitment to conservation and the use of reclaimed water. The Plan correctly recognizes that public water suppliers expect to achieve even greater water conservation and greater reuse of reclaimed water over the 20-year planning period. However, we believe the Plan should also recognize the significant achievements that the Districts and public water suppliers have already realized in both conservation and reclaimed water use.

As reflected in the following figure, since 2006, the population served by NFUCG members has increased by almost 150,000 people, from approximately 1.09 to 1.23 million. However, in that same time period, actual water use by NFUCG members has declined from 192 million gallons per day to 157 million gallons per day. Per capita water use rates have fallen by 28%. This water savings can be directly linked to water conservation efforts undertaken by NFUCG members, our customers, and the Districts, as well as an increased level of public awareness. We believe it is important for the Plan to recognize these past successes, since the ongoing emphasis and investment in conservation have significantly reduced the amounts of water necessary to meet future demand.

[1] City of Atlantic Beach, City of Neptune Beach, City of Jacksonville Beach, Town of Orange Park, Clay County Utility Authority, Gainesville Regional Utilities, JEA, and St. Johns County.



Water Use and Population Served by the North Florida Utility Coordinating Group

We have also made significant investments in increasing reclaimed water use. Since 2000, NFUCG members have invested over $150 million in beneficial reuse projects, resulting in an over 100% increase in both reclaimed water use and reclaimed water capacity. This commitment to reuse has already provided significant regional benefits, by allowing public suppliers and other users to reduce or eliminate the use of potable water for irrigation purposes and providing direct environmental benefits. As recognized in the Plan, we remain committed to expanding feasible reclaimed water use, however the Plan should also recognize the significant achievements that have already been realized by the Districts, public suppliers, and other water users.

North Florida Southeast Georgia Model

As you know NFUCG members have been active participants in the public technical and steering teams established to allow stakeholders to provide input into the development of the North Florida Southeast Georgia (NFSEG) regional groundwater flow model. District modeling staff deserves significant commendation for developing this new wide-ranging and technically complex tool. We expect that once it is peer reviewed and finalized, the model will prove to be an essential component of future planning and regulatory efforts by the Districts.

For the draft Plan, the Districts used the non-peer reviewed version 1.0 of the NFSEG model to develop several model scenarios. These scenarios were used to assess potential impacts due to increased water use in the region. This included a "pumps off" scenario, in which all groundwater withdrawals in the model domain were turned off, with no change to modeled recharge. That "pumps off" scenario was then compared to simulations of projected 2035 water withdrawals, in order to estimate changes in water levels. These 2035 future scenarios also did not take changes in recharge into account.

We understand that for the Plan, the "pumps off" approach was used as a rough screening tool to identify water bodies which may merit further evaluation. We do not feel this approach is appropriate for future uses of the model because the recharge assumptions do not represent real conditions. The Plan chapter describing these modeling scenarios should clearly state that this "pumps off" approach does not represent an actual historical condition. The results of "pumps off" model scenarios, if presented without the proper context, have the potential to be misinterpreted by the public.

When the NFSEG model is to be used for other purposes, such as permitting or regulatory decisions, it is critical that a methodology be used that more accurately assesses structural alterations, and changes in water levels, land use, recharge, and other factors that are important to take into account when making permitting or regulatory decisions. We look forward to continuing to work with District staff as the NFSEG model proceeds in its development.

Public Suppliers Participation in the Process

Finally, we appreciate the opportunities the Districts have provided to us and other stakeholders to participate in the Plan development process. This participation is important as it both allows the public to stay informed of the Districts' planning initiatives and allows stakeholders to contribute their own resources and technical expertise in support of the Districts' efforts.

In addition to being active participants, NFUCG members identified almost 80 mgd of potential alternative water supply and water resource project options for inclusion in the Plan, at a total estimated cost of over $360 million. The water resource benefits associated with these proposed projects total over 70% of all the water supply project options identified in the Plan. Given the investment NFUCG members and our customers are continuing to make toward achieving water resource goals, it is important that we continue to closely coordinate with the Districts regarding future planning, modeling, and regulatory efforts. In particular, we look forward to working with District staff and other stakeholders in the further development of the NFSEG model, and to participating in the minimum flow and level development and adoption processes.

Thank you for your consideration of these comments and we look forward to continuing to work with the Districts on these important issues.

Sincerely,

Tom Morris
Executive Director, Clay County Utility Authority
On Behalf of the North Florida Utility Coordinating Group

cc: NFUCG Members

{00512843.6}

From:	Rob Denis
To:	"Amy Brown "; John Fitzgerald; nfrwsp-comments
Subject:	Updated NFRWSP Water Supply Project Information (Appendix K and L Comments)
Date:	Monday, December 05, 2016 3:54:20 PM
Attachments:	Appendix K_20161003-NFUCG Comments.xlsx Appendix L_20161003-NFUCG Comments.xlsx

John, Amy,

We have developed updated information related to 38 of the water supply development projects previously submitted by the North Florida Utility Coordinating Group (NFUCG) for the North Florida Regional Water Supply Plan (NFRWSP). These 38 projects are currently included in Appendix L of the Draft NFRWSP.

The updates on these 38 water supply development projects include the addition of a calculated water supply benefit which accounts for each project's ability to meet peak demands. In addition, the annual operations and maintenance (O&M) cost associated with each project was calculated consistent with the methodologies used in the Draft NFRWSP.

As a result of this additional information, each of these 38 water supply development projects meet the criteria required for inclusion in the NFRWSP as a "Water Supply Development Project Option" and should be included in Appendix K (and removed from Appendix L) of the Draft NFRWSP. Attached you will find an updated Appendix K and Appendix L reflecting our proposed changes (shown in red text.)

Please let me know if you have any questions.

Sincerely,

Rob

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North Florida Regional Water Supply Plan
Water Supply Development Project Options

County	Water Management District	Project Name	Implementing Entity	Project Description	Project Type	Water Source	Estimated Water Supply Benefit (mgd)	Total Capital ($M)	Estimated Annual O&M	Timeframe for Completion*	Notes
Alachua	SJRWMD	Brytan Subdivision Reclaimed Water System Expansion	GRU	Expansion of reclaimed water distribution system pipelines in Brytan subdivision to offset use of potable water for irrigation.	Reuse - Pipeline	Reclaimed Water	0.16	$2.23	$2,000	2026	
Alachua	SJRWMD	Innovation District Reclaimed Water System Expansion	GRU	Expansion of reclaimed water distribution system pipelines to offset use of potable water for industrial cooling and irrigation in the Innovation District.	Reuse - Pipeline	Reclaimed Water	0.11	$1.50	$1,100	2035	
Alachua	SRWMD	Oakmont Reclaimed Water Main Extension	GRU	This project will include construction of reclaimed water (RCW) mains for the internal distribution network for construction of the Oakmont Subdivision, Phase 2.	Reuse - Pipeline	Reclaimed Water	0.05	$0.44	$1,000	2035	
Alachua	SRWMD	Oakmont Subdivision Reclaimed Water System Expansion	GRU	Expansion of reclaimed water distribution system pipelines in Oakmont subdivision to offset use of potable water for irrigation. Includes additional transmission and storage/pumping facilities to facilitate addition of groundwater recharge wetlands and/or further expansion of potable offset irrigation.	Reuse - Pipeline	Reclaimed Water	0.40	$8.40	$5,600	2026	
Alachua	SRWMD and SJRWMD	Reclaimed Water System Expansion into New Neighborhoods	GRU	Expansion of reclaimed water distribution system pipelines to offset use of potable water for irrigation.	Reuse - Pipeline	Reclaimed Water	0.40	$5.00	$3,000	2035	
Clay	SJRWMD	First Coast Outer Beltway Stormwater Ponds	CCUA	Horizontal well and treatment sites at 29 Stormwater ponds along SR 23 phase 3 corridor (First Coast Outer Beltway).	Reuse - Pipeline	Stormwater	2.50	$27.00	$69,000	2030	
Clay	SJRWMD	Green Cove Regional Reclaimed WTP	CCUA	New reclaim water treatment facility with 0.4 MGD AADF capacity.	Reuse - Supply	Reclaimed Water	0.40	$1.30	$24,000	2018	
Clay	SJRWMD	Mid-Clay Land Application and Recovery Site	CCUA	Construction of a rapid infiltration basin and horizontal well recovery system.	Reuse - Storage	Reclaimed Water	2.08	$2.76	$199,000	2015	
Clay	SJRWMD	Reclaim Future System Expansion	CCUA	Extension of CCUA reclaimed water transmission and distribution to supply future developments.	Reuse - Pipeline	Reclaimed Water	7.50	$7.50	$4,000	2030	
Clay	SJRWMD	Reclaimed Water Transmission/Distribution Main Extensions	CCUA	Extend CCUA reclaimed water infrastructure to developments under construction.	Reuse - Pipeline	Reclaimed Water	0.38	$1.30	$1,000	2016	
Clay	SJRWMD	Stormwater Harvest Pilot Project	CCUA	Horizontal well and treatment site to withdraw and treat groundwater near stormwater ponds for reuse supply.	Reuse - Pipeline	Stormwater	0.40	$1.20	$4,500	2017	
Clay	SJRWMD	Reclaimed Water Ground Storage Tanks	CCUA	Old Jennings and Ridaught Reclaimed Water Treatment Plants 0.75 MG Ground Storage Tanks (x2).	Reuse - Storage	Reclaimed Water	0.03	$1.25	$1,000	2018	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Clay	SJRWMD	LSJRB Reuse and Treatment	Town of Orange Park	Primarily a WWTP Upgrade for WQ improvement with secondary implementation of reuse in cooperation with CCUA through an interconnect.	Reuse - Supply	Reclaimed Water	0.25	$0.27	$7,800	2013	
Columbia	SRWMD	City of Lake City Reclaimed Water System Upgrade (Phase 1)	SRWMD	Installation of 2.7 miles of reclaimed water main to increase the amount of reclaimed water users.	Reuse - Pipeline	Reclaimed Water	0.54	$0.55	$1,000	2018	
Duval	SJRWMD	Atlantic Beach Selva Marina Reclaimed Water System Expansion	City of Atlantic Beach	Install pipeline to supply reclaimed water to golf course and residential homes.	Reuse - Supply	Reclaimed Water	0.50	$1.11	$1,000	2015	
Duval	SJRWMD	NAS Reclaimed Water Project	City of Jacksonville	Expand the reuse to the NAS-JAX golf course, weapons storage area and ballfields.	Reuse - Pipeline	Reclaimed Water	0.36	$1.87	$1,000	2012	
Duval	SJRWMD	Jacksonville Beach Water & Sewer Mains Extension	City of Jacksonville Beach	The project objective is to eliminate private wells for potable use and septic tanks adjacent to the Intracoastal Waterway by extending the water main (about 1000 feet new & 1000 feet upsized replacement) and by extending the sanitary sewer main (about 2000 feet new) to 7 residential properties on the private road extension connected to the end of Hopson Road. A fire hydrant will be added near the end of the water main extension to improve fire safety. Currently, six of these properties are developed and have private water wells and septic tanks, which are not charged. With charging for utility water & sewer services, it is ultimately anticipated that water usage may be conserved. With abandonment of septic tanks, the nutrient load into the adjacent area near the Intracoastal Waterway is reduced and reclaimed water supply is increased. Project capacity and water supply benefit are based on an estimated 500 gpd per connection.	Reuse - Supply	Reclaimed Water	0.00	$0.43	$1,000	2018	
Duval	SJRWMD	Reuse Treatment and Initiative Program	City of Neptune Beach	Upgrade WWTP to reuse standards and implement reuse program.	Reuse - Supply	Reclaimed Water	0.03	$0.95	$12,000	2014	
Duval	SJRWMD	9B Reclaimed Water System Expansion	JEA	This project is in coordination with a roadway project at a new interchange. Significant cost savings will result from this new reclaimed water main being installed during construction of new roadway. The estimated length of 30" reclaimed water main to be installed is 1,868 feet. This pipeline will provide reclaimed water to commercial and residential customers resulting in an offset of potable water used for irrigation, reducing the amount of water withdrawn from the Floridan Aquifer. Two WWTFs (Mandarin and Arlington East) will provide reclaimed water to the proposed pipeline, both WWTFs discharge effluent to the St. Johns River. Any reclaimed water used will reduce the amount effluent discharged to the St. Johns River.	Reuse - Pipeline	Reclaimed Water	13.00	$0.45	$1,000	2015	
Duval	SJRWMD	Arlington East 2 MGD Reclaimed Water Filter	JEA	2.0 MGD water reclamation facility filter expansion to support increased reclaimed water demands	Reuse - Supply	Reclaimed Water	2.00	$0.99	$11,000	2015	
Duval	SJRWMD	Arlington East Reclaim Storage Conversion	JEA	Conversion of a 2.0 MG sludge holding tank to effluent storage to be used for reclaimed water production	Reuse - Storage	Reclaimed Water	2.00	$0.64	$1,000	2012	

County	Water Management District	Project Name	Implementing Entity	Project Description	Project Type	Water Source	Estimated Water Supply Benefit (mgd)	Total Capital ($M)	Estimated Annual O&M	Timeframe for Completion*	Notes
Duval	SJRWMD	Arlington East Water Reclamation Facility - Onsite Reuse Pump Upgrade	JEA	On-site piping upgrades and pump replacement, increasing reclaimed water delivery capacity from 750 to 1200 gpm (1.1 To 1.7 MGD).	Reuse - Pipeline and Pumping	Reclaimed Water	0.60	$0.64	$1,000	2016	
Duval	SJRWMD	Arlington East WRF - Reclaimed Water Filtration Expansion - Increase Capacity from 8.0 to 10.0 MGD	JEA	2.0 MGD water reclamation facility filter expansion to support increased reclaimed water demands.	Reuse - Supply	Reclaimed Water	2.00	$2.80	$11,000	2023	
Duval	SJRWMD	Arlington East WWTP 2.0 MGD Reuse Capacity Addition	JEA	2.0 MGD water reclamation facility filter expansion to support increased reclaimed water demands	Reuse - Supply	Reclaimed Water	2.00	$0.60	$11,000	2012	
Duval	SJRWMD	CCUA Reclaimed Water Transmission Main - Southwest WWTF to CCUA	JEA	Installation of 44,000 feet of 24" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	10.15	$15.00	$8,000	2023	
Duval	SJRWMD	Glen Kernan Pkwy - Kernan Blvd to Royal Troon Lane - Reclaimed Water System Expansion	JEA	Installation of 2,100 feet of 8" reclaimed water main to serve the Glen Kernan Golf & Country Club golf course.	Reuse - Pipeline	Reclaimed Water	0.43	$0.26	$1,000	2023	
Duval	SJRWMD	Greenland Reclaimed Water Repump Facility - Storage Tank and Booster Pump Station	JEA	4.0 MG storage tank and high service pumps.	Reuse - Storage and Pumping	Reclaimed Water	4.00	$5.00	$3,500	2024	
Duval	SJRWMD	Mandarin Water Reclamation Facility - High Level UV Upgrade	JEA	UV disinfection system capacity upgrade from 5.7 to 8.75 MGD to increase supply available for public access reuse.	Reuse - Supply	Reclaimed Water	3.05	$4.15	$16,500	2017	
Duval	SJRWMD	Monument Rd - Cancun Dr to Hidden Hills Ln - Reclaimed Water System Expansion	JEA	Installation 1,600 feet of 12" and 2,300 feet of 8" reclaimed water main to serve the Hidden Hills Country Club golf course.	Reuse - Pipeline	Reclaimed Water	0.36	$0.64	$1,000	2018	
Duval	SJRWMD	RG Skinner - North Rd - Reclaimed Water System Expansion	JEA	Installation of 11,000 feet of 30" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.47	$3.00	$2,000	2020	
Duval	SJRWMD	Ridenour WTP - Reclaimed Water Storage and Repump	JEA	3.0 MG storage tank and high service pumps.	Reuse - Storage and Pumping	Reclaimed Water	3.00	$3.70	$3,500	2024	
Duval	SJRWMD	Station Creek Rd - Beach Blvd to Hunt Club Rd N - Reclaimed Water System Expansion	JEA	Installation of 2,200 feet of 8" reclaimed water main to serve the Jax Golf & Country Club golf course.	Reuse - Pipeline	Reclaimed Water	0.35	$0.28	$1,000	2023	
Duval	SJRWMD	Upgrade Pumps at Mandarin-R	JEA	Install pumps capable of supplying 5.7 MGD	Reuse - Storage and Pumping	Reclaimed Water	1.90	$0.37	$20,000	2013	
Duval	SJRWMD	Water Treatment Pilot/Demonstration Phase 1 and 2	JEA	Purified water pilot and demonstration projects.	Technology evaluation	Reclaimed Water	1.00	$20.00	$1,000	2022	
Duval	SJRWMD	Bartram Park WTP - RW - Storage Expansion	JEA	Installation of a new 2.5 Mgal storage tank.	Reuse - Storage	Reclaimed Water	0.05	$2.15	$1,000	2017	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Duval	SJRWMD	Baymeadows Rd - Point Meadows Rd to Old Still PUD - Reclaimed Water System Expansion	JEA	Installation of 9,500 feet of 8" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.01	$1.00	$1,000	2020	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Duval	SJRWMD	Davis - Gate Pkwy to RG Skinner - Reclaimed Water System Expansion	JEA	Installation of 13,700 feet of 30" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.12	$5.00	$1,000	2024	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Duval	SJRWMD	District 2 WWTF Reclaimed Water Storage Tank and Booster Pump Station	JEA	1.0 MG storage tank.	Reuse - Storage	Reclaimed Water	0.02	$2.90	$1,000	2019	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Duval	SJRWMD	District II - Broward River Crossing Replacement	JEA	Installation of 2,800 feet of 24" of reclaimed water transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.08	$4.84	$1,000	2016	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Duval	SJRWMD	Gate Pkwy - Glen Kernan to T-Line - Trans - New - Reclaimed Water System Expansion	JEA	Installation of 18,000 feet of 30" and 2,000 feet of 20" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.18	$8.50	$1,000	2020	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Duval	SJRWMD	Gate Pkwy - Shiloh Mill Blvd to Town Ctr Pkwy - Reclaimed Water System Expansion	JEA	Installation of 2,300 feet of 8" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.01	$0.33	$1,000	2018	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Duval	SJRWMD	JP - FDOT - SR 9A (I-295) - Managed Lanes - JTB - 9B Extension - Reclaimed Water System Expansion	JEA	Installation of 1,300 feet of 20" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.06	$0.31	$1,000	2017	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Duval	SJRWMD	Mandarin Water Reclamation Facility - Equalization Storage Tank and Transfer Pump Station	JEA	1.7 MG storage tank and a high service pumping upgrade from 5.7 to 8.75 MGD to increase supply available for public access reuse.	Reuse - Storage and Pumping	Reclaimed Water	0.03	$2.56	$6,310	2017	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Duval	SJRWMD	Monument Rd - Arlington East WRF to St Johns Bluff Rd - Reclaimed Water System Expansion	JEA	Installation of 7,900 feet of 20" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.06	$3.30	$1,000	2023	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Duval	SJRWMD	RG Skinner Area - 9B to Parcels 10A - 11 - Reclaimed Water System Expansion	JEA	Installation of 2,900 feet of 30" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.12	$1.11	$1,000	2017	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Duval	SJRWMD	RG Skinner Area - 9B to T-Line - Reclaimed Water System Expansion	JEA	Installation of 3,600 feet of 30" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.12	$1.23	$1,000	2017	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Duval	SJRWMD	T-Line - Greenland Substation to GEC - Reclaimed Water System Expansion	JEA	Installation of 8,000 feet of 30" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.12	$3.10	$1,000	2024	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Duval	SJRWMD	Tredinick Pkwy - Millcoe Rd to Mill Creek Rd - Reclaimed Water System Expansion	JEA	Installation of 5,800 feet of 12", 1,000 feet of 10", and 4,300 feet of 4" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.04	$1.57	$1,000	2019	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Duval/St. Johns	SJRWMD	US 1 - Greenland WRF to CR 210 - Reclaimed Water System Expansion	JEA	Installation of 30,000 feet of 20" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.06	$7.80	$1,000	2022	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Duval	SJRWMD	Queens Harbor Reclaimed Water Main Expansion	JEA and Queens Harbor Golf and Country Club	This project will provide reclaimed water to Queens Harbor. A planned 6" reclaimed water main will be installed from an existing reclaimed water main located adjacent to Wonderwood Road. The estimated length of pipe to be installed is 6,265 feet in addition to flow metering and flow control devices.	Reuse - Pipeline	Reclaimed Water	0.30	$0.46	$1,000	2014	
Duval	SJRWMD	Intermediate Well Conversion	San Jose Country Club	Installation of an intermediate zone well to a depth of 450 feet to produce approximately 25,200 gallons per day, thus reducing pumping from the Floridan aquifer.	AWS	Intermediate aquifer	0.27	$0.03	$4,800	2016	

County	Water Management District	Project Name	Implementing Entity	Project Description	Project Type	Water Source	Estimated Water Supply Benefit (mgd)	Total Capital ($M)	Estimated Annual O&M	Timeframe for Completion*	Notes
Flagler	SJRWMD	State Street Irrigation System Expansion	City of Bunnell	Extend reclaimed water mains to their public park and two median enhancement projects along the US1 and SR100 crossroads. The goal is to be able to utilize the city's reclaim water for maximum irrigation and reduce the amount of well water being used while reducing the nutrient loading rate and wet weather discharge from the city's Wastewater Treatment Facility into Old Haw Creek.	Reuse - Pipeline	Reclaimed Water	0.10	$0.05	$1,500	2016	
Flagler	SJRWMD	Palm Coast Grand Landing Reclaimed Water Transmission Main	City of Palm Coast	Construct 6,750 linear feet of 16" PVC transmission line and 350 linear feet of 18" HDPE transmission line with associated fittings, valves and site work.	Reuse - Pipeline	Reclaimed Water	0.56	$0.70	$1,000	2017	
Flagler	SJRWMD	Palm Coast Matanzas Woods Reclaimed Pipeline	City of Palm Coast	Construct a reclaimed water transmission main extension along Matanzas Woods Pkwy. between Old Kings Rd. and US 1. The capacity of this project is >2 mgd and will supply irrigation demands with reclaimed water in lieu of potable or local groundwater.	Reuse - Pipeline	Reclaimed Water	2.00	$2.53	$1,000	2016	
Flagler	SJRWMD	Palm Coast RCW Irrigation Along US-1 & Palm Coast Park	City of Palm Coast	Install a reclaimed water transmission main over Matanzas Woods Parkway from the east side of I-95 to the west side of I-95 to US#1 to make use of WWTP#1 Reclaimed water for irrigation and aquifer recharge.	Reuse - Pipeline	Reclaimed Water	1.00	$1.50	$1,000	2017	
Flagler	SJRWMD	Palm Coast Royal Palms Parkway Reclaimed Water Line	City of Palm Coast	Construct a 6,000' of reclaimed water transmission main extension along Royal Palms Parkway between Town Center Boulevard and Belle Terre Parkway to supply residents with reclaimed water for irrigation in lieu of a stormwater pond.	Reuse - Pipeline	Reclaimed Water	0.05	$0.30	$2,000	2015	
Flagler	SJRWMD	Palm Coast Utilization of Concentrate as Raw Water Supply	City of Palm Coast	Install cartridge filters and ozone treatment system to allow concentrate to be used as an alternative water supply source when blended with treated water.	AWS	Concentrate	0.75	$1.24	$7,800	2015	
Nassau	SJRWMD	Nassau Area - Radio Av - Reclaimed Water Storage Tank and Booster Pump Station	JEA	1.0 MG storage tank and 1,000 gpm high service pumps.	Reuse - Storage and Pumping	Reclaimed Water	1.44	$3.29	$5,000	2019	
Nassau	SJRWMD	Nassau Regional WWTF Reclaimed Water Storage Tank, UV Disinfection and Pumps	JEA	1.0 MG storage tank, 1,500 gpm high service pumps, and high level UV disinfection.	Reuse - Storage, Pumping and Supply	Reclaimed Water	2.16	$6.12	$20,000	2019	
Nassau	SJRWMD	William Burgess Rd - SR200 to Harts Rd - Trans - New - Reclaimed Water System Expansion	JEA	Installation of 13,000 feet of 16" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.46	$2.50	$5,500	2017	
Nassau	SJRWMD	Nassau RW Main - Radio Av to Harts Rd - Trans - Reclaimed Water System Expansion	JEA	Installation of 11,000 feet of 16" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.04	$2.30	$1,000	2019	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Nassau	SJRWMD	T-Line - Amelia Concourse to Amelia National - Reclaimed Water System Expansion	JEA	Installation of 5,700 feet of 10" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.02	$0.80	$1,000	2021	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
Putnam	SJRWMD	Vulcan Upper to Lower Floridan Aquifer Well Conversion	Vulcan and SJRWMD	Constructing a new lower Floridan aquifer well to replace an existing upper Floridan well.	Change of source	Lower Floridan Aquifer	2.61	$0.76	$64,000	2017	
St. Johns	SJRWMD	Bartram Park Reclaimed Water Storage Tank Expansion	JEA	This project adds 2.5 mgd more of storage to support peak demands. Bartram repumps reclaimed water supplied by 2 major wastewater facilities (Arlington East & Mandarin) to support St. Johns County demands, which is currently 7,000 customers. This second tank will provide an additional 5 hours of peak supply at the current pumping rate of 11 mgd.	Reuse - Storage	Reclaimed Water	0.53	$2.10	$21,000	2017	
St. Johns	SJRWMD	Bartram Trail HS - Longleaf Pine Pkwy - Reclaimed Water System Expansion	JEA	Installation of 2,600 feet of 6" reclaimed water main to serve the Bartram High School.	Reuse - Pipeline	Reclaimed Water	0.13	$0.24	$1,000	2023	
St. Johns	SJRWMD	Nocatee Booster Station	JEA	Allows for increased reclaimed water delivery capacity from 3800 to 4650 gpm (5.5 to 6.7 MGD).	Reuse - Pumping	Reclaimed Water	1.20	$1.35	$3,000	2016	
St. Johns	SJRWMD	Nocatee Coastal Oaks Phase 4	JEA	Supply new residents with reclaimed water for irrigation in lieu of potable water by constructing a reclaimed water transmission main extension in the Nocatee Coastal Oaks Phase 4 – R area. The quantity of water expected from this project is 2 mgd and consists of 4,500' of 12" diameter pipe.	Reuse - Supply	Reclaimed Water	2.00	$1.06	$1,000	2016	
St. Johns	SJRWMD	Nocatee South Reclaimed Water Storage Tank and Booster Pump Station	JEA	2.0 Mgal storage tank and high service pumps.	Reuse - Storage and Pumping	Reclaimed Water	2.00	$3.50	$2,000	2021	
St. Johns	SJRWMD	RiverTown WTP - Reclaimed Water - New Storage and Pumping System	JEA	2.0 Mgal storage tank and high service pumps.	Reuse - Storage and Pumping	Reclaimed Water	2.00	$3.95	$2,000	2021	
St. Johns	SJRWMD	Twin Creeks Reclaimed Water Storage Tank and Booster Pump Station	JEA	2.0 Mgal storage tank and high service pumps.	Reuse - Storage and Pumping	Reclaimed Water	2.00	$3.50	$2,000	2021	
St. Johns	SJRWMD	CR210 - Longleaf Pine Pkwy to Ashford Mills Rd - Reclaimed Water System Expansion	JEA	Installation of 11,600 feet of 30" and 2,300 feet of 16" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.16	5.00	$1,000	2023	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	CR210 - Old Dixie Hwy to Twin Creeks - Trans - Reclaimed Water System Expansion	JEA	Installation of 9,500 feet of 20" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.06	2.30	$1,000	2019	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	CR210 - South Hampton to Ashford Mills - Trans - Reclaimed Water System Expansion	JEA	Installation of 7,400 feet of 12" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.02	0.65	$1,000	2018	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	CR210 - St Johns Pkwy to Leo Maguire Pkwy - Reclaimed Water System Expansion	JEA	Installation of 9,000 feet of 8" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.01	1.12	$1,000	2024	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	CR210 - Twin Creeks to Russell Sampson Rd - Reclaimed Water System Expansion	JEA	Installation of 12,000 feet of 20" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.06	3.00	$1,000	2021	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools

County	Water Management District	Project Name	Implementing Entity	Project Description	Project Type	Water Source	Estimated Water Supply Benefit (mgd)	Total Capital ($M)	Estimated Annual O&M	Timeframe for Completion*	Notes
St. Johns	SJRWMD	Greenbriar Rd - Longleaf Pine Pkwy to Spring Haven Dr - Reclaimed Water System Expansion	JEA	Installation of 13,500 feet of 20" reclaimed water main to serve as a transmission pipeline	Reuse - Pipeline	Reclaimed Water	0.06	3.50	$1,000	2021	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	Nocatee - Coastal Oaks Phase 4 - Reclaimed Water System Expansion	JEA	Installation of 3,400 feet of 12" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.02	0.17	$1,000	2016	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	Nocatee Area - Artisan Lakes - N10 - Reclaimed Water System Expansion	JEA	Installation of 4,200 feet of 12" reclaimed water main to serve as a gridded transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.02	0.23	$1,000	2016	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	Nocatee Area - Crosswater Pkwy - Coastal Oaks to South Village - Reclaimed Water System Expansion	JEA	Installation of 8,400 feet of 16" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.04	0.39	$1,000	2017	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	Nocatee Area - Riverwood POD 17 - Reclaimed Water System Expansion	JEA	Installation of 4,500 feet of 12" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.02	0.17	$1,000	2016	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	Nocatee Area - Twenty Mile Village - Reclaimed Water System Expansion	JEA	Installation of 8,400 feet of 12" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.02	0.30	$1,000	2016	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	Nocatee Area - Twenty Mile Village Ph 4A - 4B - Reclaimed Water System Expansion	JEA	Installation of 1,400 feet of 12" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.02	0.32	$1,000	2016	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	Nocatee North Storage and Repump Facility - New 3.5 MG Reclaimed Water Storage Tank	JEA	Installation of a new 3.5 Mgal storage tank.	Reuse - Storage	Reclaimed Water	0.07	2.50	$1,000	2017	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	Nocatee Storage and Repump Facility Tank Expansion	JEA	Increase storage tank capacity from 1.009 to 1.178 Mgal.	Reuse - Storage	Reclaimed Water	0.003	0.29	$1,000	2016	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	Rivertown - Parcel 13 - Southern POD - Reclaimed Water System Expansion	JEA	Installation of 1,800 feet of 10" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.02	0.06	$1,000	2017	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	Russell Sampson Rd - St. Johns Pkwy to CR210 - Reclaimed Water System Expansion	JEA	Installation of 12,000 feet of 20" reclaimed water main to serve as a transmission pipeline	Reuse - Pipeline	Reclaimed Water	0.06	2.50	$1,000	2021	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	St Johns Pkwy - Racetrack Rd to Espada Ln - Reclaimed Water System Expansion	JEA	Installation of 5,000 feet of 8" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.01	0.55	$1,000	2018	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	Veterans Pkwy - Longleaf Pine Pkwy to CR210 - Reclaimed Water System Expansion	JEA	Installation of 20,000 feet of 30" and 3,700 feet of 20" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.06	8.80	$1,000	2024	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	Bannon Lakes 2 MG Reclaimed Water Storage and Booster Pump Station	SJCUD	2.0 MG storage tank, 2,500 gpm booster pump station, control valve, electrical building, civil site work and yard piping, and associated electrical and instrumentation. The project will supply reclaimed water to new residential customers along International Golf Parkway just east of I-95. The additional storage will allow the County to collect reclaimed water during times of low irrigation demand to be utilized to serve peak irrigation demands. This offsets augmentation supply and conserves groundwater use for over 1,300 homes and commercial properties. As a result of increasing the reclaimed water system storage, the County will be able to reduce the discharge from the Northwest Wastewater Treatment Plant to Mill Creek, a tributary of Six Mile Creek and the lower St. Johns River.	Reuse - Storage and Pumping	Reclaimed Water	0.05	$2.00	$18,000	2017	
St. Johns	SJRWMD	City of St. Augustine Beach Reclaimed Water System Expansion	SJCUD	10" reuse main east from the Anastasia Island WWTP along 16th Street to A1A to serve the St. Augustine Beach City Hall and park, continuing southeast to serve a new 73 home subdivision, Ocean Ridge. The new reuse main would also allow future service to customers along the route. The additional conveyance will allow the County to offset potable water demand, conserving groundwater. As a result of expanding the reclaimed water system, the County will be able to reduce the discharge from the Anastasia Island WWTP to the Matanzas River.	Reuse - Pipeline	Reclaimed Water	0.05	$0.50	$1,000	2017	
St. Johns	SJRWMD	CR 2209 Corridor Reclaimed Water System Expansion	SJCUD	20" reuse main along the future County Road 2209. The project will supply reclaimed water to new residential customers along this corridor, including Steeplechase and Smith Ranch. The additional conveyance will allow the County to offset potable water demand, conserving groundwater use for at least 1,900 homes. As a result of expanding the reclaimed water system, the County will be able to reduce the discharge from the Northwest Wastewater Treatment Plant to Mill Creek, a tributary of Six Mile Creek and the lower St. Johns River.	Reuse - Pipeline	Reclaimed Water	0.57	$2.00	$1,000	2017	
St. Johns	SJRWMD	Develop supplemental reclaimed water source from stormwater harvesting (Potential I-95 Corridor)	SJCUD	Potential partnership with FDOT to supplement reclaimed water system in the Northwest service area with harvested stormwater from I-95 corridor expansion.	Reuse - Supply	Stormwater	2.00	$14.50	$212,000	2025	
St. Johns	SJRWMD	Fox Creek Stormwater Harvesting Station	SJCUD	St. Johns County owns a stormwater pond (over 200 MG of storage) on Fox Creek relatively near the SR-16 Wastewater Treatment Facility. As part of the SJCUD Integrated Water Resource Plan, developing a supplemental reclaimed water source from the Fox Creek facility was one of the recommended options. Feasibility study is underway to determine usable volume, treatment and routing options.	Reuse - Supply	Stormwater	0.23	$6.58	$32,000	2018	
St. Johns	SJRWMD	NW WWTF Reclaimed Water System Expansions/Improvements	SJCUD	Construction of a 2 MG tank and reuse booster station on the new NW WWTF site, and 5,500 lf of offsite 20" reclaimed water transmission main to provide high pressure service to reuse customers located in the SJCUD NW service area. The construction project received SRF Loan funding from FDEP.	Reuse - Pipeline, Storage, Pumping	Reclaimed Water	3.00	$2.55	$110,000	2016	

County	Water Management District	Project Name	Implementing Entity	Project Description	Project Type	Water Source	Estimated Water Supply Benefit (mgd)	Total Capital ($M)	Estimated Annual O&M	Timeframe for Completion*	Notes
St. Johns	SJRWMD	South WRF and Reuse System Expansion	SJCUD	Construction of a 1 MGD AADF Water Reclamation Facility and associated reclaimed water infrastructure to serve new development in the southern SJCUD service area.	Reuse - Storage and Pumping, and Pipeline	Reclaimed Water	1.00	$26.80	$486,000	2025	
St. Johns	SJRWMD	SR 16 Corridor Reclaimed Water System Expansions/Improvements	SJCUD	Improvements consisted of several projects to increase capacity of reclaimed water sent from the SR 16 WWTP and provide high pressure service along SR16 to the World Golf Village area to interconnect with the NW WWTF reuse system. Projects included an inline booster station at the Turnbull Booster Site, a 1 MG GST at the SR 16 WWTP site, a 1.5 MG tank at the Turnbull Booster Site. The inline booster project received SRF Loan funding, and the SR 16 GST received a 1/3 funding grant from the SJRWMD.	Reuse - Pipeline, Storage, Pumping	Reclaimed Water	1.00	$3.13	$39,000	2016	
St. Johns	SJRWMD	Twin Creeks 1.5 MG Reclaimed Water Storage and Booster Pump Station	SJCUD	1.5 MG reuse storage tank, 4,200 gpm booster pump station, control valve, electrical building, civil site work and yard piping, and associated electrical and instrumentation. The project will supply reclaimed water to new residential and commercial customers within the Twin Creeks Development located along CR 210W just west of US Highway 1. The additional storage will allow the County to collect reclaimed water during times of low irrigation demand to be utilized to serve peak irrigation demands. This offsets augmentation supply and conserves groundwater use for over 2,000 homes and commercial properties. This project will allow the County to serve the Twin Creeks DRI with reclaimed water for irrigation via a bulk service agreement with JEA, and will reduce nutrient loading to the St Johns River by beneficially reusing wastewater effluent from JEA's Reclaimed Water System.	Reuse - Storage and Pumping	Reclaimed Water	0.60	$1.75	$25,000	2018	
St. Johns	SJRWMD	WGV Area Stormwater Harvesting	SJCUD	Harvested stormwater will be collected from a large stormwater system located at the head of the Mill Creek basin in northwest St. Johns County. Once collected, the stormwater will be filtered and disinfected to public access reuse standards, and distributed through the County's reuse transmission system. The County will construct an intake structure in the stormwater basin, install control valves, piping, filtration and disinfection systems, and a new pump station to inject the water into the reclaimed water distribution system. County is currently evaluating feasibility.	Reuse - Supply	Stormwater	0.23	$1.40	$12,000	2018	
St. Johns	SJRWMD	CR 214 Water Blending Station	SJCUD	Improvements to the CR 214 WTP site to allow for water quality conditioning of water transferred from the NW Grid to be blended and distributed into the Mainland Water System. Project helps to meet growing demands and helps sustain water quality in the Tillman Ridge Wellfield.	Interconnect	Floridan	0.06	2.67	$25,000	2017	Moved from Appendix L, Added Water Supply Benefit and O&M cost
St. Johns	SJRWMD	SR 16 Water Main Interconnect	SJCUD	20" Water Main Extension along SR 16 to connect the NW WTP grid to the CR 214 WTP grid. Project transfers service of the SR 16 corridor to the NW WTP and serves as first phase to allow up to 2 MGD of water to be transferred from the NW grid to the CR 214/Mainland Grid to help meet growing supply demands and help maintain water quality in the Tillman Ridge Wellfield.	Interconnect	Floridan	0.06	1.97	$1,000	2014	Moved from Appendix L, Added Water Supply Benefit and O&M cost from SJRWMD Cost Tools
St. Johns	SJRWMD	AI WWTP Reuse Storage Tank and Booster Pump Station	SJCUD/ SJRWMD	Construction of a 1 MG tank and reuse booster station to provide high pressure service to reuse customers near the AI WWTP facility. Ultimate goal is to provide reuse service to new developments with in a 2 mile radius of the facility. SJRWMD awarded a grant to fund 1/3 of the construction cost.	Reuse - Storage and Pumping	Reclaimed Water	2.00	$1.51	$12,000	2016	
St. Johns	SJRWMD	International Golf Parkway - Reclaimed Water System Expansion	SJCUD/ SJRWMD	Installation of a 20" and 16" Reuse WM (approx 13,500 lf total) along International Golf Parkway (IGP) to serve as the transmission main from the Northwest WRF for future development in the World Golf Village area (SJCUD Northwest Service Area). The transmission main will ultimately serve future development east of I-95 along IGP, the bulk of which will be residential reuse for irrigation. SJRWMD awarded a grant to fund 1/3 of the construction cost.	Reuse - Pipeline	Reclaimed Water	0.42	$2.40	$2,000	2016	
						Total:	**97.16**	**$309.12**			

*Project Status- Projects with past dates have been completed. Projects with 2016-2017 dates are under construction. All other projects have not started

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County	Water Management District	Project Name	Implementing Entity	Project Description	Project Type	Water Source	Estimated Water Supply	Total Capital ($M)	Timeframe for Completion	Notes
Alachua	SJRWMD or SRWMD	Groundwater Recharge Wetlands	GRU	Construction of groundwater recharge wetlands (location not yet defined).	Reuse - Recharge	Reclaimed Water	1.5	2.00 to 6.00	2035	
Alachua	SRWMD	S.R. 26 Water Supply Project	Newberry	Construct a new potable water well with a water main and an elevated storage tank.	Supply	Floridan	TBD	4.90	2035	
Bradford	SRWMD	Rayonier South WRD Area	SRWMD	Restore natural flows, with or without aquifer recharge wells.	Recharge	Surface Water	TBD	TBD	2035	
Clay	SJRWMD	CCUA AWS Initiative	CCUA	Various AWS projects currently being considered for selection and development; currently in study for feasibility, economy, etc.	Supply/Storage	Storm/Surface Water	TBD	0.00 to 103.00	2030	
Clay	SJRWMD	CCUA Data Analytics	CCUA	~~Sensus Analytics o~~Outreach/conservation project for our entire potable water system. This project will have and initial cost of approximately $263,000 and a reoccurring annual cost of approximately $240,000. Project capacity based on current CCUA demand.	Conservation	N/A	TBD	TBD	2020	Removed reference to specific company
~~Clay~~	~~SJRWMD~~	~~Reclaimed Water Ground Storage Tanks~~	~~CCUA~~	~~Old Jennings and Ridaught Reclaimed Water Treatment Plants 0.75 MG Ground Storage Tanks (x2).~~	~~Reuse - Storage~~	~~Reclaimed Water~~	~~TBD~~	~~1.25~~	~~2018~~	Moved to Appendix K
Clay	SJRWMD	Reclaimed Water SCADA System	CCUA	Automated SCADA System for handling/ diverting existing Reclaim Water Demand (2015 was 4.51 MGD avg.).	Reuse	Reclaimed Water	TBD	0.68	2016	
Clay	SJRWMD	ACES Project 1 – Clean Alligator Creek Part A	SOLO	Increase flow of Alligator Creek to Lake Brooklyn by surveying, cleaning out debris, and correcting sedimentation caused by low flow conditions, all of which will help to restore inflow to Lake Brooklyn.	Recharge	Stormwater	TBD	0.10	2016	
Clay	SJRWMD	ACES Project 10 – Lake Santa Fe water to Lake Geneva	SOLO	Redirect 5 MGD of surface water by pumping and conveyance structures from Lake Santa Fe to Lake Geneva for recharge.	Recharge	Surface water	TBD	0.30	2019	
Clay	SJRWMD	ACES Project 11– Lake Brooklyn Water to Lake Geneva	SOLO	Redirect 3 MGD of surface water by gravity outflow conveyance from Lake Brooklyn to Lake Geneva for recharge.	Recharge	Surface water	TBD	0.10	2018	
Clay	SJRWMD	ACES Project 12 – Lower Florida Aquifer Water Recharge Lakes	SOLO	Have CCUA pump at the same volume flow conditions, and release water not consumed by its users to Lake Geneva for recharge credit, offsetting the cumulative impact of CCUA drawdown on the Keystone Lakes.	Recharge	Floridan	TBD	0.40	2017	
Clay	SJRWMD	ACES Project 3 – Increase Chemours D002 Water Releases – Pumping to OMA and Etoniah Chain of Lakes	SOLO	Changing flow apportionment and timing initially, and eventually increasing flow capacity of piping and pumping system by replacement with greater capacity systems.	Recharge	Stormwater	TBD	0.25	2018	
Clay	SJRWMD	ACES Project 4 – Plan Chemours Reclamation to Direct Water toward the Etoniah Chain of Lakes	SOLO	Direct water that originates in the mine site by engineering reclamation to deliver and convey water from north to south (rather than east to west), and be pumped up to the Old Minded Area for filtration and storage before release to Alligator Creek South and the Etoniah Chain of Lakes.	Recharge	Stormwater	TBD	3.00	2020	
Clay	SJRWMD	ACES Project 5 – Channelize Alligator Creek near Lake Brooklyn	SOLO	Survey, channelize by sediment removal and stabilized creek bed, reducing sediment impediments to flow and navigation.	Recharge	Stormwater	TBD	0.50	2017	
Clay	SJRWMD	ACES Project 6 – Piping First Coast Outer Beltway Stormwater Runoff to the OMA and Etoniah Chain of Lakes	SOLO	First Coast Outer Beltway (FCOB) to pump station north of Middleburg Florida and Trail Ridge, to storage pond near OMA Camp Blanding; ultimately the Etoniah Chain of Lakes and Etoniah Creek.	Recharge	Stormwater	TBD	10.00	2023	
Clay	SJRWMD	ACES Project 7 – Piping treated water from Starke, FL	SOLO	Construct a pipeline from the City of Starke Water Treatment Plant to the Northeast corner of the OMA. Employ natural sand filtration and purification processes of the unreclaimed mine site with its purified sand to deliver high-quality, low nutrient water to the Etoniah Chain of Lakes.	Recharge	Reclaimed	TBD	0.10	2017	
Clay	SJRWMD	ACES Project 8 – JEA Treated and Reuse Water to Trail Ridge Corridor and OMA (Camp Blanding) and Etoniah Lakes	SOLO	JEA Redirect 20 MGD of effluent from SJR to Trail Ridge Corridor and OMA for purification and recharge.	Recharge	Reclaimed	TBD	10.00	2025	
Clay	SJRWMD	ACES Project 9 – Black Creek Water to Trail Ridge Corridor and OMA (Camp Blanding) and Etoniah Lakes.	SOLO	CCUA Redirect 5 MGD of surface water from Black Creek near SJR to Trail Ridge Corridor and OMA for purification and recharge.	Recharge	Surface water	TBD	3.00	2023	
~~Duval~~	~~SJRWMD~~	~~Bartram Park WTP - RW - Storage Expansion~~	~~JEA~~	~~Installation of a new 2.5 Mgal storage tank.~~	~~Reuse - Storage~~	~~Reclaimed Water~~	~~0~~	~~2.15~~	~~2017~~	Moved to Appendix K
~~Duval~~	~~SJRWMD~~	~~Baymeadows Rd - Point Meadows Rd to Old Still PUD - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 9,500 feet of 8" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~1.00~~	~~2020~~	Moved to Appendix K
~~Duval~~	~~SJRWMD~~	~~Davis - Gate Pkwy to RG Skinner - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 13,700 feet of 30" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~5.00~~	~~2024~~	Moved to Appendix K
~~Duval~~	~~SJRWMD~~	~~District 2 WWTF Reclaimed Water Storage Tank and Booster Pump Station~~	~~JEA~~	~~1.0 MG storage tank.~~	~~Reuse - Storage~~	~~Reclaimed Water~~	~~0~~	~~2.90~~	~~2019~~	Moved to Appendix K
~~Duval~~	~~SJRWMD~~	~~District II - Broward River Crossing Replacement~~	~~JEA~~	~~Installation of 2,800 feet of 24" of reclaimed water transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~4.84~~	~~2016~~	Moved to Appendix K
~~Duval~~	~~SJRWMD~~	~~Gate Pkwy - Glen Kernan to T-Line - Trans - New - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 18,000 feet of 30" and 2,000 feet of 20" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~8.50~~	~~2020~~	Moved to Appendix K
~~Duval~~	~~SJRWMD~~	~~Gate Pkwy - Shiloh Mill Blvd to Town Ctr Pkwy - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 2,300 feet of 8" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~0.33~~	~~2018~~	Moved to Appendix K
~~Duval~~	~~SJRWMD~~	~~JP - FDOT - SR 9A (I-295) - Managed Lanes - JTB - 9B Extension - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 1,300 feet of 20" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~0.31~~	~~2017~~	Moved to Appendix K
~~Duval~~	~~SJRWMD~~	~~Mandarin Water Reclamation Facility - Equalization Storage Tank and Transfer Pump Station~~	~~JEA~~	~~1.7 MG storage tank and a high service pumping upgrade from 5.7 to 8.75 MGD to increase supply available for public access reuse.~~	~~Reuse - Storage and Pumping~~	~~Reclaimed Water~~	~~0~~	~~2.56~~	~~2017~~	Moved to Appendix K
~~Duval~~	~~SJRWMD~~	~~Monument Rd - Arlington East WRF to St Johns Bluff Rd - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 7,900 feet of 20" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~3.30~~	~~2023~~	Moved to Appendix K
~~Duval~~	~~SJRWMD~~	~~RG Skinner Area - 9B to Parcels 10A - 11 - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 2,900 feet of 30" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~1.11~~	~~2017~~	Moved to Appendix K

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County	Water Management District	Project Name	Implementing Entity	Project Description	Project Type	Water Source	Estimated Water Supply	Total Capital ($M)	Timeframe for Completion	Notes
~~Duval~~	~~SJRWMD~~	~~RG Skinner Area - 9B to T-Line - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 3,600 feet of 30" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~1.23~~	~~2017~~	Moved to Appendix K
~~Duval~~	~~SJRWMD~~	~~T-Line - Greenland Substation to GEC - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 8,000 feet of 30" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~3.10~~	~~2024~~	Moved to Appendix K
~~Duval~~	~~SJRWMD~~	~~Tredinick Pkwy - Millcoe Rd to Mill Creek Rd - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 5,800 feet of 12", 1,000 feet of 10", and 4,300 feet of 4" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~1.57~~	~~2019~~	Moved to Appendix K
~~Duval/St. Johns~~	~~SJRWMD~~	~~US 1 - Greenland WRF to CR 210 - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 30,000 feet of 20" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~7.80~~	~~2022~~	Moved to Appendix K
Flagler	SJRWMD	Replacement Well 12R	Flagler Beach	Drill Well 12-R to replace Well 12 that collapsed during construction in 2009.	Supply	Floridan	0	0.26	2016	
Flagler	SJRWMD	Indirect Potable Reuse through Aquifer Recharge	Palm Coast	Recharging the Palm Coast Northern Wellfield aquifer system including rehydration of wetlands utilizing membrane filtration will provide highly treated wastewater for reclamation.	Reuse - Supply	Reclaimed Water	TBD	TBD	TBD	
Flagler	SJRWMD	Rainwater (Stormwater) Harvesting (Capture, Storage and Retention) resulting in Aquifer Recharge and increased storage time possibly improving water quality through nutrient reduction	Palm Coast	The City of Palm Coast has a large (54 miles X 80 Ft X 4 Ft = 682,463,232 gallons stored) fresh stormwater canal system spread throughout the western portion of the City. While designed as a floodwater management system, it collects stormwater from swales and ditches throughout Palm Coast and acts as a surface water reservoir.	Recharge	Stormwater	TBD	TBD	TBD	
Flagler	SJRWMD	Reuse of Reclaimed Wastewater	Palm Coast	This project would provide a means to reduce or eliminate discharge of excess reuse water to the Intracoastal Waterway. Utilizing excess reuse water for improving natural systems by rehydration of wetlands and recharge of the Northern Wellfield aquifer systems will mitigate any negative impacts from Public Water Supply withdrawals and providing a new source of supply in that region.	Recharge	Reclaimed	TBD	TBD	TBD	
Flagler	SJRWMD	Upper Floridan Aquifer Brackish Water Supply	Palm Coast	Develop a brackish alternative groundwater source for treatment at the Palm Coast Low Pressure Reverse Osmosis Plant.	Supply	Floridan	TBD	TBD	TBD	
Gilchrist	SRWMD	Water System Improvements	Trenton	Replacement of failing galvanized water mains within the City's distribution system and construction of a back-up production well.	Supply	Floridan	0	4.80	2018	
~~Nassau~~	~~SJRWMD~~	~~Nassau RW Main - Radio Av to Harts Rd - Trans - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 11,000 feet of 16" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~2.30~~	~~2019~~	Moved to Appendix K
~~Nassau~~	~~SJRWMD~~	~~T-Line - Amelia Concourse to Amelia National - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 5,700 feet of 10" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~0.80~~	~~2021~~	Moved to Appendix K
St. Johns	SJRWMD	St. Augustine Water Supply/LPRO Phase 2	COSA	Increase LPRO production from 2 mgd to 4 mgd.	Supply	Floridan	0	8.08	2016	
~~St. Johns~~	~~SJRWMD~~	~~CR210 - Longleaf Pine Pkwy to Ashford Mills Rd - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 11,600 feet of 30" and 2,300 feet of 16" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~5.00~~	~~2023~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~CR210 - Old Dixie Hwy to Twin Creeks - Trans - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 9,500 feet of 20" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~2.30~~	~~2019~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~CR210 - South Hampton to Ashford Mills - Trans - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 7,400 feet of 12" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~0.65~~	~~2018~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~CR210 - St Johns Pkwy to Leo Maguire Pkwy - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 9,000 feet of 8" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~1.12~~	~~2024~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~CR210 - Twin Creeks to Russell Sampson Rd - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 12,000 feet of 20" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~3.00~~	~~2021~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~Greenbriar Rd - Longleaf Pine Pkwy to Spring Haven Dr - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 13,500 feet of 20" reclaimed water main to serve as a transmission pipeline~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~3.50~~	~~2021~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~Nocatee - Coastal Oaks Phase 4 - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 3,400 feet of 12" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~0.17~~	~~2016~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~Nocatee Area - Artisan Lakes - N10 - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 4,200 feet of 12" reclaimed water main to serve as a gridded transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~0.23~~	~~2016~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~Nocatee Area - Crosswater Pkwy - Coastal Oaks to South Village - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 8,400 feet of 16" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~0.39~~	~~2017~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~Nocatee Area - Riverwood POD 17 - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 4,500 feet of 12" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~0.17~~	~~2016~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~Nocatee Area - Twenty Mile Village - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 8,400 feet of 12" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~0.30~~	~~2016~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~Nocatee Area - Twenty Mile Village Ph 4A - 4B - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 1,400 feet of 12" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~0.32~~	~~2016~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~Nocatee North Storage and Repump Facility - New 3.5 MG Reclaimed Water Storage Tank~~	~~JEA~~	~~Installation of a new 3.5 Mgal storage tank.~~	~~Reuse - Storage~~	~~Reclaimed Water~~	~~0~~	~~2.50~~	~~2017~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~Nocatee Storage and Repump Facility Tank Expansion~~	~~JEA~~	~~Increase storage tank capacity from 1.009 to 1.178 Mgal.~~	~~Reuse - Storage~~	~~Reclaimed Water~~	~~0~~	~~0.29~~	~~2016~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~Rivertown - Parcel 13 - Southern POD - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 1,800 feet of 10" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~0.06~~	~~2017~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~Russell Sampson Rd - St. Johns Pkwy to CR210 - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 12,000 feet of 20" reclaimed water main to serve as a transmission pipeline~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~2.50~~	~~2021~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~St Johns Pkwy - Racetrack Rd to Espada Ln - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 5,000 feet of 8" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~0.55~~	~~2018~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~Veterans Pkwy - Longleaf Pine Pkwy to CR210 - Reclaimed Water System Expansion~~	~~JEA~~	~~Installation of 20,000 feet of 30" and 3,700 feet of 20" reclaimed water main to serve as a transmission pipeline.~~	~~Reuse - Pipeline~~	~~Reclaimed Water~~	~~0~~	~~8.80~~	~~2024~~	Moved to Appendix K

North Florida Regional Water Supply Plan
Potential Water Supply Development, Water Resource Development and Water Conservation Project Options

County	Water Management District	Project Name	Implementing Entity	Project Description	Project Type	Water Source	Estimated Water Supply	Total Capital ($M)	Timeframe for Completion	Notes
~~St. Johns~~	~~SJRWMD~~	~~CR 214 Water Blending Station~~	~~SJCUD~~	~~Improvements to the CR 214 WTP site to allow for water quality conditioning of water transferred from the NW Grid to be blended and distributed into the Mainland Water System. Project helps to meet growing demands and helps sustain water quality in the Tillman Ridge Wellfield.~~	~~Interconnect~~	~~Floridan~~	~~0~~	~~2.67~~	~~2017~~	Moved to Appendix K
~~St. Johns~~	~~SJRWMD~~	~~SR 16 Water Main Interconnect~~	~~SJCUD~~	~~20" Water Main Extension along SR 16 to connect the NW WTP grid to the CR 214 WTP grid. Project transfers service of the SR 16 corridor to the NW WTP and serves as first phase to allow up to 2 MGD of water to be transferred from the NW grid to the CR 214/Mainland Grid to help meet growing supply demands and help maintain water quality in the Tillman Ridge Wellfield.~~	~~Interconnect~~	~~Floridan~~	~~0~~	~~1.97~~	~~2014~~	Moved to Appendix K

From:	Lisa Rinaman
To:	nfrwsp-comments; John Fitzgerald
Subject:	SJRK NFRWSP Comments
Date:	Monday, December 05, 2016 4:17:33 PM
Attachments:	SJRK - NFWSP 12-5-16.pdf 2016.12-02 FINAL NFRWSP Review Comments_FSC (1).pdf

Good afternoon.

Attached are comments submitted on behalf of the St. Johns Riverkeeper voicing our concern regarding the North Florida Regional Water Supply Plan. Please see attached.

Thank you.

For the River!

Lisa Rinaman
St. Johns Riverkeeper
lisa@stjohnsriverkeeper.org
(904)509-3260

ST. JOHNS
RIVERKEEPER®

December 5, 2016

TO:	St. Johns River Water Management District Suwannee River Water Management District North Florida Regional Water Supply Partnership
FROM:	Lisa Rinaman St. Johns Riverkeeper

RE: North Florida Regional Water Supply Plan (NFRWSP) Public Comments

Clean, fresh water is the lifeblood of Florida's waterways. Our springs, wetlands, forests, riparian zones adjacent to waterways, and aquatic plants provide the habitat and food sources that sustain healthy plant, fish, and wildlife populations. Healthy, vibrant waterways and wildlife are Florida's competitive advantage driving our growing economy.

The St. Johns Riverkeeper's (SJRK) mission is to be an independent voice that defends, advocates, and activates others to protect and restore the St. Johns River.

We are concerned that the North Florida Regional Water Supply Plan (NFRWSP) falls short and will lead to unacceptable damage to Florida's natural systems and wildlife.

NFRWSP FAILS TO MAKE WATER CONSERVATION A PRIORITY

Unfortunately, many effective tools driving water conservation have been eliminated recently due to budget cuts and special interests.

- Educational programs designed to promote water conservation have been abandoned.
- Incentive programs are lacking.
- Deregulation in Tallahassee relies on voluntary, less aggressive conservation measures.
- Enforcement of existing protective regulations is insufficient.

The State of Florida needs bold leadership to craft statewide water policy that prioritizes water conservation, sustainable building and planning practices, incentives that encourage the efficient use of water, and market solutions, such as aggressive conservation rates and pricing strategies for CUP withdrawals.

WATER CONSERVATION MUST BE A PRIORITY

"The overall conservation goal of the state is to prevent and reduce wasteful, uneconomical, impractical, or unreasonable use of water resources." (Section 373.227(1), F.S.)

Unfortunately, our limited public resources are being directed towards new risky sources of water instead of addressing the root causes of our water supply problems and exhausting all opportunities to use existing water resources more efficiently.

Voluntary measures alone are not sufficient. Water pricing strategies and mandatory requirements must also be implemented and enforced to achieve maximum conservation and efficiency benefits.

Water conservation and smart growth management practices will not only protect Florida's long-term water supply but will also realistically save billions of dollars and potentially save Florida waters from significant harm. Water conservation will also save taxpayers billions of dollars by reducing the need for environmental restoration to restore the damage done by over consumption.

The bottom line is that water conservation does work, can potentially meet most if not all of our water supply needs, and is much more cost-effective and environmentally-responsible.

SJRK Endorses Florida Springs Council's NFRWSP Comments

The NFRWSP fails to protect Florida's natural resources. Adoption of the NFRWSP is premature and potentially damaging to the very natural resources it is intended to protect.

We formally endorse and incorporate Florida Springs Council's (FSC) NFRWSP Comments as our own.

The inherent flaws in the process, plans and justification outlined in the FSC NFRWSP Comments must be corrected and statutory obligations must be met.

We look forward to working with all stakeholders to achieve a balanced approach to Florida's water needs and the protection of Florida's natural resources.

For the river,

Lisa Rinaman
St. Johns Riverkeeper

Attached: FSC NFRWSP Comments

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www.SpringsForever.org

North Florida Regional Water Supply Plan (NFRWSP) Review Comments

Reviewed by the Florida Springs Council (FSC)

The Florida Springs Council is a consortium of thirty-nine springs-focused organizations that represent over 155,000 Floridians. The mission of the FSC is to ensure the regional, state, and federal conservation, preservation, protection, and restoration for future generations of Florida's springs, spring runs, and groundwater in the Floridan aquifer that sustains those natural systems and provides our drinking water.

The following organizations are members of the Council:

1,000 Friends of Florida
Alachua Audubon Society
Audubon Florida
Center for Biological Diversity
Center for Earth Jurisprudence
Chassahowitzka Civic Association, Inc.
Florida Clean Water Network
Florida Defenders of the Environment
Florida Federation of Garden Clubs, Inc.
Florida Paddling Trails Association
Florida Wildlife Federation
Friends of Lake Apopka
Friends of the Wekiva River
Friends of Warm Mineral Springs
Hernando Environmental Land Protectors
Homosassa River Alliance

Howard T. Odum Florida Springs Institute
Ichetucknee Alliance
Kings Bay Springs Alliance
Nature Coast Unitarian Universalist Fellowship Water Task Force
Oklawaha Valley Audubon Society
Orange Audubon Society
Our Santa Fe River
Paddle Florida
Putnam County Environmental Council
Rainbow River Conservation
Santa Fe Lake Dwellers Association
Save the Manatee Club
Sea to Shore Alliance
Sierra Club Florida
Silver Springs Alliance
Springs Eternal Project
St. Johns Riverkeeper
Suwannee/St. Johns Sierra Club
Villages Environmental Discussion
Volusia Blue Spring Alliance
Wakulla Springs Alliance
Withlacoochee Aquatic Restoration
WWALS Watershed Coalition

The following comments are submitted by the Council on behalf of its member organizations.

Executive Summary

The Plan is a regional water supply plan that must comply with Section 373.709(2), Florida Statutes. The Plan also will adopt the second phase of the recovery strategy for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs (LSFI) MFLs and must therefore comply with Section 373.0421(2), Florida Statutes. Several of the priority springs protected by the LSFI MFLs are first magnitude springs (e.g., Santa Fe Rise, Treehouse Spring, Columbia Spring, Devil's Ear Spring, July Spring, Ichetucknee Head Spring, and Blue Hole). Therefore, the Plan and Recovery Strategy must meet the requirements of Section 373.805(4), Florida Statutes as well.

The Plan and Recovery Strategy fail to meet the requirements of Sections 373.709(2) and 373.0421(2) because the Plan fails to provide reasonable assurances that sufficient projects will be implemented to meet projected demand while providing the needed recovery of the LSFI MFLs. The Plan also fails to include important information Section 373.805(4) requires regarding priorities and funding for the recovery projects. The Plan and Recovery Strategy do not provide reasonable assurances that the LSFI MFLs will be recovered as required.

The Plan provides insufficient motivations and incentives for conservation. This Plan was to include long-term regulatory strategies, but only proposes designation as a Water Resource Caution Area. This designation requires reuse of domestic wastewater in certain circumstances when it is determined to be feasible, but does not fund or require reuse of domestic effluent. The designation does not address recovery strategies other than reuse of domestic wastewater. At a minimum, FSC urges Florida's legislature and water management agencies to implement universal water fees as a strong inducement to conserve water.

The pumping of brackish water is unsustainable and self-destructive. It should be avoided. Rather, FSC advises that new demands be met through aquifer recharge using treated wastewater that has been cleansed by recycling through constructed wetlands.

The Plan's Critical Sufficiency Analysis Relies on a Non-Scientific Assumption and Suffers Fatal Textual Errors

The Plan includes a "Sufficiency Analysis" addressing whether the Plan and LSFI Recovery Strategy could meet the regional water supply planning requirements of Section 373.709(2), Florida Statutes by including sufficient water resource development projects (WRDPs) and water supply development projects (WSDPs) to meet projected demands without causing unacceptable water resource impacts. Plan pp. 40-41. In this case, such project options must, along with conservation, provide recovery of LSFI MFL flows as well. §373.0421(2), Fla. Stat.

The Plan assumes each 4.48 mgd of implemented water resource development projects (WRDPs) and water supply development projects (WSDPs) will result in 1 cfs recovery for the LSFI MFLs. (p. 40) This assumption is used to convert listed WRDP and WSDP options (with impacts measured in million gallons per day) to projected LSFI MFL flow recovery (in cfs). Thus, this conversion factor is critical to an understanding of whether the Plan includes adequate project options to meet projected 2035 demand for water and to bring about recovery of the LSFI MFLs.

The Plan provides no discussion, explanation or analysis of the selection of the one-size-fits-all 4.48 mgd assumption regarding WRDP and WSDP benefit to flows and recovery of the LSFI MFLs. The impact of WRDPs and WSDPs is largely a function of the net change in groundwater pumping at a particular location attributable to the project, and the distance between the location where the net change would occur and the location of the MFL point of compliance. In general, the beneficial impact is directly proportional to the reduction in pumping, and inversely proportional to the square of the distance from the pumping location to the MFL point of compliance. So, in general, the further the project is from the gages used to monitor the LSFI MFLs, the less impact will be measured at the gages. A generic one-size-fits-all proportionality for calculating recovery attributable to projects is unscientific and not appropriate, even for planning-level analysis.

Indeed, using the NFSEG Model, the text at p.41 explains that 60.19 mgd of projects provided only 8.4 cfs of recovery. This is 7.165 mgd per cfs of recovery. It is possible the reference to 60.19 mgd is a typographical error that should read 65.19 mgd, the amount of the WRDPs shown in Table 6, Chapter 7. (p. 49) If 65.19 mgd was modeled and resulted in 8.4 cfs of recovery, then the ratio is 7.76 mgd of projects to 1 cfs of recovery. Either modeled ratio is widely divergent from the 4.48 mgd assumption.

The Plan provides no analysis relevant to the huge discrepancy between assumed and modeled flow recovery. Using the 4.48 mgd assumption, there could be about 11 mgd surplus in the Plan after covering the 2035 demand, after conservation, and after the LSFI MFL flow recovery. If 7.76 mgd or 7.165 mgd is used instead of 4.48 mgd as the conversion factor, the Plan does not meet the requirements of Sections 373.709(2) and 373.0421(2), Florida Statutes. The Plan is much less than clear on this issue and errors in the text of page 41 regarding quantities and the two project option tables defy clarity. This discrepancy and textual errors must be explained and the sufficiency analysis of project benefit to LSFI MFL flows must be addressed properly.

The Plan should analyze and report on NFSEG modeling scenarios in which the WRDP and WSDP options are evaluated for their effect on flows at the LSFI MFL gages. Ultimately all projects in the Plan should be modeled to determine whether the Plan, including all projects, meets the sufficiency requirements of Sections 373.709(2) and 373.0421(2), Florida Statutes. Without more than a naked and unexplained assumption of 4.48 mgd per 1 cfs recovery, the Plan does not provide reasonable assurances of meeting these requirements.

Additional Plan Deficiencies

The projects necessary to recover groundwater flows, by law, should be included in the Water Resource Development Project list. §373.709(2), Fla. Stat. In this Plan, the WRDP list is not sufficient to recover even the 2010 deficit condition of 17 cfs below the LSFI MFLs. The Plan should explain why the Plan must also rely upon projects on the WSDP list to restore the recovery deficit.

The Plan lacks the priority listing of each WRDP and WSDP required by Section 373.805(4)(b), Florida Statutes. The Plan also lacks required information for each project regarding the estimated cost of and the estimated date of completion; and “the source and amount of financial assistance to be made available by the water management district for each listed project, which may not be less than 25 percent of the total project cost unless a specific funding source or sources are identified which will provide more than 75 percent of the total project cost.” §373.805(4)(c) and (d), Fla. Stat.

The Plan also lacks "An estimate of each listed project's benefit to an Outstanding Florida Spring;" and "An implementation plan designed with a target to achieve the adopted minimum flow or minimum water level no more than 20 years after the adoption of a recovery or prevention strategy." *See* §373.805(4)(e) and (f), Fla. Stat.

The Plan lacks "an assessment of how the regional water supply plan and the projects identified in the funding plans prepared pursuant to sub-subparagraphs [§373.709(2)] (a)3.c. and (b)2.c. support the recovery or prevention strategies for implementation of adopted minimum flows and minimum water levels. . . ." §373.709(2)(k), Fla. Stat. The Plan must specify which WSDPs support recovery of flows at LSFI MFL gages, and how they support flow recovery.

The Plan lacks an adequate funding strategy. The Plan includes only a catalog of potential funding options, not a "funding strategy for water resource development projects, which shall be reasonable and sufficient to pay the cost of constructing or implementing all of the listed projects." §373.709(2)(d), Fla. Stat. Finally, the Plan lacks any analysis of whether the funding strategy is reasonable and sufficient for all projects. *Id.*

Failure to Adopt Further Regulatory Recovery Strategies

The LSFI Recovery Strategy, Appendix G, at p.36 explains:

Phase II Regulatory Strategies

The development of long-term strategies to address the impacts of regional groundwater trends and water use patterns is critical to achieving the recovery of minimum flows in the Lower Santa Fe Basin. As such, <u>the Department, SRWMD, and SJRWMD, will develop long-term recovery measures concurrently with the development of the North Florida Regional Water Supply Plan</u>. This will assist the Districts and the Department in refining the Recovery Strategies and future regulatory measures to address regional groundwater impacts to the Lower Santa Fe and Ichetucknee Rivers. (underline added)

The LSFI Recovery Strategy at Page 20 adds that this:

Phase II of the Recovery Strategy will focus on the implementation of the recommendations in the North Florida Regional Water Supply Plan, <u>the adoption of long-term regulatory measures</u>, and the identification and execution of any necessary water resource development and alternative water supply projects. (underline added)

This Plan was to include long-term regulatory strategies, but only proposes designation of the Plan area as a Water Resource Caution Area. This designation requires reuse of domestic wastewater in certain circumstances when it is determined to be feasible, but does not fund or require reuse of domestic effluent. The designation does not address recovery strategies other than reuse of domestic wastewater.

No other regulatory recovery strategies are included in the Plan. Without further regulatory changes, there are few real legal compunctions on the implementing parties to implement the projects, and the Districts have limited leverage to bring about conservation. The Plan should analyze and explain why the implementation of further regulatory recovery strategies has been abandoned.

For the foregoing reasons, the Plan does not demonstrate or provide reasonable assurances that the Lower Santa Fe and Ichetucknee River MFLs will be met within the planning horizon, nor whether recovery pursuant to the Plan will be "as soon as practicable." §373.0421(2), Fla. Stat.

FSC would also note that the Plan fails to address the reality that the amount of water permitted in the planning area currently far exceeds the amount that is actually used. The difference between permit allocations and pumping cannot be accurately determined directly because metering of water use is spotty in the planning area. However, it has been reported that in the SRWMD, the amount of water permitted may exceed the amount pumped by as much as a factor of 2. This excess availability of permitted water is an enormously important factor in 20-year water planning, and the Districts are remiss in ignoring it. What would be the value of this planning exercise if permittees decided, over the next 20 years, to pump all of their permitted quantities, or even three-quarters of their allocation? The Districts should have an aggressive program in place to meter water use and to take back unused allocations over time. Otherwise, surprises in water usage could pop up, rendering this planning exercise useless.

Greater Incentives for Conservation Are Needed

On balance, the Plan is to be commended for acknowledging the potential benefit of conservation, which has always been the first priority of FSC. Beginning on page 51, the Plan outlines eight "Water Conservation Project Options", and the first option to be noted is the successful implementation of tiered billing rates by some regional utilities. Tiered rates are a proven incentive to conserve, in contrast to the failure of consumptive use permits (CUPs) to remedy excessive pumping. Implementing universal water use monitoring and fees deserves far more emphasis than that given to them in the Plan. Conservation, as it now stands is almost entirely voluntary. Even CUPs are de-facto voluntary, because so many permitted wells are unmetered. This is an area in which further regulatory strategies are needed and sorely lacking in this Plan.

Because tiered water fees have proven to elicit greater conservation in the North Florida region, FSC strongly urges that they be extended to all users – domestic self-supply, agriculture and commercial/industrial/mining, as well as urban users. Such expansion will, of course, require significant changes in infrastructure, administration and legal status. Setting an effective schedule of fees will require first that a cap be estimated and placed on total withdrawals in each District. Afterwards the infrastructure to monitor all users must be implemented. Significant advances in the technologies of flow measurement, data reporting and recording render this task less expensive than it would have been in the past. A preliminary schedule of fees (which could be distinct for each class of users) must be established that will progressively tax users according to increasing use. FSC would recommend that the impacts of tiered water pricing should be carefully studied before such pricing is established, so that unintended consequences for smaller users, including small agricultural operations, can be avoided. This rate structure can subsequently be amended to optimize the distribution of water among users while not exceeding the regional cap.

Many may object to the imposition of fees as a new form of taxation. It should be pointed out, however, that ad-valorem taxes are already being collected to support the Districts. The task of setting fees, monitoring usage and collecting charges could be assigned to the Districts, which could be partly or wholly supported by the collected fees, while any excess could go to funding water conservation and aquifer/spring restoration projects.

FSC wishes to stress that water fees enjoy a proven record of success, whereas CUPs, BMPs and even minimum flows and levels (MFLs) have failed to halt the progressive degradation of Florida's water resources. While the costs and effort necessary to institute universal water fees are not insignificant, neither do they proportionately exceed efforts elsewhere in the United States to create reliable future supplies of water; and Florida, more than most of these other areas, is critically dependent on secure supplies of water.

The Plan Should Discourage Pumping Brackish Water

FSC objects to the prominence the Plan gives to the desalination of brackish water. For example, this source is listed first among the suggested Water Resource Development Project Options (p. 47). Pumping and reverse osmosis treatment of brackish groundwater should be avoided at all possible costs, for at least two reasons. First, saline intrusion is irreversible over any practical time frame. Once a well goes saline, the slow diffusion time among the less channelized regions of the karst substrate insures that it will be decades, if not centuries, before a saline well runs fresh again. Secondly, pumping a brackish well accelerates the rate of saline intrusion. That is, the well becomes progressively more saline and the water costlier to treat.

The Plan portrays saline intrusion as a problem confined to the coastal and riverine portions of the North Florida region. This perspective is short-sighted, because saltwater underlies the entire Floridan aquifer, and excessive pumping will cause salt everywhere to migrate to higher levels in the karst substrate. Furthermore, a given drop in the potentiometric surface of the aquifer has the effect of raising the underlying salt water interface by a factor as much as 40 times greater than that drop. In particular, withdrawals from the Lower Floridan Aquifer must be reduced, because pumping from that depth will cause a disproportionate vertical rise in the proximate saline interface.

Regarding the rate of saline intrusion, FSC finds the analysis of this problem (beginning on page 27) to be overly optimistic. The Plan assumes that salt concentrations will rise in linear fashion, but vertical saline profiles are usually sigmoidal in nature. That is, increase is slow and almost linear, but a “log-phase” ascent soon ensues as the saline “front” approaches. Hence, a linear analysis will significantly overestimate the time required for saline intrusion. The arrival of the front can at times be episodic, as happened during the drought of 2012 with the sudden intrusion into the well supplying Cedar Key.

These reservations against pumping brackish water do not necessarily pertain to the desalination of seawater, so long as the concentrate from the process is returned to the sea. But this remedy is extremely costly, both energetically and financially -- treatment of brackish water is some 10-fold more expensive than extraction from the Upper Floridan Aquifer. Although desalination of seawater might provide a few localities with water for drinking and bathing, it is economically infeasible to sustain agriculture or industry. If the entire Floridan Aquifer System were to turn brackish, Florida could evolve toward a dry-island Caribbean economy.

The Plan Should Emphasize Sustainable Recharge

The Plan emphasizes reclaimed water as a primary AWS. While it does mention aquifer recharge, it fails to accord that option the priority it deserves and thereby overlooks a potentially significant and highly economical AWS. Figure 14 (p. 21), for example, shows approximately 108 mgd of treated wastewater in the region that is simply “disposed”. Most of that water could be returned to the aquifer at low cost through treatment by constructed wetlands, as has been amply demonstrated at several sites in Florida (e.g., Sweetwater and Kanapaha in Gainesville and Green Cay in Boynton Beach). Treated wastewater is supplied at one end of an artificial wetland and allowed to percolate horizontally across the wetland. The water at the other end is low in nutrients and xenobiotics and can be re-injected into the aquifer. FSC has had discussions with JEA urging the utility to implement such treatment on the large amount of their treated wastewater that now flows into the ocean. Similar recharge is appropriate for other locations in the North Florida region and taken together could resupply a substantial fraction of the 117 mgd projected demand. FSC strongly recommends the adoption of this method of recharge throughout the North Florida region.

Conclusions

FSC submits that the Plan is not sufficient to meet the requirements of Sections 373.709(2) and 373.0421(2), Florida Statutes. Most critically, the Plan depends upon an unscientific and highly questionable assumption regarding the recovery to be derived from the projects listed in the Plan. The basis of the assumption and its selection instead of a modeling analysis is not substantiated. Because of the stated discrepancy between modeled and assumed recovery benefits of listed projects, the Plan does not provide reasonable assurances that sufficient projects are listed in the Plan.

The Plan fails to include critical information required for recovery strategies for Outstanding Florida Springs, including details regarding priorities and commitments regarding funding. Further, without any coercive and/or regulatory strategies, the Plan and particularly the funding plan do not meet statutory requirements.

FSC does commend the NFRWSP for highlighting the severe problems facing water supply in the North Florida region and appreciates the re-focusing of attention away from increased pumping of the over-stressed Upper Floridan toward other alternative water supplies. This is an acknowledgement from the State that the Upper Floridan Aquifer is already over-pumped. In fact, we would like to see the NFRWSP go beyond its call to limit pumping to an active program to decrease current pumping rates.

FSC supports the Plan's call for further water conservation, although we would recommend use of different mechanisms, especially the implementation of tiered water fees. This method deserves far more emphasis than it has been given in the Plan. It has proven to be effective in the public-supply sector (JEA, GRU) and holds great promise for becoming the major tool for conserving water throughout the State. The Plan should include a regulatory strategy to move conservation from a voluntary aspiration to a regulatory compunction.

FSC recommends against any pumping of brackish water, as this option only accelerates the decline of Florida's vital water resources. FSC also advocates, as the primary method for meeting the region's increasing water resource demands over the next 20 years, the polishing and subsequent recharge of cleansed wastewater to the Upper Floridan Aquifer by constructed wetlands.

From:	Wwals Watershed Coalition
To:	nfrwsp-comments
Cc:	Amy Brown; Noah Valenstein; WWALS Watershed Coalition
Subject:	WWALS comments on North Florida Regional Water Supply Plan
Date:	Monday, December 05, 2016 4:26:03 PM
Attachments:	2016-12-05--WWALS-NFRWSP-att.pdf

Dear Ms. Brown, Mr. Valenstein,

Please find attached comments from WWALS Watershed Coalition
on the North Florida Regional Water Supply Plan.

For the rivers and the aquifer,
-jsq

John S. Quarterman, President
WWALS Watershed Coalition, Inc.,
the WATERKEEPER® Affiliate for the upper Suwannee River
including its tributaries the Withlacoochee and Alapaha Rivers.
Member, Georgia River Network, Georgia Water Coalition,
Florida Springs Council, Floridians Against Fracking,
and national River Network.
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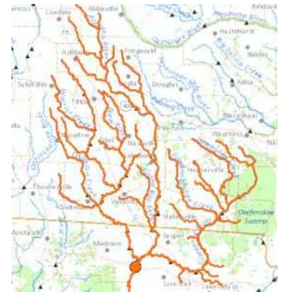

WWALS Watershed Coalition, Inc.

the WATERKEEPER® Alliance Affiliate for the upper
Suwannee, Withlacoochee, and Alapaha Rivers
a 501(c)(3) nonprofit charity
PO Box 88, Hahira, GA 31632
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wwalswatershed@gmail.com
www.wwals.net

December 5, 2016

To: nfrwsp-comments@sjrwmd.com

Cc: Amy Brown	Noah Valenstein
Senior Hydrologist	Executive Director
Suwannee River Water Management District	SRWMD
386.362.1001	(386) 688-6653
ALB@srwmd.org	NDV@srwmd.org

Re: **North Florida Regional Water Supply Plan**

Dear Ms. Brown and Mr. Valenstein,

Thank you for providing an opportunity to comment on the NFRWSP. Here are some comments about water supply, aquifer recharge, threats, peer review, modeling, comment area, involving Georgia, MFLs for the upper Suwannee River and nearby springs, and river water quality monitoring. WWALS congratulates everyone involved for the multi-year process that has gotten this far, and offers some suggestions for tuning going forward.

Water Supply

WWALS applauds the water supply projects involving reuse or stormwater in Appendix K: Water Supply Development Project Options. We note they seem to be mostly in Duval or Alachua Counties, which addresses the problem at its origin, in Jacksonville and Gainesville. WWALS applauds that.

Aquifer Recharge

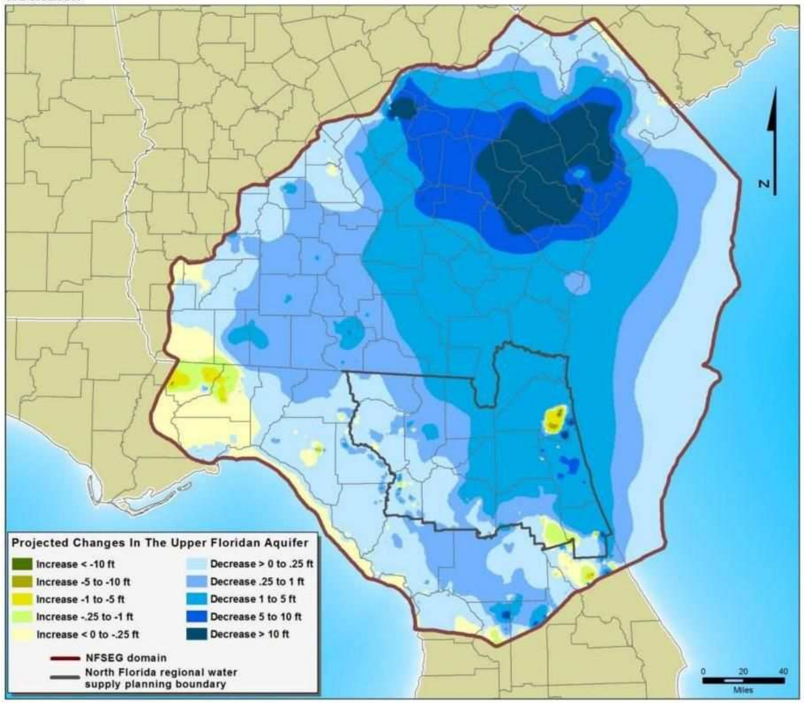
Any plan that puts water back into the aquifer is worthy of study, including for cost vs benefit. Among the projects in Appendix J: Water Resource Development Project Option, we must single out the Falling Creek project, described in the table in that appendix as:

> "This project involves a maximum daily capacity from the Upper Suwannee River to Falling Creek Falls, recharging the aquifer."

The Falling Creek project has very large up-front expense, involves environmental risk in running a large-diameter pipe through wetlands, and has high maintenance cost. In addition it only benefits the Ichetucknee Springs watershed. It is seasonal, for instance at the water levels now in the Suwannee, there is no water to pump to Falling Creek.

The maps in the plan, including Figure C3 on page 3 of [Appendix C: Simulated Change in the Potentiometric Surface within the North Florida-Southeast Georgia Regional Groundwater Flow Model Area](), show that the area that is losing water to the Atlantic coast of south Georgia and north Florida has lost 20 or more feet of aquifer levels. None of the projects address that problem in any significant way. Much of the area in Florida that has lost that water in the Floridan is below Columbia, Hamilton, and Baker Counties. Overpumping is not the only reason for this loss: silviculture management has something to do with it as well, for example. WWALS recommends the much more practical and cost-effective plan Dennis J. Price P.G. has already submitted to SRWMD and NFRWSP. His plan is appended to this letter.

Figure C3: Change in Upper Floridan aquifer from 2035 withdrawals within the NFSEG domain.



Threats to the Aquifer and to the Rivers

In the Falling Creek watershed is a pipe yard with Sabal Trail pipeline pipe apparently sitting on fill in wetlands. The filling in the wetland was started several years before the pipes were placed there, yet the owner has not been sent a notice of violation. The U.S. Army Corps of Engineers (USACE) when asked by WWALS was unsure whether that pipe yard is in jurisdictional wetlands. All of USACE, DEP, and SRWMD, DEP, declined to do anything about that pipe yard or those wetlands, even though the Federal Energy Regulatory Commission never approved Sabal Trail use of it, as far as WWALS can find.

Aerial photograph above Falling Creek watershed to pipe yard by WWALS on Southwings flight November 23rd 2016

As I write, Sabal Trail is drilling under the Suwannee and Santa Fe Rivers and over Falmouth Cathedral Cavern, in the core NFRWSP area. In very similar karst geography in the NFSEG area at the WIthlacoochee River US 84 crossing in Georgia, Sabal Trail has caused a frac-out of drilling mud up into the river and a sinkhole near the drilling site,[1] and Sabal Trail has caused several sinkholes in Florida, including one in the roadway of CR 49 in Suwannee County.

Just south of the NFSEG area, Strom, Inc., a Florida corporation with its principal place of business in Tampa, Florida, has received authorization from the United States Department of Energy Office of Fossil Energy (FE) to export domestically-produced Liquefied Natural Gas by ISO containers on vessels from the company's Project at 6700 N. Tallahassee Road, Crystal River, Florida. The volume authorized is equivalent to approximately 28.21 Bcf/yr of natural gas for a 25-year term. Strom states the natural gas to be liquefied at the Project will come from natural gas produced from shale deposits and that the "Source of Natural Gas" in the future will come from the proposed Sabal Trail Transmission Pipeline.[2] Sabal Trail runs through the heart of the NFSEG study area, in the Springs Heartland of Florida. Strom and at least one other LNG exporter (in Martin County) also have FE permission for Florida East Coast Railway to pick up LNG and ship it as far south as Miami, and as far north as Jacksonville, which is certainly in

[1] "Sinkhole, Sabal Trail HDD, Lowndes County, GA 2016-12-02," John S. Quarterman, WWALS Watershed Coalition, December 2, 2016, http://www.wwals.net/?p=27600
[2] United States Department of Energy, FE Docket No. 14-56-LNG, DOE/FE Order No. 3537 dated October 21, 2014: "Order Granting Long-Term Multi-Contract Authorization to Export Liquefied Natural Gas in ISO Containers Loaded at the Proposed Strom LNG Terminal in Crystal River, Florida, and Exported to Free Trade Agreement Nations."

NFSEG territory. Florida Gas Transmission (FGT) has received permission from the Federal Energy Regulatory Commission to expand its pipeline from Sabal Trail in Suwannee County to Jacksonville, and FGT has an open season now for bids to expand its main pipeline through the panhandle and the NFSEG territory down to Martin County, both involving new construction and trenching in water-containing karst limestone.

Yet there is no mention of pipelines as threats to the Rivers and to the Floridan Aquifer, nor of similar threats such as fracking. These omissions need to be remedied.

Peer Review

In a letter to Drew Bartlett, Florida Springs Council (FSC) President Dan Hilliard emphasized the importance of peer review, and the apparent lack thereof for the NFRWSP.[3] The peer review described in the draft plan in section 2.2 on page 14 dates from two years before that letter. In Chapter 6 on page 61 there is an additional note:

> "The projects provided in this water supply plan were developed as a planning level assessment to show that sufficient options are available to address potential water resource impacts in the NFRWSP area. These assessments were developed using available information and the NFSEG, which has yet to be peer reviewed, so limitations are inherent in the analysis as discussed in Chapter 4."

Presumably that is the not-yet-conducted peer review referred to back in Chapter 4, page 24:

> "NFSEG version 1.0 meets the requirements to be used in water supply planning in the NEFSEG domain. Version 1.0 of the model will not be utilized in regulatory evaluations or in the establishment of MFLs. However, the model may be used to determine the status of MFLs. NFSEG version 1.0 does not meet the requirements outlined in Rule 62-42.300(1)(e), Florida Administrative Code (F.A.C.), requiring the re-evaluation of the established LSFI MFLs that will occur prior to the end of 2019. It is anticipated that the peer reviewed version of the model will be used in planning, regulatory and MFLs programs."

Please clarify the text on page 24 to say that peer review has not been done yet and to invite peer reviewers, as well as public comment, beyond the present public comment deadline.

Regarding specific peer reviewers, FSC's suggestion of Todd Kincaid seems a very good one.

WWALS would also like to suggest as NFRWSP and especially NFSEG peer reviewers Dennis J. Price P.G. of SE Environmental Geology LLC, White Springs, Florida, and Can Denizman, Ph,D Associate Professor of Geosciences, PhD in Geology from the University of Florida.

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[3] "NFSEG model may not be adequately peer-reviewed before it is implemented," letter to Drew Bartlett, Deputy Secretary for Ecological Preservation, FDEP, from Dan Hilliard, President, Florida Springs Council, April 20th, 2016, http://springsforever.org/wp-content/uploads/2015/02/2016.04-28-FSC-Letter-to-Drew-Bartlett-Re-NFSEG-Model.pdf

Data Availability and Model Calibration

The Floridan aquifer is a karst aquifer. Therefore, it is heterogeneous and anisotropic with turbulent groundwater flow unlike conventional aquifers that could be assumed homogeneous and isotropic with laminar flow. That means standard groundwater models based on Darcian flow of homogeneous and isotropic conditions are not realistic in karst environments.

The draft NFRWSP does not seem to include any specific information as to the groundwater models used. If they are standard Darcian groundwater flow models liked they have always used, it very unlikely that their forecasts vis a vis MFL would be accurate.

Groundwater models in karst aquifers should accommodate the dual porosity of the aquifer, i.e, the flow within the matrix and within the conduits. That requires incorporating into the model cave and conduit systems delineated by dye tracing experiments and/or cave surveys by cave divers.

More basic than peer review is the availability of suitable data to calibrate and validate the model. Performance metrics are needed across several validation periods (e.g. those including predominantly wet and dry years). Please see "Model Evaluation Guidelines for Systematic Quantification of Accuracy in Watershed Simulations," D.N. Moriasi et al.[4] for some insight into the need for this and the types of “statistics” that are commonly used to evaluate hydrologic models.

Modeling is important for future developments, especially for issuing agriculture water use permits. Please add in the NFRWSP or in a further document an explanation on how drawdown when a new water user applies for a permit will be modeled, especially the most common scenario of every agricultural user turning on their pumps at the same time for months on end during the growing season during a drought.

It is also essential that uncertainty in predictions be quantified in varying climate/hydrologic scenarios, as Daggupati, et al. note:[5]

> “...model developers and practitioners have the responsibility to ensure that the essential characteristics and processes of the real world are simulated appropriately and that the model performs adequately for a given purpose. One important step in model applications is the comparison of model results to observed data through calibration and validation (C/V)”.

Modeling can and should involve “Monte Carlo” simulations where each of the model parameters is evaluated across their distributional range. These are big tasks, but essential, especially for the NFSEG.

No doubt SRWMD and SJRWMD are aware of the political difficulties of using a Monte Carlo model, due to the recent use of one in the Florida Environmental Regulation Commission (ERC) decision to raise toxicity levels for Florida waters. WWALS is a co-signatory of a letter from all the Waterkeepers of

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[4] "Model Evaluation Guidelines for Systematic Quantification of Accuracy in Watershed Simulations," D.N. Moriasi et al., Transactions of the American Society of Agricultural and Biological Engineers (ASABE), 2007, Vol. 50(3): 885−900, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.532.2506&rep=rep1&type=pdf

[5] "A recommended calibration and validation strategy for hydrologic and water quality models," P. Daggupati, N. Pai, S. Ale, K. R. Douglas-Mankin, R. W. Zeckoski, J. Jeong, P. B. Parajuli, D. Saraswat, M. A. Youssef, American Society of Agricultural and Biological Engineers (ASABE), Transactions, 2015, Vol. 58(6): 1705-1719, DOI 10.13031/trans.58.10712, http://agrilife.org/vernon/files/2012/11/36_Daggupati_et_al_2015_TransASABE.pdf

Florida criticising that ERC Monte Carlo modeling for leaving native Floridians who eat a lot of fish as outliers especially susceptible to cancer and other ill effects of water contaminants. Thus any use of a Monte Carlo model (or any other model) must be done so as to not leave such outliers and must be clearly defended against such a possibility. Such defense should include robust peer review, especially by critics of the ERC's decision, including WWALS and other Florida (and Georgia) Waterkeepers.

Expand the area of peer review and public comment

The area mapped in Figure 2: North Florida Regional Water Supply Planning Partnership on page 3 is far too constrained. The potentiometric simulations in Appendix C go all the way to the Gulf and South Carolina and show most pronounced effects not only around Jacksonville, but also as far away as Savannah. Many of the projects items in [Appendix J: Water Resource Development Project Options](), including some in progress or completed, are outside the nominal Partnership area, to the west of the Suwannee and Withlacoochee Rivers, in Madison, Lafayette, and Dixie Counties, Florida. Peer review and public comment need to extend at least as far as those simulations go, which would be at least as far as NFSEG Domain of Figure 15 on page 25.

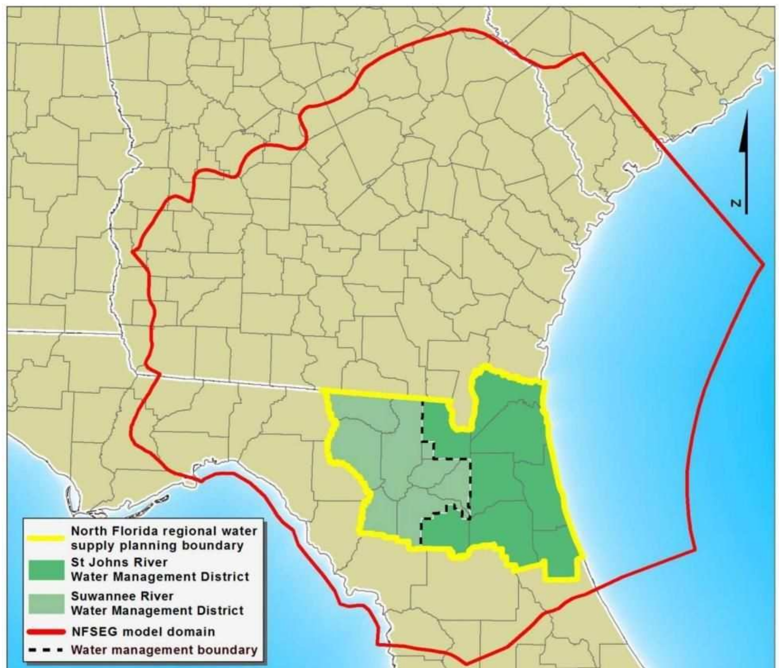


Figure 15: NFSEG Domain

There are two regional forces working on the Floridan aquifer in the NFSEG:

1. Under the Okefenokee/Osceola area. The limited recharge is reduced even further by forestry methods of dewatering the wetlands. Before Jacksonville became a major water user, the big culprits of drawdown under the Okefenokee and Osceola were the paper mills and other large users along the South Georgia coast. The drawdown in the Floridan was mainly South Georgia pulling water from the aquifer; there are many geologic-enforced boundaries that cause this to occur.
2. In the Withlacoochee and Alapaha basins, it is agricultural water use in south Georgia and north Florida that needs to be studied. This is where modeling to determine issuing water use permits needs to be explained in the NFRWSP for the NFSEG. There have been hundreds of large water use permits issued to agricultural users in the last 5 years in north Florida alone. The permitting situation in south Georgia is different, but does not seem to be addressed yet in the NFRWSP.

Involving Georgia

Nick Porter's slides, "July 2015 Update On North Florida Water Resource and Planning Issues,"[6] provide a useful summary of the process to that date, and conclude with two hanging questions:

- What portion of impacts come from Georgia withdrawals?
- How will Georgia be incorporated into process?

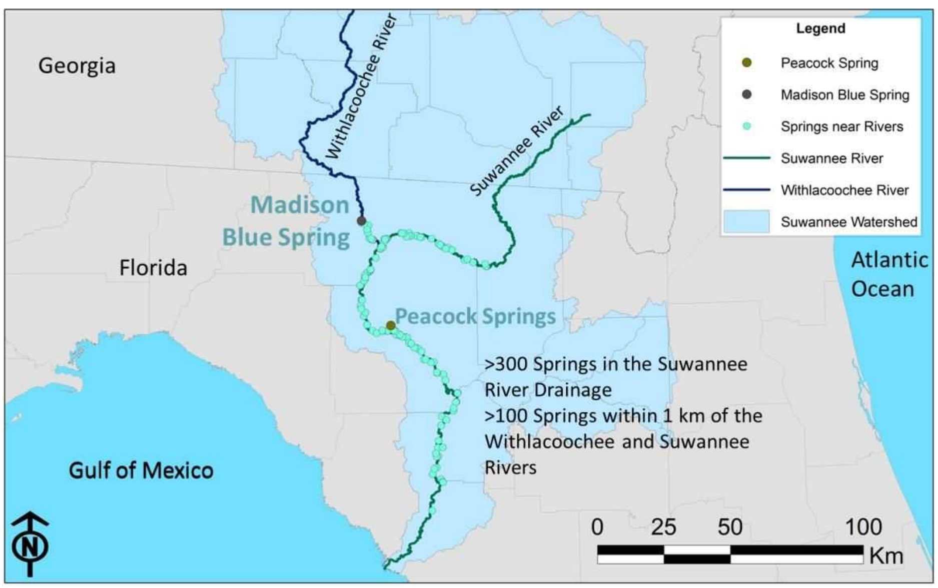
I would add a third Georgia question between those two:

- What effect will Florida withdrawals have on Georgia?

For many years there has been concern in south Georgia about the effect of water use by Gainesville, Orlando, and Jacksonville on the Floridan Aquifer in south Georgia. The development of the NFSEG is a good start towards addressing those issues.

There is no mention in the draft plan of the Georgia Suwannee-Satilla Regional Water Council, which is currently finalizing a similar plan for the Georgia watersheds (Suwannee, Satilla, and St Marys) north of the nominal Partnership area. Nor is there any mention of the other Georgia Regional Water Councils, such as the ones for the Atlantic coast watersheds, which all recently held two joint meetings with Suwannee-Satilla. Better cross-state-line coordination is needed.

Amy Brown's slides on Groundwater-surface water interaction in Florida's karst springs[7] provide an excellent overview of the subject, especially on the Suwannee River downstream of White Springs and on the Withlacoochee River from Madison Blue Spring downstream on the Withlacoochee River, as in the map on her slide 3 (see right).



[6] "July 2015 Update On North Florida Water Resource and Planning Issues", Nick Porter, July 2015, http://floridaenet.com/wp-content/uploads/2015/08/NP-North-Fla-ESS-Pres1.pdf

[7] "Groundwater-surface water interaction in Florida's karst springs: Tropical storms and spring floods", Amy Brown et al., apparently 2013, http://www.alachuacounty.us/Depts/epd/WaterResources/GroundwaterAndSprings/SFRSBWG%20Presentations/140725-Groundwater-Surface%20Water%20Interactions_Brown.pdf

Yet there are springs on the Alapaha River, including some in Georgia, and there are springs upstream on the Withlacoochee River, including three second-magnitude springs between Valdosta and the GA-FL line: Wade (Blue) Spring just south of US 84,[8] and McIntyre and Arnold Springs[9] closer to the state line. McIntyre Spring has been explored by cave divers for 4,610 feet underground.[10] There appears to be no mention of any of those three second magnitude Withlacoochee River springs in the NFRWSP. Nor for that matter, any mention of springs not directly on rivers, such as Adams Spring in Hamilton County.[11] The NFRWSP will affect all these other springs, and they should be taken into account.

Minimum Flow Levels (MFLs)

The one area indicated in the draft plan for new MFLs in 2017 is in WWALS territory. See Appendix H, Technical Memorandum, page 1 of 2:

> "**Results**
>
> "The Alapaha, and the Upper Suwannee Rivers and Stevenson Springs, did not show predicted flow reductions greater than 10 percent at 2035 conditions within the NFRWSP area or at 2035 conditions within the entire NFSEG domain. Alapaha Rise did not show predicted flow reduction greater than 10 percent at 2035 conditions within the NFRWSP area, however, flow reductions exceeded 10 percent under 2035 conditions within the entire NFSEG domain. Holton Creek Rise, Unnamed spring (SUW1017972), Suwannee Spring, and White Spring predicted flow reductions exceeded 10 percent under both 2035 pumping scenarios. Per the SRWMD priority list, MFLs will be set on the Upper Suwannee River and associated priority springs in 2017."

WWALS plans to be involved in setting those MFLs.

Regular River Water Quality Monitoring

The NFRWSP does not seem to mention the recent massive consolidation of agricultural lands into the hands of a few owners, on both sides of the state line. SRWMD has told WWALS they are talking to the landowners about possible agricultural runoff issues. This topic of water quality as well as quantity should be addressed in the plan.

In addition to the water quality monitoring using wells mentioned on pages 1, 3, and 7, there needs to be regular, frequent river water quality monitoring on the Withlacoochee, Alapaha, and Suwannee Rivers in both Florida and Georgia. Such monitoring will help distinguish sources of contamination, such as the chronic Valdosta wastewater overflows now mostly solved,[12] excretions of wild, farmed, or domestic

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[8] "Blue Spring and McIntyre Spring, Withlacoochee River, Brooks County, GA, 1903-11," John S. Quarterman, WWALS Watershed Coalition, April 2, 2016, http://www.wwals.net/?p=19299
[9] "Arnold Springs," Points, Withlacoochee and Little River Water Trail, WWALS Watershed Coalition, 2016, http://www.wwals.net/maps/withlacoochee-river-water-trail/wrwt-map/wrwt-points/#Arnold-Springs
[10] "McIntyre Spring", Guy Bryant, A Cave Diving History of Little Known Springs, April 19, 2016, https://guybryantcavedivingblog.wordpress.com/2016/04/19/mcintyre-spring/
[11] "Bill Gates land purchases, Florida Springs Council, and Adams Spring," by John S. Quarterman, WWALS Watershed Coalition, August 14, 2015, http://www.wwals.net/?p=10285
[12] Valdosta Wastewater, WWALS Watershed Coalition, http://www.wwals.net/issues/vww/

animals or humans, or agricultural fertilizer or pesticides. Such contaminants of river water affect surface water and aquifer water, and should be used in the modeling and calibration.

The NFRWSP should advocate for adequate funding for and its agency participants should implement such regular, frequent river water quality monitoring.

Thank You

Thanks to all involved for putting together the North Florida Water Supply Plan. WWALS looks forward to being involved ongoing.

Sincerely,

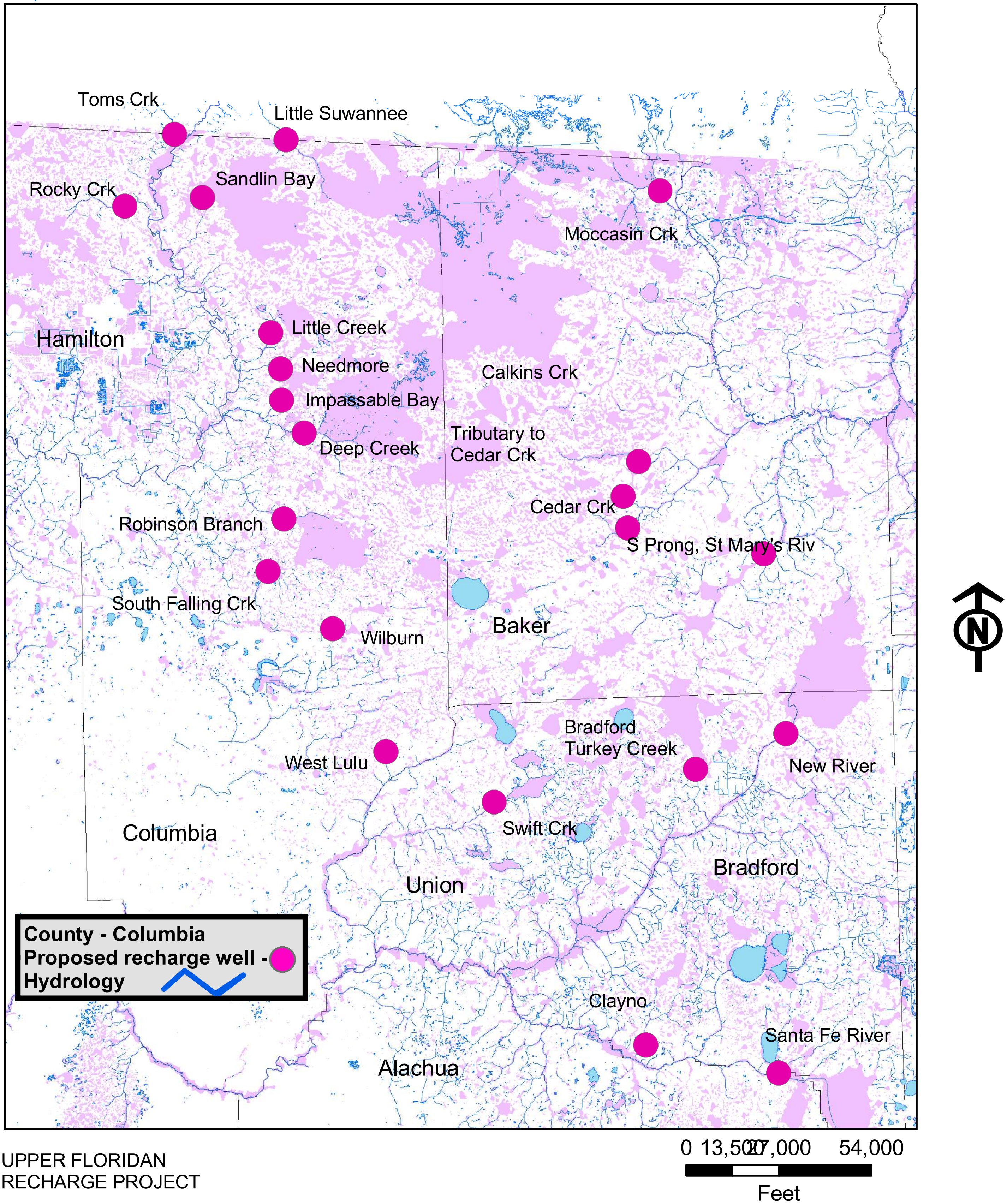
[/s]

John S. Quarterman, President

Attachment: Flatwoods aquifer recharge proposal by Dennis J. Price P.G.[13]

[13] "Proposal for the recharge of the upper Floridan Aquifer in the north Florida flatwoods environment, Hamilton, Columbia, Union, Baker and Alachua Counties," Dennis J. Price P.G., SE Environmental Geology, to North Florida Regional Water Supply Partnership, 14 November 2016.

SE Environmental Geology, LLC
PO Box 45
White Springs, FL 32096



UPPER FLORIDAN
RECHARGE PROJECT

Flatwoods recharge wells with names of basins or creeks, located upstream of stream entrenchment, at dishcarge from larger basin, upstream of, but on, roads

1:473,689

SE ENVIRONMENTAL GEOLOGY
DENNIS J. PRICE, P.G.
P.O. BOX 45
WHITE SPRINGS, FL 32096
cell 362-8189, den1@windstream.net

November 14, 2016

North Florida Regional Water Supply Partnership

RE: PROPOSAL FOR THE RECHARGE OF THE UPPER FLORIAN AQUIFER IN THE NORTH FLORIDA FLATWOODS ENVIRONMENT, HAMILTON, COLUMBIA, UNION, BAKER AND ALACHUA COUNTIES.

My proposal is directed towards those areas in the SRWMD and the SJRWMD that are underlain by the Hawthorn formation resulting in extensive areas containing a surficial aquifer and the intermediate aquifers that exist in the Hawthorn. Recharge to the Floridan is retarded by the presence of the clay layers in the Hawthorn. Very large wetland systems are common in these areas.

Water balance studies were produced twice that I am aware of in the SRWMD, one by Dave Fisk of the SRWMD and one for the Environmental Impact Statement regarding Phosphate Mining in Columbia County in the Osceola National Forest, in the 1970’s. Both studies resulted in an estimated recharge to the Florida of about 4” per year ±. All water balance studies were done after the majority of the wetland drainage systems were constructed and therefor do not take into account the natural recharge that occurred prior to ditching.

Starting in the late 1800’s and continuing through the 1950’s-1970’s when planted pine plantations started, much of our large wetlands systems have been drained purposefully in order to harvest the cypress out of the wetlands and to dry up marginal wetlands around these wetlands to create more acres of pine plantations.

I have been working in the North Florida Flatwoods as a geologist for the last 42 years, starting as an exploration geologist, mapping the ore body in Columbia and Hamilton counties, for what is now PCS phosphate in Hamilton County. I have walked hundreds of miles through the Flatwoods, including my time with the FDEP and the SRWMD. I have spent the last 20 years working for myself as a licensed well driller and wetlands/geologist consultant. Most recently I spent 4 years permitting a wetlands mitigation bank, Bayfield Mitigation Bank, a few miles south of Sandlin Bay in Columbia County. I rarely go into wetlands that have not been ditched.

Through all this time I have discovered that all the road side ditches, pine plantation planting beds, wetland ditching and interior ditching has drained the wetlands of most of the water from significant rainfall events, especially during the winter months when most recharge to the aquifer happens.

Plugging ditches on the Bayfield Mitigation Bank site flooded the adjacent pine plantations and ruined the interior roads so it is difficult to travel on them. Plugging ditches to rehydrate swamps to increase recharge would never be allowed by landowners because it makes the land to wet. Plugging ditches may be a good tool on public lands. Pre and post hydrographs from piezometers installed in wetlands and the surficial aquifer on the Bayfield Mitigation Bank site clearly demonstrate the significant increase in water retention and length of time water remains in the wetlands in between rain events.

Consequently this proposal for recharging the Floridan was created. The assumption is that the drainage referenced above does occur. The area proposed for this project is located over the Floridan where significant lowering of groundwater levels have occurred over a very large area. The most efficient way to recharge large areas is by constructing drainage wells. In the attached map, the major wetland systems have a drainage-well constructed in a location that is accessible and, is located, where the wetland system begins to narrow down.

Top of casing elevations can be set at an elevation where they capture water during high flow conditions that occur after large rainfall events and during the winter months, both times of higher recharge to the Floridan.

The wells are intended to capture a portion of the flow from the system. The entire plan could be constructed for less money than the plan calling for pumping water from the Suwannee River over to Falling Creek in Columbia County and the recharge would benefit more areas than the Falling Creek site and still include the Ichetucknee Springs basin.

It is a passive system depending on gravity, maintenance costs are minimal and changing the desired invert elevation is as simple as cutting and welding or a spillway.

All the wetlands depicted on the plans are important and they should be purchased with Amendment 1 money, directed towards buying environmental sensitive lands. For those opposed to recharging swamp water into the aquifer, this water still recharges naturally all along the Suwannee through springs, vents and siphons and into the numerous stream to sink areas in the District.

Out of professional respect, if people have misgivings about the plan, please allow me to discuss my thoughts with them. This is not a comprehensive scientific study, it is just a proposal based on experience.

Sincerely,

Dennis J. Price, P.G.
SE Environmental Geology

From:	Anne Harvey Holbrook
To:	nfrwsp-comments
Subject:	Draft NFRWSP Comments
Date:	Monday, December 05, 2016 4:52:37 PM
Attachments:	SMC Comments_NFRWSP 12_5_2016.pdf

Hello,

Attached please find Save the Manatee Club's comments regarding the 2016 North Florida Regional Water Supply Plan. Please feel free to contact me with any questions or concerns.

Regards,

Anne Harvey Holbrook, JD, MS
Staff Attorney
Save the Manatee Club
500 N. Maitland Ave.
Maitland, FL 32751
Office: 407-539-0990
e-mail: aholbrook@savethemanatee.org

Adopt-A-Manatee! Go to: savethemanatee.org/adopt

St. Johns River Water Management District
Palatka, Florida

Suwannee River Water Management District
Live Oak, Florida

Submitted via electronic mail to nfrwsp-comments@sjrwmd.com

December 5, 2016

Re: North Florida Regional Water Supply Plan (2010-2035 Planning Horizon)

Save the Manatee Club (SMC) appreciates the opportunity to review and comment on the North Florida Regional Water Supply Plan (NFRWSP). Save the Manatee Club is an award-winning national 501(c)(3) nonprofit, established in 1981 by singer and activist Jimmy Buffett and former US Senator Bob Graham. The organization represents 11,000 members and supporters throughout Florida and an additional 33,000 nationwide in efforts to protect endangered manatees and their aquatic habitat from threats posed by human activity, including habitat destruction and water quality degradation. As a member of the Florida Springs Council (FSC), SMC supports and incorporates herein the comments offered on behalf of the Council, and submits the following additional comments for consideration. All comments refer to the October 4, 2016 Draft NFRWSP.

As a preliminary matter, the Water Management Districts should begin with a firm acknowledgement that Florida is running out of water. Even water-rich North Florida lacks sufficient groundwater to supply projected demand over the next twenty years without causing unacceptable impacts to water resources (thus triggering the NFRWSP process). And yet, this concerning fact is obfuscated by the Districts' assertion in its frequently asked questions portion of the public website by the conclusion that the Districts have identified 200 million gallons per day (mgd) of additional water supplies to meet the growing 117 mgd in demand, albeit using alternative supplies which include a range from sensible and cost-effective solutions, such as reclaimed water, to the costly and environmentally damaging, such as desalination. The finding that there are insufficient regional water supplies to cover a 20-year planning horizon should be the subject of intense public discussion and urgent policymaking, but is instead glossed over in a planning document whose projects and recommendations are nonbinding on water users and permitting agencies.

The minimum flows and levels rulemaking process for the lower Santa Fe and Ichetucknee Rivers and associated springs found that these water bodies are already experiencing consumptive use beyond that which they can sustain without incurring significant harm. As such, recovery efforts must be fully accounted for in the NFRWSP. Although prevention and recovery strategies are mentioned for these water bodies and the total estimated recovery needed to achieve the MFL under anticipated 2035 conditions are given, the Draft RWSP does not clearly discuss the alternative water sources or conservation measures anticipated or available to make up that difference with a specific regional focus on alleviating impacts to those waterways.

Similarly, the Draft plan notes that four priority springs will show reductions greater than ten percent under 2035 conditions, and that the remaining four priority springs and both priority rivers also show flow reductions, though less than ten percent. The draft RWSP should therefore anticipate that the MFL process may require prevention and recovery strategies (or at least impose certain water withdrawal limits so as not to exceed significant harm), and should identify alternative water sources or conservation reuse opportunities within those watersheds as well.

SMC recognizes the need to identify additional and alternative sources of water as well as to identify opportunities for water conservation. However, the use of alternative water supplies (AWS) as a general term in regional water supply planning is misleading, and specific types of AWS should be discussed with a view toward determining what types of projects might be appropriate to offset use of groundwater in a particular area. The use of alternative water supplies generically is further complicated because of the interconnected nature of surface water, groundwater, recharge, and brackish groundwater. Despite the fact that AWS are statutorily authorized sources for the Districts' consideration in water supply planning, some assessment and modeling of the relationship among these sources should be accounted for in water supply planning efforts that rely on use of AWS to supplement traditional groundwater. The incorporation of MFLs touches on this but does not explicitly or fully address the issues involved because the water budget inappropriately distinguishes between groundwater and surface water in recovering systems. For the NFRWSP to be an effective tool for both local government and state permitting agencies, these reductions and offsets should be analyzed regionally with appropriate conservation and AWS projects outlined and clear funding opportunities identified.

The uncertainties and complications associated with climate change are discussed late in the document, but should be addressed earlier in its sections discussing demand calculations, drought, and saltwater intrusion. The Draft NFRWSP includes in its demand calculations a 1-in-10 year drought water demand figure to represent an event that would increase water demand that has a ten percent probability of occurring in any given year. In the final draft, SMC asks the Districts to clarify how they determined the likelihood of drought occurrence, and how modeling accounts for the potential impacts of climate change. Already areas of North Florida are experiencing rising temperatures and altered rainfall patterns. The Draft should also take into account seasonal changes in rainfall fluctuations as a result of changing climate and weather patterns. If, as stated in the Draft plan, a single one-in-ten year drought event can increase demand an additional 6%, it seems that demand estimates may be too low given the potential for previously rare drought events to occur with increasing frequency and intensity as the climate changes. Moreover, the impacts of drought should also be discussed in the plan's section on saline water intrusion. A small drop in aquifer levels can result in substantial saltwater intrusion; thus groundwater pumping combined with drought could have a serious deleterious impact on fresh groundwater availability, and that possibility and calculations should be incorporated into the RWSP assessment.

Given the above considerations as well as additional details provided in the Draft plan, SMC supports the designation of the entire NFRWSP as a Water Resource Caution Area (WRCA).

Lastly, SMC believes that even greater emphasis should be placed on the use of reclaimed water, both for non-potable and potable reuse. The Water Management Districts should strongly incentivize implementation of potable reuse projects within their jurisdictions. Conversely, substantially less investment should be encouraged for water supply development projects that tap "new" sources of water; use of brackish groundwater and Lower Floridan Aquifer withdrawals are detrimental to the long-term sustainability of North Florida's water supply and should be discouraged. SMC appreciates the emphasis on water conservation and demand reduction projects. In particular, SMC supports the Districts' support of tiered public supply billing rates, landscape and irrigation restrictions and design codes, meter reading technology (including for agricultural water use, which is not discussed), agricultural efficiency, and more effective outreach and education.

Thank you for the opportunity to comment on the Draft NFRWSP. Please do not hesitate to contact me with any questions regarding this letter.

Regards,

Anne Harvey Holbrook
Staff Attorney
Save the Manatee Club

From: noreply@formstack.com
To: Jerry Carter; nfrwsp-comments
Subject: northfloridawater-draftreview
Date: Monday, December 05, 2016 5:07:42 PM

Formstack Submission for form northfloridawater-draftreview

Submitted at 12/05/16 5:07 PM

Name:	Kerry Kates
Organization:	Florida Fruit & Vegetable Association
Email:	kerry.kates@ffva.com
Phone number:	(321) 214-5200
Comments:	•Water Conservation and Irrigation Efficiency, Table 1: "2035 Water Conservation and Irrigation Efficiency Potential" (pg 23) o In the draft supply plan, both the proposed Low and High Conservation Potentials for agriculture are listed at 25 million gallons per day (mgd). The total agricultural demand for 2035 is projected at 154 mgd, meaning that over the course of the next 20 years the expectation is that agriculture will initiate a conservation effort resulting in a 16% reduction of water use, equating to 25 mgd conserved. The way it is presented in Table 1, as both the low and high conservation potential, could lead the reader to mistakenly interpret the 25 mgd as an infallible and unquestionable reduction goal that the agricultural community is then obligated to obtain. It is much more realistic to provide a range of values, such as was done with the conservation projection for public supply (11 mgd-21mgd). The table should be amended to include a low conservation potential other than 25 mgd to better reflect variable, real-world conditions and to thwart unrealistic and/or unobtainable expectations.

From:	Gus Olmos
To:	nfrwsp-comments
Subject:	Draft North Florida Regional Water Supply Plan Comments
Date:	Monday, December 05, 2016 5:24:17 PM
Attachments:	Alachua County Comments - Water Supply Plan 12.5.16.xlsx

Thanks for the opportunity to provide comments. Please feel free to contact me with any questions.

Gus

Gus Olmos, P.E.
Water Resources Manager
Alachua County Environmental Protection Department
gus@alachuacounty.us
Office: (352) 264-6806
Cell: (352) 275-1344

Appendix A Comment Template - Comments Received from Stakeholders Regarding the Draft North Florida Regional Water Supply Plan

Contact Information							Comment Information			
Date	From	Affiliation	Title	Phone	Email	Address	Comment Type (select from Drop Down)	Chapter (select from dropdown)	Page Number	Comment
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	General	Chapter 2 - Introduction to Water Supply Planning	7	Local governments are required to modify the potable water sub-elements of their comp plan by incorporating water supply projects. What if the local government is not a utility?
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	General	Chapter 3 - Water Demand, Reclaimed Water and Water Conservation Projections	14	Is freeze protection inclued in agriculture water use projections?
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	General	Chapter 3 - Water Demand, Reclaimed Water and Water Conservation Projections	15	Agriculture acreage is expected to increase. What land use is expected to be converted to ag? Silvaculture?
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	General	Chapter 3 - Water Demand, Reclaimed Water and Water Conservation Projections	16	It should be clarified that the CCI water use only includes CCI uses that are self supplied, not those supplied with public supply as the water source.
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	General	Chapter 3 - Water Demand, Reclaimed Water and Water Conservation Projections	17	It should be clarified that the Landscape/Recreational/Aesthetic category does not include most residential and commercial landscape irrigation, as that is included in DSS or Public Supply. I have seen these numbers misinterpreted by readers assuming that this category includes all landscape irrigation.
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	General	Chapter 7 - Project Options	46	It is likely that many of the projects overestimate water savings.
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	General	Chapter 7 - Project Options	51	Tiered rates are a great tool, but to be most effective the WMDs need to prohibit new wells where public supply is available. This would avoid the alarming trend of property owners shifting outdoor use to a private well that is then not accounted for in water use estimates. At the very least, the WMDs could delegate this authority to local governments.
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	General	Chapter 3 - Water Demand, Reclaimed Water and Water Conservation Projections	12	Current USGS water use estimates do not include the water used for outdoor uses from private irrigation wells for properties that are also served by public supply. There is concern that total water use may be grossly underestimated and that per capita water use may be artifically decreased by omitting this use from the equation.
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	Demands	Appendix B - Demand Projection, Reclaimed Water and Water Conservation Methodology and Tables	5	As indicated in Appendix B, the projected demand from different types of supply sources, i.e. public water supply, small public supply and "domestic self supply", is based on the assumption that the % share from each of these in 2035 will generally* be the same as it is currently.This constant "percent-share method" for projections very likely understates the demand from public water supply sources in 2035 in areas such as Alachua County (and probably in other urbanizing counties in the region) where the trend has been significantly higher proportions of new development being approved in urban areas connected to public water supply sources; this trend along with Comprehensive Plan policies promoting such development in urban areas served by public water supply systems will result in increasing shares of population utilizing public water supply systems rather than small public systems or DSS. (*According to discussion in Appendix B, " a 1 percent per conversion of domestic-self-supply to public supply systems was added to viable public supply systems by proportion in" seven counties in the region. There are other counties in the region, including but probably not limited to Alachua County, where recognition of such a shift in the share of demand to public supply systems would also be appropriate.)
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	Demands	Chapter 3 - Water Demand, Reclaimed Water and Water Conservation Projections	10 - 14	The projected increases discussed in the text and shown in Figures 5,7, and 8 in demands from Domestic Self Supply in this section are likely overstated, and, conversely the projected increases in demand from Public Water Supply are likely understated, because the use of the constant "percent-share method' for projections doesn't correspond with shifts of population to urban areas with Public Water Supply systems,as detailed in the comment above on Appendix B.
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	Grammatical	Appendix L	1 - 3	Missing units for Estimated Water Supply
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	Grammatical	Appendix M	1 - 3	Missing units for Estimated Water Supply Benefit
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	Grammatical	Appendix M	1	Project # 16 should be listed under Levy County not City of Archer

Appendix A Comment Template - Comments Received from Stakeholders Regarding the Draft North Florida Regional Water Supply Plan

Contact Information							Comment Information			
Date	**From**	**Affiliation**	**Title**	**Phone**	**Email**	**Address**	**Comment Type** (select from Drop Down)	**Chapter** (select from dropdown)	**Page Number**	**Comment**
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	Other Technical	Chapter 2 - Introduction to Water Supply Planning	6	**"It is important to note that, while the NFRWSP may not be used in the review of CUPs/WUPs, the Districts are allowed to use data or other information used to establish the plan in reviewing CUPs/WUPs".** This statement seem in conflict with the requirements of Subsection 373.709(7), F.S.
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	General	Executive Summary	i - iii	Comment: Water policies that promote reclaimed water credits for landscape irrigation, in particular for new development, have the unintended consequences of perpetuating and promoting water and fertilizer dependent landscapes, increasing nutrient loadings in impaired watersheds, decreasing aquifer recharge, and increasing water loss due to evapotranspiration. Water policies that give credit for reclaimed water credits for industrial uses, such as cooling water for power plants, reflects a "highest and best use" credit hierarchy Alachua County Recommends: The draft water supply plan be revised so that reclaimed water credit policy discourages credits for residential and commercial landscape irrigation for new development. The policy should clearly encourage only uses of reclaimed water uses that do not involve landscape irrigation such as agricultural, industrial or commercial uses. Regarding residential and commercial landscaping, partial credit should only be considered for retrofitting existing landscape irrigation with reclaimed water, not for new development landscape irrigation. With regards to water credits for landscape irrigation, the utility other responsible party will need to establish a framework such as deed restrictions to ensure that low/no irrigated landscaping is not replaced with high irrigation landscaping at later date or establish a trigger that requires additional water offsets to compensate for changes to water intensive landscaping.
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	General	Chapter 2 - Introduction to Water Supply Planning	7	**"Identifying water supply projects to meet the water needs identified in the NFRWSP within the local government's jurisdiction".** The demand projections in Appendix B are aggregated to the County level. It is difficult to estimate the specific local government's water need from the information supplied in the plan; especially for local governments without a utility.
12/5/2016	Gus Olmos	Alachua County	Water Resources Manager	352-264-6806	gus@alachuacounty.us	408 W University Ave, Suite 106, Gainesville, FL 32601	General	Chapter 2 - Introduction to Water Supply Planning	7	**Relationship to SJRWMD and SRWMD Regulatory Programs.** The plan should include a discussion of all the tools avilable to the Districts, including permit reductions, denials and more stringent water use restrictions as part of a water shortage declaration.

From:	noreply@formstack.com
To:	Jerry Carter; nfrwsp-comments
Subject:	northfloridawater-draftreview
Date:	Monday, December 05, 2016 9:55:55 PM

Formstack Submission for form northfloridawater-draftreview

Submitted at 12/05/16 9:55 PM

Name:	Lauren Staples
Organization:	resident
Email:	laurenleesc@gmail.com
Phone number:	(803) 351-7784
Comments:	1a) Appendix B technical memorandum states "the PSC requires each Power Generation facility produce detailed ten-year site plans for each of its facilities." Where is this specific, enforceable type plan in the body of the plan? This plan merely suggests ideas and mentions some projects that have been submitted for helping the problem. It needs to be a strong, clear and enforceable plan with quantifiable mandates to users in the body of the plan, not the appendix. 1b) There needs to be a plan to audit the water use on a schedule between now and 2035; and to amend if the use grows at a faster rate than projected. Accountability and roles and responsibilities need to be clearly delegated and the audits should be published on an established frequency to the public. 2) Amendment 1 moneys are already being divided by the legislature and we need to remind them that those funds were intended for land acquisition and protection of our water resources. This plan should clearly stake a claim on this money! 3) This plan does not mention any current dam issues and arguments/resolutions such as the Rodman Dam. 4) The methodology used in this plan assumes the neighboring water districts will be at 2009 levels and only looks at the 2035 project increase within our boundaries. I think the plan should reach out to the neighboring water districts and get a more realistic projected use from those outside our boundary.

8604 Allisonville Rd.
Suite 300
Indianapolis, IN 46250

From: noreply@formstack.com
To: Jerry Carter; nfrwsp-comments
Subject: northfloridawater-draftreview
Date: Tuesday, December 06, 2016 1:16:18 PM

Formstack Submission for form northfloridawater-draftreview

Submitted at 12/06/16 1:15 PM

Name:	Phillip Scanlan
Organization:	
Email:	phillipscanlan@att.net
Phone number:	(904) 491-8852
Comments:	Clearly we are using up our aquifer (Traditional) water supply as a result of continued growth. In addition the aquifer water supply is at risk of salinization in key growth areas like Fernandina Beach, Florida. Therefore, there should be a plan to reduce reliance on Aquifer (Traditional) water supply and move to other water supplies. One way would be to rank order Aquifer water supply uses and limit lower level uses. For example drinking water would be a high level use and perhaps Agriculture a Mid-range use and Industrial use a low level use. An alternative to limiting low level uses of the aquifer would be to use a market based technique to deter low level uses. Aquifer withdrawals are free today for a limited and valuable community resource. Put a price on aquifer withdrawals, perhaps when permits are issued. For example a permit could have a fixed fee and an annual fee per gallon of annual withdrawal permitted. This would encourage users to look for conservation methods and alternative sources of water. A price on water withdrawals would also enable building of a Capital Fund for desalinization plants that appear to be needed in the future -- due to the continued and unlimited growth in Florida. All existing users should be asked to develop a plan to reduce their current water usage by 21% by 2035, to offset the 21% growth projected. An incentive could be provided to do this by providing a discount on the aquifer water withdrawal charges for meeting this goal. Money drives everything, we need an economic driver to control usage of our limited water supply. We need a user charge for the amount of water being withdrawn to drive the right user behavior. It is either charge me now or charge me more later. If we do not control the

water usage we will need desalinization plants later and high costs to build and operate those plants will be charged to users.

I believe we have to admit the current approach to permitting free water usage for all growth is not a workable to sustain our limited water supply. Therefore, we need to introduce a new economic driver as an incentive to manage use of this limited resource, before it is too late to save a resource that is depleted or ruined by salinizaiton.

Phil Scanlan

Establish the Maximum allowable water withdrawals for the aquifer.

Establish clear sustainability goals, not just a set of options, for conservation, and water reuse.

APPENDIX B

Demand Projection, Reclaimed Water and Water Conservation Methodology and Tables

Technical Memorandum
Joint North Florida Regional Water Supply Plan
Population and Water Demand Projection Methodology
January 21, 2016

Contributors

Tammy Bader, Technical Program Manager, St. Johns River Water Management District (SJRWMD)
Carlos Herd, P.G., Water Supply Division Director, Suwannee River Water Management District (SRWMD)

Introduction

The SJRWMD and SRWMD (Districts) develop water demand projections to determine "existing legal uses, anticipated future needs, and existing and reasonably anticipated sources of water and conservation efforts," as set forth by subparagraph 373.036(2)(b)4a, Florida Statutes (F.S.). The Districts' goal in projecting water demands is to develop estimates of projected need that appear to be reasonable based on the best information available and that are mutually acceptable to the water users. The Water Demand Protection Subcommittee (WDPS), a subcommittee of the Water Planning Coordination Group (WPCG), developed the currently used definitions of the water use categories (WDPS 1998a). WDPS was composed of representatives of the state's five water management districts (WMDs) and the Florida Department of Environmental Protection (FDEP) (WDPS 1998a). In addition, definitions of the water use categories (used in this process) were recently updated through the statewide consumptive use permitting (CUP) consistency process, initiated by FDEP. The six water use categories as defined by WDPS are:

1. Public Supply
2. Domestic Self-supply and Small Public Supply Systems
3. Agricultural Irrigation Self-supply
4. Landscape / Recreational / Aesthetic Irrigation Self-supply
5. Commercial / Industrial / Institutional and Mining / Dewatering Self-supply
6. Thermoelectric Power Generation Self-supply

In addition, the Districts project future reclaimed water flows that could potentially be used to offset water demand.

Purpose

This technical memorandum details the actions taken and methodologies utilized to develop the water demand projections for the six water use categories, as well as future reclaimed water flows. This technical memorandum also details the methodologies utilized to for the spatial distribution of future groundwater withdrawals for modeling purposes for water use categories listed above, with the exception of agriculture. Water demand projections for the six water use categories were calculated for the years 2015, 2020, 2025, 2030 and 2035 (Chapter 62-40.531 (1)(a) Florida Administrative Code (F.A.C.), requires intermediate water use projections for every five-year interval). Water demand projections were also calculated for a 1-in-10 drought event for year 2035. The 1-in-10 drought event "is an event that results in an increase in water demand of a magnitude that would have a 10 percent probability of occurring during any given year," (WDPS 1998). Future reclaimed water flows were calculated for the year 2035.

Water use is defined as current or historic levels of water withdrawn from fresh (ground and surface) water sources and is expressed in average million gallons per day (mgd) unless otherwise noted.

Water demand projections are estimates of the amount of water that will be needed in the future (withdrawn from fresh (ground and surface) water sources) to meet the needs of increasing population and to meet the needs of the aforementioned water use categories and is expressed in average mgd unless otherwise noted.

Reclaimed water is treated wastewater that has received at least secondary treatment and basic disinfection and is expressed in average mgd unless otherwise noted.

Background

SJRWMD completed Water Supply Assessments in 1994, 1998 and 2003 (WSA 1998 and WSA 2003) (Vergara 1994 & 1998, SJRWMD 2006). The 1994 assessment is commonly referred to as the water supply needs and sources assessment. For the WSA 1998, year 1995 water use served as the base year for the 2020 projections and for the WSA 2003, year 2000 water use served as the base year for the 2025 projections. The SJRWMD also has a Draft District Water Supply Plan (SJRWMD 2013b) in which year 2005 water use served as the base year for the 2035 projections. SRWMD completed a 2010 Water Supply Assessment (SRWMD 2011), in which year 2005 water use served as the base year for the 2030 projections. In the 2015 Joint North Florida Regional Water Supply Plan (NFRWSP), year 2010 will be the starting point, or baseline year, for the purpose of developing and reporting water demand projections. This is consistent with the methodology agreed upon by the WPCG. The data for the baseline year consist of reported and estimated usage for 2010, whereas data for the years 2015 through 2035 are projected demands (estimated needs). The NFRWSP will consist of projections from the following counties: SJRWMD – Alachua, Baker, Bradford, Clay, Duval, Flagler, Nassau, Putnam and St. Johns (SJRWMD Region 1) and SRWMD – Alachua, Baker, Bradford, Columbia, Gilchrist, Hamilton, Suwannee and Union. Although the NFRWSP does not cover all of the counties within the Districts' boundaries, water demand projections were developed for all of the SJRWMD and SRWMD counties for modeling purposes, e.g., Madison County. This Appendix only contains projections for those counties within the NFRWSP area; projections for counties located outside the NFRWSP area are available upon request.

Data and Information Sources

The methodology to develop population and water demand projections utilizes many data sources such as:

1. Water use and population estimates reported by utilities collected by the FDEP, commonly called Monthly Operating Reports (MORs).
2. Water use estimates reported by utilities collected by SJRWMD through the EN50 form, commonly called EN50 data.
3. SJRWMD annual water use inventory data, commonly called Annual Water Use Survey (AWUS) data (SJRWMD 2007-2011, 2013a and 2014-2015).
4. Water use, population, permitted quantities and percentages of use reported in CUPs and water use permits (WUPs).
5. SJRWMD's Public Supply Permittee Historic Database, which contains historic population, water use and gross per capita rates for all SJRWMD public supply permittees.

6. University of Florida's Bureau of Economic and Business Research (BEBR) publications (Smith 2007-2010, 2011a, 2011b, 2012-2015).
7. United States Geological Survey (USGS) water use estimates (Marella 2009, 2014).
8. FDEP Annual Reuse Inventory Reports (FDEP 2011).
9. Ten-Year Site Plans collected by the Public Service Commission (PSC).

Assumptions

The Districts make a considerable effort to develop water demand projections that are consistent with the specific plans of major water users at the time projections are made. For the purposes of the NFRWSP, the Districts assume that projected increases in supply will come from traditional sources, which, in this planning region, is fresh groundwater, unless water suppliers have made a final commitment to the development and use of other sources of supply. Public water supply utilities in Florida are in varying stages of transitioning exclusively from fresh groundwater sources to alternative sources, which include reclaimed water, surface water, brackish groundwater and seawater. Future water supply assessments will include water use projections based on commitments to develop alternative sources as the transition to diversified sources progresses. In addition, the Districts assume that current levels of water conservation and use of reclaimed water will continue through the year 2035 projection horizon. If water conservation efforts and the use of reclaimed water within the NFRWSP area are effective in reducing demands, then 2035 actual water use should be less than projected under average climatic conditions.

Public Supply and Small Public Supply Systems

Water demand was calculated for each public supply and small public supply system that has a public water utility service area boundary (PWSAB). The Public Supply category includes water provided by any municipality, county, regional water supply authority, special district, public or privately owned water utility or multijurisdictional water supply authority for human consumption and other purposes (sometimes a public supply permittee is not classified as a utility). The Public Supply category includes those permittees that have average annual permitted quantities of 0.1 mgd or more.

Small Public Supply Systems (which are combined with the Domestic Self-supply (DSS) category for reporting purposes) are permittees that have average annual permitted quantities of less than 0.1 mgd.

<u>Demand</u>

The per capita water use rate is the factor applied to projected population (described below) to project water demand. Therefore, it is necessary for the base per capita rate to represent water use in an average year. Water demand projections were based on the most recent five-year average gross per capita rate (at the time the projections were developed), which accounts for annual variations in water use with respect to climatic variations and recent implementations of conservation programs. To address this variability, the Districts calculated five-year average gross per capita use rates for each individual public supply and small public supply system.

For the NFRWSP, the five-year average gross per capita rate was calculated using water use and population data for the years 2010-2014. The relationship between public supply water use and annual precipitation amounts is typically inverse (less rain results in increased water use, largely due to outdoor water use). This is confirmed by a higher SJRWMD average gross per capita water use rate in 2011 of 141 gallons per day (gpd) versus the SJRWMD average gross per capita water use rate of 134 gpd in 2012. The SJRWMD rainfall for these respective years was 45.05 inches and 49.26 inches (SJRWMD 2012, 2013a). As such, water use projections based solely on observed 2011 per capita rates would be higher than a reasonable average water use projection and water use projections based on observed 2012 per capita rates would be lower than a reasonable average water use projection.

For public supply and small public supply systems, the gross per capita rate is defined as the total water use (including residential and non-residential uses) for each individual permittee divided by its respective residential population served. The gross per capita rate (in gallons per capita per day or gpcd) represents on average how much water one person would use in a day. Water use and population served for each year (2010-2014) and for each public supply system (as discussed above) was obtained from the sources listed in the Data and Information Sources Section. These sources include the *SJRWMD's Public Supply Permittee Historic Database*. The database, which contains historic population, water use and gross per capita rates for all SJRWMD public supply permittees, was developed by the SJRWMD to assist in planning and permitting efforts and to allow for the automatic calculation of gross per capita rates and rolling five-year average gross per capita rates. The data contained in the database was derived from FDEP MORs, EN50s, AWUS data, CUPs and BEBR. In cases where water use data was not available from these sources, the Districts used professional analyses of historical data and trends to estimate values.

The SJRWMD and Southwest Florida Water Management District (SWFWMD) currently have in their CUP rules (SJRWMD - Applicant's Handbook: Consumptive Uses of Water - Section 2.2.2.2 - Page 2-4 and SWFWMD - Water Use Permit - Applicant's Handbook, Part B - Section 2.3.7.2.2 - Page 19) the use of a historical five-year average gross per capita (most recent five years) for calculating demand for public supply permits. In an attempt to be consistent with the CUP program, as well as to represent water use in an average year, the Districts use a five-year average gross per capita in planning for calculating demand for public supply permits. The CUP rules do allow for varying the five-year average if sufficient data is not available (e.g., for new applicants) or if data has been provided indicating that future development and growth will have different characteristics than historic/present development and growth. Of note, since 2008, 198 public supply CUPs in SJRWMD have been issued using five-year average per capita rates, of which 33 were located in the NFRWSP area. In addition, it is recognized that public supply permittees also use a five-year average per capita rate in their water resource master plans (JEA 2013).

Beginning in early 2012, the WMDs and DEP began the CUP Consistency (CUPcon) effort. A portion of this effort was to have all the WMDs come to a consensus on the basis for public supply projections in planning and consumptive use permitting. During this intensive collaborative effort, the WMDs and DEP agreed that the basis for public supply projections in planning and consumptive use permitting would be a five-year average gross per capita rate. Unfortunately, a formal CUPcon guidance document was not created, due to factors unrelated to the five-year timeframe. Also, as a result, F.S. related to water supply planning (373.709, F.S.) and CUP / WUP rules in the South Florida Water Management District (SFWMD), SRWMD and Northwest Florida Water Management District were not updated to reflect the consensus of a five-year average gross per capita rate. Currently, SWFWMD does use the most recent five-year average gross per capita rate for public supply projections in planning. Also, during the Central Florida Water Initiative (CFWI) Regional Water Supply Plan (RWSP) development, SFWMD, SJRWMD, SWFWMD, DEP, Florida Department of Agriculture and

Consumer Services (FDACS) and utility stakeholders agreed to use a five-year average gross per capita rate for public supply projections.

Gross per capita rates are a function of several factors that have to be considered. The Districts have observed a reduction in per capita water use that may be attributed to a variety of factors, including a downturn in economic conditions, indoor and outdoor conservation and source substitution. Alternatively, the converse of these observed conditions could have the opposite effect. The use of a five-year average per capita accounts for variability in these factors.

Water demand for each public supply system is shown in a Table A-5, with county totals, and includes the years 2015, 2020, 2025, 2030 and 2035. Water use for 2010 and water demand for a 2035 1-in-10 drought year is also shown for analysis purposes. Water demand for small public supply systems were aggregated for each county and were added to the respective county demand for the DSS category. The water demand by county is shown in Table A-6 and includes the years 2015, 2020, 2025, 2030 and 2035. Water use for 2010 and water demand for a 2035 1-in-10 drought year is also shown for analysis purposes. Although the water demand for each small public supply system is not listed out separately in the NFRWSP, the data is available in Table A-6c and can be of use in other planning efforts.

The 1-in-10 year Drought Subcommittee of the WPCG, as stated in their final report (WDPS 1998a), determined that a six percent increase in demand would occur in such an event for public supply water use. Therefore, the 1-in-10 year water demand projections are the average year demands multiplied by 1.06.

Population

Using BEBR's estimates of population by county (Smith 2011a), a percentage of 2010 county population for each public supply and small public supply system was calculated. These respective percentages were used to calculate future population projections for the years 2015, 2020, 2025, 2030 and 2035 for each public supply and small public supply system. The projection methodology is commonly referred to as a percent-share method. For example, if a utility serves 10 percent of the county population in 2010, then this utility will also serve 10 percent of the county population in 2035.

The population projections developed by BEBR are generally accepted as the standard throughout Florida. In developing RWSPs, the Districts must consider BEBR medium population projections [Section 373.709(2)(a)1a, F.S.]. These projections are made at the county level only (Smith 2015) and require specific methods to distribute the county level projections among public supply systems. While the percent-share method does not take into account varying growth rates, it is generally accepted as a valid method for regional planning purposes. The Districts did estimate a "build-out" population, or the maximum population within a PWSAB, for each public supply and small public supply system using current land use and zoning / parcel layers.

As a result of the North Florida Regional Water Supply Stakeholder Advisory Committee and North Florida Utility Coordination Group comments from December 15, 2014; a 1 percent per year conversion of domestic-self-supply to public supply systems was added to viable public supply systems by proportion in Baker, Clay, Duval, Lake (CFWI), Nassau, Orange and St. Johns Counties.

While not available for this joint planning effort, the SJRWMD is developing a Population Distribution Model, which will distribute population to the parcel level using growth drivers and growth inhibitors. It is anticipated that this model will be used in future joint RWSP efforts.

Spatial Groundwater Distribution

As noted above, projected water demand for each public supply and small public system was estimated. For modeling purposes, the groundwater demand and associated location of withdrawal needed to be determined. It should be noted that there are some public systems within the SJRWMD that have surface water withdrawals; for this purpose, only the groundwater demand estimated was distributed. For those permits with surface water, groundwater demand was estimated as the total demand minus the permitted surface water withdrawal. The Districts, as part of the CUP process have the location of each well or station associated with a public supply and small public supply system. The future groundwater demand, specific to each public supply and small public system, was distributed evenly to their respective active or proposed wells/stations. In addition, well size and pumping capabilities were taken into account, so as to not exceed the maximum yield of the well/station. Also, it should be noted that for public supply systems with multiple wellfields and/or specific wellfield allocations, the associated demand was divided proportionally amongst the respective wellfields and then further to the wellfields' respective wells/stations.

Domestic Self-supply

The DSS category consists of residential dwellings that are provided water from a dedicated, on-site well and are not connected to a central utility. As noted above, historic water use and population and water demand and population projections for small public supply systems are calculated individually, but are combined with the DSS category for reporting purposes at the county level.

Demand

For DSS, the residential per capita rate (also referred to as household) is defined as the water use for solely residential (indoor and outdoor) purposes. The residential per capita is estimated from the county level residential population served and residential water use. To achieve this, the water use for each year (2010-2014) for each of SJRWMD's public supply and small public supply systems, obtained from the gross per capita methodology above, is multiplied by the percentage of the total water use allocated to residential use, as authorized in the CUPs. The resulting residential water use values for each of SJRWMD's public supply and small public supply system are then summed to the county level and divided by the total public supply population served (at county level) to obtain the county-level average 2010-2014 residential per capita value. The average 2010-2014 residential per capita (by county) value is then multiplied by the projected 2015, 2020, 2025, 2030 and 2035 DSS population (by county) (described below). SRWMD currently does not collect sufficiently detailed information on the total water use allocated to solely residential use in their public supply WUPs. As such, the SJRWMD average 2010-2014 residential per capita value for Alachua, Baker and Bradford counties was used for the SRWMD portions of the respective counties and the SJRWMD total average 2010-2014 residential per capita value was used for the remaining SRWMD counties.

The DSS water demand by county (after adding the total water demand for small public supply systems) is shown in Table A-6 and includes the years 2015, 2020, 2025, 2030 and 2035. Water use for 2010 and water demand for a 2035 1-in-10 drought year is also shown for analysis purposes.

The 1-in-10 year Drought Subcommittee of the WPCG, as stated in their final report, determined that a six percent increase in demand would occur in such an event for DSS water use. Therefore, the 1-in-10 year water demand projections are the average year demands multiplied by 1.06.

Population

The 2010 population for DSS was estimated for each county using the total 2010 population from public supply and small public supply systems and subtracting the BEBR Estimate of Population by County, (Smith 2011a). The 2010 DSS county estimates were compared and adjusted when necessary to coincide with the Districts' DSS parcel estimates. The SJRWMD developed a DSS parcel calculation using Department of Revenue codes and housing units built for areas outside of PWSABs. The total number of 2010 DSS parcels was multiplied by the 2010 persons per household value from BEBR (Smith 2011b) to verify the estimate of the 2010 DSS population.

Years 2015, 2020, 2025, 2030 and 2035 population for DSS was estimated for each county using the total 2015, 2020, 2025, 2030 and 2035 population from the public supply and small public supply systems and subtracting the BEBR medium population projections (Smith 2015). The population by county (after adding the total population for small public supply systems for each respective county) is shown in a Table A-6 and includes the years 2015, 2020, 2025, 2030 and 2035. Population for 2010 is also shown for analysis purposes.

As noted in the Public Supply section, a 1 percent per year conversion of domestic-self-supply to public supply systems was added to viable public supply systems by proportion in Baker, Clay, Duval, Lake (CFWI), Nassau, Orange and St. Johns Counties.

Spatial Groundwater Distribution

Small public supply system future groundwater demand and location of withdrawal was spatially distributed as defined above in the public supply section.

As noted above, the SJRWMD developed a DSS parcel model using Department of Revenue codes and housing units built for areas outside of PWSABs; a point is added to the centroid of each identified parcel to represent a well/station. The SJRWMD also has approximately twenty public supply systems that have provided account level billing data. This data allows the SJRWMD to determine DSS within those respective service areas. Well completion reports, identified as DSS were also taken into consideration to determine the location of DSS within PWSABs. The DSS demand for each five-year increment was then distributed evenly amongst the DSS parcels identified. It should be noted that DSS demand is only anticipated to come from groundwater withdrawal sources. It should be noted, that for counties located in more than one water management district (e.g., Alachua County) the projected DSS demand for the respective water management district was only applied to the respective DSS parcels identified within their respective portion of the county.

Agricultural Irrigation Self-supply

The Agricultural Irrigation Self-supply category includes the irrigation of crops and other miscellaneous water uses associated with agricultural production. Self-supply categories obtain water from a dedicated, on-site well and are not connected to a central utility. Irrigated acreage and projected water demands were determined for a variety of crop categories, such as citrus, vegetables, melons, berries, field crops, greenhouse/nursery, sod and pasture. In addition, projected demands associated with other agriculture uses were estimated and reported as miscellaneous type uses, such as aquaculture, dairy/cattle, poultry and swine.

In 2013, legislation was passed that requires the Districts, in developing RWSPs, to consider agricultural demand projections produced by FDACS [Section 373.709(2)(a)1b, F.S.]. FDACS, through a contract with The Balmoral Group, developed future agricultural acreage and water demand projections for the State of Florida for the years 2015, 2020, 2025, 2030 and 2035, as well as a water demand for a 2035 1-in-10 drought year and delivered the Final Draft to the Districts on June 5, 2015 (FDACS, 2015). This product is known as the Florida Statewide Agricultural Irrigation Demand (FSAID) and the June 5, 2015 version is identified as FSAID II.

The Districts considered FDACS' FSAID II projections and decided to use the agricultural acreage and water demand projections as presented in the Final Draft (FDACS, 2015) for the NFRWSP. Detailed methodology can be found in the June 5, 2015 FSAID II Final Report (FDACS, 2015).

<u>Acreage</u>

The FDACS, through a contract with The Balmoral Group, developed a statewide 2010 agricultural acreage land coverage geodatabase. This geodatabase, also known as FSAID I, was used to obtain 2010 irrigated acreage by crop type and by county (FDACS, 2014). As noted above, acreage projections were taken directly from the June 5, 2015 FSAID II Final Report (FDACS, 2015).

The total Agricultural Irrigation Self-supply acreage by county is shown in a Table A-7 and includes the years 2015, 2020, 2025, 2030 and 2035. Acreage for 2010 is also shown for analysis purposes. Acreage by crop type is included in Table A-7a and can be of use in other planning efforts.

<u>Demand</u>

Water use for year 2010 from FSAID I (FDACS, 2014) was considered by the Districts, however the Districts decided to use other data, more reflective of the year 2010. For SRWMD, water use was tensioned to 2010 values published by the United States Geologic Survey (USGS) (USGS, 2014) and applied to the agricultural land locations provided from FSAID I (FDACS, 2014). For SJRWMD, 2010 EN50 data was used where available. For agricultural areas in SJRWMD with a CUP where there was no EN50 data and in non-CUP agricultural areas (areas below permitting thresholds where a CUP was not required), 2010 water use simulations were run using the Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) Model. As noted above, water demand projections for all years were taken directly from the June 5, 2015 FSAID II Final Report (FDACS, 2015).

The total agricultural water demand by county is shown in Table A-7 and includes the years 2015, 2020, 2025, 2030 and 2035. Water use for 2010 and water demand for a 2035 1-in-10 drought year is also shown for analysis purposes. Water demand by crop type and miscellaneous type uses is included in the NFRWSP appendices and can be of use in other planning efforts.

The Districts are committed to working in cooperation with FDACS on agricultural water supply planning and SJRWMD is currently working with FDACS on a joint effort to update the SJRWMD portion of the Statewide Irrigated Lands Geodatabase (FDACS, 2014) with 2015 field verified crop type, irrigation system and acreage estimates for FSAID III. While not available for this joint planning effort, the SJRWMD is also developing an Agricultural Water Use Planning (AWUP) Model, which will use the AFSIRS model to estimate water demand from agricultural acreage projections. It is anticipated that this AWUP model will be used in future joint RWSP efforts for comparison with FDACS water demand projections.

It should be noted that agricultural acreages and water demands are difficult to predict because they depend upon the choices individual agricultural producers make from year to year. Those choices are affected by numerous factors, including weather, markets, disease, proprietary information and demand for agricultural land for other uses. Agricultural projections can be volatile and it is uncertain how population changes/future land use conversions may affect them. In addition, it is difficult to project acreage and water use demands for crop types that are relatively new or expanding rapidly because there are limited data available upon which to base projections.

Spatial Groundwater Distribution

As noted above, The Balmoral Group, developed future agricultural acreage and total water demand projections for the State of Florida for the years 2015, 2020, 2025, 2030 and 2035, as well as a water demand for a 2035 1-in-10 drought year and delivered the Final Draft to the Districts on June 5, 2015 (FDACS, 2015). This product is known as the Florida Statewide Agricultural Irrigation Demand (FSAID) and the June 5, 2015 version is identified as FSAID II. The FSAID II deliverable has the spatial location, in polygon format, of all estimated future agricultural demand in the five-year increments necessary for groundwater modeling. The Districts used the FSAID II deliverable and refined to account for those agricultural areas using surface water (via reported CUP data and USGS data from 2010 (SJRWMD, 2011 and USGS, 2014)) and converted the delivered polygon layer to a point layer (tied to CUP well/station location) for use in groundwater modeling. Where a polygon was identified with both groundwater and surface water withdrawals in 2010, the 2010 percent split was applied to future demand years. If an agricultural polygon had more than one groundwater well/station attributed to its location, the future groundwater demand identified was distributed equally.

Landscape / Recreational / Aesthetic Irrigation Self-supply

The Landscape, Recreational and Aesthetic (L/R/A) Irrigation self-supply category represents water use associated with the irrigation, maintenance, and operation of golf courses, cemeteries, parks, medians, attractions, and other large self-supplied green areas. Landscape use includes the outside watering of plants, shrubs, lawns, ground cover, trees, and other flora in such diverse locations as the common areas of residential developments and industrial buildings, parks, recreational areas, cemeteries, public right-of-ways, and medians. Recreational use includes the irrigation of recreational areas such as golf courses, soccer, baseball and football fields, and playgrounds. Water-based recreation use is also included in this category, which includes public or private swimming and wading pools, and other water-oriented recreation such as water slides. Aesthetic use includes fountains, waterfalls, and landscape lakes and ponds where such uses are ornamental and decorative.

The L/R/A category also includes miscellaneous irrigation or additional irrigation demand. Miscellaneous irrigation use represents wells that are less than six inches in diameter, and those uses which have a permit by rule and are used for irrigation at residences that receive potable water for indoor use from a utility. Currently, due to data limitations, residential irrigation wells are not included in the Districts' future projections.

Demand and Acreage

Demand for the L/R/A category was projected at the county level using a respective L/R/A historic average gpcd. The county specific L/R/A average gpcd was calculated from L/R/A average water use for 2010-2014, obtained from SJRWMD AWUS data (SJRWMD 2011-2012, 2013a and 2014-2015) and USGS data (Marella 2009, 2014); and BEBR estimates of county population for 2010-2014 (Smith 2011a, 2012-2015).

The average L/R/A gpcd was applied to the additional population projected by BEBR (Smith 2015) for each five-year increment and the associated demand was added to the 2010 base-year water use. Future acreage estimates were interpolated from 2010 acreage and 2010 water use ratios.

The total L/R/A water demand and acreage by county is shown in Table A-8 and includes the years 2015, 2020, 2025, 2030 and 2035. Water use and acreage for 2010 and water demand for a 2035 1-in-10 drought year is also shown for analysis purposes.

The 1-in-10 year Drought Subcommittee of the WPCG, as stated in their final report, determined that values using agricultural (irrigation) models, historic data and net irrigation ratios are acceptable when calculating the 1-in-10 year water demand projection. A 1-in-10 year factor was developed for each county, using the highest year water use from 2006-2014 (SJRWMD 2007-2012, 2013a and 2015) and the percent increase from the 2006-2014 L/R/A water use. For example, if water use in 2007 is X percent higher than the 2006-2014 five-year average, X percent was applied to the average 2035 water demand to project a 2035 1-in-10 year water demand.

<u>Spatial Groundwater Distribution</u>

As noted above, projected water demand for the L/R/A category is only estimated at the county level. For modeling purposes, the groundwater demand and associated location of withdrawal needed to be determined. It should be noted that although there are several L/R/A CUPs that have surface water withdrawals; for this purpose, only the groundwater demand estimated was distributed. Future groundwater demand for the respective future years at the county level was calculated using the 2010 percent split between groundwater and surface water (via reported CUP data and USGS data from 2010 (SJRWMD, 2011 and USGS, 2014)). The county level groundwater demand for future year scenarios was then distributed to the CUP level using a percent share method of permitted allocation. For example, if an L/R/A CUPs groundwater allocation represented 10 percent of the county's total groundwater allocation in 2010, then the L/R/A CUP allocation will also maintain 10 percent of the county groundwater allocation in 2035. The future groundwater demand estimated, specific to each L/R/A permit, was then distributed evenly to their respective active or proposed wells/stations. In addition, well size and pumping capabilities were taken into account, so as to not exceed the maximum yield of the well/station. It should be noted, that for counties located in more than one water management district (e.g., Alachua County), the projected L/R/A demand for the respective water management district was only applied to the respective L/R/A permits and wells/stations identified within their portion of the county. While future land use and potential new locations of L/R/A polygons was not taken into consideration, the method applied is generally accepted as a valid method for regional planning purposes.

Commercial / Industrial / Institutional and Mining / Dewatering Self-supply

The Commercial, Industrial, and Institutional (C/I/I) Self-supply category represents water use associated with the production of goods or provisions of services by C/I/I establishments. This category also includes the use of water associated with mining and long-term dewatering operations (M/D). Commercial uses include general businesses, office complexes, commercial cooling and heating, bottled water, food and beverage processing restaurants, gas stations, hotels, car washes, laundromats, and water used in zoos, theme parks, and other attractions. Industrial uses include manufacturing and chemical processing plants and other industrial facilities; spraying water for dust control; maintenance, cleaning, and washing of structures and mobile equipment; and the washing of streets, driveways, sidewalks, and similar areas. Institutional use includes hospitals, group home / assisted living facilities, churches, prisons, schools, universities, military bases, etc. Mining uses include water associated with the extraction, transport, and processing of subsurface materials and minerals. Dewatering uses includes the long-term removal of water to control surface or groundwater levels during construction or excavation activities.

<u>Demand</u>

Demand for the C/I/I and M/D category were projected at the county level using a respective C/I/I and M/D historic average gpcd. The county specific C/I/I and M/D average gpcd was calculated from C/I/I and M/D average water use for 2010-2014, obtained from SJRWMD AWUS data (SJRWMD 2011-2012, 2013a and 2014-2015) and USGS data (Marella 2009, 2014) and BEBR estimates of county population for 2010-2014 (2011a, 2012-2015). C/I/I and M/D historic water use and demand consists of only consumptive uses; recycled surface water or non-consumptive uses were removed. For this NFRWSP, surface water use by mining operations represents 5 percent of total surface water use, to account for the loss of water in mining products and evaporation. The remaining surface water was assumed to be recirculated in the mining process and, therefore, is considered nonconsumptive. Nonconsumptive is defined by the Districts as any use of water that does not reduce the water supply from which it is withdrawn or diverted. For further clarification, consumptive use is defined by the Districts as any use of water that reduces the supply from which it is withdrawn or diverted.

The C/I/I and M/D average gpcd was applied to the additional population projected by BEBR (Smith 2015) for each five-year increment and the associated demand was added to the base year, 2010, water use. Water demands for large C/I/I and M/D facilities that are not impacted by population growth (e.g., pulp and paper mills) were held constant.

The total C/I/I and M/D water demand by county is shown in Table A-9 and includes the years 2015, 2020, 2025, 2030 and 2035. Water use for 2010 and water demand for a 2035 1-in-10 drought year is also shown for analysis purposes.

The 1-in-10 year Drought Subcommittee of the WPCG, as stated in their final report, determined that drought events do not have significant impacts on water use in C/I/I and M/D self-supply category. Water use for these categories are related primarily to processing and production needs.

It should be noted that the M/D category can experience a tremendous amount of volatility in a short amount of time. It has been documented that several factors can impact the M/D industry, such as judicial decisions, permit decisions, government moratoriums, new residential developments, quality and availability of rock, etc. (Herbert, 2007).

<u>Spatial Groundwater Distribution</u>

See the L/R/A spatial groundwater distribution explanation above. The methodology for spatial distribution of future groundwater for the C/I/I and M/D categories modeling purposes is the same, using the projected C/I/I and M/D future groundwater demands.

Thermoelectric Power Generation Self-supply

Thermoelectric Power Generation (PG) Self-supply category represents the water use associated with power plant and power generation facilities. PG water use includes the consumptive use of water for steam generation, cooling, and replenishment of cooling reservoirs.

Demand

Demand was calculated for each PG facility and then summed to the county level for consumptive uses of water only; recycled surface water or non-consumptive uses were removed. For this NFRWSP, surface water use by PG facilities represents 2 percent of total surface water use, to account for the loss of water due to evaporation. An example of this nonconsumptive use is surface water used for once-through cooling for power plants, which is recycled.

The PSC requires that each PG facility produce detailed ten-year site plans for each of its facilities. These plans include planned facilities and generating capacity expansion. The 2015 ten-year site plans for each PG facility within the NFRWSP counties were downloaded from the PSC website (http://www.psc.state.fl.us/utilities/electricgas/10yrsiteplans.aspx) and were used in developing the PG demand projections.

For each PG facility with a planned capacity expansion, PG consumptive use capacity projections were interpolated between the existing capacity and the planned capacity, as detailed in the ten-year site plans. The projection of PG consumptive demand beyond the planned expansion in the ten-year site plans was calculated for each facility using a linear extrapolation of the existing and planned expansion dates and data and BEBR medium population projection rates (Smith 2015). In addition, the average daily gallon per megawatt use was estimated for 2010-2014 and used as a proxy to project future water demand beyond the ten-year site plans and when projected water demand (for the ten-year site plan period) was not included.

The total PG water demand by county is shown in Table A-10 and includes the years 2015, 2020, 2025, 2030 and 2035. Water use for 2010 and water demand for a 2035 1-in-10 drought year is also shown for analysis purposes. The breakout for individual PG facilities is included in Table A-10a and can be of use in other planning efforts.

The 1-in-10 year Drought Subcommittee of the WPCG, as stated in their final report, determined that drought events do not have significant impacts on water use in the PG Self-supply category. Water use for this category is related primarily to processing and production needs.

Spatial Groundwater Distribution

Similar to the public supply and small public supply systems category, future water demand was projected in five-year increments through 2035 for each PG facility in the SJRWMD and SRWMD. However, groundwater and surface water was projected separately for each facility based on the five-year (2010-2014) average gallons used per historic megawatt. The Districts, as part of the CUP process or DEP power plant siting act plan, have the location of each well or station associated with a PG facility. The future groundwater demand, specific to each PG facility, was distributed evenly to their respective active or proposed wells/stations. In addition, well size and pumping capabilities were taken into account, so as to not exceed the maximum yield of the well/station.

2035 Reclaimed Water

Projections of future reclaimed water flows were made for domestic wastewater treatment facilities (WWTF) with 2010 permitted wastewater treatment capacities equal to or greater then 0.1 mgd. The source of information was obtained from the FDEP 2010 Reuse Inventory (FDEP, 2011).

It should be noted that the methodology used (described below) to develop the Districts' reclaimed water projections was developed during the CFWI RWSP process by the Water Supply Options Subgroup, which consisted of staff from the SJRWMD, SFWMD, SWFWMD, FDEP and FDACS staff, as well as utility and agricultural industry representatives from the CFWI Planning Area. This method was also used in the SJRWMD Draft District Water Supply Plan (SJRWMD 2013b).

Existing Flows

The 2010 flows were broken out by total WWTF flow and beneficial reuse.

The Districts consider beneficial reuse to be only those uses in which reclaimed water takes the place of an existing or potential use of higher quality water for which reclaimed water is suitable, such as water used for landscape irrigation. Delivery of reclaimed water to sprayfields, absorption fields and rapid infiltration basins are not considered beneficial reuse. Exceptions are made for certain areas that have shown to be recharge areas.

The FDEP has a statewide reuse utilization goal of 75 percent (FDEP, 2003). The total WWTF flow was multiplied by 75 percent. The difference between the 2010 WWTF flow at 75 percent utilization and 2010 beneficial reuse was considered the potential existing additional reclaimed water that could be used for beneficial reuse. This method ensured existing flows would not exceed the 75 percent utilization goal. It is recognized that each WWTF is unique and items such as system upgrades and treatment, additional storage, expansion of system, customer availability, etc. have to be taken into consideration.

Future Flows

Using PWSAB and CUPs/WUPs, the Districts identified WWTFs that could potentially receive sewered flow as a result of population growth. The 2010-2035 increase in population for each CUP/WUP identified was obtained from the public supply and small public supply systems projections, as described above. It was assumed that 95 percent of the population increase identified will receive sewer service and thereby return wastewater for treatment. It is acknowledged that the percentage of sewered growth population and resulting wastewater flows will vary for individual service providers due to a number of factors.

It was further assumed that the increased sewered population will generate approximately 84 gpcd of wastewater to the local WWTF. The 84 gpcd represents an average of 69 gpcd of wastewater generated by residential customers (indoor use) and 15 gpcd of wastewater generated by C/I/I customers (indoor use), based upon the same permanent population. The 84 gpcd is based upon empirical sources for residential flows (Vickers 2001, Mayer 1999). The 69 gpcd, for residential indoor wastewater, is also supported by the American Water Works Association (AWWA, 1999). Additionally, F.A.C., Chapter 64E-6, "Standards for Onsite Sewage Treatment and Disposal Systems", Rule 64E-6.008 System Size Determinations, Section (1)(B) Table I (effective date 6/25/2009) -

System Design, supports designs for wastewater return flows averaging 15 gpcd for employees at a commercial/industrial facility. The estimated future flow was then multiplied by the FDEP utilization goal of 75 percent (FDEP, 2003), generating a 2035 potential new additional reclaimed water for reuse.

It is recognized that only a portion of the existing and future wastewater treated for reuse is actually utilized to offset demands that would otherwise require the use of fresh groundwater. The amount of potable offset that is typically achieved utility-wide is approximately 65 percent to 75 percent, but can range downwards of 50 percent to as much as 100 percent, depending on the type of use being replaced. While the amount of potable offset that is achieved by reuse is dependent upon the demographics of a particular utility's reuse customers, it is important that the utility understands that the projected wastewater flows do not represent an amount equal to the demand reduction due to system losses and inefficiencies of its reuse customers.

Reclaimed water systems are unique to each utility and the potential WWTF flow estimated for this NFRWSP may not necessarily represent the amount of reclaimed water that could be used in projects. Current treatment processes, WWTF capacities, storage and infrastructure have to be considered and could potentially have a cost impact of utilization of additional or currently available reclaimed water. Likewise, the Districts realize that future and existing reclaimed water utilization may be higher than the scenarios presented, if the WWTF provided reclaimed water for reuse to more efficient customers. For the purposes of this NFRWSP, the Districts also created a future reclaimed water scenario using the 2010 percent beneficial reuse utilization for existing and future flows; which assumes that no changes to current treatment processes are made (e.g., WWTF upgrade). In addition, the Districts recognize potential future wastewater flows could be less if additional residential indoor water conservation is achieved. For example, AWWA has identified on their website (Drinktap.org) that if residences installed, for every instance, more efficient water fixtures and regularly checked for leaks, daily indoor water use (and associated wastewater flow) could potentially be reduced to 45.2 gpcd (Vickers, 2001).

<u>Spatial Distribution</u>

The Districts did not attempt to identify where future reclaimed water flows or beneficial reuse will occur. Location of potential projects using reclaimed water will be determined if and when groundwater modeling and water resource assessments indicate that potential harm could occur to natural systems within the NFRWSP area.

Review

This technical memorandum, including resulting population and demand projection tables, supporting agricultural tables, PG and DSS tables and reclaimed water projections (Appendices A, B, C, D and E, respectively), was provided to District permitting staff and public stakeholders for review. Comments were incorporated as appropriate. It is important to note that this is a long-term planning effort and methodology changes based on short-term trends will not be incorporated. However, additional refinements may be considered as public supply population and water use is continually monitored. Comments and suggested changes may be taken into consideration if they are justifiable, defensible, based on historical regression data and long term trends, and supported by complete documentation. Of note, during the development of this technical memorandum and draft projections for the NFRWSP, the Districts have already incorporated updated historic data from Clay County Utility Authority, JEA, the City of Lake City and the Florida Department of Corrections Marion/Lowell

Correctional Institution. In addition, the NFRWSP Stakeholder Advisory Committee (SAC) voted 12-0 on December 15, 2014 to approve the methodology and associated projections for the public supply and small public supply systems, DSS, L/R/A, C/I/I & M/D categories. The NFRWSP SAC also voted 11-1 on February 17, 2015 to approve the methodology and associated projections for the reclaimed water category.

The Districts understand and share stakeholder's concerns of how critically important accurate demand projections are, however, the Districts must comply with Chapter 373.709(2)(a)1a, F.S. which sets forth requirements for regional water supply planning: *"Population projections used for determining public water supply needs must be based upon the best available data. In determining the best available data, the district shall consider the University of Florida's BEBR medium population projections and any population projection data and analysis submitted by a local government pursuant to the public workshop described in subsection if the data and analysis support the local government's comprehensive plan."*

Summary

The Districts believe that the methodologies presented in this technical memorandum for calculating population and water demand projections for the six water use categories, as well as future reclaimed water flows categories, will be consistent with the specific plans of major water users at the time projections are made. The Districts assume that the current levels of water conservation efforts and the use of reclaimed water will continue through the year 2035 projection horizon. If the water conservation efforts and the use of reclaimed water within the NFRWSP area are effective in reducing demands, then 2035 actual water use should be less than projected under average climatic conditions.

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Table B-1 (NFRWSP). Population Estimates for 2010 and Population Projections for 2015-2035, by County, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	County Population	District Population	Public Supply Population	Domestic and Small Public Supply Systems Population	County Population	District Population	Public Supply Population	Domestic and Small Public Supply Systems Population	County Population	District Population	Public Supply Population	Domestic and Small Public Supply Systems Population	County Population	District Population	Public Supply Population	Domestic and Small Public Supply Systems Population	County Population	District Population	Public Supply Population	Domestic and Small Public Supply Systems Population	County Population	District Population	Public Supply Population	Domestic and Small Public Supply Systems Population	Population Percent Change 2010-2035
		2010				2015				2020				2025				2030				2035				
Alachua	SJRWMD	N/A	203,953	193,326	10,627	N/A	208,789	197,891	10,898	N/A	219,014	207,553	11,461	N/A	228,662	216,668	11,994	N/A	237,732	225,238	12,494	N/A	246,638	233,654	12,984	21%
Alachua	SRWMD	N/A	43,383	21,492	21,891	N/A	44,411	22,001	22,410	N/A	46,586	23,078	23,508	N/A	48,638	24,096	24,542	N/A	50,568	25,052	25,516	N/A	52,462	25,991	26,471	21%
Alachua	**Total**	**247,336**	**247,336**	**214,818**	**32,518**	**253,200**	**253,200**	**219,892**	**33,308**	**265,600**	**265,600**	**230,631**	**34,969**	**277,300**	**277,300**	**240,764**	**36,536**	**288,300**	**288,300**	**250,290**	**38,010**	**299,100**	**299,100**	**259,645**	**39,455**	**21%**
Baker	SJRWMD	N/A	26,513	6,434	20,079	N/A	26,792	6,631	20,161	N/A	28,650	7,208	21,442	N/A	30,507	7,788	22,719	N/A	32,267	8,343	23,924	N/A	33,930	8,874	25,056	28%
Baker	SRWMD	N/A	602	0	602	N/A	608	0	608	N/A	650	0	650	N/A	693	0	693	N/A	733	0	733	N/A	770	0	770	28%
Baker	**Total**	**27,115**	**27,115**	**6,434**	**20,681**	**27,400**	**27,400**	**6,631**	**20,769**	**29,300**	**29,300**	**7,208**	**22,092**	**31,200**	**31,200**	**7,788**	**23,412**	**33,000**	**33,000**	**8,343**	**24,657**	**34,700**	**34,700**	**8,874**	**25,826**	**28%**
Bradford	SJRWMD	N/A	5,781	905	4,876	N/A	5,595	876	4,719	N/A	5,757	901	4,856	N/A	5,919	926	4,993	N/A	6,061	949	5,112	N/A	6,182	967	5,215	7%
Bradford	SRWMD	N/A	22,739	6,179	16,560	N/A	22,005	5,978	16,027	N/A	22,643	6,152	16,491	N/A	23,281	6,325	16,956	N/A	23,839	6,477	17,362	N/A	24,318	6,608	17,710	7%
Bradford	**Total**	**28,520**	**28,520**	**7,084**	**21,436**	**27,600**	**27,600**	**6,854**	**20,746**	**28,400**	**28,400**	**7,053**	**21,347**	**29,200**	**29,200**	**7,251**	**21,949**	**29,900**	**29,900**	**7,426**	**22,474**	**30,500**	**30,500**	**7,575**	**22,925**	**7%**
Clay	SJRWMD	190,865	190,865	122,132	68,733	201,800	201,800	130,484	71,316	224,600	224,600	146,193	78,407	247,000	247,000	160,889	86,111	268,400	268,400	174,993	93,407	288,300	288,300	188,202	100,098	51%
Columbia	SRWMD	67,531	67,531	21,242	46,289	68,400	68,400	21,519	46,881	72,000	72,000	22,651	49,349	75,500	75,500	23,752	51,748	78,600	78,600	24,728	53,872	81,200	81,200	25,546	55,654	20%
Duval	SJRWMD	864,263	864,263	730,470	133,793	899,300	899,300	763,683	135,617	945,900	945,900	805,848	140,052	989,600	989,600	845,759	143,841	1,030,400	1,030,400	883,420	146,980	1,067,900	1,067,900	918,516	149,384	24%
Flagler	SJRWMD	95,696	95,696	92,832	2,864	101,900	101,900	98,732	3,168	122,100	122,100	117,132	4,968	141,700	141,700	134,666	7,034	160,000	160,000	150,967	9,033	177,200	177,200	166,104	11,096	85%
Gilchrist	SRWMD	16,939	16,939	1,999	14,940	16,900	16,900	1,999	14,901	17,800	17,800	1,999	15,801	18,600	18,600	1,999	16,601	19,400	19,400	1,999	17,401	20,100	20,100	1,999	18,101	19%
Hamilton	SRWMD	14,799	14,799	4,641	10,158	14,600	14,600	4,580	10,020	15,000	15,000	4,705	10,295	15,500	15,500	4,861	10,639	15,900	15,900	4,987	10,913	16,200	16,200	5,081	11,119	9%
Nassau	SJRWMD	73,314	73,314	43,070	30,244	76,800	76,800	45,115	31,685	84,400	84,400	48,784	35,616	91,900	91,900	52,407	39,493	99,100	99,100	55,897	43,203	105,700	105,700	58,213	47,487	44%
Putnam	SJRWMD	74,364	74,364	17,643	56,721	72,600	72,600	17,228	55,372	73,100	73,100	17,348	55,752	73,500	73,500	17,442	56,058	73,800	73,800	17,514	56,286	74,200	74,200	17,608	56,592	0%
St. Johns	SJRWMD	190,039	190,039	160,542	29,497	214,800	214,800	181,938	32,862	253,400	253,400	214,929	38,471	290,900	290,900	246,913	43,987	325,000	325,000	271,851	53,149	356,500	356,500	294,390	62,110	88%
Suwannee	SRWMD	41,551	41,551	8,028	33,523	44,700	44,700	8,601	36,099	47,300	47,300	9,075	38,225	49,700	49,700	9,512	40,188	52,000	52,000	9,930	42,070	54,100	54,100	10,297	43,803	30%
Union	SRWMD	15,535	15,535	1,897	13,638	15,900	15,900	1,925	13,975	16,400	16,400	1,925	14,475	16,900	16,900	1,925	14,975	17,400	17,400	1,925	15,475	17,900	17,900	1,925	15,975	15%
SJRWMD Region 1 Total		**N/A**	**1,724,788**	**1,367,354**	**357,434**	**N/A**	**1,808,376**	**1,442,578**	**365,798**	**N/A**	**1,956,921**	**1,565,896**	**391,025**	**N/A**	**2,099,688**	**1,683,458**	**416,230**	**N/A**	**2,232,760**	**1,789,172**	**443,588**	**N/A**	**2,356,550**	**1,886,528**	**470,022**	**37%**
SRWMD NFRWSP Total		**N/A**	**223,079**	**65,478**	**157,601**	**N/A**	**227,524**	**66,603**	**160,921**	**N/A**	**238,379**	**69,585**	**168,794**	**N/A**	**248,812**	**72,470**	**176,342**	**N/A**	**258,440**	**75,098**	**183,342**	**N/A**	**267,050**	**77,447**	**189,603**	**20%**
NFRWSP Total		**1,947,867**	**1,947,867**	**1,432,832**	**515,035**	**2,035,900**	**2,035,900**	**1,509,181**	**526,719**	**2,195,300**	**2,195,300**	**1,635,481**	**559,819**	**2,348,500**	**2,348,500**	**1,755,928**	**592,572**	**2,491,200**	**2,491,200**	**1,864,270**	**626,930**	**2,623,600**	**2,623,600**	**1,963,975**	**659,625**	**35%**

Notes:

1.) Rounding errors account for nominal discrepancies.

2.) 2015 to 2035 county population projections were obtained from BEBR Population Projections: Volume 48, Bulletin 171, Published April 2015.

3.) Population projections shown here are permanent population projections only and do not include any factors such as seasonal residents, tourist population or net commuter population.

4.) Public water supply utility service areas often include residences that derive their water supply from privately owned (domestic self-supply) wells. Typically, these domestic self-supply water uses existed prior to their locations becoming part of public water supply service areas. For public water supply service areas, the Districts do not have sufficient information to separate the populations served by public supply systems from those served by domestic self-supply wells. Therefore, public water supply populations estimated by the Districts often include some domestic self-supply population. In certain counties the domestic self-supply population is projected to decrease.

Table B-1a (NFRWSP). Population Calculation for the St. Johns River Water Management District and Suwannee River Water Management District Split Counties.

County	District	Census Estimates	BEBR Medium Population Projections					Population as a % of County Population	Population Served	Population Projections				
		2010	2015	2020	2025	2030	2035		2010	2015	2020	2025	2030	2035
Alachua	SJRWMD	N/A	N/A	N/A	N/A	N/A	N/A	82.46%	203,953	208,789	219,014	228,662	237,732	246,638
Alachua	SRWMD	N/A	N/A	N/A	N/A	N/A	N/A	17.54%	43,383	44,411	46,586	48,638	50,568	52,462
Alachua	**Total**	**247,336**	**253,200**	**265,600**	**277,300**	**288,300**	**299,100**	**N/A**	**247,336**	**253,200**	**265,600**	**277,300**	**288,300**	**299,100**
Baker	SJRWMD	N/A	N/A	N/A	N/A	N/A	N/A	97.78%	26,513	26,792	28,650	30,507	32,267	33,930
Baker	SRWMD	N/A	N/A	N/A	N/A	N/A	N/A	2.22%	602	608	650	693	733	770
Baker	**Total**	**27,115**	**27,400**	**29,300**	**31,200**	**33,000**	**34,700**	**N/A**	**27,115**	**27,400**	**29,300**	**31,200**	**33,000**	**34,700**
Bradford	SJRWMD	N/A	N/A	N/A	N/A	N/A	N/A	20.27%	5,781	5,595	5,757	5,919	6,061	6,182
Bradford	SRWMD	N/A	N/A	N/A	N/A	N/A	N/A	79.73%	22,739	22,005	22,643	23,281	23,839	24,318
Bradford	**Total**	**28,520**	**27,600**	**28,400**	**29,200**	**29,900**	**30,500**	**N/A**	**28,520**	**27,600**	**28,400**	**29,200**	**29,900**	**30,500**
Clay	SJRWMD	190,865	201,800	224,600	247,000	268,400	288,300	100.00%	190,865	201,800	224,600	247,000	268,400	288,300
Columbia	SRWMD	67,531	68,400	72,000	75,500	78,600	81,200	100.00%	67,531	68,400	72,000	75,500	78,600	81,200
Duval	SJRWMD	864,263	899,300	945,900	989,600	1,030,400	1,067,900	100.00%	864,263	899,300	945,900	989,600	1,030,400	1,067,900
Flagler	SJRWMD	95,696	101,900	122,100	141,700	160,000	177,200	100.00%	95,696	101,900	122,100	141,700	160,000	177,200
Gilchrist	SRWMD	16,939	16,900	17,800	18,600	19,400	20,100	100.00%	16,939	16,900	17,800	18,600	19,400	20,100
Hamilton	SRWMD	14,799	14,600	15,000	15,500	15,900	16,200	100.00%	14,799	14,600	15,000	15,500	15,900	16,200
Nassau	SJRWMD	73,314	76,800	84,400	91,900	99,100	105,700	100.00%	73,314	76,800	84,400	91,900	99,100	105,700
Putnam	SJRWMD	74,364	72,600	73,100	73,500	73,800	74,200	100.00%	74,364	72,600	73,100	73,500	73,800	74,200
St. Johns	SJRWMD	190,039	214,800	253,400	290,900	325,000	356,500	100.00%	190,039	214,800	253,400	290,900	325,000	356,500
Suwannee	SRWMD	41,551	44,700	47,300	49,700	52,000	54,100	100.00%	41,551	44,700	47,300	49,700	52,000	54,100
Union	SRWMD	15,535	15,900	16,400	16,900	17,400	17,900	100.00%	15,535	15,900	16,400	16,900	17,400	17,900
SJRWMD Region 1 Total									**1,724,788**	**1,808,376**	**1,956,921**	**2,099,688**	**2,232,760**	**2,356,550**
SRWMD NFRWSP Total									**223,079**	**227,524**	**238,379**	**248,812**	**258,440**	**267,050**
NFRWSP Total		**1,947,867**	**2,035,900**	**2,195,300**	**2,348,500**	**2,491,200**	**2,623,600**	**N/A**	**2,250,838**	**2,344,100**	**2,518,600**	**2,686,200**	**2,842,400**	**2,987,900**

Notes:

1.) BEBR Source: Volume 48, Bulletin 171, Published April 2015.

2.) Rounding errors account for nominal discrepancies.

Table B-1b (NFRWSP). Population Estimates for 2010, by County, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	2010 Public Supply Population	2010 Small Public Supply System Population	2010 DSS Parcels	2010 BEBR PPH	2010 Domestic Self-supply Population	2010 Total County Population	2010 BEBR Population Estimate	Deviation	Correct 2010 DSS (Adjustment) to bring to BEBR	2010 Total County Population	Deviation
Alachua	SJRWMD	193,326	0	5,397	2.32	12,521	**205,847**	203,953	-1,894	10,627	203,953	0
Alachua	SRWMD	21,492	192	10,837	2.32	25,142	**46,826**	43,383	-3,443	21,699	43,383	0
Alachua Total		**214,818**	**192**	**16,234**	**2.32**	**37,663**	**252,673**	**247,336**	**-5,337**	**32,326**	**247,336**	**0**
Baker	SJRWMD	6,434	0	5,613	2.82	15,829	**22,263**	26,513	4,250	20,079	26,513	0
Baker	SRWMD	0	0	168	2.82	474	**474**	602	128	602	602	0
Baker Total		**6,434**	**0**	**5,781**	**2.82**	**16,303**	**22,737**	**27,115**	**4,378**	**20,681**	**27,115**	**0**
Bradford	SJRWMD	905	0	572	2.53	1,447	**2,352**	5,781	3,429	4,876	5,781	0
Bradford	SRWMD	6,179	838	5,423	2.53	13,720	**20,737**	22,739	2,002	15,722	22,739	0
Bradford Total		**7,084**	**838**	**5,995**	**2.53**	**15,167**	**23,089**	**28,520**	**5,431**	**20,598**	**28,520**	**0**
Clay	SJRWMD	122,132	1,690	17,646	2.76	48,703	**172,525**	190,865	18,340	67,043	190,865	0
Columbia	SRWMD	21,242	567	15,031	2.52	37,878	**59,687**	67,531	7,844	45,722	67,531	0
Duval	SJRWMD	730,470	0	13,297	2.47	32,844	**763,314**	864,263	100,949	133,793	864,263	0
Flagler	SJRWMD	92,832	369	9,522	2.42	23,043	**116,244**	95,696	-20,548	2,495	95,696	0
Gilchrist	SRWMD	1,999	0	5,282	2.58	13,628	**15,627**	16,939	1,312	14,940	16,939	0
Hamilton	SRWMD	4,641	0	2,984	2.54	7,579	**12,220**	14,799	2,579	10,158	14,799	0
Nassau	SJRWMD	43,070	114	10,573	2.53	26,750	**69,934**	73,314	3,380	30,130	73,314	0
Putnam	SJRWMD	17,643	3,024	26,482	2.48	65,675	**86,342**	74,364	-11,978	53,697	74,364	0
St. Johns	SJRWMD	160,542	1,299	10,289	2.49	25,620	**187,461**	190,039	2,578	28,198	190,039	0
Suwannee	SRWMD	8,028	295	11,792	2.52	29,716	**38,039**	41,551	3,512	33,228	41,551	0
Union	SRWMD	1,897	0	2,090	2.66	5,559	**7,456**	15,535	8,079	13,638	15,535	0

Notes:
1.) Rounding errors account for nominal discrepancies.
2.) 2010 county persons per household were obtained from BEBR Number of Households and Average Household Size in Florida Volume 44, Bulletin 158, Published April 2011.
3.) 2010 county population was obtained from BEBR Florida Estimates of Population, April 2011.
4.) 2010 DSS parcels obtained from SJRWMD DSS parcel calculation model.

Table B-2 (NFRWSP). Water Use for 2010 and 5-in-10 Year Total Water Demand Projections for 2015-2035 and 1-in-10 Year Water Demand Projections for 2035, by Category of Use, in the St. Johns River Water Management District and Suwannee River Water Management District.

Category	District	Water Use 2010 Ground	Water Use 2010 Surface	Water Use 2010 Total	2015 Ground	2015 Surface	2015 Total	2020 Ground	2020 Surface	2020 Total	2025 Ground	2025 Surface	2025 Total	2030 Ground	2030 Surface	2030 Total	2035 Ground	2035 Surface	2035 Total	Percent Change 2010-2035	Demand Projections (1-in-10) 2035 Ground	2035 Surface	2035 Total
Public Supply	SJRWMD	188.90	**0.00**	**188.90**	189.46	0.03	**189.49**	205.17	0.03	**205.20**	220.16	0.03	**220.19**	233.38	0.03	**233.41**	245.56	0.03	**245.59**	30%	260.27	0.03	**260.30**
Public Supply	SRWMD	9.49	**0.00**	**9.49**	9.47	0.00	**9.47**	9.89	0.00	**9.89**	10.29	0.00	**10.29**	10.64	0.00	**10.64**	10.99	0.00	**10.99**	16%	11.65	0.00	**11.65**
Public Supply	**Total**	**198.39**	**0.00**	**198.39**	**198.93**	**0.03**	**198.96**	**215.06**	**0.03**	**215.09**	**230.45**	**0.03**	**230.48**	**244.02**	**0.03**	**244.05**	**256.55**	**0.03**	**256.58**	**29%**	**271.92**	**0.03**	**271.95**
Domestic Self-supply and Small Public Supply Systems	SJRWMD	34.92	0.00	**34.92**	33.61	0.00	**33.61**	36.00	0.00	**36.00**	38.41	0.00	**38.41**	40.96	0.00	**40.96**	43.49	0.00	**43.49**	25%	46.10	0.00	**46.10**
Domestic Self-supply and Small Public Supply Systems	SRWMD	14.19	0.00	**14.19**	14.60	0.00	**14.60**	15.33	0.00	**15.33**	16.02	0.00	**16.02**	16.66	0.00	**16.66**	17.22	0.00	**17.22**	21%	18.24	0.00	**18.24**
Domestic Self-supply and Small Public Supply Systems	**Total**	**49.11**	**0.00**	**49.11**	**48.21**	**0.00**	**48.21**	**51.33**	**0.00**	**51.33**	**54.43**	**0.00**	**54.43**	**57.62**	**0.00**	**57.62**	**60.71**	**0.00**	**60.71**	**24%**	**64.34**	**0.00**	**64.34**
Agricultural Irrigation Self-supply	SJRWMD	56.63	6.14	**62.77**	60.23	5.29	**65.52**	55.78	4.84	**60.62**	52.79	4.42	**57.21**	51.68	4.09	**55.77**	49.86	3.72	**53.58**	-15%	57.06	4.22	**61.28**
Agricultural Irrigation Self-supply	SRWMD	67.34	4.90	**72.24**	66.57	5.64	**72.21**	72.66	6.13	**78.79**	79.16	6.58	**85.74**	85.94	7.09	**93.03**	92.42	7.58	**100.00**	38%	105.50	8.61	**114.11**
Agricultural Irrigation Self-supply	**Total**	**123.97**	**11.04**	**135.01**	**126.80**	**10.93**	**137.73**	**128.44**	**10.97**	**139.41**	**131.95**	**11.00**	**142.95**	**137.62**	**11.18**	**148.80**	**142.28**	**11.30**	**153.58**	**14%**	**162.56**	**12.83**	**175.39**
Landscape/Recreational/Aesthetic Self-supply	SJRWMD	7.53	13.12	**20.65**	7.80	13.95	**21.85**	8.65	15.40	**24.05**	9.40	16.79	**26.19**	10.08	18.09	**28.17**	10.71	19.29	**30.00**	45%	15.67	28.07	**43.74**
Landscape/Recreational/Aesthetic Self-supply	SRWMD	0.68	0.18	**0.86**	0.70	0.18	**0.88**	0.74	0.18	**0.92**	0.75	0.20	**0.95**	0.78	0.20	**0.98**	0.79	0.21	**1.00**	16%	1.06	0.30	**1.36**
Landscape/Recreational/Aesthetic Self-supply	**Total**	**8.21**	**13.30**	**21.51**	**8.50**	**14.13**	**22.73**	**9.39**	**15.58**	**24.97**	**10.15**	**16.99**	**27.14**	**10.86**	**18.29**	**29.15**	**11.50**	**19.50**	**31.00**	**44%**	**16.73**	**28.37**	**45.10**
Commercial / Industrial / Institutional Self-supply	SJRWMD	70.34	20.98	**91.32**	71.35	20.97	**92.32**	73.05	21.04	**94.09**	74.65	21.11	**95.76**	76.16	21.16	**97.32**	77.56	21.21	**98.77**	8%	77.56	21.21	**98.77**
Commercial / Industrial / Institutional Self-supply	SRWMD	30.01	0.00	**30.01**	29.81	0.00	**29.81**	30.61	0.00	**30.61**	31.56	0.00	**31.56**	32.34	0.00	**32.34**	32.95	0.00	**32.95**	10%	32.95	0.00	**32.95**
Commercial / Industrial / Institutional Self-supply	**Total**	**100.35**	**20.98**	**121.33**	**101.16**	**20.97**	**122.13**	**103.66**	**21.04**	**124.70**	**106.21**	**21.11**	**127.32**	**108.50**	**21.16**	**129.66**	**110.51**	**21.21**	**131.72**	**9%**	**110.51**	**21.21**	**131.72**
Thermoelectric Power Generation Self-supply	SJRWMD	8.00	12.91	**20.91**	7.20	11.54	**18.74**	7.92	7.97	**15.89**	8.15	8.32	**16.47**	8.61	8.87	**17.48**	9.09	9.47	**18.56**	-11%	9.09	9.47	**18.56**
Thermoelectric Power Generation Self-supply	SRWMD	2.33	2.16	**4.49**	3.16	3.63	**6.79**	3.56	10.11	**13.67**	3.24	10.67	**13.91**	3.28	11.32	**14.60**	3.32	12.00	**15.32**	241%	3.32	12.00	**15.32**
Thermoelectric Power Generation Self-supply	**Total**	**10.33**	**15.07**	**25.40**	**10.36**	**15.17**	**25.53**	**11.48**	**18.08**	**29.56**	**11.39**	**18.99**	**30.38**	**11.89**	**20.19**	**32.08**	**12.41**	**21.47**	**33.88**	**33%**	**12.41**	**21.47**	**33.88**
SJRWMD Region 1 Total		**366.32**	**53.15**	**419.47**	**369.65**	**51.78**	**421.53**	**386.57**	**49.28**	**435.85**	**403.56**	**50.67**	**454.23**	**420.87**	**52.24**	**473.11**	**436.27**	**53.72**	**489.99**	**17%**	**465.75**	**63.00**	**528.75**
SRWMD NFRWSP Total		**124.04**	**7.24**	**131.28**	**124.31**	**9.45**	**133.76**	**132.79**	**16.42**	**149.21**	**141.02**	**17.45**	**158.47**	**149.64**	**18.61**	**168.25**	**157.69**	**19.79**	**177.48**	**35%**	**172.72**	**20.91**	**193.63**
NFRWSP Total		**490.36**	**60.39**	**550.75**	**493.96**	**61.23**	**555.29**	**519.36**	**65.70**	**585.06**	**544.58**	**68.12**	**612.70**	**570.51**	**70.85**	**641.36**	**593.96**	**73.51**	**667.47**	**21%**	**638.47**	**83.91**	**722.38**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.

Table B-3 (NFRWSP). Total Water Use for 2010 and 5-in-10 Year Water Demand Projections for 2015-2035, and 1-in-10 Year Water Demand Projections for 2035 by County in the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Water Use			Demand Projections (5-in-10)															Percent	Demand Projections (1-in-10)		
		2010			2015			2020			2025			2030			2035			Change	2035		
		Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	2010-2035	Ground	Surface	Total
Alachua	SJRWMD	27.63	0.68	**28.31**	29.17	0.69	**29.86**	30.86	0.71	**31.57**	32.18	0.73	**32.91**	33.74	0.75	**34.49**	35.40	0.77	**36.17**	28%	38.42	1.61	**40.03**
Alachua	SRWMD	21.97	0.41	**22.38**	19.06	0.36	**19.42**	19.89	0.37	**20.26**	20.19	0.39	**20.58**	20.76	0.40	**21.16**	21.32	0.41	**21.73**	-3%	23.76	0.51	**24.27**
Alachua	**Total**	**49.60**	**1.09**	**50.69**	**48.23**	**1.05**	**49.28**	**50.75**	**1.08**	**51.83**	**52.37**	**1.12**	**53.49**	**54.50**	**1.15**	**55.65**	**56.72**	**1.18**	**57.90**	**14%**	**62.18**	**2.12**	**64.30**
Baker	SJRWMD	5.44	0.24	**5.68**	4.29	0.12	**4.41**	4.59	0.13	**4.72**	4.86	0.13	**4.99**	5.15	0.14	**5.29**	5.42	0.15	**5.57**	-2%	5.67	0.15	**5.82**
Baker	SRWMD	0.25	0.00	**0.25**	0.29	0.00	**0.29**	0.30	0.00	**0.30**	0.33	0.00	**0.33**	0.34	0.00	**0.34**	0.36	0.00	**0.36**	44%	0.37	0.00	**0.37**
Baker	**Total**	**5.69**	**0.24**	**5.93**	**4.58**	**0.12**	**4.70**	**4.89**	**0.13**	**5.02**	**5.19**	**0.13**	**5.32**	**5.49**	**0.14**	**5.63**	**5.78**	**0.15**	**5.93**	**0%**	**6.04**	**0.15**	**6.19**
Bradford	SJRWMD	0.30	0.00	**0.30**	0.49	0.00	**0.59**	0.69	0.00	**0.69**	0.70	0.00	**0.70**	0.71	0.00	**0.71**	0.72	0.00	**0.72**	140%	0.77	0.00	**0.77**
Bradford	SRWMD	4.89	0.23	**5.12**	4.49	0.23	**4.72**	4.62	0.24	**4.86**	4.72	0.24	**4.96**	4.80	0.24	**5.04**	4.88	0.24	**5.12**	0%	5.23	0.30	**5.53**
Bradford	**Total**	**5.19**	**0.23**	**5.42**	**4.98**	**0.23**	**5.31**	**5.31**	**0.24**	**5.55**	**5.42**	**0.24**	**5.66**	**5.51**	**0.24**	**5.75**	**5.60**	**0.24**	**5.84**	**8%**	**6.00**	**0.30**	**6.30**
Clay	SJRWMD	21.37	2.93	**24.30**	22.46	3.18	**25.64**	25.12	3.46	**28.58**	27.66	3.69	**31.35**	29.99	3.89	**33.88**	32.37	4.15	**36.52**	50%	35.27	8.10	**43.37**
Columbia	SRWMD	11.71	0.40	**12.11**	12.76	0.42	**13.18**	16.63	0.69	**17.32**	19.87	0.93	**20.80**	23.19	1.16	**24.35**	26.27	1.39	**27.66**	128%	29.27	1.58	**30.85**
Duval	SJRWMD	162.23	18.08	**180.31**	161.88	15.86	**177.74**	170.31	12.30	**182.61**	177.87	12.64	**190.51**	185.10	13.13	**198.23**	191.76	13.58	**205.34**	14%	201.70	15.27	**216.97**
Flagler	SJRWMD	20.98	1.27	**22.25**	24.46	1.63	**26.09**	25.12	1.69	**26.81**	26.07	1.78	**27.85**	26.90	1.86	**28.76**	27.51	1.93	**29.44**	32%	29.71	2.34	**32.05**
Gilchrist	SRWMD	9.44	2.13	**11.57**	12.08	2.84	**14.92**	12.58	2.95	**15.53**	12.89	3.01	**15.90**	13.38	3.13	**16.51**	13.83	3.23	**17.06**	47%	15.41	3.64	**19.05**
Hamilton	SRWMD	38.84	0.14	**38.98**	37.80	0.13	**37.93**	38.55	0.13	**38.68**	39.46	0.13	**39.59**	40.41	0.13	**40.54**	41.21	0.14	**41.35**	6%	42.97	0.16	**43.13**
Nassau	SJRWMD	48.49	1.45	**49.94**	46.02	1.63	**47.65**	47.18	1.67	**48.85**	48.16	1.67	**49.83**	49.42	1.78	**51.20**	50.55	1.88	**52.43**	5%	51.98	2.24	**54.22**
Putnam	SJRWMD	31.92	22.41	**54.33**	25.95	21.89	**47.84**	24.25	21.78	**46.03**	23.00	21.69	**44.69**	21.82	21.59	**43.41**	20.47	21.48	**41.95**	-23%	23.12	21.81	**44.93**
St. Johns	SJRWMD	47.96	6.09	**54.05**	54.93	6.78	**61.71**	58.45	7.54	**65.99**	63.06	8.34	**71.40**	68.04	9.10	**77.14**	72.07	9.78	**81.85**	51%	79.11	11.48	**90.59**
Suwannee	SRWMD	34.31	3.81	**38.12**	34.29	5.21	**39.50**	36.66	11.79	**48.45**	40.07	12.52	**52.59**	43.24	13.33	**56.57**	46.29	14.17	**60.46**	59%	51.90	14.48	**66.38**
Union	SRWMD	2.63	0.12	**2.75**	3.54	0.26	**3.80**	3.56	0.25	**3.81**	3.49	0.23	**3.72**	3.52	0.22	**3.74**	3.53	0.21	**3.74**	36%	3.81	0.24	**4.05**
SJRWMD Region 1 Total		**366.32**	**53.15**	**419.47**	**369.65**	**51.78**	**421.53**	**386.57**	**49.28**	**435.85**	**403.56**	**50.67**	**454.23**	**420.87**	**52.24**	**473.11**	**436.27**	**53.72**	**489.99**	**17%**	**465.75**	**63.00**	**528.75**
SRWMD NFRWSP Total		**124.04**	**7.24**	**131.28**	**124.31**	**9.45**	**133.76**	**132.79**	**16.42**	**149.21**	**141.02**	**17.45**	**158.47**	**149.64**	**18.61**	**168.25**	**157.69**	**19.79**	**177.48**	**35%**	**172.72**	**20.91**	**193.63**
NFRWSP Total		**490.36**	**60.39**	**550.75**	**493.96**	**61.23**	**555.29**	**519.36**	**65.70**	**585.06**	**544.58**	**68.12**	**612.70**	**570.51**	**70.85**	**641.36**	**593.96**	**73.51**	**667.47**	**21%**	**638.47**	**83.91**	**722.38**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.

Table B-4 (NFRWSP). Public Supply Population Served and Water Use for 2010, Public Supply Population and 5-in-10 Year Water Demand Projections for 2015-2035, and 1-in-10 Year Water Demand Projections for 2035 by County in the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Population Served	Population Projections					Water Use			Demand Projections (5-in-10)															Percent Change	Demand Projections (1-in-10)		
								2010			2015			2020			2025			2030			2035				2035		
		2010	2015	2020	2025	2030	2035	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	2010-2035	Ground	Surface	Total
Alachua	SJRWMD	193,326	197,891	207,553	216,668	225,238	233,654	23.00	0.00	**23.00**	23.34	0.00	**23.34**	24.47	0.00	**24.47**	25.55	0.00	**25.55**	26.55	0.00	**26.55**	27.55	0.00	**27.55**	20%	29.20	0.00	**29.20**
Alachua	SRWMD	21,492	22,001	23,078	24,096	25,052	25,991	2.46	0.00	**2.46**	2.31	0.00	**2.31**	2.43	0.00	**2.43**	2.53	0.00	**2.53**	2.62	0.00	**2.62**	2.73	0.00	**2.73**	11%	2.90	0.00	**2.90**
Alachua	**Total**	**214,818**	**219,892**	**230,631**	**240,764**	**250,290**	**259,645**	**25.46**	**0.00**	**25.46**	**25.65**	**0.00**	**25.65**	**26.90**	**0.00**	**26.90**	**28.08**	**0.00**	**28.08**	**29.17**	**0.00**	**29.17**	**30.28**	**0.00**	**30.28**	**19%**	**32.10**	**0.00**	**32.10**
Baker	SJRWMD	6,434	6,631	7,208	7,788	8,343	8,874	1.00	0.00	**1.00**	0.98	0.00	**0.98**	1.06	0.00	**1.06**	1.15	0.00	**1.15**	1.23	0.00	**1.23**	1.31	0.00	**1.31**	31%	1.39	0.00	**1.39**
Baker	SRWMD	0	0	0	0	0	0	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0.00	0.00	**0.00**
Baker	**Total**	**6,434**	**6,631**	**7,208**	**7,788**	**8,343**	**8,874**	**1.00**	**0.00**	**1.00**	**0.98**	**0.00**	**0.98**	**1.06**	**0.00**	**1.06**	**1.15**	**0.00**	**1.15**	**1.23**	**0.00**	**1.23**	**1.31**	**0.00**	**1.31**	**31%**	**1.39**	**0.00**	**1.39**
Bradford	SJRWMD	905	876	901	926	949	967	0.11	0.00	**0.11**	0.09	0.00	**0.09**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	-9%	0.11	0.00	**0.11**
Bradford	SRWMD	6,179	5,978	6,152	6,325	6,477	6,608	1.00	0.00	**1.00**	0.92	0.00	**0.92**	0.94	0.00	**0.94**	0.97	0.00	**0.97**	0.99	0.00	**0.99**	1.02	0.00	**1.02**	2%	1.08	0.00	**1.08**
Bradford	**Total**	**7,084**	**6,854**	**7,053**	**7,251**	**7,426**	**7,575**	**1.11**	**0.00**	**1.11**	**1.01**	**0.00**	**1.01**	**1.04**	**0.00**	**1.04**	**1.07**	**0.00**	**1.07**	**1.09**	**0.00**	**1.09**	**1.12**	**0.00**	**1.12**	**1%**	**1.19**	**0.00**	**1.19**
Clay	SJRWMD	122,132	130,484	146,193	160,889	174,993	188,202	15.10	0.00	**15.10**	14.22	0.00	**14.22**	15.94	0.00	**15.94**	17.55	0.00	**17.55**	19.08	0.00	**19.08**	20.54	0.00	**20.54**	36%	21.78	0.00	**21.78**
Columbia	SRWMD	21,242	21,519	22,651	23,752	24,728	25,546	3.48	0.00	**3.48**	3.49	0.00	**3.49**	3.67	0.00	**3.67**	3.85	0.00	**3.85**	4.01	0.00	**4.01**	4.14	0.00	**4.14**	19%	4.39	0.00	**4.39**
Duval	SJRWMD	730,470	763,683	805,848	845,759	883,420	918,516	109.22	0.00	**109.22**	108.86	0.00	**108.86**	115.06	0.00	**115.06**	120.90	0.00	**120.90**	126.44	0.00	**126.44**	131.58	0.00	**131.58**	20%	139.47	0.00	**139.47**
Flagler	SJRWMD	92,832	98,732	117,132	134,666	150,967	166,104	10.12	0.00	**10.12**	9.68	0.03	**9.71**	11.48	0.03	**11.51**	13.22	0.03	**13.25**	14.82	0.03	**14.85**	16.30	0.03	**16.33**	61%	17.27	0.03	**17.30**
Gilchrist	SRWMD	1,999	1,999	1,999	1,999	1,999	1,999	0.23	0.00	**0.23**	0.23	0.00	**0.23**	0.23	0.00	**0.23**	0.23	0.00	**0.23**	0.23	0.00	**0.23**	0.23	0.00	**0.23**	0%	0.24	0.00	**0.24**
Hamilton	SRWMD	4,641	4,580	4,705	4,861	4,987	5,081	0.86	0.00	**0.86**	0.89	0.00	**0.89**	0.91	0.00	**0.91**	0.94	0.00	**0.94**	0.96	0.00	**0.96**	0.97	0.00	**0.97**	13%	1.02	0.00	**1.02**
Nassau	SJRWMD	43,070	45,115	48,784	52,407	55,897	58,213	7.71	0.00	**7.71**	7.17	0.00	**7.17**	7.77	0.00	**7.77**	8.35	0.00	**8.35**	8.92	0.00	**8.92**	9.28	0.00	**9.28**	20%	9.83	0.00	**9.83**
Putnam	SJRWMD	17,643	17,228	17,348	17,442	17,514	17,608	2.73	0.00	**2.73**	2.22	0.00	**2.22**	2.24	0.00	**2.24**	2.25	0.00	**2.25**	2.25	0.00	**2.25**	2.27	0.00	**2.27**	-17%	2.39	0.00	**2.39**
St. Johns	SJRWMD	160,542	181,938	214,929	246,913	271,851	294,390	19.91	0.00	**19.91**	22.90	0.00	**22.90**	27.05	0.00	**27.05**	31.09	0.00	**31.09**	33.99	0.00	**33.99**	36.63	0.00	**36.63**	84%	38.83	0.00	**38.83**
Suwannee	SRWMD	8,028	8,601	9,075	9,512	9,930	10,297	1.09	0.00	**1.09**	1.30	0.00	**1.30**	1.38	0.00	**1.38**	1.44	0.00	**1.44**	1.50	0.00	**1.50**	1.57	0.00	**1.57**	44%	1.67	0.00	**1.67**
Union	SRWMD	1,897	1,925	1,925	1,925	1,925	1,925	0.37	0.00	**0.37**	0.33	0.00	**0.33**	0.33	0.00	**0.33**	0.33	0.00	**0.33**	0.33	0.00	**0.33**	0.33	0.00	**0.33**	-11%	0.35	0.00	**0.35**
SJRWMD Region 1 Total		**1,367,354**	**1,442,578**	**1,565,896**	**1,683,458**	**1,789,172**	**1,886,528**	**188.90**	**0.00**	**188.90**	**189.46**	**0.03**	**189.49**	**205.17**	**0.03**	**205.20**	**220.16**	**0.03**	**220.19**	**233.38**	**0.03**	**233.41**	**245.56**	**0.03**	**245.59**	**30%**	**260.27**	**0.03**	**260.30**
SRWMD NFRWSP Total		**65,478**	**66,603**	**69,585**	**72,470**	**75,098**	**77,447**	**9.49**	**0.00**	**9.49**	**9.47**	**0.00**	**9.47**	**9.89**	**0.00**	**9.89**	**10.29**	**0.00**	**10.29**	**10.64**	**0.00**	**10.64**	**10.99**	**0.00**	**10.99**	**16%**	**11.65**	**0.00**	**11.65**
NFRWSP Total		**1,432,832**	**1,509,181**	**1,635,481**	**1,755,928**	**1,864,270**	**1,963,975**	**198.39**	**0.00**	**198.39**	**198.93**	**0.03**	**198.96**	**215.06**	**0.03**	**215.09**	**230.45**	**0.03**	**230.48**	**244.02**	**0.03**	**244.05**	**256.55**	**0.03**	**256.58**	**29%**	**271.92**	**0.03**	**271.95**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 1-in-10 rainfall year demand for 2035 calculated as an additional 6 percent of 2035 average demand.

Table B-5 (NFRWSP). Public Supply Population Served and Water Use for 2010 and Public Supply Population Projections for 2015-2035, 5-in-10 Year Water Demand Projections for 2015-2035 and 1-in-10 Year Water Demand Projections for 2035 by County and Utility, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	Utility	CUP Number	Population Served	Population Projections					2010 % of County	Percent Change 2010	Water Use			Demand Projections (5-in-10)															Percent Change	2010-2014 Avg Gross	Demand Projections (1-in-10)		
											2010			2015			2020			2025			2030			2035					2035		
			2010	2015	2020	2025	2030	2035	Total	2035	GW	SW	Total	GW	SW	Total	GW	SW	Total	GW	SW	Total	GW	SW	Total	GW	SW	Total	2010-2035	GPCD	GW	SW	Total
Alachua - SJRWMD	City of Hawthorne	1674	1,495	1,524	1,599	1,669	1,735	1,800	0.73%	20%	0.17	0.00	**0.17**	0.19	0.00	**0.19**	0.20	0.00	**0.20**	0.21	0.00	**0.21**	0.21	0.00	**0.21**	0.22	0.00	**0.22**	29%	123	0.23	0.00	**0.23**
	Gainesville Regional Utilities (includes SRWMD)	11339	189,495	193,986	203,486	212,450	220,877	229,151	92.91%	21%	22.61	0.00	**22.61**	22.89	0.00	**22.89**	24.01	0.00	**24.01**	25.07	0.00	**25.07**	26.06	0.00	**26.06**	27.04	0.00	**27.04**	20%	118	28.66	0.00	**28.66**
	Kincaid Hills Water Company	11343	606	606	606	606	606	606	N/A	0%	0.07	0.00	**0.07**	0.09	0.00	**0.09**	0.09	0.00	**0.09**	0.09	0.00	**0.09**	0.09	0.00	**0.09**	0.09	0.00	**0.09**	29%	153	0.10	0.00	**0.10**
	Town of Micanopy	11356	856	877	920	960	998	1,036	0.42%	21%	0.06	0.00	**0.06**	0.07	0.00	**0.07**	0.07	0.00	**0.07**	0.07	0.00	**0.07**	0.08	0.00	**0.08**	0.08	0.00	**0.08**	33%	76	0.08	0.00	**0.08**
	Arredondo Utility Co / Aqua Source Utilities	11364, 132141	874	898	942	983	1,022	1,061	0.43%	21%	0.09	0.00	**0.09**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	0.11	0.00	**0.11**	0.11	0.00	**0.11**	0.12	0.00	**0.12**	33%	110	0.13	0.00	**0.13**
	SJRWMD Alachua Total		**193,326**	**197,891**	**207,553**	**216,668**	**225,238**	**233,654**	**N/A**	**21%**	**23.00**	**0.00**	**23.00**	**23.34**	**0.00**	**23.34**	**24.47**	**0.00**	**24.47**	**25.55**	**0.00**	**25.55**	**26.55**	**0.00**	**26.55**	**27.55**	**0.00**	**27.55**	**20%**	**N/A**	**29.20**	**0.00**	**29.20**
Alachua - SRWMD	City Of Alachua	220667	9,059	9,273	9,727	10,156	10,559	10,954	20.88%	21%	1.37	0.00	**1.37**	1.23	0.00	**1.23**	1.29	0.00	**1.29**	1.35	0.00	**1.35**	1.40	0.00	**1.40**	1.46	0.00	**1.46**	7%	133	1.55	0.00	**1.55**
	City Of Newberry	216450	4,950	5,067	5,315	5,550	5,770	5,986	11.41%	21%	0.48	0.00	**0.48**	0.49	0.00	**0.49**	0.51	0.00	**0.51**	0.53	0.00	**0.53**	0.55	0.00	**0.55**	0.57	0.00	**0.57**	19%	96	0.60	0.00	**0.60**
	City Of Archer	216647	1,118	1,146	1,202	1,255	1,305	1,354	2.58%	21%	0.11	0.00	**0.11**	0.10	0.00	**0.10**	0.11	0.00	**0.11**	0.11	0.00	**0.11**	0.12	0.00	**0.12**	0.12	0.00	**0.12**	9%	90	0.13	0.00	**0.13**
	City Of High Springs Water Plant	216833	5,350	5,476	5,744	5,997	6,235	6,469	12.33%	21%	0.42	0.00	**0.42**	0.42	0.00	**0.42**	0.44	0.00	**0.44**	0.46	0.00	**0.46**	0.47	0.00	**0.47**	0.49	0.00	**0.49**	17%	76	0.52	0.00	**0.52**
	City Of Waldo	217300	1,015	1,039	1,090	1,138	1,183	1,228	2.34%	21%	0.08	0.00	**0.08**	0.07	0.00	**0.07**	0.08	0.00	**0.08**	0.08	0.00	**0.08**	0.08	0.00	**0.08**	0.09	0.00	**0.09**	13%	70	0.10	0.00	**0.10**
	SRWMD Alachua Total		**21,492**	**22,001**	**23,078**	**24,096**	**25,052**	**25,991**	**N/A**	**21%**	**2.46**	**0.00**	**2.46**	**2.31**	**0.00**	**2.31**	**2.43**	**0.00**	**2.43**	**2.53**	**0.00**	**2.53**	**2.62**	**0.00**	**2.62**	**2.73**	**0.00**	**2.73**	**11%**	**N/A**	**2.90**	**0.00**	**2.90**
Baker - SJRWMD	City of Macclenny	15	6,042	6,234	6,784	7,336	7,865	8,372	22.79%	39%	0.97	0.00	**0.97**	0.95	0.00	**0.95**	1.03	0.00	**1.03**	1.12	0.00	**1.12**	1.20	0.00	**1.20**	1.27	0.00	**1.27**	31%	152	1.35	0.00	**1.35**
	Town of Glen St Mary	24	392	397	424	452	478	502	1.48%	28%	0.03	0.00	**0.03**	0.03	0.00	**0.03**	0.03	0.00	**0.03**	0.03	0.00	**0.03**	0.03	0.00	**0.03**	0.04	0.00	**0.04**	33%	70	0.04	0.00	**0.04**
	SJRWMD Baker Total		**6,434**	**6,631**	**7,208**	**7,788**	**8,343**	**8,874**	**N/A**	**38%**	**1.00**	**0.00**	**1.00**	**0.98**	**0.00**	**0.98**	**1.06**	**0.00**	**1.06**	**1.15**	**0.00**	**1.15**	**1.23**	**0.00**	**1.23**	**1.31**	**0.00**	**1.31**	**31%**	**N/A**	**1.39**	**0.00**	**1.39**
Bradford - SJRWMD	Clay County Utility Authority	431	905	876	901	926	949	967	15.65%	7%	0.11	0.00	**0.11**	0.09	0.00	**0.09**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	-9%	106	0.11	0.00	**0.11**
	SJRWMD Bradford Total		**905**	**876**	**901**	**926**	**949**	**967**	**N/A**	**7%**	**0.11**	**0.00**	**0.11**	**0.09**	**0.00**	**0.09**	**0.10**	**0.00**	**0.10**	**0.10**	**0.00**	**0.10**	**0.10**	**0.00**	**0.10**	**0.10**	**0.00**	**0.10**	**-9%**	**N/A**	**0.11**	**0.00**	**0.11**
Bradford - SRWMD	City of Lawtey	218998	730	706	727	747	765	781	3.21%	7%	0.19	0.00	**0.19**	0.18	0.00	**0.18**	0.18	0.00	**0.18**	0.19	0.00	**0.19**	0.19	0.00	**0.19**	0.20	0.00	**0.20**	5%	250	0.21	0.00	**0.21**
	City of Starke	216650	5,449	5,272	5,425	5,578	5,712	5,827	23.96%	7%	0.81	0.00	**0.81**	0.74	0.00	**0.74**	0.76	0.00	**0.76**	0.78	0.00	**0.78**	0.80	0.00	**0.80**	0.82	0.00	**0.82**	1%	140	0.87	0.00	**0.87**
	SRWMD Bradford Total		**6,179**	**5,978**	**6,152**	**6,325**	**6,477**	**6,608**	**N/A**	**7%**	**1.00**	**0.00**	**1.00**	**0.92**	**0.00**	**0.92**	**0.94**	**0.00**	**0.94**	**0.97**	**0.00**	**0.97**	**0.99**	**0.00**	**0.99**	**1.02**	**0.00**	**1.02**	**2%**	**N/A**	**1.08**	**0.00**	**1.08**
Clay - SJRWMD	Clay County Utility Authority	416, 431	104,706	111,972	125,745	139,298	152,303	164,485	54.86%	57%	12.66	0.00	**12.66**	11.87	0.00	**11.87**	13.33	0.00	**13.33**	14.77	0.00	**14.77**	16.14	0.00	**16.14**	17.44	0.00	**17.44**	38%	106	18.49	0.00	**18.49**
	Town of Orange Park	453	8,421	8,899	9,669	9,669	9,669	9,669	4.41%	15%	1.02	0.00	**1.02**	0.93	0.00	**0.93**	1.02	0.00	**1.02**	1.02	0.00	**1.02**	1.02	0.00	**1.02**	1.02	0.00	**1.02**	0%	105	1.08	0.00	**1.08**
	City of Green Cove Springs	499	6,908	7,376	8,273	9,153	9,999	10,790	3.62%	56%	1.07	0.00	**1.07**	1.09	0.00	**1.09**	1.22	0.00	**1.22**	1.35	0.00	**1.35**	1.48	0.00	**1.48**	1.60	0.00	**1.60**	50%	148	1.70	0.00	**1.70**
	JEA (Also in Duval, Nassau, St. Johns)	88271	2,097	2,237	2,506	2,769	3,022	3,258	1.10%	55%	0.35	0.00	**0.35**	0.33	0.00	**0.33**	0.37	0.00	**0.37**	0.41	0.00	**0.41**	0.44	0.00	**0.44**	0.48	0.00	**0.48**	37%	147	0.51	0.00	**0.51**
	SJRWMD Clay Total		**122,132**	**130,484**	**146,193**	**160,889**	**174,993**	**188,202**	**N/A**	**54%**	**15.10**	**0.00**	**15.10**	**14.22**	**0.00**	**14.22**	**15.94**	**0.00**	**15.94**	**17.55**	**0.00**	**17.55**	**19.08**	**0.00**	**19.08**	**20.54**	**0.00**	**20.54**	**36%**	**N/A**	**21.78**	**0.00**	**21.78**
Columbia - SRWMD	City of Lake City	217754	21,242	21,519	22,651	23,752	24,728	25,546	31.46%	20%	3.48	0.00	**3.48**	3.49	0.00	**3.49**	3.67	0.00	**3.67**	3.85	0.00	**3.85**	4.01	0.00	**4.01**	4.14	0.00	**4.14**	19%	162	4.39	0.00	**4.39**
	Columbia County Board of Commissioners	2-07-00122	0	0	0	0	0	0	N/A	N/A	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	156	0.00	0.00	**0.00**
	Clayton Smith Wells	2-86-00138	0	0	0	0	0	0	N/A	N/A	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	N/A	0.00	0.00	**0.00**
	Melton Bishop Wells	2-86-00143	0	0	0	0	0	0	N/A	N/A	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	N/A	0.00	0.00	**0.00**
	SRWMD Columbia Total		**21,242**	**21,519**	**22,651**	**23,752**	**24,728**	**25,546**	**N/A**	**20%**	**3.48**	**0.00**	**3.48**	**3.49**	**0.00**	**3.49**	**3.67**	**0.00**	**3.67**	**3.85**	**0.00**	**3.85**	**4.01**	**0.00**	**4.01**	**4.14**	**0.00**	**4.14**	**19%**	**N/A**	**4.39**	**0.00**	**4.39**
Duval - SJRWMD	Neighborhood Utilities, Inc.	756	1,015	1,079	1,135	1,188	1,236	1,281	0.12%	26%	0.10	0.00	**0.10**	0.09	0.00	**0.09**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	0.11	0.00	**0.11**	0.11	0.00	**0.11**	10%	85	0.12	0.00	**0.12**
	City of Baldwin	784	1,901	1,978	2,081	2,177	2,267	2,349	0.22%	24%	0.35	0.00	**0.35**	0.32	0.00	**0.32**	0.34	0.00	**0.34**	0.35	0.00	**0.35**	0.37	0.00	**0.37**	0.38	0.00	**0.38**	9%	162	0.40	0.00	**0.40**
	City of Jacksonville Beach	793	25,518	25,518	25,518	25,518	25,518	25,518	N/A	0%	2.45	0.00	**2.45**	2.48	0.00	**2.48**	2.48	0.00	**2.48**	2.48	0.00	**2.48**	2.48	0.00	**2.48**	2.48	0.00	**2.48**	1%	97	2.63	0.00	**2.63**
	Atlantic Beach Utility	810	26,172	26,172	26,172	26,172	26,172	26,172	N/A	0%	2.30	0.00	**2.30**	2.20	0.00	**2.20**	2.20	0.00	**2.20**	2.20	0.00	**2.20**	2.20	0.00	**2.20**	2.20	0.00	**2.20**	-4%	84	2.33	0.00	**2.33**
	City of Neptune Beach	842	7,673	7,673	7,673	7,673	7,673	7,673	N/A	0%	0.80	0.00	**0.80**	0.87	0.00	**0.87**	0.87	0.00	**0.87**	0.87	0.00	**0.87**	0.87	0.00	**0.87**	0.87	0.00	**0.87**	9%	113	0.92	0.00	**0.92**
	St Johns County Utilities / Intercoastal (Also in St. Johns)	1142	36	36	36	36	36	36	N/A	0%	0.01	0.00	**0.01**	0.01	0.00	**0.01**	0.01	0.00	**0.01**	0.01	0.00	**0.01**	0.01	0.00	**0.01**	0.01	0.00	**0.01**	0%	181	0.01	0.00	**0.01**
	Normandy Villages Utilities	50293	3,305	3,417	3,594	3,760	3,916	4,058	0.38%	23%	0.33	0.00	**0.33**	0.31	0.00	**0.31**	0.33	0.00	**0.33**	0.34	0.00	**0.34**	0.36	0.00	**0.36**	0.37	0.00	**0.37**	12%	91	0.39	0.00	**0.39**
	JEA (Also in Clay, Nassau, St. Johns)	88271	664,850	697,810	739,639	779,235	816,602	851,429	76.93%	28%	102.88	0.00	**102.88**	102.58	0.00	**102.58**	108.73	0.00	**108.73**	114.55	0.00	**114.55**	120.04	0.00	**120.04**	125.16	0.00	**125.16**	22%	147	132.67	0.00	**132.67**
	SJRWMD Duval Total		**730,470**	**763,683**	**805,848**	**845,759**	**883,420**	**918,516**	**N/A**	**26%**	**109.22**	**0.00**	**109.22**	**108.86**	**0.00**	**108.86**	**115.06**	**0.00**	**115.06**	**120.90**	**0.00**	**120.90**	**126.44**	**0.00**	**126.44**	**131.58**	**0.00**	**131.58**	**20%**	**N/A**	**139.47**	**0.00**	**139.47**
Flagler - SJRWMD	City of Flagler Beach	59	4,484	4,779	5,726	6,646	7,504	8,125	4.69%	81%	0.70	0.00	**0.70**	0.75	0.00	**0.75**	0.89	0.00	**0.89**	1.04	0.00	**1.04**	1.17	0.00	**1.17**	1.27	0.00	**1.27**	81%	156	1.35	0.00	**1.35**
	City of Palm Coast	1947	76,831	81,816	98,034	113,771	128,464	142,274	80.29%	85%	8.04	0.00	**8.04**	7.77	0.00	**7.77**	9.31	0.00	**9.31**	10.81	0.00	**10.81**	12.20	0.00	**12.20**	13.52	0.00	**13.52**	68%	95	14.33	0.00	**14.33**
	Plantation Bay Utility Company (Also in Volusia)	1960	1,247	1,325	1,587	1,842	2,080	2,304	1.30%	85%	0.10	0.00	**0.10**	0.09	0.00	**0.09**	0.10	0.00	**0.10**	0.12	0.00	**0.12**	0.14	0.00	**0.14**	0.15	0.00	**0.15**	50%	66	0.16	0.00	**0.16**
	City of Bunnell	1982	2,676	2,853	3,419	3,968	4,480	4,962	2.80%	85%	0.31	0.00	**0.31**	0.31	0.00	**0.31**	0.37	0.00	**0.37**	0.43	0.00	**0.43**	0.49	0.00	**0.49**	0.54	0.00	**0.54**	74%	109	0.57	0.00	**0.57**
	Manufactured Home Communities	2002	1,354	1,377	1,377	1,377	1,377	1,377	1.41%	2%	0.14	0.00	**0.14**	0.05	0.03	**0.08**	0.05	0.03	**0.08**	0.05	0.03	**0.08**	0.05	0.03	**0.08**	0.05	0.03	**0.08**	-43%	59	0.05	0.03	**0.08**
	City of Ormond Beach (Also in Volusia)	8932	0	0	0	0	0	0	N/A	0%	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	131	0.00	0.00	**0.00**
	Volusia County Utilities (Also in Volusia)	50157, 50659, 86278	1,189	1,189	1,189	1,189	1,189	1,189	N/A	0%	0.13	0.00	**0.13**	0.19	0.00	**0.19**	0.19	0.00	**0.19**	0.19	0.00	**0.19**	0.19	0.00	**0.19**	0.19	0.00	**0.19**	46%	156	0.20	0.00	**0.20**
	Dunes Community Development District	51136	5,051	5,380	5,722	5,722	5,722	5,722	5.28%	13%	0.70	0.00	**0.70**	0.52	0.00	**0.52**	0.56	0.00	**0.56**	0.56	0.00	**0.56**	0.56	0.00	**0.56**	0.56	0.00	**0.56**	-20%	97	0.59	0.00	**0.59**
	D & E Water Resources , LLC / Heart Island (Also in Volusia)	112981	0	13	78	151	151	151	0.00%	N/A	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.01	0.00	**0.01**	0.02	0.00	**0.02**	0.02	0.00	**0.02**	0.02	0.00	**0.02**	N/A	128	0.02	0.00	**0.02**
	SJRWMD Flagler Total		**92,832**	**98,732**	**117,132**	**134,666**	**150,967**	**166,104**	**N/A**	**79%**	**10.12**	**0.00**	**10.12**	**9.68**	**0.03**	**9.71**	**11.48**	**0.03**	**11.51**	**13.22**	**0.03**	**13.25**	**14.82**	**0.03**	**14.85**	**16.30**	**0.03**	**16.33**	**61%**	**N/A**	**17.27**	**0.03**	**17.30**
Gilchrist - SRWMD	City of Trenton Water Treatment Plant	216453	1,999	1,999	1,999	1,999	1,999	1,999	N/A	0%	0.23	0.00	**0.23**	0.23	0.00	**0.23**	0.23	0.00	**0.23**	0.23	0.00	**0.23**	0.23	0.00	**0.23**	0.23	0.00	**0.23**	0%	117	0.24	0.00	**0.24**
	SRWMD Gilchrist Total		**1,999**	**1,999**	**1,999**	**1,999**	**1,999**	**1,999**	**N/A**	**0%**	**0.23**	**0.00**	**0.23**	**0.23**	**0.00**	**0.23**	**0.23**	**0.00**	**0.23**	**0.23**	**0.00**	**0.23**	**0.23**	**0.00**	**0.23**	**0.23**	**0.00**	**0.23**	**0%**	**N/A**	**0.24**	**0.00**	**0.24**
Hamilton - SRWMD	City of Jasper	220463	2,936	2,897	2,976	3,075	3,155	3,214	19.84%	9%	0.66	0.00	**0.66**	0.64	0.00	**0.64**	0.66	0.00	**0.66**	0.68	0.00	**0.68**	0.70	0.00	**0.70**	0.71	0.00	**0.71**	8%	222	0.75	0.00	**0.75**
	Hamilton County Water Facilities	2-08-00093	50	50	51	53	54	55	0.34%	10%	0.01	0.00	**0.01**	0.05	0.00	**0.05**	0.05	0.00	**0.05**	0.05	0.00	**0.05**	0.05	0.00	**0.05**	0.05	0.00	**0.05**	400%	902	0.05	0.00	**0.05**
	Town of White Springs	216651	777	767	788	814	835	851	5.25%	10%	0.06	0.00	**0.06**	0.06	0.00	**0.06**	0.06	0.00	**0.06**	0.06	0.00	**0.06**	0.06	0.00	**0.06**	0.06	0.00	**0.06**	0%	73	0.06	0.00	**0.06**
	Town of Jennings	216567	878	866	890	919	943	961	5.93%	9%	0.13	0.00	**0.13**	0.14	0.00	**0.14**	0.14	0.00	**0.14**	0.15	0.00	**0.15**	0.15	0.00	**0.15**	0.15	0.00	**0.15**	15%	160	0.16	0.00	**0.16**
	SRWMD Hamilton Total		**4,641**	**4,580**	**4,705**	**4,861**	**4,987**	**5,081**	**N/A**	**9%**	**0.86**	**0.00**	**0.86**	**0.89**	**0.00**	**0.89**	**0.91**	**0.00**	**0.91**	**0.94**	**0.00**	**0.94**	**0.96**	**0.00**	**0.96**	**0.97**	**0.00**	**0.97**	**13%**	**N/A**	**1.02**	**0.00**	**1.02**
Nassau - SJRWMD	City of Fernandina Beach	122	18,603	19,484	21,412	23,315	25,142	25,910	25.37%	39%	3.42	0.00	**3.42**	3.41	0.00	**3.41**	3.75	0.00	**3.75**	4.08	0.00	**4.08**	4.40	0.00	**4.40**	4.53	0.00	**4.53**	32%	175	4.80	0.00	**4.80**
	Town of Callahan	922	1,609	1,609	1,609	1,609	1,609	1,609	N/A	0%	0.17	0.00	**0.17**	0.17	0.00	**0.17**	0.17	0.00	**0.17**	0.17	0.00	**0.17**	0.17	0.00	**0.17**	0.17	0.00	**0.17**	0%	103	0.18	0.00	**0.18**
	Town of Hilliard	948	2,763	2,895	3,182	3,465	3,736	3,985	3.77%	44%	0.30	0.00	**0.30**	0.27	0.00	**0.27**	0.30	0.00	**0.30**	0.32	0.00	**0.32**	0.35	0.00	**0.35**	0.37	0.00	**0.37**	23%	93	0.39	0.00	**0.39**
	Nassau Amelia Utilities	50087	8,736	8,955	8,955	8,955	8,955	8,955	11.92%	3%	1.40	0.00	**1.40**	1.37	0.00	**1.37**	1.37	0.00	**1.37**	1.37	0.00	**1.37**	1.37	0.00	**1.37**	1.37	0.00	**1.37**	-2%	153	1.45	0.00	**1.45**
	JEA (Also in Clay, Duval, St. Johns / Old 942)	88271	11,359	12,172	13,626	15,063	16,455	17,754	15.49%	56%	2.42	0.00	**2.42**	1.95	0.00	**1.95**	2.18	0.00	**2.18**	2.41	0.00	**2.41**	2.63	0.00	**2.63**	2.84	0.00	**2.84**	17%	160	3.01	0.00	**3.01**
	SJRWMD Nassau Total		**43,070**	**45,115**	**48,784**	**52,407**	**55,897**	**58,213**	**N/A**	**35%**	**7.71**	**0.00**	**7.71**	**7.17**	**0.00**	**7.17**	**7.77**	**0.00**	**7.77**	**8.35**	**0.00**	**8.35**	**8.92**	**0.00**	**8.92**	**9.28**	**0.00**	**9.28**	**20%**	**N/A**	**9.83**	**0.00**	**9.83**
Putnam - SJRWMD	Town of Interlachen	1624, 8150	926	908	914	919	923	928	1.25%	0%	0.10	0.00	**0.10**	0.08	0.00	**0.08**	0.08	0.00	**0.08**	0.08	0.00	**0.08**	0.08	0.00	**0.08**	0.08	0.00	**0.08**	-20%	84	0.08	0.00	**0.08**
	City of Crescent City	1627	1,577	1,539	1,550	1,558	1,565	1,573	2.12%	0%	0.34	0.00	**0.34**	0.20	0.00	**0.20**	0.20	0.00	**0.20**	0.20	0.00	**0.20**	0.20	0.00	**0.20**	0.20	0.00	**0.20**	-41%	127	0.21	0.00	**0.21**
	Melrose Water Association	7961	469	457	461	463	465	467	0.63%	0%	0.12	0.00	**0.12**	0.09	0.00	**0.09**	0.09	0.00	**0.09**	0.09	0.00	**0.09**	0.09	0.00	**0.09**	0.10	0.00	**0.10**	-17%	204	0.11	0.00	**0.11**
	River Park Utilities Management Assoc.	7981	736	719	724	728	731	735	0.99%	0%	0.04	0.00	**0.04**	0.04	0.00	**0.04**	0.04	0.00	**0.04**	0.04	0.00	**0.04**	0.04	0.00	**0.04**	0.04	0.00	**0.04**	0%	52	0.04	0.00	**0.04**
	City of Palatka	8114	10,558	10,309	10,380	10,437	10,480	10,536	14.20%	0%	1.67	0.00	**1.67**	1.36	0.00	**1.36**	1.37	0.00	**1.37**	1.38	0.00	**1.38**	1.38	0.00	**1.38**	1.39	0.00	**1.39**	-17%	132	1.47	0.00	**1.47**
	Town of Welaka	8168	1,100	1,074	1,082	1,088	1,092	1,098	1.48%	0%	0.09	0.00	**0.09**	0.07	0.00	**0.07**	0.07	0.00	**0.07**	0.07	0.00	**0.07**	0.07	0.00	**0.07**	0.07	0.00	**0.07**	-22%	63	0.07	0.00	**0.07**
	Putnam County BOCC	92165	2,277	2,222	2,237	2,249	2,258	2,271	3.06%	0%	0.37	0.00	**0.37**	0.38	0.00	**0.38**	0.39	0.00	**0.39**	0.39	0.00	**0.39**	0.39	0.00	**0.39**	0.39	0.00	**0.39**	5%	173	0.41	0.00	**0.41**
	SJRWMD Putnam Total		**17,643**	**17,228**	**17,348**	**17,442**	**17,514**	**17,608**	**N/A**	**0%**	**2.73**	**0.00**	**2.73**	**2.22**	**0.00**	**2.22**	**2.24**	**0.00**	**2.24**	**2.25**	**0.00**	**2.25**	**2.25**	**0.00**	**2.25**	**2.27**	**0.00**	**2.27**	**-17%**	**N/A**	**2.39**	**0.00**	**2.39**
St. Johns - SJRWMD	North Beach Utilities	157	3,653	4,162	4,941	5,699	6,392	6,556	1.92%	79%	0.37	0.00	**0.37**	0.50	0.00	**0.50**	0.59	0.00	**0.59**	0.68	0.00	**0.68**	0.76	0.00	**0.76**	0.78	0.00	**0.78**	111%	119	0.83	0.00	**0.83**
	Wildwood Water Company	324	878	988	1,069	1,069	1,069	1,069	0.46%	22%	0.13	0.00	**0.13**	0.08	0.00	**0.08**	0.09	0.00	**0.09**	0.09	0.00	**0.09**	0.09	0.00	**0.09**	0.09	0.00	**0.09**	-31%	86	0.10	0.00	**0.10**
	St Johns County Utilities / Intercoastal (Also in Duval)	1142	23,652	26,743	31,548	36,217	36,271	36,271	12.45%	53%	4.74	0.00	**4.74**	4.84	0.00	**4.84**	5.71	0.00	**5.71**	6.56	0.00	**6.56**	6.57	0.00	**6.57**	6.57	0.00	**6.57**	39%	181	6.96	0.00	**6.96**
	St Johns County Utilities	1198	64,062	72,409	85,421	98,062	109,558	120,176	33.71%	88%	6.70	0.00	**6.70**	7.17	0.00	**7.17**	8.46	0.00	**8.46**	9.71	0.00	**9.71**	10.85	0.00	**10.85**	11.90	0.00	**11.90**	78%	99	12.61	0.00	**12.61**
	Town of Hastings	1392	531	634	777	915	1,043	1,164	0.28%	119%	0.09	0.00	**0.09**	0.09	0.00	**0.09**	0.11	0.00	**0.11**	0.13	0.00	**0.13**	0.14	0.00	**0.14**	0.16	0.00	**0.16**	78%	137	0.17	0.00	**0.17**
	City of St. Augustine Utilities	50299	27,833	31,659	37,506	43,191	48,379	53,184	14.65%	91%	3.23	0.00	**3.23**	3.55	0.00	**3.55**	4.20	0.00	**4.20**	4.84	0.00	**4.84**	5.42	0.00	**5.42**	5.96	0.00	**5.96**	85%	112	6.32	0.00	**6.32**
	JEA (Also in Clay, Duval, Nassau)	88271	39,933	45,343	53,667	61,760	69,139	75,970	21.01%	90%	4.65	0.00	**4.65**	6.67	0.00	**6.67**	7.89	0.00	**7.89**	9.08	0.00	**9.08**	10.16	0.00	**10.16**	11.17	0.00	**11.17**	140%	147	11.84	0.00	**11.84**
	SJRWMD St. Johns Total		**160,542**	**181,938**	**214,929**	**246,913**	**271,851**	**294,390**	**N/A**	**83%**	**19.91**	**0.00**	**19.91**	**22.90**	**0.00**	**22.90**	**27.05**	**0.00**	**27.05**	**31.09**	**0.00**	**31.09**	**33.99**	**0.00**	**33.99**	**36.63**	**0.00**	**36.63**	**84%**	**N/A**	**38.83**	**0.00**	**38.83**
Suwannee - SRWMD	City of Live Oak	220612	6,850	7,371	7,800	8,196	8,575	8,921	16.49%	30%	0.94	0.00	**0.94**	1.17	0.00	**1.17**	1.24	0.00	**1.24**	1.30	0.00	**1.30**	1.36	0.00	**1.36**	1.42	0.00	**1.42**	51%	159	1.51	0.00	**1.51**
	Wellborn	216507	466	466	466	466	466	466	1.12%	0%	0.05	0.00	**0.05**	0.04	0.00	**0.04**	0.04	0.00	**0.04**	0.04	0.00	**0.04**	0.04	0.00	**0.04**	0.04	0.00	**0.04**	-20%	91	0.04	0.00	**0.04**
	Town of Branford	216658	712	764	809	850	889	910	1.71%	28%	0.10	0.00	**0.10**	0.09	0.00	**0.09**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	0.11	0.00	**0.11**	10%	118	0.12	0.00	**0.12**
	SRWMD Suwannee Total		**8,028**	**8,601**	**9,075**	**9,512**	**9,930**	**10,297**	**N/A**	**28%**	**1.09**	**0.00**	**1.09**	**1.30**	**0.00**	**1.30**	**1.38**	**0.00**	**1.38**	**1.44**	**0.00**	**1.44**	**1.50**	**0.00**	**1.50**	**1.57**	**0.00**	**1.57**	**44%**	**N/A**	**1.67**	**0.00**	**1.67**
Union - SRWMD	City of Lake Butler	2-85-00310	1,897	1,925	1,925	1,925	1,925	1,925	12.21%	1%	0.37	0.00	**0.37**	0.33	0.00	**0.33**	0.33	0.00	**0.33**	0.33	0.00	**0.33**	0.33	0.00	**0.33**	0.33	0.00	**0.33**	-11%	169	0.35	0.00	**0.35**
	SRWMD Union Total		**1,897**	**1,925**	**1,925**	**1,925**	**1,925**	**1,925**	**N/A**	**1%**	**0.37**	**0.00**	**0.37**	**0.33**	**0.00**	**0.33**	**0.33**	**0.00**	**0.33**	**0.33**	**0.00**	**0.33**	**0.33**	**0.00**	**0.33**	**0.33**	**0.00**	**0.33**	**-11%**	**N/A**	**0.35**	**0.00**	**0.35**
SJRWMD Region 1 Total			**1,367,354**	**1,442,578**	**1,565,896**	**1,683,458**	**1,789,172**	**1,886,528**	**N/A**	**38%**	**188.90**	**0.00**	**188.90**	**189.46**	**0.03**	**189.49**	**205.17**	**0.03**	**205.20**	**220.16**	**0.03**	**220.19**	**233.38**	**0.03**	**233.41**	**245.56**	**0.03**	**245.59**	**30%**	**N/A**	**260.27**	**0.03**	**260.30**
SRWMD NFRWSP Total			**65,478**	**66,603**	**69,585**	**72,470**	**75,098**	**77,447**	**N/A**	**18%**	**9.49**	**0.00**	**9.49**	**9.47**	**0.00**	**9.47**	**9.89**	**0.00**	**9.89**	**10.29**	**0.00**	**10.29**	**10.64**	**0.00**	**10.64**	**10.99**	**0.00**	**10.99**	**16%**	**N/A**	**11.65**	**0.00**	**11.65**
NFRWSP Total			**1,432,832**	**1,509,181**	**1,635,481**	**1,755,928**	**1,864,270**	**1,963,975**	**N/A**	**37%**	**198.39**	**0.00**	**198.39**	**198.93**	**0.03**	**198.96**	**215.06**	**0.03**	**215.09**	**230.45**	**0.03**	**230.48**	**244.02**	**0.03**	**244.05**	**256.55**	**0.03**	**256.58**	**29%**	**N/A**	**271.92**	**0.03**	**271.95**

Notes:
1.) All water use and demand projections are shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) Projected county population for years 2010 - 2035 are based on BEBR Medium Projections from Volume 48, Bulletin 171, Published April 2015.
4.) Population projections shown here are permanent population projections only and do not include any factors such as seasonal residents, tourist population or net commuter population.
5.) Population and demand projections for GRU represent both within the SJRWMD and SRWMD.
6.) Per capita used to calculate demand projections is an average from 2010 - 2014 and is calculated as (Total Water Use / Total Estimated Population). This per capita is commonly referred to as a gross per capita, as it includes all uses within a utility.
7.) 1-in-10 rainfall year demand for 2035 calculated as an additional 6 percent of 2035 average demand.
8.) SW quantities were obtained from permits, with the exception of Manufactured Home Communities. SW for Manufactured Home Communities estimated using permit SW/Total ratio due to demand being lower than SW permit quantities.
9.) Public water supply utility service areas often include residences that derive their water supply from privately owned (domestic self-supply) wells. Typically, these domestic self-supply water uses existed prior to their locations becoming part of public water supply service areas. For public water supply service areas, the Districts do not have sufficient information to separate the water use demand served by public supply systems from those served by domestic self-supply wells. Therefore, public water supply water demands estimated often include some domestic self-supply demand.
10.) As a result of the North Florida Regional Water Supply Stakeholder Advisory Committee and North Florida Utility Coordination Group comments from December 15, 2014; a 1 percent per year conversion of domestic-self-supply to public supply systems was added to viable utilities by proportion in Baker, Clay, Duval, Nassau, and St. Johns Counties.
11.) On January 20, 2015 a letter was received from the St. Johns County Utility Department. While the recommendation by SJCUD was to proceed with the demand projections as presented, it was requested to recognize that future gross per capita rates and specific rates of growth for a utility within a county may differ due to the types of development being established and shift in the percent of the county served. SJCUD, in their Integrated Water Resources Plan is anticipating to serve a population of 173,461 in 2035, with an associated demand of 23.1 mgd.

Table B-5a (NFRWSP). 2010-2014 Water Use, Population Served and Five-Year Gross Per Capita Averages for Public Supply Permitted Equal to or Greater than 0.10 mgd, in the St. Johns River Water Management District and Suwannee River Water Management District.

Cup Number	Owner	Utility	Alternate Name / Comments	County	Water Use					Population					2010-2014 Average Gross GPCD	Notes
					2010	2011	2012	2013	2014	2010	2011	2012	2013	2014		
1674	City of Hawthorne	City of Hawthorne		Alachua	0.167	0.187	0.254	0.159	0.158	1,495	1,508	1,508	1,508	1,508	123	
11339	Gainesville Regional Utilities	Gainesville Regional Utilities	GRU	Alachua	22.611	24.048	22.070	21.166	20.310	189,495	189,715	189,715	183,368	181,468	118	
11343	Kincaid Hills Water Company	Kincaid Hills Water Company	Kincaid Hills	Alachua	0.072	0.158	0.081	0.079	0.075	606	606	606	606	606	153	
11356	Town of Micanopy	Town of Micanopy		Alachua	0.060	0.070	0.067	0.065	0.060	856	863	863	824	824	76	
11364, 132141	Arredondo Utility Co / Aqua Source Utilities	Arredondo Utility Co / Aqua Source Utilities	Arredondo Farms	Alachua	0.090	0.082	0.079	0.084	0.079	874	874	874	571	571	110	
	SJRWMD Alachua Total				**23.000**	**24.545**	**22.551**	**21.553**	**20.682**	**193,326**	**193,566**	**193,566**	**186,877**	**184,977**	**118**	
220667	City Of Alachua	87		Alachua	1.372	1.294	1.159	1.146	1.131	9,059	9,108	9,134	9,300	9,300	133	
216450	City Of Newberry	133		Alachua	0.481	0.510	0.497	0.480	0.452	4,950	4,945	4,957	5,148	5,148	96	
216647	City Of Archer	543		Alachua	0.107	0.111	0.109	0.100	0.110	1,118	1,139	1,130	1,123	1,440	90	
216833	City Of High Springs Water Plant	836		Alachua	0.420	0.424	0.399	0.389	0.409	5,350	5,358	5,355	5,440	5,440	76	
217300	City Of Waldo	1186		Alachua	0.075	0.074	0.068	0.068	0.065	1,015	1,003	969	969	1,042	70	
	SRWMD Alachua Total				**2.455**	**2.413**	**2.232**	**2.183**	**2.167**	**21,492**	**21,553**	**21,545**	**21,980**	**22,370**	**105**	
15	City of Macclenny	City of Macclenny		Baker	0.974	1.054	1.052	0.864	0.846	6,042	5,950	6,600	6,600	6,391	152	
24	Town of Glen St Mary	Town of Glen St Mary		Baker	0.025	0.023	0.031	0.032	0.031	392	392	392	428	428	70	
	SJRWMD Baker Total				**0.999**	**1.077**	**1.083**	**0.896**	**0.877**	**6,434**	**6,342**	**6,992**	**7,028**	**6,819**	**147**	
218998	City of Lawtey	104		Bradford	0.189	0.185	0.182	0.171	0.186	730	727	730	735	735	250	
216650	City of Starke	545		Bradford	0.811	0.801	0.812	0.709	0.696	5,449	5,441	5,437	5,542	5,542	140	
	SRWMD Bradford Total				**1.000**	**0.986**	**0.994**	**0.880**	**0.882**	**6,179**	**6,168**	**6,167**	**6,277**	**6,277**	**153**	
416, 431	Clay County Utility Authority	Clay County Utility Authority	Postmaster Village, Keystone Heights, CCUA	Bradford, Clay	12.770	12.513	11.240	10.527	10.640	105,611	106,776	108,140	110,016	114,237	106	
453	Town of Orange Park	Town of Orange Park		Clay	1.023	1.008	0.934	0.859	0.863	8,421	9,042	9,042	9,042	9,042	105	
499	City of Green Cove Springs	City of Green Cove Springs		Clay	1.068	1.118	1.005	0.944	0.829	6,908	7,053	6,500	6,500	6,500	148	
	SJRWMD Clay Total				**14.861**	**14.639**	**13.179**	**12.330**	**12.332**	**120,940**	**122,871**	**123,682**	**125,558**	**129,779**	**108**	
217754	City of Lake City	37		Columbia	3.483	3.572	3.415	3.407	3.231	21,242	21,253	21,261	21,039	21,039	162	
2-07-00122	Columbia County Board Of Commissioners	122		Columbia	0.000	0.017	0.038	0.040	0.042	0	25	25	25	25	1,370	No GPCD Values available - used 156 from 2010 WSA SRWMD Average gross GPCD value.
2-86-00138	Clayton Smith Wells	138		Columbia	0.000	0.000	0.000	0.000	0.000	0	0	0	0	0	N/A	
2-86-00143	Melton Bishop Wells	143		Columbia	0.000	0.000	0.000	0.000	0.000	0	0	0	0	0	N/A	
	SRWMD Columbia Total				**3.483**	**3.589**	**3.453**	**3.447**	**3.273**	**21,242**	**21,278**	**21,286**	**21,064**	**21,064**	**163**	
756	Neighborhood Utilities, Inc.	Neighborhood Utilities, Inc.		Duval	0.095	0.083	0.098	0.080	0.075	1,015	1,015	1,015	1,015	1,015	85	
784	City of Baldwin	City of Baldwin		Duval	0.349	0.283	0.252	0.249	0.242	1,901	1,657	1,657	1,657	1,601	162	
793	City of Jacksonville Beach	City of Jacksonville Beach		Duval	2.448	2.503	2.420	2.352	2.367	25,518	25,211	25,211	25,211	23,279	97	
810	Atlantic Beach Utility	Atlantic Beach Utility	Buccaneer / Atlantic Beach	Duval	2.296	2.423	2.165	1.987	2.101	26,172	26,172	26,172	26,172	26,172	84	
842	City of Neptune Beach	City of Neptune Beach		Duval	0.803	0.880	0.847	0.769	0.958	7,673	7,580	7,580	7,580	7,270	113	
50293	Normandy Villages Utilities	Normandy Villages Utilities		Duval	0.332	0.309	0.297	0.283	0.275	3,305	3,305	3,265	3,265	3,265	91	
88271	JEA	JEA		Clay, Duval,	107.765	113.109	101.503	97.239	100.551	706,879	700,307	706,767	720,154	704,525	147	
	SJRWMD Duval Total				**114.088**	**119.590**	**107.582**	**102.959**	**106.569**	**772,463**	**765,247**	**771,667**	**785,054**	**767,127**	**143**	
59	City of Flager Beach	City of Flager Beach		Flagler	0.698	0.688	0.646	0.667	0.819	4,484	4,504	4,482	4,510	4,630	156	
1947	City of Palm Coast	City of Palm Coast	Include Beverly Beach Area	Flagler	8.041	7.922	7.514	7.404	6.578	76,831	79,759	79,905	79,905	79,905	95	
1960	Plantation Bay Utility Company	Plantation Bay Utility Company		Flagler,	0.230	0.245	0.214	0.138	0.175	2,996	3,086	3,000	3,000	3,000	66	
1982	City of Bunnell	City of Bunnell		Flagler	0.314	0.282	0.221	0.250	0.353	2,676	2,700	2,685	2,362	2,648	109	
2002	Manufactured Home Communities	Manufactured Home Communities	Bulow Village Campground	Flagler	0.142	0.073	0.081	0.053	0.055	1,354	1,394	1,394	1,394	1,284	59	
51136	Dunes Community Development District	Dunes Community Development District		Flagler	0.700	0.734	0.709	0.657	0.673	5,051	5,051	4,100	4,100	4,017	156	Includes Golf Course. Per capita of 97 for just PS.
	SJRWMD Flagler Total				**10.125**	**9.944**	**9.385**	**9.169**	**8.653**	**93,392**	**96,494**	**95,566**	**95,271**	**95,484**	**99**	
216453	City Of Trenton Water Treatment Plant	134		Gilchrist	0.228	0.236	**0.244**	**0.212**	**0.231**	1,999	1,985	1,956	1,965	1,965	117	
	SRWMD Gilchrist Total				**0.228**	**0.236**	**0.244**	**0.212**	**0.231**	**1,999**	**1,985**	**1,956**	**1,965**	**1,965**	**117**	
220463	City Of Jasper	13		Hamilton	0.657	0.673	0.674	0.660	0.611	2,936	2,868	2,970	2,978	2,978	222	
2-08-00093	Hamilton County Water Facilities	93		Hamilton	0.013	0.032	0.055	0.056	0.074	50	50	50	50	55	902	
316651	Town of White Springs	546		Hamilton	0.06	0.053	0.066	0.064	0.043	777	784	770	771	819	73	
216567	Town of Jennings	1143		Hamilton	0.129	0.137	0.142	0.131	0.157	878	884	906	895	800	160	
	SRWMD Hamilton Total				**0.859**	**0.895**	**0.937**	**0.911**	**0.885**	**4,641**	**4,586**	**4,696**	**4,694**	**4,652**	**193**	
122	City of Fernandina Beach	City of Fernandina Beach		Nassau	3.418	3.464	3.295	3.080	3.061	18,603	18,603	18,603	18,661	18,661	175	
922	Town of Callahan	Town of Callahan		Nassau	0.167	0.170	0.182	0.160	0.152	1,609	1,609	1,609	1,609	1,609	103	
948	Town of Hilliard	Town of Hilliard		Nassau	0.298	0.276	0.259	0.249	0.221	2,763	2,763	2,763	2,763	3,000	93	
50087	Nassau County Board of County	Nassau Amelia Utilities	Amelia Island	Nassau	1.398	1.426	1.346	1.316	1.267	8,736	8,788	8,788	8,788	8,946	153	
88271	JEA	JEA	Nassau Regional (Old 942)	Nassau	2.420	2.296	2.192	2.011	2.185	11,359	14,292	14,424	14,697	14,697	160	
	SJRWMD Nassau Total				**7.701**	**7.632**	**7.274**	**6.816**	**6.886**	**43,070**	**46,055**	**46,187**	**46,518**	**46,913**	**159**	

Table B-5a (NFRWSP), Continued. 2010-2014 Water Use, Population Served and Five-Year Gross Per Capita Averages for Public Supply Permitted Equal to or Greater than 0.10 mgd, in the St. Johns River Water Management District and Suwannee River Water Management District.

Cup Number	Owner	Utility	Alternate Name / Comments	County	Water Use					Population					2010-2014 Average Gross GPCD	Notes
					2010	2011	2012	2013	2014	2010	2011	2012	2013	2014		
1624, 8150	Town of Interlachen	Town of Interlachen		Putnam	0.103	0.088	0.081	0.059	0.069	926	930	1054	930	930	84	
1627	City of Crescent City	City of Crescent City		Putnam	0.343	0.177	0.180	0.171	0.176	1,577	1,524	1,522	1,800	1,800	127	
7961	Melrose Water Association	Melrose Water Association		Putnam	0.118	0.110	0.104	0.099	0.100	469	505	505	545	585	204	
7981	River Park Utility Mgt. Assoc.	River Park Utilities Management Assoc.		Putnam	0.042	0.029	0.060	0.040	0.047	736	736	736	1,000	1,000	52	
8114	City of Palatka	City of Palatka		Putnam	1.673	1.466	1.525	1.268	1.327	10,558	10,522	10,203	11,900	11,900	132	
8168	Town of Welaka	Town of Welaka		Putnam	0.085	0.077	0.094	0.083	0.094	1,100	1,100	1,100	1,780	1,780	63	
92165	Putnam County BOCC	Putnam County BOCC	East Putnam County Water System. East	Putnam	0.368	0.405	0.412	0.410	0.416	2,277	2,287	2,287	2,393	2,393	173	
SJRWMD Putnam Total					**2.732**	**2.352**	**2.456**	**2.130**	**2.229**	**17,643**	**17,604**	**17,407**	**20,348**	**20,388**	**127**	
157	North Beach Utilities	North Beach Utilities		St. Johns	0.368	0.405	0.412	0.410	0.416	3,653	3,295	3,295	3,295	3,295	119	
324	Wildwood Water Company	Wildwood Water Company		St. Johns	0.129	0.067	0.062	0.059	0.061	878	896	911	848	848	86	
1142	St Johns County Utilities	St Johns County Utilities	Was previously Intercoastal Utilities CUP 1213 (consolidated)	Duval, St. Johns	4.746	4.853	4.435	4.080	3.671	23,688	23,973	23,531	23,531	25,353	181	
1198	St Johns County Utilities	St Johns County Utilities	Serves Eagle Creek - PWSID interconnection	St. Johns	6.700	6.651	6.706	6.390	6.827	64,062	67,697	71,289	71,289	62,677	99	
1392	Town of Hastings	Town of Hastings		St. Johns	0.088	0.081	0.081	0.081	0.080	531	639	639	593	593	137	
50299	City of St. Augustine Utilities	City of St. Augustine Utilities		St. Johns	3.227	3.098	3.094	2.902	2.946	27,833	26,233	26,233	28,207	28,207	112	
SJRWMD St. Johns Total					**15.258**	**15.155**	**14.790**	**13.922**	**14.001**	**120,645**	**122,733**	**125,898**	**127,763**	**120,973**	**118**	
220612	City of Live Oak	36		Suwannee	0.937	**1.452**	**0.945**	**1.035**	**1.071**	**6,850**	**6,858**	**6,826**	**6,800**	**6,826**	159	
216507	Wellborn	164		Suwannee	0.045	**0.044**	**0.041**	**0.041**	**0.042**	**466**	**466**	**466**	**466**	**466**	91	
216658	Town of Branford	549		Suwannee	0.095	**0.092**	**0.079**	**0.074**	**0.075**	**712**	**705**	**705**	**694**	**700**	118	
SRWMD Suwannee Total					**1.077**	**1.588**	**1.065**	**1.150**	**1.188**	**8,028**	**8,029**	**7,997**	**7,960**	**7,992**	**152**	
2-85-00310	City of Lake Butler	310		Union	0.374	0.312	0.347	0.345	0.219	1,897	1,892	1,893	1,872	1,920	169	
SRWMD Union Total					**0.374**	**0.312**	**0.347**	**0.345**	**0.219**	**1,897**	**1,892**	**1,893**	**1,872**	**1,920**	**169**	
SJRWMD Region 1 Total					**188.764**	**194.934**	**178.300**	**169.775**	**172.229**	**1,367,913**	**1,370,912**	**1,380,965**	**1,394,417**	**1,372,460**	**131**	
SRWMD NFRWSP Total					**9.476**	**10.019**	**9.272**	**9.128**	**8.845**	**65,478**	**65,491**	**65,540**	**65,812**	**66,240**	**142**	
NFRWSP Total					**198.240**	**204.953**	**187.572**	**178.903**	**181.074**	**1,433,391**	**1,436,403**	**1,446,505**	**1,460,229**	**1,438,700**	**132**	

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
4.) 2010-2014 water use obtained from SJRWMD Estimated Water Use Survey, SJRWMD metered EN50 data, DEP MOR data and USGS data.
5.) 2010-2014 population obtained from Technical Staff Reports, BEBR estimates of population, DEP MOR and Base Facility Report Data, parcel data and permittee surveys.

Table B-6 (NFRWSP). Domestic Self-supply and Small Public Supply Systems Population and Water Use for 2010 and 5-in-10 Year Water Demand Projections for 2015-2035, and 1-in-10 Year Water Demand Projections for 2035 by County, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Population	Population Projections					Percent Change	Water Use			Demand Projections (5-in-10)															Percent Change	Demand Projections (1-in-10)		
									2010			2015			2020			2025			2030			2035				2035		
		2010	2015	2020	2025	2030	2035	2010-2035	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	2010-2035	Ground	Surface	Total
Alachua	SJRWMD	10,627	10,898	11,461	11,994	12,494	12,984	22%	0.73	0.00	**0.73**	0.75	0.00	**0.75**	0.79	0.00	**0.79**	0.83	0.00	**0.83**	0.86	0.00	**0.86**	0.90	0.00	**0.90**	23%	0.95	0.00	**0.95**
Alachua	SRWMD	21,891	22,410	23,508	24,542	25,516	26,471	21%	2.80	0.00	**2.80**	1.54	0.00	**1.54**	1.62	0.00	**1.62**	1.69	0.00	**1.69**	1.76	0.00	**1.76**	1.82	0.00	**1.82**	-35%	1.93	0.00	**1.93**
Alachua	**Total**	**32,518**	**33,308**	**34,969**	**36,536**	**38,010**	**39,455**	**21%**	**3.53**	**0.00**	**3.53**	**2.29**	**0.00**	**2.29**	**2.41**	**0.00**	**2.41**	**2.52**	**0.00**	**2.52**	**2.62**	**0.00**	**2.62**	**2.72**	**0.00**	**2.72**	-23%	2.88	0.00	**2.88**
Baker	SJRWMD	20,079	20,161	21,442	22,719	23,924	25,056	25%	2.97	0.00	**2.97**	2.30	0.00	**2.30**	2.44	0.00	**2.44**	2.59	0.00	**2.59**	2.73	0.00	**2.73**	2.86	0.00	**2.86**	-4%	3.03	0.00	**3.03**
Baker	SRWMD	602	608	650	693	733	770	28%	0.04	0.00	**0.04**	0.07	0.00	**0.07**	0.07	0.00	**0.07**	0.08	0.00	**0.08**	0.08	0.00	**0.08**	0.09	0.00	**0.09**	125%	0.10	0.00	**0.10**
Baker	**Total**	**20,681**	**20,769**	**22,092**	**23,412**	**24,657**	**25,826**	**25%**	**3.01**	**0.00**	**3.01**	**2.37**	**0.00**	**2.37**	**2.51**	**0.00**	**2.51**	**2.67**	**0.00**	**2.67**	**2.81**	**0.00**	**2.81**	**2.95**	**0.00**	**2.95**	-2%	3.13	0.00	**3.13**
Bradford	SJRWMD	4,876	4,719	4,856	4,993	5,112	5,215	7%	0.09	0.00	**0.09**	0.40	0.00	**0.40**	0.41	0.00	**0.41**	0.42	0.00	**0.42**	0.43	0.00	**0.43**	0.44	0.00	**0.44**	389%	0.47	0.00	**0.47**
Bradford	SRWMD	16,560	16,027	16,491	16,956	17,362	17,710	7%	1.70	0.00	**1.70**	1.38	0.00	**1.38**	1.43	0.00	**1.43**	1.47	0.00	**1.47**	1.50	0.00	**1.50**	1.53	0.00	**1.53**	-10%	1.61	0.00	**1.61**
Bradford	**Total**	**21,436**	**20,746**	**21,347**	**21,949**	**22,474**	**22,925**	**7%**	**1.79**	**0.00**	**1.79**	**1.78**	**0.00**	**1.78**	**1.84**	**0.00**	**1.84**	**1.89**	**0.00**	**1.89**	**1.93**	**0.00**	**1.93**	**1.97**	**0.00**	**1.97**	10%	2.08	0.00	**2.08**
Clay	SJRWMD	68,733	71,316	78,407	86,111	93,407	100,098	46%	4.32	0.00	**4.32**	5.84	0.00	**5.84**	6.41	0.00	**6.41**	7.04	0.00	**7.04**	7.62	0.00	**7.62**	8.17	0.00	**8.17**	89%	8.66	0.00	**8.66**
Columbia	SRWMD	46,289	46,881	49,349	51,748	53,872	55,654	20%	3.72	0.00	**3.72**	4.48	0.00	**4.48**	4.72	0.00	**4.72**	4.95	0.00	**4.95**	5.16	0.00	**5.16**	5.32	0.00	**5.32**	43%	5.64	0.00	**5.64**
Duval	SJRWMD	133,793	135,617	140,052	143,841	146,980	149,384	12%	12.06	0.00	**12.06**	12.61	0.00	**12.61**	13.02	0.00	**13.02**	13.38	0.00	**13.38**	13.67	0.00	**13.67**	13.89	0.00	**13.89**	15%	14.72	0.00	**14.72**
Flagler	SJRWMD	2,864	3,168	4,968	7,034	9,033	11,096	287%	0.16	0.00	**0.16**	0.18	0.00	**0.18**	0.29	0.00	**0.29**	0.42	0.00	**0.42**	0.54	0.00	**0.54**	0.66	0.00	**0.66**	313%	0.70	0.00	**0.70**
Gilchrist	SRWMD	14,940	14,901	15,801	16,601	17,401	18,101	21%	1.29	0.00	**1.29**	1.42	0.00	**1.42**	1.50	0.00	**1.50**	1.58	0.00	**1.58**	1.65	0.00	**1.65**	1.72	0.00	**1.72**	33%	1.82	0.00	**1.82**
Hamilton	SRWMD	10,158	10,020	10,295	10,639	10,913	11,119	9%	0.74	0.00	**0.74**	0.95	0.00	**0.95**	0.98	0.00	**0.98**	1.01	0.00	**1.01**	1.04	0.00	**1.04**	1.06	0.00	**1.06**	43%	1.12	0.00	**1.12**
Nassau	SJRWMD	30,244	31,685	35,616	39,493	43,203	47,487	57%	6.87	0.00	**6.87**	4.55	0.00	**4.55**	5.12	0.00	**5.12**	5.68	0.00	**5.68**	6.21	0.00	**6.21**	6.82	0.00	**6.82**	-1%	7.23	0.00	**7.23**
Putnam	SJRWMD	56,721	55,372	55,752	56,058	56,286	56,592	0%	4.76	0.00	**4.76**	3.95	0.00	**3.95**	3.98	0.00	**3.98**	4.00	0.00	**4.00**	4.01	0.00	**4.01**	4.03	0.00	**4.03**	-15%	4.27	0.00	**4.27**
St. Johns	SJRWMD	29,497	32,862	38,471	43,987	53,149	62,110	111%	2.96	0.00	**2.96**	3.03	0.00	**3.03**	3.54	0.00	**3.54**	4.05	0.00	**4.05**	4.89	0.00	**4.89**	5.72	0.00	**5.72**	93%	6.07	0.00	**6.07**
Suwannee	SRWMD	33,523	36,099	38,225	40,188	42,070	43,803	31%	2.74	0.00	**2.74**	3.43	0.00	**3.43**	3.63	0.00	**3.63**	3.82	0.00	**3.82**	4.00	0.00	**4.00**	4.16	0.00	**4.16**	52%	4.41	0.00	**4.41**
Union	SRWMD	13,638	13,975	14,475	14,975	15,475	15,975	17%	1.16	0.00	**1.16**	1.33	0.00	**1.33**	1.38	0.00	**1.38**	1.42	0.00	**1.42**	1.47	0.00	**1.47**	1.52	0.00	**1.52**	31%	1.61	0.00	**1.61**
SJRWMD Region 1 Total		**357,434**	**365,798**	**391,025**	**416,230**	**443,588**	**470,022**	31%	**34.92**	**0.00**	**34.92**	**33.61**	**0.00**	**33.61**	**36.00**	**0.00**	**36.00**	**38.41**	**0.00**	**38.41**	**40.96**	**0.00**	**40.96**	**43.49**	**0.00**	**43.49**	**25%**	**46.10**	**0.00**	**46.10**
SRWMD NFRWSP Total		**157,601**	**160,921**	**168,794**	**176,342**	**183,342**	**189,603**	20%	**14.19**	**0.00**	**14.19**	**14.60**	**0.00**	**14.60**	**15.33**	**0.00**	**15.33**	**16.02**	**0.00**	**16.02**	**16.66**	**0.00**	**16.66**	**17.22**	**0.00**	**17.22**	**21%**	**18.24**	**0.00**	**18.24**
NFRWSP Total		**515,035**	**526,719**	**559,819**	**592,572**	**626,930**	**659,625**	28%	**49.11**	**0.00**	**49.11**	**48.21**	**0.00**	**48.21**	**51.33**	**0.00**	**51.33**	**54.43**	**0.00**	**54.43**	**57.62**	**0.00**	**57.62**	**60.71**	**0.00**	**60.71**	**24%**	**64.34**	**0.00**	**64.34**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) Public water supply utility service areas often include residences that derive their water supply from privately owned (domestic self-supply) wells. Typically, these domestic self-supply water uses existed prior to their locations becoming part of public water supply service areas. For public water supply service areas, the Districts do not have sufficient information to separate the populations served by public supply systems from those served by domestic self-supply wells. Therefore, public water supply populations estimated often include some domestic self-supply population.
4.) 1-in-10 rainfall year demand for 2035 calculated as an additional 6 percent of 2035 average demand.

Table B-6a (NFRWSP). Domestic Self-Supply Population and Water Use for 2010 and Population Projections for 2015-2035, 5-in-10 Year Wate Demand Projections for 2015-2035 and 1-in-10 Year Water Demand Projections for 2035 by County, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Population	Population Projections					Percent Change	Water Use			Demand Projections (5-in-10)															Percent Change	2010-2014 Avg GPCD	Demand Projections (1-in-10)		
									2010			2015			2020			2025			2030			2035					2035		
		2010	2015	2020	2025	2030	2035	2010-2035	GW	SW	Total	GW	SW	Total	GW	SW	Total	GW	SW	Total	GW	SW	Total	GW	SW	Total	2010-2035		GW	SW	Total
Alachua	SJRWMD	10,627	10,898	11,461	11,994	12,494	12,984	22%	0.73	0.00	0.73	0.75	0.00	0.75	0.79	0.00	0.79	0.83	0.00	0.83	0.86	0.00	0.86	0.90	0.00	0.90	23%	69	0.95	0.00	0.95
Alachua	SRWMD	21,699	22,215	23,303	24,328	25,294	26,240	21%	2.79	0.00	2.79	1.53	0.00	1.53	1.61	0.00	1.61	1.68	0.00	1.68	1.75	0.00	1.75	1.81	0.00	1.81	-35%	69	1.92	0.00	1.92
Alachua	**Total**	**32,326**	**33,113**	**34,764**	**36,322**	**37,788**	**39,224**	**21%**	**3.52**	**0.00**	**3.52**	**2.28**	**0.00**	**2.28**	**2.40**	**0.00**	**2.40**	**2.51**	**0.00**	**2.51**	**2.61**	**0.00**	**2.61**	**2.71**	**0.00**	**2.71**	**-23%**	**69**	**2.87**	**0.00**	**2.87**
Baker	SJRWMD	20,079	20,161	21,442	22,719	23,924	25,056	25%	2.97	0.00	2.97	2.30	0.00	2.30	2.44	0.00	2.44	2.59	0.00	2.59	2.73	0.00	2.73	2.86	0.00	2.86	-4%	114	3.03	0.00	3.03
Baker	SRWMD	602	608	650	693	733	770	28%	0.04	0.00	0.04	0.07	0.00	0.07	0.07	0.00	0.07	0.08	0.00	0.08	0.08	0.00	0.08	0.09	0.00	0.09	125%	114	0.10	0.00	0.10
Baker	**Total**	**20,681**	**20,769**	**22,092**	**23,412**	**24,657**	**25,826**	**25%**	**3.01**	**0.00**	**3.01**	**2.37**	**0.00**	**2.37**	**2.51**	**0.00**	**2.51**	**2.67**	**0.00**	**2.67**	**2.81**	**0.00**	**2.81**	**2.95**	**0.00**	**2.95**	**-2%**	**114**	**3.13**	**0.00**	**3.13**
Bradford	SJRWMD	4,876	4,719	4,856	4,993	5,112	5,215	7%	0.09	0.00	0.09	0.40	0.00	0.40	0.41	0.00	0.41	0.42	0.00	0.42	0.43	0.00	0.43	0.44	0.00	0.44	389%	84	0.47	0.00	0.47
Bradford	SRWMD	15,722	15,215	15,656	16,097	16,483	16,813	7%	1.58	0.00	1.58	1.28	0.00	1.28	1.32	0.00	1.32	1.35	0.00	1.35	1.38	0.00	1.38	1.41	0.00	1.41	-11%	84	1.49	0.00	1.49
Bradford	**Total**	**20,598**	**19,934**	**20,512**	**21,090**	**21,595**	**22,028**	**7%**	**1.67**	**0.00**	**1.67**	**1.68**	**0.00**	**1.68**	**1.73**	**0.00**	**1.73**	**1.77**	**0.00**	**1.77**	**1.81**	**0.00**	**1.81**	**1.85**	**0.00**	**1.85**	**11%**	**84**	**1.96**	**0.00**	**1.96**
Clay	SJRWMD	67,043	69,589	76,621	84,267	91,507	98,146	46%	4.11	0.00	4.11	5.64	0.00	5.64	6.21	0.00	6.21	6.83	0.00	6.83	7.41	0.00	7.41	7.95	0.00	7.95	93%	81	8.43	0.00	8.43
Columbia	SRWMD	45,722	46,306	48,744	51,114	53,212	54,972	20%	3.63	0.00	3.63	4.40	0.00	4.40	4.63	0.00	4.63	4.86	0.00	4.86	5.06	0.00	5.06	5.22	0.00	5.22	44%	95	5.53	0.00	5.53
Duval	SJRWMD	133,793	135,617	140,052	143,841	146,980	149,384	12%	12.06	0.00	12.06	12.61	0.00	12.61	13.02	0.00	13.02	13.38	0.00	13.38	13.67	0.00	13.67	13.89	0.00	13.89	15%	93	14.72	0.00	14.72
Flagler	SJRWMD	2,495	2,799	4,599	6,665	8,664	10,727	330%	0.15	0.00	0.15	0.17	0.00	0.17	0.28	0.00	0.28	0.41	0.00	0.41	0.53	0.00	0.53	0.65	0.00	0.65	333%	61	0.69	0.00	0.69
Gilchrist	SRWMD	14,940	14,901	15,801	16,601	17,401	18,101	21%	1.29	0.00	1.29	1.42	0.00	1.42	1.50	0.00	1.50	1.58	0.00	1.58	1.65	0.00	1.65	1.72	0.00	1.72	33%	95	1.82	0.00	1.82
Hamilton	SRWMD	10,158	10,020	10,295	10,639	10,913	11,119	9%	0.74	0.00	0.74	0.95	0.00	0.95	0.98	0.00	0.98	1.01	0.00	1.01	1.04	0.00	1.04	1.06	0.00	1.06	43%	95	1.12	0.00	1.12
Nassau	SJRWMD	30,130	31,562	35,481	39,346	43,044	47,318	57%	6.87	0.00	6.87	4.54	0.00	4.54	5.11	0.00	5.11	5.67	0.00	5.67	6.20	0.00	6.20	6.81	0.00	6.81	-1%	144	7.22	0.00	7.22
Putnam	SJRWMD	53,697	52,410	52,773	53,067	53,286	53,578	0%	4.51	0.00	4.51	3.72	0.00	3.72	3.75	0.00	3.75	3.77	0.00	3.77	3.78	0.00	3.78	3.80	0.00	3.80	-16%	71	4.03	0.00	4.03
St. Johns	SJRWMD	28,198	31,512	37,101	42,617	51,779	60,740	115%	2.80	0.00	2.80	2.90	0.00	2.90	3.41	0.00	3.41	3.92	0.00	3.92	4.76	0.00	4.76	5.59	0.00	5.59	100%	92	5.93	0.00	5.93
Suwannee	SRWMD	33,228	35,804	37,930	39,893	41,775	43,508	31%	2.71	0.00	2.71	3.40	0.00	3.40	3.60	0.00	3.60	3.79	0.00	3.79	3.97	0.00	3.97	4.13	0.00	4.13	52%	95	4.38	0.00	4.38
Union	SRWMD	13,638	13,975	14,475	14,975	15,475	15,975	17%	1.16	0.00	1.16	1.33	0.00	1.33	1.38	0.00	1.38	1.42	0.00	1.42	1.47	0.00	1.47	1.52	0.00	1.52	31%	95	1.61	0.00	1.61
SJRWMD Region 1 Total		**350,938**	**359,267**	**384,386**	**409,509**	**436,790**	**463,148**	**32%**	**34.29**	**0.00**	**34.29**	**33.03**	**0.00**	**33.03**	**35.42**	**0.00**	**35.42**	**37.82**	**0.00**	**37.82**	**40.37**	**0.00**	**40.37**	**42.89**	**0.00**	**42.89**	**25%**	**N/A**	**45.47**	**0.00**	**45.47**
SRWMD NFRWSP Total		**155,709**	**159,044**	**166,854**	**174,340**	**181,286**	**187,498**	**20%**	**13.94**	**0.00**	**13.94**	**14.38**	**0.00**	**14.38**	**15.09**	**0.00**	**15.09**	**15.77**	**0.00**	**15.77**	**16.40**	**0.00**	**16.40**	**16.96**	**0.00**	**16.96**	**22%**	**N/A**	**17.97**	**0.00**	**17.97**
NFRWSP Total		**506,647**	**518,311**	**551,240**	**583,849**	**618,076**	**650,646**	**28%**	**48.23**	**0.00**	**48.23**	**47.41**	**0.00**	**47.41**	**50.51**	**0.00**	**50.51**	**53.59**	**0.00**	**53.59**	**56.77**	**0.00**	**56.77**	**59.85**	**0.00**	**59.85**	**24%**	**N/A**	**63.44**	**0.00**	**63.44**

Notes:

1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) Projected county population source for years 2010-2035 is BEBR Medium Projections from Volume 48, Bulletin 171, Published April 2015. Domestic Self-Supply Population is BEBR Medium County population minus large public supply population and small public supply population.
4.) Population projections shown here are permanent population projections only and do not include any factors such as seasonal residents, tourist population or net commuter population.
5.) Per capita used to calculate demand projections is an average from 2010-2014 and is calculated as (Total County-wide Residential Water Use / Total Estimated Population). This per capita is commonly referred to as a residential per capita, as it only includes the indoor and outdoor residential uses.
6.) 1-in-10 rainfall year demand for 2035 calculated as an additional 6 percent of 2035 average demand.
7.) All demands are expected to come from groundwater, thus surface water projections are zero.
8.) Due to lack of SRWMD household use data, the SJRWMD 2010-2014 residential average per capita for Alachua, Baker and Bradford was used to estimate SRWMD Domestic Self-supply projections and the SJRWMD 2010-2014 residential average per capita for the SJRWMD was used to estimate the remaining SRWMD Domestic Self-supply county projections.
9.) 2010 estimates of domestic self-supply water use obtained from SJRWMD Annual Water Use Surveys and USGS data. Duval County was adjusted from published values to account for domestic self-supply population within JEA public supply service area.

Table B-6b. 2010-2014 Residential Water Use and Five-Year Residential Per Capita Averages for All Public Supply Permittees in the St. Johns River Water Management District.

CUP Number	Owner	Utility	Alternate Name	Utility Category	County	2010 Water Use	2010 % Household	2010 Household Use	2010 Population	2010 Residential GPCD	2011 Water Use	2011 % Household	2011 Household Use	2011 Population	2011 Residential GPCD
1674	City of Hawthorne	City of Hawthorne		Large	Alachua	0.167	83.9%	0.140	1,495	94	0.187	83.9%	0.157	1,508	104
11339	Gainesville Regional Utilities	Gainesville Regional Utilities	GRU	Large	Alachua	22.611	58.1%	13.137	189,495	69	24.048	58.1%	13.972	189,715	74
11343	Kincaid Hills Water Company	Kincaid Hills Water Company	Kincaid Hills	Large	Alachua	0.072	100.0%	0.072	606	119	0.158	100.0%	0.158	606	261
11356	Town of Micanopy	Town of Micanopy		Large	Alachua	0.060	99.1%	0.059	856	69	0.070	99.1%	0.069	863	80
11364, 132141	Arredondo Utility Co / Aqua Source Utilities	Arredondo Utility Co / Aqua Source Utilities	Arredondo Farms	Large	Alachua	0.090	100.0%	0.090	874	103	0.082	100.0%	0.082	874	94
Alachua Total						**23.000**	**58.7%**	**13.498**	**193,326**	**70**	**24.545**	**58.8%**	**14.438**	**193,566**	**75**
15	City of Macclenny	City of Macclenny		Large	Baker	0.974	77.0%	0.750	6,042	124	1.054	77.0%	0.812	5,950	136
24	Town of Glen St Mary	Town of Glen St Mary		Large	Baker	0.025	94.1%	0.024	392	61	0.023	94.1%	0.022	392	56
Baker Total						**0.999**	**77.5%**	**0.774**	**6,434**	**120**	**1.077**	**77.4%**	**0.834**	**6,342**	**132**
202	Palm Bay Utilities	Palm Bay Utilities	Palm Bay / Town of Malabar	Large	Brevard	6.582	65.0%	4.278	105,833	40	6.370	65.0%	4.141	102,698	40
233	Brevard County Utility Services	Brevard County Utility Services	North Brevard	Large	Brevard	1.085	100.0%	1.085	8,988	121	0.866	100.0%	0.866	8,988	96
236	Brevard County Utility Services	Brevard County Utility Services	Former Barefoot Bay Water and Sewer District - Barefoot and Crystal Bay. Snug Harbor	Large	Brevard	0.473	100.0%	0.473	12,889	37	0.450	100.0%	0.450	12,188	37
1606	South Brevard Water CO-OP Inc	South Brevard County Utilities		Large	Brevard	0.102	100.0%	0.102	1,018	100	0.101	100.0%	0.101	1,023	99
1719	Service Management Systems Inc	Service Management Systems Inc	Aquarina	Large	Brevard	0.032	15.4%	0.005	696	7	0.393	15.4%	0.061	699	87
1738	Riverview Florida Associates, LLC	Riverview Florida Associates, LLC	Pelican Bay	Small	Brevard	0.036	40.4%	0.015	250	60	0.045	40.4%	0.018	250	72
1742	San Sebastian Water LLC	San Sebastian Water LLC	San Sebastian Woods	Small	Brevard	0.014	100.0%	0.014	61	230	0.018	100.0%	0.018	61	295
1749	South Shores Utility Assoc	South Shores Utility Assoc	South Shores	Large	Brevard	0.036	78.2%	0.028	696	40	0.042	78.2%	0.033	699	47
1783	Northgate Properties Inc.	Northgate Properties Inc.	Northgate Mobile Ranch	Small	Brevard	0.021	78.9%	0.017	812	21	0.020	78.9%	0.016	812	20
1804	Bonnie Douglas - River Grove Mobile Home Village I & II	Bonnie Douglas - River Grove Mobile Home Village I & II	River Grove Mobile Home Village I & II	Small	Brevard	0.036	88.0%	0.032	401	80	0.060	88.0%	0.053	401	132
1808	Summit Cove Condo Assoc	Summit Cove Condo Assoc	Summit Cove Condo	Small	Brevard	0.020	55.2%	0.011	195	56	0.022	55.2%	0.012	195	62
1831	Lighthouse Cove Condominimium Association	Lighthouse Cove Condominimium Association	Lighthouse Cove	Small	Brevard	0.007	41.9%	0.003	193	16	0.007	41.9%	0.003	193	16
10647, 99052	City of Titusville	City of Titusville		Large	Brevard	3.477	62.6%	2.177	49,572	44	3.416	62.6%	2.138	49,869	43
50245	City of Cocoa	City of Cocoa	Also Serves Kennedy Space Center and City of Rockledge (CUP 107643), USAF (CUPs 1733 and 86898 (PWSID for Pump Station 3054140)).	Large	Brevard	25.893	75.2%	19.472	161,709	120	23.217	75.2%	17.459	165,442	106
50301	City of Melbourne	City of Melbourne		Large	Brevard	17.276	51.5%	8.897	149,060	60	17.340	51.5%	8.930	150,731	59
89992	City of West Melbourne	City of West Melbourne	Wholesale Importer of City of Melbourne	Large	Brevard	1.412	51.5%	0.727	18,355	40	1.406	51.5%	0.724	18,712	39
Brevard Total						**56.502**	**66.1%**	**37.336**	**510,728**	**73**	**53.773**	**65.1%**	**35.023**	**512,961**	**68**
416, 431	Clay County Utility Authority	Clay County Utility Authority	Postmaster Village, Keystone Heights, CCUA	Large	Bradford, Clay	12.770	79.5%	10.152	105,611	96	12.513	79.3%	9.923	106,776	93
453	Town of Orange Park	Town of Orange Park		Large	Clay	1.023	47.5%	0.486	8,421	58	1.008	47.5%	0.479	9,042	53
497	Penney Retirement Community Inc	Penney Retirement Community Inc	Penney Retirement Community	Small	Clay	0.050	52.0%	0.026	202	129	0.051	52.0%	0.027	202	134
499	City of Green Cove Springs	City of Green Cove Springs		Large	Clay	1.068	50.8%	0.543	6,908	79	1.118	50.8%	0.568	7,053	81
509	Penney Farms Water Utility Enterprise	Penney Farms Water Utility Enterprise	Town of Penney Farms	Small	Clay	0.042	95.0%	0.040	488	82	0.041	95.0%	0.039	488	80
527	Green Cove Springs LP	Green Cove Springs LP	St Johns Landing	Small	Clay	0.122	100.0%	0.122	1,000	122	0.129	100.0%	0.129	1,000	129
Clay Total						**15.075**	**75.4%**	**11.369**	**122,630**	**93**	**14.860**	**75.1%**	**11.165**	**124,561**	**90**
88271	JEA	JEA		Large	Clay, Duval, St. Johns	107.765	63.7%	68.646	706,879	97	113.109	63.7%	72.050	720,135	100
756	Neighborhood Utilities, Inc.	Neighborhood Utilities, Inc.		Large	Duval	0.095	95.2%	0.090	1,015	89	0.083	95.2%	0.079	1,015	78
784	City of Baldwin	City of Baldwin		Large	Duval	0.349	100.0%	0.349	1,901	184	0.283	100.0%	0.283	1,657	171
793	City of Jacksonville Beach	City of Jacksonville Beach		Large	Duval	2.448	96.7%	2.367	25,518	93	2.503	96.7%	2.420	25,211	96
810	Atlantic Beach Utility	Atlantic Beach Utility	Buccaneer / Atlantic Beach	Large	Duval	2.296	100.0%	2.296	26,172	88	2.423	100.0%	2.423	26,172	93
842	City of Neptune Beach	City of Neptune Beach		Large	Duval	0.803	75.1%	0.603	7,673	79	0.88	75.1%	0.661	7,580	87
50293	Normandy Villages Utilities	Normandy Villages Utilities		Large	Duval	0.332	100.0%	0.332	3,305	100	0.309	100.0%	0.309	3,305	93
Duval Total						**114.088**	**65.5%**	**74.683**	**772,463**	**97**	**119.590**	**65.4%**	**78.225**	**785,075**	**100**
59	City of Flager Beach	City of Flager Beach		Large	Flagler	0.698	74.1%	0.517	4,484	115	0.688	74.1%	0.510	4,504	113
1947	City of Palm Coast	City of Palm Coast	Include Beverly Beach Area	Large	Flagler	8.041	57.2%	4.599	76,831	60	7.922	57.2%	4.531	79,759	57
1960	Plantation Bay Utility Company	Plantation Bay Utility Company		Large	Flagler	0.230	79.4%	0.183	2,996	61	0.245	79.4%	0.195	3,086	63
1979	Holiday Travel Park Co-op Inc	Holiday Travel Park Co-op Inc	Holiday Travel Park	Small	Flagler	0.012	100.0%	0.012	369	33	0.011	100.0%	0.011	369	30
1982	City of Bunnell	City of Bunnell		Large	Flagler	0.314	56.0%	0.176	2,676	66	0.282	56.0%	0.158	2,700	59
2002	Manufactured Home Communities	Manufactured Home Communities	Bulow Village Campground	Large	Flagler	0.142	37.8%	0.054	1,354	40	0.073	37.8%	0.028	1,394	20
51136	Dunes Community Development District	Dunes Community Development District		Large	Flagler	0.700	49.2%	0.344	5,051	68	0.734	49.2%	0.361	5,051	71
Flagler Total						**10.137**	**58.1%**	**5.885**	**93,761**	**63**	**9.955**	**58.2%**	**5.794**	**96,863**	**60**
2377	City of Fellsmere	City of Fellsmere		Large	Indian River	0.341	100.0%	0.341	5,310	64	0.341	100.0%	0.341	5,310	64
10524	Indian River County Utilities	Indian River County Utilities		Large	Indian River	9.572	21.3%	2.039	91,779	22	7.969	21.3%	1.697	92,479	18
10705	City of Vero Beach	City of Vero Beach		Large	Indian River	6.757	57.0%	3.851	37,326	103	6.529	57.0%	3.722	37,563	99
50203	Manufactured Home Communities Inc.	Manufactured Home Communities Inc.	CountrySide MHP	Small	Indian River	0.005	50.0%	0.003	1,027	3	0.005	50.0%	0.003	1,027	3
Indian River Total						**16.675**	**37.4%**	**6.234**	**135,442**	**46**	**14.844**	**38.8%**	**5.763**	**136,379**	**42**
	Timber Village Mobile Home Pk	Timber Village Mobile Home Pk		Small	Lake	0.023	100.0%	0.023	176	131	0.021	100.0%	0.021	176	119
94	City of Leesburg	City of Leesburg		Large	Lake	6.681	55.4%	3.701	24,257	153	6.053	55.4%	3.353	28,937	116
279	Harbor Hills Utilities Ltd.	Harbor Hills Utilities Ltd.		Large	Lake	0.020	54.5%	0.011	1,047	11	0.664	54.5%	0.362	1,091	332
282	Sun Communities Inc	Water Oak Utilities	Water Oak Country Club Estates	Large	Lake	0.304	85.2%	0.259	1,698	153	0.303	85.2%	0.258	1,698	152
288	Lake Joanna Estates Assoc Inc	General Utilities Corporation	Lake Joanna Estates	Small	Lake	0.008	15.3%	0.001	104	10	0.006	15.3%	0.001	104	10
289	Harbor Oaks Homeowners Cooperative, Inc.	General Utilities Corporation	Harbor Oaks	Small	Lake	0.103	88.0%	0.091	376	242	0.073	88.0%	0.064	376	170
290	Midway Manor MHP	Midway Manor MHP	Midway Manor	Small	Lake	0.007	100.0%	0.007	157	45	0.007	100.0%	0.007	157	45
292	Citrus Circle Water Systems Inc	Citrus Circle Water Systems Inc	Citrus Circle Mobile Home Pk	Small	Lake	0.013	100.0%	0.013	66	197	0.006	100.0%	0.006	66	91
2392	Cagan Management Corp	Southlake Utilities Inc.	Southlake Utilities	Large	Lake	1.372	99.0%	1.358	7,204	189	1.373	99.0%	1.359	7,204	189
2416	Oak Springs LLC	Oak Springs Mobile Home Park		Small	Lake	0.060	94.8%	0.057	779	73	0.065	94.8%	0.062	779	80
2447	Beauclaire Homeowners Association	General Utilities Corporation	Lake Beauclair	Small	Lake	0.016	92.0%	0.015	65	231	0.012	92.0%	0.011	65	169
2453	City of Mascotte	City of Mascotte		Large	Lake	0.412	94.6%	0.390	4,364	89	0.367	94.6%	0.347	4,450	78
2454	Community Sunlake Joint Venture	Sunlake Estates		Large	Lake	0.411	82.5%	0.339	713	475	0.341	82.5%	0.281	713	394
2472	Springs Park Area Inc	Springs Park Area Inc		Small	Lake	0.079	87.0%	0.069	321	215	0.048	87.0%	0.042	321	131
2473	Century Estates Utilities Inc	Century Estates Utilities Inc	Century Estates	Small	Lake	0.017	97.4%	0.017	193	88	0.020	97.4%	0.019	193	98
2477	Fisherman's Wharf	Fisherman's Wharf		Small	Lake	0.005	90.0%	0.005	50	100	0.005	90.0%	0.005	50	100
2478	City of Clermont	City of Clermont		Large	Lake	5.780	89.7%	5.185	27,834	186	5.774	89.7%	5.179	28,283	183
2482	City of Fruitland Park	City of Fruitland Park		Large	Lake	0.538	72.0%	0.387	4,379	88	0.638	72.0%	0.459	4,554	101
2483	Country Life LLC	Country Life LLC	Country Life Park / Diamond Point Mobile Home Park	Small	Lake	0.039	75.0%	0.029	378	77	0.036	75.0%	0.027	378	71
2488	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Grand Terrace	Small	Lake	0.020	94.6%	0.019	261	73	0.019	94.6%	0.018	256	70
2513	Molokai Co-op	Molokai Co-op		Small	Lake	0.071	35.7%	0.025	397	63	0.076	35.7%	0.027	397	68
2530	Blue Parrot RV Resort	Blue Parrot RV Resort		Small	Lake	0.037	95.2%	0.035	262	134	0.040	95.2%	0.038	262	145
2531	Thousand Trails Inc	Thousand Trails		Large	Lake	0.149	65.0%	0.097	1,590	61	0.147	65.0%	0.096	1,590	60
2535	Lake Yale Treatment Assoc Inc	Lake Yale Treatment Assoc Inc	Lake Yale Estates/Sandpiper Mobile Home Manor	Small	Lake	0.040	94.0%	0.038	136	279	0.036	94.0%	0.034	140	243
2565	Chateau Communities Inc	Hometown America	Orange Lake MHP	Small	Lake	0.042	88.0%	0.037	578	64	0.022	88.0%	0.019	595	32
2575	Brendenwood Water Systems	Brendenwood Water System		Small	Lake	0.027	90.9%	0.025	136	184	0.024	90.9%	0.022	140	157
2596	Town of Howey-in-the-Hills	Town of Howey-in-the-Hills		Large	Lake	0.211	75.0%	0.158	1,225	129	0.229	75.0%	0.172	1,329	129
2598	Haines Creek RV Village	Haines Creek RV Village		Small	Lake	0.003	100.0%	0.003	166	18	0.008	100.0%	0.008	166	48
2604	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Piney Woods / Spring Lake	Small	Lake	0.040	100.0%	0.040	423	95	0.037	100.0%	0.037	436	85
2605	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Carlton Village	Large	Lake	0.051	89.0%	0.045	564	80	0.046	89.0%	0.041	581	71
2606	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Stone Mountain	Small	Lake	0.002	100.0%	0.002	27	74	0.002	100.0%	0.002	27	74
2607	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	East Lake Harris	Small	Lake	0.015	100.0%	0.015	416	36	0.013	100.0%	0.013	428	30
2608	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Venetian Village	Small	Lake	0.027	100.0%	0.027	400	68	0.024	100.0%	0.024	411	58
2609	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Picciola Island	Small	Lake	0.035	100.0%	0.035	355	99	0.029	100.0%	0.029	365	79
2610	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Morning View	Small	Lake	0.007	77.3%	0.005	82	61	0.007	77.3%	0.005	85	59
2611	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Fern Terrace	Small	Lake	0.027	100.0%	0.027	294	92	0.023	100.0%	0.023	303	76
2612	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Palms Mobile Home Park	Small	Lake	0.009	100.0%	0.009	102	88	0.010	100.0%	0.010	102	98
2613	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Hobby Hills	Small	Lake	0.013	100.0%	0.013	181	72	0.013	100.0%	0.013	181	72
2614	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Skycrest	Small	Lake	0.021	100.0%	0.021	216	97	0.025	100.0%	0.025	216	116
2621	Astatula Estates	General Utilities Corporation	Meadows of Astatula	Small	Lake	0.059	90.0%	0.053	175	303	0.059	90.0%	0.053	177	299
2622	Brittany Estates Residents Owners Assoc Inc	General Utilities Corporation	Brittany Estates	Small	Lake	0.045	88.0%	0.040	194	206	0.053	88.0%	0.047	194	242

Table B-6b, Continued. 2010-2014 Residential Water Use and Five-Year Residential Per Capita Averages for All Public Supply Permittees in the St. Johns River Water Management District.

CUP Number	Owner	Utility	Alternate Name	Utility Category	County	2012 Water Use	2012 % Household	2012 Household Use	2012 Population	2012 Residential GPCD	2013 Water Use	2013 % Household	2013 Household Use	2013 Population	2013 Residential GPCD	2014 Water Use	2014 % Household	2014 Household Use	2014 Population	2014 Residential GPCD	2010-2014 Average Residential GPCD
1674	City of Hawthorne	City of Hawthorne		Large	Alachua	0.254	83.9%	0.213	1,508	141	0.159	83.9%	0.133	1,508	88	0.158	83.9%	0.133	1,508	88	103
11339	Gainesville Regional Utilities	Gainesville Regional Utilities	GRU	Large	Alachua	22.070	58.1%	12.823	189,715	68	21.166	58.1%	12.297	183,368	67	20.130	58.1%	11.696	181,468	64	68
11343	Kincaid Hills Water Company	Kincaid Hills Water Company	Kincaid Hills	Large	Alachua	0.081	100.0%	0.081	606	134	0.079	100.0%	0.079	606	130	0.075	100.0%	0.075	606	124	153
11356	Town of Micanopy	Town of Micanopy		Large	Alachua	0.067	99.1%	0.066	863	76	0.065	99.1%	0.064	824	78	0.060	99.1%	0.059	824	72	75
11364	Arredondo Utility Co / Aqua Source Utilities	Arredondo Utility Co / Aqua Source Utilities	Arredondo Farms	Large	Alachua	0.079	100.0%	0.079	874	90	0.084	100.0%	0.084	571	147	0.079	100.0%	0.079	571	138	110
Alachua Total						**22.551**	**58.8%**	**13.262**	**193,566**	**69**	**21.553**	**58.7%**	**12.657**	**186,877**	**68**	**20.502**	**58.7%**	**12.042**	**184,977**	**65**	**69**
15	City of Macclenny	City of Macclenny		Large	Baker	1.052	77.0%	0.810	6,600	123	0.864	77.0%	0.665	6,600	101	0.846	77.0%	0.651	6,391	102	117
24	Town of Glen St Mary	Town of Glen St Mary		Large	Baker	0.031	94.1%	0.029	392	74	0.032	94.1%	0.030	428	70	0.031	94.1%	0.029	428	68	66
Baker Total						**1.083**	**77.5%**	**0.839**	**6,992**	**120**	**0.896**	**77.6%**	**0.695**	**7,028**	**99**	**0.877**	**77.5%**	**0.680**	**6,819**	**100**	**114**
202	Palm Bay Utilities	Palm Bay Utilities	Palm Bay / Town of Malabar	Large	Brevard	6.418	65.0%	4.172	102,698	41	6.606	65.0%	4.294	110,638	39	6.542	65.0%	4.252	112,025	38	40
233	Brevard County Utility Services	Brevard County Utility Services	North Brevard	Large	Brevard	0.784	100.0%	0.784	8,988	87	0.729	100.0%	0.729	7,867	93	0.750	100.0%	0.750	7,893	95	99
236	Brevard County Utility Services	Brevard County Utility Services	Former Barefoot Bay Water and Sewer District - Barefoot and Crystal Bay. Snug Harbor	Large	Brevard	0.450	100.0%	0.450	12,188	37	0.450	100.0%	0.450	12,188	37	0.452	100.0%	0.452	12,188	37	37
1606	South Brevard Water CO-OP Inc	South Brevard County Utilities		Large	Brevard	0.110	100.0%	0.110	1,023	108	0.103	100.0%	0.103	1,023	101	0.126	100.0%	0.126	1,023	123	106
1719	Service Management Systems Inc	Service Management Systems Inc	Aquarina	Small	Brevard	0.586	15.4%	0.090	699	129	0.417	15.4%	0.064	699	92	0.363	15.4%	0.056	699	80	79
1738	Riverview Florida Associates, LLC	Riverview Florida Associates, LLC	Pelican Bay	Small	Brevard	0.024	40.4%	0.010	250	40	0.024	40.4%	0.010	250	40	0.018	40.4%	0.007	250	28	48
1742	San Sebastian Water LLC	San Sebastian Water LLC	San Sebastian Woods	Small	Brevard	0.016	100.0%	0.016	107	150	0.019	100.0%	0.019	107	178	0.026	100.0%	0.026	115	226	206
1749	South Shores Utility Assoc	South Shores Utility Assoc	South Shores	Large	Brevard	0.049	78.2%	0.038	699	54	0.036	78.2%	0.028	699	40	0.039	78.2%	0.030	699	43	45
1783	Northgate Properties Inc.	Northgate Properties Inc.	Northgate Mobile Ranch	Small	Brevard	0.019	78.9%	0.015	816	18	0.030	78.9%	0.024	816	29	0.019	78.9%	0.015	812	18	21
1804	Bonnie Douglas - River Grove Mobile Home Village I & II	Bonnie Douglas - River Grove Mobile Home Village I & II	River Grove Mobile Home Village I & II	Small	Brevard	0.028	88.0%	0.025	403	62	0.043	88.0%	0.038	403	94	0.041	88.0%	0.036	401	90	92
1808	Summit Cove Condo Assoc	Summit Cove Condo Assoc	Summit Cove Condo	Small	Brevard	0.007	55.2%	0.004	196	20	0.007	55.2%	0.004	196	20	0.008	55.2%	0.004	196	20	36
1831	Lighthouse Cove Condominimium Association	Lighthouse Cove Condominimium Association	Lighthouse Cove	Small	Brevard	0.006	41.9%	0.003	193	16	0.007	41.9%	0.003	193	16	0.008	41.9%	0.003	193	16	16
10647, 99052	City of Titusville	City of Titusville		Large	Brevard	3.376	62.6%	2.113	49,869	42	3.056	62.6%	1.913	49,869	38	3.046	62.6%	1.907	49,938	38	41
50245	City of Cocoa	City of Cocoa	Also Serves Kennedy Space Center and City of Rockledge (CUP 107643), USAF (CUPs 1733 and 86898 (PWSID for Pump Station 3054140)).	Large	Brevard	23.028	75.2%	17.317	168,419	103	25.112	75.2%	18.884	171,397	110	21.699	75.2%	16.318	171,397	95	107
50301	City of Melbourne	City of Melbourne		Large	Brevard	19.532	51.5%	10.059	152,401	66	16.888	51.5%	8.697	154,072	56	16.420	51.5%	8.456	159,617	53	59
89992	City of West Melbourne	City of West Melbourne	Wholesale Importer of City of Melbourne	Large	Brevard	1.407	51.5%	0.725	19,118	38	1.621	51.5%	0.835	18,712	45	1.483	51.5%	0.764	18,712	41	40
Brevard Total						**55.840**	**64.3%**	**35.931**	**518,067**	**69**	**55.148**	**65.5%**	**36.095**	**529,129**	**68**	**51.040**	**65.1%**	**33.202**	**536,158**	**62**	**68**
416	Clay County Utility Authority	Clay County Utility Authority	Postmaster Village, Keystone Heights, CCUA	Large	Clay	11.240	78.7%	8.846	108,140	82	10.527	78.7%	8.285	110,016	75	10.640	78.7%	8.374	114,237	73	84
453	Town of Orange Park	Town of Orange Park		Large	Clay	0.934	47.5%	0.444	9,042	49	0.859	47.5%	0.408	9,042	45	0.863	47.5%	0.410	9,042	45	50
497	Penney Retirement Community Inc	Penney Retirement Community Inc	Penney Retirement Community	Small	Clay	0.052	52.0%	0.027	202	134	0.044	52.0%	0.023	202	114	0.043	52.0%	0.022	202	109	124
499	City of Green Cove Springs	City of Green Cove Springs		Large	Clay	1.005	50.8%	0.511	6,500	79	0.944	50.8%	0.480	6,500	74	0.829	50.8%	0.421	6,500	65	75
509	Penney Farms Water Utility Enterprise	Penney Farms Water Utility Enterprise	Town of Penney Farms	Small	Clay	0.037	95.0%	0.035	488	72	0.032	95.0%	0.030	495	61	0.031	95.0%	0.029	495	59	70
527	Green Cove Springs LP	Green Cove Springs LP	St Johns Landing	Small	Clay	0.132	100.0%	0.132	1,087	121	0.107	100.0%	0.107	1,084	99	0.082	100.0%	0.082	1,000	82	111
Clay Total						**13.400**	**74.6%**	**9.995**	**125,459**	**80**	**12.513**	**74.6%**	**9.333**	**127,339**	**73**	**12.488**	**74.8%**	**9.338**	**131,476**	**71**	**81**
88271	JEA	JEA		Large	Clay, Duval, St. Johns	101.503	63.7%	64.657	712,476	91	97.239	63.7%	61.941	720,154	86	100.551	63.7%	64.051	704,525	91	93
756	Neighborhood Utilities, Inc.	Neighborhood Utilities, Inc.		Large	Duval	0.098	95.2%	0.093	1,015	92	0.080	95.2%	0.076	1,015	75	0.075	95.2%	0.071	1,015	70	81
784	City of Baldwin	City of Baldwin		Large	Duval	0.252	100.0%	0.252	1,657	152	0.249	100.0%	0.249	1,657	150	0.242	100.0%	0.242	1,601	151	162
793	City of Jacksonville Beach	City of Jacksonville Beach		Large	Duval	2.420	96.7%	2.340	25,211	93	2.352	96.7%	2.274	25,211	90	2.367	96.7%	2.289	23,279	98	94
810	Atlantic Beach Utility	Atlantic Beach Utility	Buccaneer / Atlantic Beach	Large	Duval	2.165	100.0%	2.165	26,172	83	1.987	100.0%	1.987	26,172	76	2.101	100.0%	2.101	26,172	80	84
842	City of Neptune Beach	City of Neptune Beach		Large	Duval	0.847	75.1%	0.636	7,580	84	0.769	75.1%	0.578	7,580	76	0.958	75.1%	0.719	7,270	99	85
50293	Normandy Villages Utilities	Normandy Villages Utilities		Large	Duval	0.297	100.0%	0.297	3,265	91	0.283	100.0%	0.283	3,265	87	0.275	100.0%	0.275	3,265	84	91
Duval Total						**107.582**	**65.5%**	**70.440**	**777,376**	**91**	**102.959**	**65.5%**	**67.388**	**785,054**	**86**	**106.569**	**65.4%**	**69.748**	**767,127**	**91**	**93**
59	City of Flager Beach	City of Flager Beach		Large	Flagler	0.646	74.1%	0.479	4,482	107	0.667	74.1%	0.494	4,510	110	0.819	74.1%	0.607	4,630	131	115
1947	City of Palm Coast	City of Palm Coast	Include Beverly Beach Area	Large	Flagler	7.514	57.2%	4.298	79,905	54	7.404	57.2%	4.235	79,905	53	6.578	57.2%	3.763	49,905	75	58
1960	Plantation Bay Utility Company	Plantation Bay Utility Company		Large	Flagler	0.214	79.4%	0.170	3,000	57	0.138	79.4%	0.110	3,000	37	0.175	79.4%	0.139	3,000	46	53
1979	Holiday Travel Park Co-op Inc	Holiday Travel Park Co-op Inc	Holiday Travel Park	Small	Flagler	0.005	100.0%	0.005	369	14	0.010	100.0%	0.010	380	26	0.010	100.0%	0.010	380	26	26
1982	City of Bunnell	City of Bunnell		Large	Flagler	0.221	56.0%	0.124	2,685	46	0.250	56.0%	0.140	2,362	59	0.353	56.0%	0.198	2,648	75	61
2002	Manufactured Home Communities	Manufactured Home Communities	Bulow Village Campground	Large	Flagler	0.081	37.8%	0.031	1,394	22	0.053	37.8%	0.020	1,394	14	0.055	37.8%	0.021	1,284	16	23
51136	Dunes Community Development District	Dunes Community Development District		Large	Flagler	0.709	49.2%	0.349	4,100	85	0.657	49.2%	0.323	4,100	79	0.673	49.2%	0.331	4,017	82	77
Flagler Total						**9.390**	**58.1%**	**5.456**	**95,935**	**57**	**9.179**	**58.1%**	**5.332**	**95,651**	**56**	**8.663**	**58.5%**	**5.069**	**65,864**	**77**	**61**
2377	City of Fellsmere	City of Fellsmere		Large	Indian River	0.309	100.0%	0.309	4,465	69	0.252	100.0%	0.252	4,465	56	0.290	100.0%	0.290	4,465	65	64
10524	Indian River County Utilities	Indian River County Utilities		Large	Indian River	9.310	21.3%	1.983	99,853	20	9.306	21.3%	1.982	92,479	21	9.819	21.3%	2.091	94,356	22	21
10705	City of Vero Beach	City of Vero Beach		Large	Indian River	6.257	57.0%	3.566	37,653	95	6.256	57.0%	3.566	37,308	96	5.658	57.0%	3.225	37,308	86	96
50203	Manufactured Home Communities Inc.	Manufactured Home Communities Inc.	CountrySide MHP	Small	Indian River	0.005	50.0%	0.003	1,027	3	0.005	50.0%	0.003	1,027	3	0.016	50.0%	0.008	1,027	8	4
Indian River Total						**15.881**	**36.9%**	**5.861**	**142,998**	**41**	**15.819**	**36.7%**	**5.803**	**135,279**	**43**	**15.783**	**35.6%**	**5.614**	**137,156**	**41**	**43**
	Timber Village Mobile Home Pk	Timber Village Mobile Home Pk		Small	Lake	0.020	100.0%	0.020	176	114	0.015	100.0%	0.015	176	85	0.018	100.0%	0.018	176	102	110
94	City of Leesburg	City of Leesburg		Large	Lake	5.505	55.4%	3.050	30,473	100	5.896	55.4%	3.266	33,885	96	5.946	55.4%	3.294	34,159	96	110
279	Harbor Hills Utilities Ltd.	Harbor Hills Utilities Ltd.		Large	Lake	0.692	54.5%	0.377	1,135	332	0.613	54.5%	0.334	1,219	274	0.587	54.5%	0.320	1,219	263	246
282	Sun Communities Inc	Water Oak Utilities	Water Oak Country Club Estates	Large	Lake	0.328	85.2%	0.279	1,539	181	0.286	85.2%	0.244	1,539	159	0.253	85.2%	0.216	1,539	140	157
288	Lake Joanna Estates Assoc Inc	General Utilities Corporation	Lake Joanna Estates	Small	Lake	0.003	15.3%	0.000	104	0	0.006	15.3%	0.001	111	9	0.006	15.3%	0.001	104	10	8
289	Harbor Oaks Homeowners Cooperative, Inc.	General Utilities Corporation	Harbor Oaks	Small	Lake	0.038	88.0%	0.033	376	88	0.078	88.0%	0.069	421	164	0.065	88.0%	0.057	376	152	163
290	Midway Manor MHP	Midway Manor MHP	Midway Manor	Small	Lake	0.008	100.0%	0.008	157	51	0.008	100.0%	0.008	157	51	0.007	100.0%	0.007	157	45	47
292	Citrus Circle Water Systems Inc	Citrus Circle Water Systems Inc	Citrus Circle Mobile Home Pk	Small	Lake	0.004	100.0%	0.004	66	61	0.006	100.0%	0.006	66	91	0.006	100.0%	0.006	66	91	106
2392	Cagan Management Corp	Southlake Utilities Inc.	Southlake Utilities	Large	Lake	1.760	99.0%	1.742	7,204	242	1.397	99.0%	1.383	7,204	192	1.450	99.0%	1.436	7,204	199	202
2416	Oak Springs LLC	Oak Springs Mobile Home Park		Small	Lake	0.062	94.8%	0.059	779	76	0.049	94.8%	0.046	779	59	0.048	94.8%	0.046	779	59	69
2447	Beauclaire Homeowners Association	General Utilities Corporation	Lake Beauclair	Small	Lake	0.013	92.0%	0.012	65	185	0.012	92.0%	0.011	65	169	0.012	92.0%	0.011	65	169	185
2453	City of Mascotte	City of Mascotte		Large	Lake	0.347	94.6%	0.328	4,450	74	0.350	94.6%	0.331	4,450	74	0.361	94.6%	0.342	4,844	71	77
2454	Community Sunlake Joint Venture	Sunlake Estates		Large	Lake	0.342	82.5%	0.282	713	396	0.328	82.5%	0.271	637	425	0.251	82.5%	0.207	637	325	404
2472	Springs Park Area Inc	Springs Park Area Inc		Small	Lake	0.043	87.0%	0.037	321	115	0.039	87.0%	0.034	321	106	0.039	87.0%	0.034	321	106	135
2473	Century Estates Utilities Inc	Century Estates Utilities Inc	Century Estates	Small	Lake	0.022	97.4%	0.021	193	109	0.020	97.4%	0.019	193	98	0.019	97.4%	0.019	193	98	98
2477	Fisherman's Wharf	Fisherman's Wharf		Small	Lake	0.002	90.0%	0.002	50	40	0.004	90.0%	0.004	50	80	0.003	90.0%	0.003	50	60	76
2478	City of Clermont	City of Clermont		Large	Lake	5.833	89.7%	5.232	28,731	182	5.555	89.7%	4.983	30,201	165	5.263	89.7%	4.721	30,201	156	174
2482	City of Fruitland Park	City of Fruitland Park		Large	Lake	0.641	72.0%	0.462	4,596	101	0.649	72.0%	0.467	5,127	91	0.568	72.0%	0.409	5,127	80	92
2483	Country Life LLC	Country Life LLC	Country Life Park / Diamond Point Mobile Home Park	Small	Lake	0.049	75.0%	0.037	378	98	0.040	75.0%	0.030	242	124	0.051	75.0%	0.038	378	101	92
2488	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Grand Terrace	Small	Lake	0.017	94.6%	0.016	256	63	0.015	94.6%	0.014	256	55	0.016	94.6%	0.015	256	59	64
2513	Molokai Co-op	Molokai Co-op		Small	Lake	0.034	35.7%	0.012	397	30	0.022	35.7%	0.008	397	20	0.019	35.7%	0.007	397	18	40
2530	Blue Parrot RV Resort	Blue Parrot RV Resort		Small	Lake	0.020	95.2%	0.019	262	73	0.030	95.2%	0.029	262	111	0.024	95.2%	0.023	262	88	110
2531	Thousand Trails Inc	Thousand Trails		Large	Lake	0.134	65.0%	0.087	1,590	55	0.153	65.0%	0.099	1,590	62	0.194	65.0%	0.126	1,590	79	64
2535	Lake Yale Treatment Assoc Inc	Lake Yale Treatment Assoc Inc	Lake Yale Estates/Sandpiper Mobile Home Manor	Small	Lake	0.006	94.0%	0.006	140	43	0.006	94.0%	0.006	140	43	0.006	94.0%	0.006	136	44	130
2565	Chateau Communities Inc	Hometown America	Orange Lake MHP	Small	Lake	0.033	88.0%	0.029	595	49	0.042	88.0%	0.037	595	62	0.046	88.0%	0.040	610	66	54
2575	Brendenwood Water Systems	Brendenwood Water System		Small	Lake	0.024	90.9%	0.022	140	157	0.022	90.9%	0.020	140	143	0.023	90.9%	0.021	130	162	160
2596	Town of Howey-in-the-Hills	Town of Howey-in-the-Hills		Large	Lake	0.225	75.0%	0.169	1,329	127	0.199	75.0%	0.149	1,329	112	0.200	75.0%	0.150	1,150	130	125
2598	Haines Creek RV Village	Haines Creek RV Village		Small	Lake	0.006	100.0%	0.006	166	36	0.003	100.0%	0.003	166	18	0.002	100.0%	0.002	166	12	27
2604	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Piney Woods / Spring Lake	Small	Lake	0.032	100.0%	0.032	436	73	0.031	100.0%	0.031	436	71	0.030	100.0%	0.030	436	69	78
2605	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Carlton Village	Large	Lake	0.042	89.0%	0.037	577	64	0.036	89.0%	0.032	577	55	0.044	89.0%	0.039	577	68	67
2606	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Stone Mountain	Small	Lake	0.002	100.0%	0.002	27	74	0.002	100.0%	0.002	27	74	0.030	100.0%	0.030	436	69	70
2607	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	East Lake Harris	Small	Lake	0.014	100.0%	0.014	428	33	0.016	100.0%	0.016	428	37	0.002	100.0%	0.002	27	74	35
2608	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Venetian Village	Small	Lake	0.023	100.0%	0.023	411	56	0.021	100.0%	0.021	411	51	0.015	100.0%	0.015	428	35	53
2609	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Picciola Island	Small	Lake	0.025	100.0%	0.025	373	67	0.027	100.0%	0.027	373	72	0.022	100.0%	0.022	440	50	72
2610	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Morning View	Small	Lake	0.007	77.3%	0.005	85	59	0.007	77.3%	0.005	85	59	0.023	77.3%	0.018	274	66	62
2611	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Fern Terrace	Small	Lake	0.022	100.0%	0.022	303	73	0.024	100.0%	0.024	303	79	0.007	100.0%	0.007	85	82	80
2612	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Palms Mobile Home Park	Small	Lake	0.006	100.0%	0.006	102	59	0.006	100.0%	0.006	102	59	0.018	100.0%	0.018	286	63	71
2613	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Hobby Hills	Small	Lake	0.013	100.0%	0.013	181	72	0.014	100.0%	0.014	256	55	0.006	100.0%	0.006	102	59	65
2614	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Skycrest	Small	Lake	0.016	100.0%	0.016	216	74	0.018	100.0%	0.018	216	83	0.014	100.0%	0.014	198	71	89
2621	Astatula Estates	General Utilities Corporation	Meadows of Astatula	Small	Lake	0.033	90.0%	0.030	128	234	0.043	90.0%	0.039	128	305	0.015	90.0%	0.014	216	65	229
2622	Brittany Estates Residents Owners Assoc Inc	General Utilities Corporation	Brittany Estates	Small	Lake	0.027	88.0%	0.024	194	124	0.054	88.0%	0.048	194	247	0.046	88.0%	0.040	122	328	222

Table B-6b, Continued. 2010-2014 Residential Water Use and Five-Year Residential Per Capita Averages for All Public Supply Permittees in the St. Johns River Water Management District.

CUP Number	Owner	Utility	Alternate Name	Utility Category	County	2010 Water Use	2010 % Household	2010 Household Use	2010 Population	2010 Residential GPCD	2011 Water Use	2011 % Household	2011 Household Use	2011 Population	2011 Residential GPCD
2628	Lakeside Village LTD	General Utilities Corporation	Lakeside Village Ltd	Small	Lake	0.040	87.0%	0.035	141	248	0.037	87.0%	0.032	141	227
2632	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Lake Utilities / Valencia Terrace	Large	Lake	0.047	100.0%	0.047	332	142	0.048	100.0%	0.048	332	145
2634, 84879, 85195	City of Eustis	City of Eustis	CUPs 81906 and 83231 are separate permits for GC.	Large	Lake	3.410	79.4%	2.708	22,011	123	3.440	79.4%	2.731	22,486	121
2644	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Silver Lakes / Western Shores	Large	Lake	0.521	88.0%	0.458	3,776	121	0.502	88.0%	0.442	3,776	117
2646	City of Umatilla	City of Umatilla		Large	Lake	0.492	100.0%	0.492	3,469	142	0.365	100.0%	0.365	3,572	102
2659	Hometown America	Hometown America	Haselton Village MHP	Small	Lake	0.039	98.0%	0.038	190	200	0.040	98.0%	0.039	190	205
2662	Mission Golf & Tennis Resort	Mission Golf & Tennis Resort	Las Colinas	Large	Lake	0.457	34.1%	0.156	461	338	0.734	34.1%	0.250	461	542
2671	Town of Monteverde	Town of Monteverde		Large	Lake	0.197	56.3%	0.111	1,463	76	0.189	56.3%	0.106	1,463	72
2700	Lake Utility Services Inc.	Lake Utility Services Inc.		Large	Lake	5.219	58.2%	3.037	20,802	146	5.167	58.2%	3.007	21,129	142
2701	Aqua Source Inc.	Aqua Source Inc.	Kings Cove	Large	Lake	0.055	93.0%	0.051	464	110	0.052	93.0%	0.048	470	102
2717	Utilities Inc. of Pennbrooke	Pennbrooke Utilities	Pennbrooke	Large	Lake	0.448	82.2%	0.368	2,357	156	0.531	82.2%	0.436	2,357	185
2718	Plantation at Leesburg	Plantation at Leesburg		Large	Lake	1.299	70.2%	0.912	5,061	180	1.379	70.2%	0.968	5,061	191
2765	City of Tavares	City of Tavares	Per Bill Adams CUP # 2741 is being retired and will be served by Tavares.	Large	Lake	2.519	70.0%	1.763	17,286	102	2.600	70.0%	1.820	17,398	105
2775	Ridgecrest Management Co. LLC	General Utilities Corporation	Ridgecrest Village	Small	Lake	0.044	87.0%	0.038	253	150	0.045	87.0%	0.039	253	154
2778	Waterwood Community Assoc. Inc.	General Utilities Corporation	Waterwood	Small	Lake	0.066	71.0%	0.047	277	170	0.080	71.0%	0.057	286	199
2782	Raintree Utilities Inc.	Raintree Utilities Inc.	Raintree Harbor	Small	Lake	0.045	82.2%	0.037	275	135	0.052	82.2%	0.043	275	156
2796, 2913	City of Groveland	City of Groveland	Garden City, Groveland, Tradewinds, Green Valley, Palisades Country Club, Cherry Lake Road, Christopher Ford Commerce Park, Sunshine Parkway, South Lake High School, Turnpike Hyponex, Sampey Pomello	Large	Lake	1.058	75.4%	0.798	11,506	69	1.450	75.4%	1.093	12,454	88
2810	Lake Griffin Isles	Lake Griffin Isles		Large	Lake	0.085	95.5%	0.081	237	342	0.077	95.5%	0.074	237	312
2840	Woodlands Church Lake LLC	Woodlands Church Lake LLC	Woodland Heritage MHP	Large	Lake	0.115	87.2%	0.100	336	298	0.148	87.2%	0.129	346	373
2847	Vacation Village Condominium Association	Vacation Village Condominium Association	Vacation Village	Small	Lake	0.028	75.0%	0.021	479	44	0.024	75.0%	0.018	494	36
2858	Pine Island Fish Camp	Pine Island Fish Camp		Small	Lake	0.001	100.0%	0.001	20	50	0.001	100.0%	0.001	25	40
2860	Hawthorne Residents Coop Assoc	Hawthorne at Leesburg		Large	Lake	0.447	66.3%	0.296	1,787	166	0.444	66.3%	0.294	1,787	165
2862	Lady Lake Mobile Home Park Inc	Lady Lake Mobile Home Park Inc	Lady Lake Mobile Home Park	Small	Lake	0.038	86.3%	0.033	253	130	0.044	86.3%	0.038	253	150
2863	Bonfire Cooperative Assoc Inc	Bonfire Cooperative Assoc Inc	Bonfire COOP Mobile Home Park	Small	Lake	0.031	65.6%	0.020	400	50	0.025	65.6%	0.016	400	40
2865	Community of Christ	Community of Christ	Deerhaven Camp	Small	Lake	0.009	100.0%	0.009	35	257	0.009	100.0%	0.009	25	360
2867	T & T Inc dba Country Squire Mobile Home Village	T & T Inc dba Country Squire Mobile Home Village	Country Squire Mobile Home Park	Small	Lake	0.020	86.0%	0.017	289	59	0.018	86.0%	0.015	298	50
2886	City of Minneola	City of Minneola		Large	Lake	1.477	74.0%	1.093	11,161	98	1.552	74.0%	1.148	11,161	103
2888	Mid Florida Lakes	Mid Florida Lakes	Mid Florida Lakes MHP	Large	Lake	0.460	83.5%	0.384	1,709	225	0.347	83.5%	0.290	1,709	170
2890	Monteverde Mobile Home Subd Assn Inc	Monteverde Mobile Home Subd Assn Inc	Monteverde Mobile Home Subdivision	Small	Lake	0.032	100.0%	0.032	658	49	0.031	100.0%	0.031	678	46
2891	Corley Island Mobile Manor	Corley Island Mobile Manor		Small	Lake	0.025	98.4%	0.025	200	125	0.028	98.4%	0.028	200	140
2893	Torch Lite MHP LLC	Torch Lite MHP LLC	Torchlite MHP	Small	Lake	0.009	94.2%	0.008	74	108	0.011	94.2%	0.010	74	135
2900	Ginn-LA Pine Island LTD LLLP	Ginn-LA Pine Island LTD LLLP	Hillcrest PUD	Large	Lake	0.264	23.9%	0.063	16	3,938	0.086	23.9%	0.021	17	1,235
2901	Pine Harbour Water Utilities	Pine Harbour Water Utilities		Small	Lake	0.014	89.9%	0.013	132	98	0.015	89.9%	0.013	123	106
2973	Lakes of Lady Lake Homeowners Association, Inc.	Lakes of Lady Lake Homeowners Assocation, Inc.	The Lakes of Lady Lake	Small	Lake	0.038	66.0%	0.025	101	248	0.021	66.0%	0.014	100	140
2989	Citrus Cove Homeowners Association Water System	Citrus Cove Homeowners Association Water System	Citrus Cove	Small	Lake	0.021	90.0%	0.019	98	194	0.021	90.0%	0.019	94	202
4487	Edgewater Beach Homeowners Assoc	Edgewater Beach		Small	Lake	0.006	90.2%	0.005	32	156	0.005	90.2%	0.005	32	156
4493	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Imperial Terrace	Small	Lake	0.015	100.0%	0.015	490	31	0.015	100.0%	0.015	490	31
4512	Cypress Creek Mobile Home Park	Cypress Creek Mobile Home Park	Cypress Creek	Small	Lake	0.029	100.0%	0.029	251	116	0.027	100.0%	0.027	251	108
4545	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Quail Ridge	Small	Lake	0.013	100.0%	0.013	181	72	0.014	100.0%	0.014	186	75
4555	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Tavares Ridge	Small	Lake	0.031	100.0%	0.031	561	55	0.027	100.0%	0.027	532	51
4565	Tara Village	Tara Village		Small	Lake	0.029	91.1%	0.026	266	98	0.035	91.1%	0.032	273	117
5753	WBB Utilities Inc	WBB Utilities Inc	Lake Idlewild	Small	Lake	0.060	95.5%	0.057	164	348	0.056	95.5%	0.053	164	323
6398	Clerbrook Golf and RV Resort	Clerbrook Golf and RV Resort		Large	Lake	0.103	50.0%	0.052	2,364	22	0.099	50.0%	0.050	2,364	21
6781	Shangri-La by the Lake Utilities Inc	Shangri-La by the Lake Utilities Inc	Shangri-La by the Lake	Small	Lake	0.030	90.6%	0.027	395	68	0.028	90.6%	0.025	407	61
10846	Presco Associates LLC	Barrington Estates	Barrington Estates	Large	Lake	0.000	86.1%	0.000	0	0	0.000	86.1%	0.000	0	0
50049	Town of Lady Lake	Town of Lady Lake		Large	Lake	0.626	100.0%	0.626	4,779	131	0.690	100.0%	0.690	4,847	142
50094	Lake Utility Services, Inc.	Lake Saunders Utilities	Lake Saunders Acres	Small	Lake	0.010	100.0%	0.010	108	93	0.008	100.0%	0.008	109	73
50115	Ginn-LA Pine Island II LLLP	Ginn-LA Pine Island II LLLP	Pine Island PUD	Large	Lake	0.100	28.3%	0.028	138	203	0.085	28.3%	0.024	138	174
50147	City of Mount Dora	City of Mount Dora		Large	Lake	2.916	78.0%	2.274	21,916	104	3.008	78.0%	2.346	22,817	103
50152	Wedgewood Homeowners Assoc. Inc.	Wedgewood Homeowners Assoc. Inc.	Wedgewood Club	Large	Lake	0.131	87.0%	0.114	721	158	0.139	87.0%	0.121	721	168
50178	St. Johns River Utility Inc.	Astor-Astor Park Water Association	Southlake Utilities	Large	Lake	0.448	100.0%	0.448	3,807	118	0.265	100.0%	0.265	3,920	68
50218	Highlands MHP and Sales Inc	Highlands MHP and Sales Inc	Highlands MHP	Small	Lake	0.017	100.0%	0.017	130	131	0.018	100.0%	0.018	103	175
50254	Treasure Island Estates Inc	Treasure Island Estates Inc	Treasure Cove Homeowners Association	Small	Lake	0.011	94.9%	0.010	89	112	0.010	94.9%	0.009	89	101
50279	Village Center Community Development District	Village Center Community Development District	Villages of Lady Lake. (Villages of Marion / Little Sumter Service Area. The permit 63454 that Steve Brown has listed is actually an ERP, not CUP. This area is served by wells located in Sumter County in the SWFWMD.)	Large	Lake	3.966	72.0%	2.856	11,032	259	4.796	72.0%	3.453	11,032	313
50307	Lake-Ulmerton Corporation	Lake-Ulmerton Corporation	Bee's RV Resort	Small	Lake	0.022	80.6%	0.018	414	43	0.021	80.6%	0.017	414	41
50334	Park at Wolf Branch Oaks	Park at Wolf Branch Oaks		Large	Lake	0.096	73.9%	0.071	263	270	0.123	73.9%	0.091	281	324
50780	Cove Water System Incorporated	General Utilities Corporation	Cove Water System	Small	Lake	0.011	95.4%	0.010	134	75	0.008	95.4%	0.008	134	60
62724	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Fairways at Mt. Plymouth	Large	Lake	0.136	89.6%	0.122	566	216	0.121	89.6%	0.108	583	185
98980	Raintree Utilities Inc.	Raintree Utilities Inc.	Bentwood Subdivision	Small	Lake	0.001	90.0%	0.001	4	250	0.004	90.0%	0.004	4	1,000
103822	Colina Bay Water Company	Colina Bay Water Company	Colina Bay	Large	Lake	0.000	79.0%	0.000	0	N/A	0.001	79.0%	0.001	0	0
107839	Leesburg Associates Limited Partnership	Leesburg Associates Limited Partnership	Holiday Travel Resort	Large	Lake	0.104	83.4%	0.087	1,004	87	0.115	83.4%	0.096	1,004	96
110807	Lake County Acreage LLC	Wolf Branch Meadows		Small	Lake	0.006	97.1%	0.006	9	667	0.007	97.1%	0.007	9	778
114536	Lake County	Lake County	South Umatilla Water System	Small	Lake	0.041	84.0%	0.034	400	85	0.052	84.0%	0.044	400	110
120333	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Ravenswood CUP	Small	Lake	0.009	94.0%	0.008	90	89	0.007	94.0%	0.007	90	78
128295	Black Bear Reserve Water Corporation	Black Bear Reserve	Formerly Upson Downs. PS CUP 2959 was changed to a LRA permit only and a new permit for PS portion was issued 7/6/2011.	Large	Lake	0.056	100.0%	0.056	592	95	0.057	100.0%	0.057	592	96
	Lake Total					**44.932**	**73.7%**	**33.113**	**241,350**	**137**	**46.208**	**73.4%**	**33.933**	**250,087**	**136**
	Aqua Utilities of Florida, Inc.		Belleview Hills / Fairfax Hills / Chappell Hills / Marion Hills / West View / Woodberry Forest	Small	Marion	0.088	100.0%	0.088	0	0	0.100	100.0%	0.100	0	0
	Debra Demers	Sunshine Utilities	Fox Mountain AKA Sun Resort	Small	Marion	0.004	100.0%	0.004	32	125	0.004	100.0%	0.004	32	125
	Marion Utilities Inc.	Marion Utilities Inc.	Libra Oaks, Bordering Oaks, Pine Ridge Estates, Hunters Trace, Ft King Forest / Sleepy Hollow / Dellcrest / Golden Holiday MHP / Hicliff Heights	Small	Marion	0.221	100.0%	0.221	1,573	140	0.221	100.0%	0.221	1,573	140
	Ocala Garden Apartments Inc.	Sunshine Utilities of Central Fla Inc	Ocala Garden Apartments	Small	Marion	0.002	100.0%	0.002	48	42	0.004	100.0%	0.004	48	83
	Sunshine Utilities	Sunshine Utilities	Ashley Heights / Floyd Clark Subdividion (PS CUP 6880 closed)	Small	Marion	0.025	100.0%	0.025	277	90	0.023	100.0%	0.023	268	86
	Sunshine Utilities of Central Fl Inc.	Sunshine Utilities of Central Fl Inc.	Eleven Oaks Subdivision	Small	Marion	0.012	100.0%	0.012	106	113	0.010	100.0%	0.010	85	118
	Sunshine Utilities of Central Fl Inc.	Sunshine Utilities of Central Fl Inc.	Country Walk Subdivision	Small	Marion	0.016	100.0%	0.016	153	105	0.017	100.0%	0.017	143	119
104	Shady Road Villas	Shady Road Villas		Small	Marion	0.030	71.0%	0.021	283	74	0.016	71.0%	0.011	287	38
108	Marion County Utilities	Marion County Utilities	Salt Springs	Small	Marion	0.052	20.1%	0.010	420	24	0.041	20.1%	0.008	342	23
2993	Sunshine Utilities	Sunshine Utilities	South Marion Regional System (Little Lake Weir, Lakeview Hills, Hilltop at Lake Weir, Town of Ocklawaha, Belleview Oaks Estates)	Large	Marion	0.209	75.2%	0.157	1,143	137	0.212	75.2%	0.159	1,159	137
2995	Tradewinds Utilities Inc.	Tradewinds Utilities Inc.		Large	Marion	0.191	95.5%	0.182	1,312	139	0.114	95.5%	0.109	1,313	83
2996	Sunshine Utilities	Sunshine Utilities	Sunlight Acres	Small	Marion	0.017	100.0%	0.017	183	93	0.019	100.0%	0.019	186	102
2998	Mr Juerg and Germaine Mueller	Whispering Pines RV Park		Small	Marion	0.001	100.0%	0.001	25	40	0.001	100.0%	0.001	25	40
3002	Residential Water Systems	Residential Water Systems	High Pointe	Large	Marion	0.268	87.2%	0.234	2,224	105	0.275	87.2%	0.240	1,796	134
3008	East Marion Sanitary Systems Inc	East Marion Sanitary Systems Inc	Lakeview Woods	Small	Marion	0.008	92.0%	0.007	148	47	0.015	92.0%	0.014	150	93
3010	Windstream Utilities Company	Windstream Utilities Company	Windstream / Carriage Hill	Small	Marion	0.124	100.0%	0.124	336	369	0.085	100.0%	0.085	301	282
3013	Sunshine Utilities	Sunshine Utilities	Fore Oaks	Small	Marion	0.048	100.0%	0.048	357	134	0.053	100.0%	0.053	362	146
3016	Ocala East Villas	Ocala East Villas		Large	Marion	0.159	54.5%	0.087	575	151	0.118	54.5%	0.064	583	110
3019	Sunshine Utilities	Sunshine Utilities	Ocala Heights	Large	Marion	0.065	95.9%	0.062	675	92	0.062	95.9%	0.059	684	86
3021	Camelot Communities	Rolling Greens Communities	Rolling Greens MHP	Large	Marion	0.393	67.3%	0.264	2,318	114	0.421	67.3%	0.283	2,348	121
3043	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Ocala Oaks	Large	Marion	0.147	90.7%	0.133	1,459	91	0.150	90.7%	0.136	1,478	92
3054	Marion County Utilities	Marion County Utilities	Silver Springs Shores	Large	Marion	1.303	78.2%	1.019	11,155	91	1.715	78.2%	1.341	11,155	120
3060	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	49th Street	Small	Marion	0.023	91.2%	0.021	234	90	0.023	91.2%	0.021	237	89
3061	Oak Bend Mobile Home Park	Oak Bend Mobile Home Park	Oak Bend MHC	Large	Marion	0.088	91.1%	0.080	543	147	0.064	91.1%	0.058	550	105
3077	GMN Landfair LTD	GMN Landfair LTD	Landfair	Small	Marion	0.029	89.0%	0.026	538	48	0.026	89.0%	0.023	545	42
3079	Marion County Utilities	Marion County Utilities	Silver Springs Woods and Villages	Large	Marion	0.064	100.0%	0.064	803	80	0.056	100.0%	0.056	803	70
3080	Sunshine Utilities of Central Fla Inc	Sunshine Utilities of Central Fla Inc	Oakhaven	Small	Marion	0.041	91.7%	0.038	95	400	0.032	91.7%	0.029	96	302

Table B-6b, Continued. 2010-2014 Residential Water Use and Five-Year Residential Per Capita Averages for All Public Supply Permittees in the St. Johns River Water Management District.

CUP Number	Owner	Utility	Alternate Name	Utility Category	County	2012 Water Use	2012 % Household	2012 Household Use	2012 Population	2012 Residential GPCD	2013 Water Use	2013 % Household	2013 Household Use	2013 Population	2013 Residential GPCD	2014 Water Use	2014 % Household	2014 Household Use	2014 Population	2014 Residential GPCD	2010-2014 Average Residential GPCD
2628	Lakeside Village LTD	General Utilities Corporation	Lakeside Village Ltd	Small	Lake	0.017	87.0%	0.015	141	106	0.035	87.0%	0.030	141	213	0.046	87.0%	0.040	194	206	201
2632	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Lake Utilities / Valencia Terrace	Large	Lake	0.044	100.0%	0.044	332	133	0.042	100.0%	0.042	332	127	0.042	100.0%	0.042	332	127	134
2634, 84879, 85195	City of Eustis	City of Eustis	CUPs 81906 and 83231 are separate permits for GC.	Large	Lake	3.344	79.4%	2.655	22,961	116	3.224	79.4%	2.560	23,815	107	3.238	79.4%	2.571	23,815	108	115
2644	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Silver Lakes / Western Shores	Large	Lake	0.418	88.0%	0.368	3,776	97	0.373	88.0%	0.328	3,776	87	0.384	88.0%	0.338	3,776	90	102
2646	City of Umatilla	City of Umatilla		Large	Lake	0.366	100.0%	0.366	3,572	102	0.440	100.0%	0.440	3,874	114	0.450	100.0%	0.450	3,894	116	115
2659	Hometown America	Hometown America	Haselton Village MHP	Small	Lake	0.022	98.0%	0.022	190	116	0.039	98.0%	0.038	190	200	0.033	98.0%	0.032	141	227	188
2662	Mission Golf & Tennis Resort	Mission Golf & Tennis Resort	Las Colinas	Large	Lake	0.802	34.1%	0.273	461	592	0.441	34.1%	0.150	461	325	0.687	34.1%	0.234	435	538	466
2671	Town of Monteverde	Town of Monteverde		Large	Lake	0.194	56.3%	0.109	1,468	74	0.191	56.3%	0.108	1,498	72	0.181	56.3%	0.102	1,498	68	73
2700	Lake Utility Services Inc.	Lake Utility Services Inc.		Large	Lake	4.464	58.2%	2.598	21,129	123	3.976	58.2%	2.314	21,976	105	3.600	58.2%	2.095	21,976	95	122
2701	Aqua Source Inc.	Aqua Source Inc.	Kings Cove	Large	Lake	0.040	93.0%	0.037	470	79	0.036	93.0%	0.033	506	65	0.033	93.0%	0.031	506	61	83
2717	Utilities Inc. of Pennbrooke	Pennbrooke Utilities	Pennbrooke	Large	Lake	0.418	82.2%	0.344	2,357	146	0.414	82.2%	0.340	2,488	137	0.364	82.2%	0.299	2,488	120	148
2718	Plantation at Leesburg	Plantation at Leesburg		Large	Lake	1.255	70.2%	0.881	5,061	174	1.205	70.2%	0.846	5,141	165	1.031	70.2%	0.724	5,061	143	171
2765	City of Tavares	City of Tavares	Per Bill Adams CUP # 2741 is being retired and will be served by Tavares.	Large	Lake	2.519	70.0%	1.763	17,802	99	2.441	70.0%	1.709	17,802	96	2.390	70.0%	1.673	17,802	94	99
2775	Ridgecrest Management Co. LLC	General Utilities Corporation	Ridgecrest Village	Small	Lake	0.028	87.0%	0.024	253	95	0.023	87.0%	0.020	253	79	0.031	87.0%	0.027	190	142	123
2778	Waterwood Community Assoc. Inc.	General Utilities Corporation	Waterwood	Small	Lake	0.078	71.0%	0.055	286	192	0.075	71.0%	0.053	286	185	0.012	71.0%	0.009	253	36	159
2782	Raintree Utilities Inc.	Raintree Utilities Inc.	Raintree Harbor	Small	Lake	0.050	82.2%	0.041	275	149	0.042	82.2%	0.035	275	127	0.071	82.2%	0.058	295	197	153
2796, 2913	City of Groveland	City of Groveland	Garden City, Groveland, Tradewinds, Green Valley, Palisades Country Club, Cherry Lake Road, Christopher Ford Commerce Park, Sunshine Parkway, South Lake High School, Turnpike Hyponex, Sampey Pomello	Large	Lake	1.612	75.4%	1.215	13,402	91	1.562	75.4%	1.178	15,578	76	1.603	75.4%	1.209	13,681	88	82
2810	Lake Griffin Isles	Lake Griffin Isles		Large	Lake	0.080	95.5%	0.076	237	321	0.078	95.5%	0.074	237	312	0.069	95.5%	0.066	237	278	313
2840	Woodlands Church Lake LLC	Woodlands Church Lake LLC	Woodland Heritage MHP	Large	Lake	0.142	87.2%	0.124	346	358	0.119	87.2%	0.104	346	301	0.072	87.2%	0.063	346	182	302
2847	Vacation Village Condominium Association	Vacation Village Condominium Association	Vacation Village	Small	Lake	0.031	75.0%	0.023	494	47	0.029	75.0%	0.022	494	45	0.030	75.0%	0.023	479	48	44
2858	Pine Island Fish Camp	Pine Island Fish Camp		Small	Lake	0.001	100.0%	0.001	25	40	0.001	100.0%	0.001	25	40	0.040	100.0%	0.040	265	151	122
2860	Hawthorne Residents Coop Assoc	Hawthorne at Leesburg		Large	Lake	0.403	66.3%	0.267	1,787	149	0.378	66.3%	0.251	1,886	133	0.365	66.3%	0.242	1,787	135	149
2862	Lady Lake Mobile Home Park Inc	Lady Lake Mobile Home Park Inc	Lady Lake Mobile Home Park	Small	Lake	0.041	86.3%	0.035	253	138	0.034	86.3%	0.029	253	115	0.001	86.3%	0.001	25	40	131
2863	Bonfire Cooperative Assoc Inc	Bonfire Cooperative Assoc Inc	Bonfire COOP Mobile Home Park	Small	Lake	0.018	65.6%	0.012	400	30	0.029	65.6%	0.019	400	48	0.029	65.6%	0.019	270	70	46
2865	Community of Christ	Community of Christ	Deerhaven Camp	Small	Lake	0.006	100.0%	0.006	25	240	0.006	100.0%	0.006	25	240	0.019	100.0%	0.019	400	48	96
2867	T & T Inc dba Country Squire Mobile Home Village	T & T Inc dba Country Squire Mobile Home Village	Country Squire Mobile Home Park	Small	Lake	0.029	86.0%	0.025	298	84	0.026	86.0%	0.022	298	74	0.006	86.0%	0.005	25	200	70
2886	City of Minneola	City of Minneola		Large	Lake	1.536	74.0%	1.137	11,417	100	1.498	74.0%	1.109	11,773	94	1.512	74.0%	1.119	11,773	95	98
2888	Mid Florida Lakes	Mid Florida Lakes	Mid Florida Lakes MHP	Large	Lake	0.300	83.5%	0.251	1,709	147	0.308	83.5%	0.257	1,709	150	0.292	83.5%	0.244	1,709	143	167
2890	Monteverde Mobile Home Subd Assn Inc	Monteverde Mobile Home Subd Assn Inc	Monteverde Mobile Home Subdivision	Small	Lake	0.030	100.0%	0.030	678	44	0.032	100.0%	0.032	378	85	0.033	100.0%	0.033	670	49	52
2891	Corley Island Mobile Manor	Corley Island Mobile Manor		Small	Lake	0.015	98.4%	0.015	200	75	0.030	98.4%	0.030	250	120	0.024	98.4%	0.024	240	100	112
2893	Torch Lite MHP LLC	Torch Lite MHP LLC	Torchlite MHP	Small	Lake	0.013	94.2%	0.012	74	162	0.014	94.2%	0.013	50	260	0.011	94.2%	0.010	50	200	165
2900	Ginn-LA Pine Island LTD LLLP	Ginn-LA Pine Island LTD LLLP	Hillcrest PUD	Large	Lake	0.059	23.9%	0.014	17	824	0.074	23.9%	0.018	30	600	0.127	23.9%	0.030	30	1,000	1327
2901	Pine Harbour Water Utilities	Pine Harbour Water Utilities		Small	Lake	0.017	89.9%	0.015	123	122	0.015	89.9%	0.013	123	106	0.028	89.9%	0.025	200	125	113
2973	Lakes of Lady Lake Homeowners Assocation, Inc.	Lakes of Lady Lake Homeowners Assocation, Inc.	The Lakes of Lady Lake	Small	Lake	0.039	66.0%	0.026	100	260	0.041	66.0%	0.027	100	270	0.016	66.0%	0.011	100	110	206
2989	Citrus Cove Homeowners Association Water System	Citrus Cove Homeowners Association Water System	Citrus Cove	Small	Lake	0.023	90.0%	0.021	94	223	0.017	90.0%	0.015	94	160	0.019	90.0%	0.017	94	181	192
4487	Edgewater Beach Homeowners Assoc	Edgewater Beach		Small	Lake	0.005	90.2%	0.005	32	156	0.005	90.2%	0.005	32	156	0.005	90.2%	0.005	32	156	156
4493	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Imperial Terrace	Small	Lake	0.015	100.0%	0.015	490	31	0.015	100.0%	0.015	490	31	0.015	100.0%	0.015	490	31	31
4512	Cypress Creek Mobile Home Park	Cypress Creek Mobile Home Park	Cypress Creek	Small	Lake	0.026	100.0%	0.026	251	104	0.028	100.0%	0.028	251	112	0.027	100.0%	0.027	251	108	109
4545	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Quail Ridge	Small	Lake	0.014	100.0%	0.014	231	61	0.012	100.0%	0.012	231	52	0.012	100.0%	0.012	181	66	64
4555	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Tavares Ridge	Small	Lake	0.030	100.0%	0.030	532	56	0.034	100.0%	0.034	532	64	0.034	100.0%	0.034	532	64	58
4565	Tara Village	Tara Village		Small	Lake	0.012	91.1%	0.011	283	39	0.019	91.1%	0.017	283	60	0.016	91.1%	0.015	266	56	74
5753	WBB Utilities Inc	WBB Utilities Inc	Lake Idlewild	Small	Lake	0.056	95.5%	0.053	164	323	0.039	95.5%	0.037	164	226	0.044	95.5%	0.042	164	256	295
6398	Clerbrook Golf and RV Resort	Clerbrook Golf and RV Resort		Large	Lake	0.137	50.0%	0.069	2,364	29	0.095	50.0%	0.048	2,364	20	0.098	50.0%	0.049	2,364	21	23
6781	Shangri-La by the Lake Utilities Inc	Shangri-La by the Lake Utilities Inc	Shangri-La by the Lake	Small	Lake	0.025	90.6%	0.023	407	57	0.025	90.6%	0.023	407	57	0.027	90.6%	0.024	407	59	60
10846	Presco Associates LLC	Barrington Estates	Barrington Estates	Large	Lake	0.000	86.1%	0.000	0	0	0.000	86.1%	0.000	0	0	0.000	86.1%	0.000	0	0	0
50049	Town of Lady Lake	Town of Lady Lake		Large	Lake	0.705	100.0%	0.705	5,629	125	0.646	100.0%	0.646	5,629	115	0.683	100.0%	0.683	5,629	121	126
50094	Lake Utility Services, Inc.	Lake Saunders Utilities	Lake Saunders Acres	Small	Lake	0.009	100.0%	0.009	109	83	0.009	100.0%	0.009	109	83	0.010	100.0%	0.010	109	92	85
50115	Ginn-LA Pine Island II LLLP	Ginn-LA Pine Island II LLLP	Pine Island PUD	Large	Lake	0.065	28.3%	0.018	111	162	0.065	28.3%	0.018	111	162	0.097	28.3%	0.027	111	243	189
50147	City of Mount Dora	City of Mount Dora		Large	Lake	3.331	78.0%	2.598	23,718	110	3.163	78.0%	2.467	23,718	104	2.765	78.0%	2.157	23,718	91	102
50152	Wedgewood Homeowners Assoc. Inc.	Wedgewood Homeowners Assoc. Inc.	Wedgewood Club	Large	Lake	0.123	87.0%	0.107	721	148	0.140	87.0%	0.122	721	169	0.113	87.0%	0.098	721	136	156
50178	St. Johns River Utility Inc.	Astor-Astor Park Water Association	Southlake Utilities	Large	Lake	0.258	100.0%	0.258	3,920	66	0.255	100.0%	0.255	3,920	65	0.262	100.0%	0.262	2,946	89	80
50218	Highlands MHP and Sales Inc	Highlands MHP and Sales Inc	Highlands MHP	Small	Lake	0.016	100.0%	0.016	130	123	0.020	100.0%	0.020	130	154	0.018	100.0%	0.018	130	138	143
50254	Treasure Island Estates Inc	Treasure Island Estates Inc	Treasure Cove Homeowners Association	Small	Lake	0.015	94.9%	0.014	89	157	0.009	94.9%	0.009	89	101	0.017	94.9%	0.016	89	180	130
50279	Village Center Community Development District	Village Center Community Development District	Villages of Lady Lake. (Villages of Marion / Little Sumter Service Area. The permit 63454 that Steve Brown has listed is actually an ERP, not CUP. This area is served by wells located in Sumter County in the SWFWMD.)	Large	Lake	4.549	72.0%	3.275	11,032	297	4.247	72.0%	3.058	11,032	277	4.034	72.0%	2.904	11,032	263	282
50307	Lake-Ulmerton Corporation	Lake-Ulmerton Corporation	Bee's RV Resort	Small	Lake	0.025	80.6%	0.020	414	48	0.028	80.6%	0.023	414	56	0.031	80.6%	0.025	414	60	50
50334	Park at Wolf Branch Oaks	Park at Wolf Branch Oaks		Large	Lake	0.113	73.9%	0.084	281	299	0.109	73.9%	0.081	281	288	0.095	73.9%	0.070	281	249	286
50780	Cove Water System Incorporated	General Utilities Corporation	Cove Water System	Small	Lake	0.005	95.4%	0.005	134	37	0.009	95.4%	0.009	134	67	0.009	95.4%	0.009	134	67	61
62724	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Fairways at Mt. Plymouth	Large	Lake	0.090	89.6%	0.081	583	139	0.080	89.6%	0.072	583	123	0.077	89.6%	0.069	583	118	156
98980	Raintree Utilities Inc.	Raintree Utilities Inc.	Bentwood Subdivision	Small	Lake	0.001	90.0%	0.001	4	250	0.004	90.0%	0.004	21	190	0.004	90.0%	0.004	21	190	259
103822	Colina Bay Water Company	Colina Bay Water Company	Colina Bay	Large	Lake	0.001	79.0%	0.001	0	0	0.082	79.0%	0.065	65	0	0.163	79.0%	0.129	65	1,985	1,508
107839	Leesburg Associates Limited Partnership	Leesburg Associates Limited Partnership	Holiday Travel Resort	Large	Lake	0.119	83.4%	0.099	1,004	99	0.111	83.4%	0.093	1,004	93	0.121	83.4%	0.101	1,004	101	95
110807	Lake County Acreage LLC	Wolf Branch Meadows		Small	Lake	0.000	97.1%	0.000	0	0	0.007	97.1%	0.007	7	0	0.007	97.1%	0.007	7	1,000	844
114536	Lake County	Lake County	South Umatilla Water System	Small	Lake	0.042	84.0%	0.035	438	80	0.042	84.0%	0.035	438	80	0.042	84.0%	0.035	438	80	87
120333	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Ravenswood CUP	Small	Lake	0.007	94.0%	0.007	90	78	0.007	94.0%	0.007	90	78	0.007	94.0%	0.007	90	78	80
128295	Black Bear Reserve Water Corporation	Black Bear Reserve	Formerly Upson Downs. PS CUP 2959 was changed to a LRA permit only and a new permit for PS portion was issued 7/6/2011.	Large	Lake	0.299	100.0%	0.299	592	505	0.386	100.0%	0.386	618	625	0.383	100.0%	0.383	625	613	391
		Lake Total				**45.020**	**74.1%**	**33.378**	**255,808**	**130**	**43.121**	**74.3%**	**32.041**	**265,985**	**120**	**41.860**	**74.0%**	**30.992**	**263,790**	**117**	**128**
	Aqua Utilities of Florida, Inc.		Belleview Hills / Fairfax Hills / Chappell Hills / Marion Hills / West View / Woodberry Forest	Small	Marion	0.097	100.0%	0.097	0	0	0.102	100.0%	0.102	0	0	0.089	100.0%	0.089	0	0	0
	Debra Demers	Sunshine Utilities	Fox Mountain AKA Sun Resort	Small	Marion	0.004	100.0%	0.004	32	125	0.004	100.0%	0.004	32	125	0.004	100.0%	0.004	32	125	125
	Marion Utilities Inc.	Marion Utilities Inc.	Libra Oaks, Bordering Oaks, Pine Ridge Estates, Hunters Trace, Ft King Forest / Sleepy Hollow / Dellcrest / Golden Holiday MHP / Hicliff Heights	Small	Marion	0.213	100.0%	0.213	1,573	135	0.195	100.0%	0.195	1,788	109	0.192	100.0%	0.192	1,995	96	123
	Ocala Garden Apartments Inc.	Sunshine Utilities of Central Fla Inc	Ocala Garden Apartments	Small	Marion	0.004	100.0%	0.004	48	83	0.003	100.0%	0.003	48	63	0.003	100.0%	0.003	48	63	67
	Sunshine Utilities	Sunshine Utilities	Ashley Heights / Floyd Clark Subdividion (PS CUP 6880 closed)	Small	Marion	0.023	100.0%	0.023	268	86	0.022	100.0%	0.022	268	82	0.025	100.0%	0.025	325	77	84
	Sunshine Utilities of Central Fl Inc.	Sunshine Utilities of Central Fl Inc.	Eleven Oaks Subdivision	Small	Marion	0.008	100.0%	0.008	85	94	0.010	100.0%	0.010	85	118	0.008	100.0%	0.008	118	68	100
	Sunshine Utilities of Central Fl Inc.	Sunshine Utilities of Central Fl Inc.	Country Walk Subdivision	Small	Marion	0.016	100.0%	0.016	143	112	0.015	100.0%	0.015	143	105	0.015	100.0%	0.015	169	89	105
104	Shady Road Villas	Shady Road Villas		Small	Marion	0.029	71.0%	0.021	287	73	0.048	71.0%	0.034	287	118	0.024	71.0%	0.017	287	59	73
108	Marion County Utilities	Marion County Utilities	Salt Springs	Small	Marion	0.045	20.1%	0.009	342	26	0.034	76.4%	0.026	342	76	0.045	76.4%	0.034	342	99	49
2993	Sunshine Utilities	Sunshine Utilities	South Marion Regional System (Little Lake Weir, Lakeview Hills, Hilltop at Lake Weir, Town of Ocklawaha, Belleview Oaks Estates)	Large	Marion	0.159	75.2%	0.120	1,090	110	0.163	75.2%	0.123	1,090	113	0.153	75.2%	0.115	1,090	106	121
2995	Tradewinds Utilities Inc.	Tradewinds Utilities Inc.		Large	Marion	0.098	95.5%	0.094	1,313	72	0.093	95.5%	0.089	1,313	68	0.103	95.5%	0.098	1,313	75	87
2996	Sunshine Utilities	Sunshine Utilities	Sunlight Acres	Small	Marion	0.008	100.0%	0.008	186	43	0.015	100.0%	0.015	186	81	0.017	100.0%	0.017	186	91	82
2998	Mr Juerg and Germaine Mueller	Whispering Pines RV Park		Small	Marion	0.001	100.0%	0.001	25	40	0.001	100.0%	0.001	25	40	0.001	100.0%	0.001	25	40	40
3002	Residential Water Systems	Residential Water Systems	High Pointe	Large	Marion	0.252	87.2%	0.220	1,796	122	0.223	87.2%	0.194	1,796	108	0.200	87.2%	0.174	1,796	97	113
3008	East Marion Sanitary Systems Inc	East Marion Sanitary Systems Inc	Lakeview Woods	Small	Marion	0.009	92.0%	0.008	150	53	0.017	92.0%	0.016	150	107	0.014	92.0%	0.013	150	87	78
3010	Windstream Utilities Company	Windstream Utilities Company	Windstream / Carriage Hill	Small	Marion	0.070	100.0%	0.070	301	233	0.073	100.0%	0.073	301	243	0.059	100.0%	0.059	301	196	267
3013	Sunshine Utilities	Sunshine Utilities	Fore Oaks	Small	Marion	0.049	100.0%	0.049	362	135	0.047	100.0%	0.047	362	130	0.051	100.0%	0.051	362	141	137
3016	Ocala East Villas	Ocala East Villas		Large	Marion	0.108	54.5%	0.059	583	101	0.086	54.5%	0.047	583	81	0.092	54.5%	0.050	575	87	106
3019	Sunshine Utilities	Sunshine Utilities	Ocala Heights	Large	Marion	0.058	95.9%	0.056	684	82	0.058	95.9%	0.056	684	82	0.063	95.9%	0.060	684	88	86
3021	Camelot Communities	Rolling Greens Communities	Rolling Greens MHP	Large	Marion	0.400	67.3%	0.269	2,348	115	0.255	67.3%	0.172	2,348	73	0.333	67.3%	0.224	2,318	97	104
3043	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Ocala Oaks	Large	Marion	0.145	90.7%	0.132	1,478	89	0.206	90.7%	0.187	1,478	127	0.173	90.7%	0.157	1,478	106	101
3054	Marion County Utilities	Marion County Utilities	Silver Springs Shores	Large	Marion	1.302	78.2%	1.018	14,076	72	1.464	76.4%	1.118	18,032	62	1.547	76.4%	1.182	18,032	66	78
3060	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	49th Street	Small	Marion	0.021	91.2%	0.019	237	80	0.021	91.2%	0.019	237	80	0.021	91.2%	0.019	362	52	76
3061	Oak Bend Mobile Home Park	Oak Bend Mobile Home Park	Oak Bend MHC	Large	Marion	0.055	91.1%	0.050	550	91	0.050	91.1%	0.046	550	84	0.049	91.1%	0.045	550	82	102
3077	GMN Landfair LTD	GMN Landfair LTD	Landfair	Small	Marion	0.013	89.0%	0.012	545	22	0.031	89.0%	0.028	545	51	0.032	89.0%	0.028	580	48	42
3079	Marion County Utilities	Marion County Utilities	Silver Springs Woods and Villages	Large	Marion	0.127	100.0%	0.127	766	166	0.055	76.4%	0.042	766	55	0.056	76.4%	0.043	766	56	85
3080	Sunshine Utilities of Central Fla Inc	Sunshine Utilities of Central Fla Inc	Oakhaven	Small	Marion	0.028	91.7%	0.026	96	271	0.037	91.7%	0.034	96	354	0.037	91.7%	0.034	103	330	331

Table B-6b, Continued. 2010-2014 Residential Water Use and Five-Year Residential Per Capita Averages for All Public Supply Permittees in the St. Johns River Water Management District.

CUP Number	Owner	Utility	Alternate Name	Utility Category	County	2010 Water Use	2010 % Household	2010 Household Use	2010 Population	2010 Residential GPCD	2011 Water Use	2011 % Household	2011 Household Use	2011 Population	2011 Residential GPCD
3083	Lake Oklawaha RV Resort Inc.	Lake Oklawaha RV Resort Inc.	Lake Oklawaha RV Resort	Small	Marion	0.003	58.1%	0.002	399	5	0.003	58.1%	0.002	399	5
3087	Tropicana Village Homeowners Assoc Inc	Tropicana Village Homeowners Assoc Inc	Tropicana Village	Small	Marion	0.017	100.0%	0.017	258	66	0.026	100.0%	0.026	261	100
3092	Willow Reed Inc	Briar Patch MHC		Small	Marion	0.005	100.0%	0.005	80	63	0.005	100.0%	0.005	80	63
3093	Sunshine Utilities	Sunshine Utilities	Winding Waters	Small	Marion	0.046	97.0%	0.045	401	112	0.042	97.0%	0.041	407	101
3094	Marion Utilities Inc.	Marion Utilities Inc.	Fore Acres	Large	Marion	0.173	100.0%	0.173	1,111	156	0.118	100.0%	0.118	1,126	105
3095	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Hawks Point	Small	Marion	0.028	100.0%	0.028	306	92	0.025	100.0%	0.025	310	81
3101	Marion Utilities Inc.	Marion Utilities Inc.	Greenfields / Indian Pines	Large	Marion	0.227	100.0%	0.227	1,067	213	0.146	100.0%	0.146	1,081	135
3127	Town of McIntosh	Town of McIntosh		Small	Marion	0.068	100.0%	0.068	580	117	0.074	100.0%	0.074	588	126
3130	Sunshine Utilities	Sunshine Utilities	Sun Ray Estates	Large	Marion	0.238	100.0%	0.238	1,223	195	0.168	100.0%	0.168	1,238	136
3131	Sunshine Utilities	Sunshine Utilities	Florida Heights	Small	Marion	0.019	100.0%	0.019	230	83	0.026	100.0%	0.026	233	112
3132	Sunshine Utilities	Sunshine Utilities	Oakhurst	Small	Marion	0.024	97.7%	0.023	232	99	0.022	97.7%	0.021	235	89
3137	City of Belleview	City of Belleview		Large	Marion	0.811	56.2%	0.456	8,226	55	0.804	56.2%	0.452	7,945	57
4573	Forest Green Merchants and Homeowners Assoc Inc	Forest Green Merchants and Homeowners Assoc Inc	Forest Green Subdivision	Small	Marion	0.008	94.6%	0.008	179	45	0.005	94.6%	0.005	181	28
4578	Marion County Utilities	Marion County Utilities	Silver Springs Regional Water & Sewer	Large	Marion	0.356	22.3%	0.079	1,832	43	0.363	22.3%	0.081	1,832	44
4580	Marion Utilities Inc.	Marion Utilities Inc.	Turning Pointe	Small	Marion	0.013	95.9%	0.012	174	69	0.013	95.9%	0.012	176	68
4581	Marion Utilities Inc.	Marion Utilities Inc.	Windgate Estates	Small	Marion	0.029	89.8%	0.026	334	78	0.041	89.8%	0.037	338	109
4582	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Belleview Hills Estates	Small	Marion	0.062	88.1%	0.055	703	78	0.056	88.1%	0.049	712	69
6850	Sunshine Utilities	Sunshine Utilities	Whispering Sands	Small	Marion	0.042	100.0%	0.042	668	63	0.043	100.0%	0.043	668	64
6858	Smith Lake Shores Village	Smith Lake Shores Village		Small	Marion	0.041	97.7%	0.040	445	90	0.041	97.7%	0.040	368	109
6893	Wilderness RV Park Estates LLC	Wilderness RV Park Estates LLC	Wilderness RV Park Estates	Small	Marion	0.018	88.1%	0.016	378	42	0.048	88.1%	0.042	383	110
7017	Grand Lake RV & Golf Resort	Grand Lake RV & Golf Resort		Large	Marion	0.091	100.0%	0.091	150	607	0.091	100.0%	0.091	150	607
7116	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Belleair / Quail Ridge	Small	Marion	0.045	100.0%	0.045	506	89	0.043	100.0%	0.043	512	84
50324	City of Ocala	City of Ocala	CUP 51172 allocations were transferred to Ocala and the wells are inactive, Raven Hills is now served by Ocala.	Large	Marion	10.573	55.4%	5.857	51,367	114	10.964	55.4%	6.074	50,924	119
50381	Marion County Utilities	Marion County Utilities	Deerpath	Large	Marion	0.162	80.0%	0.130	1,243	105	0.055	80.0%	0.044	1,254	35
50425	Marion County Utilities	Marion County Utilities	South Lake Weir	Small	Marion	0.030	84.6%	0.025	954	26	0.030	84.6%	0.025	966	26
51173	Marion County Utilities	Marion County Utilities	South Oak Subdivision	Large	Marion	0.093	83.0%	0.077	1,095	70	0.002	83.0%	0.002	1,095	2
71676	Marion County Utilities	Marion County Utilities	Stonecrest	Large	Marion	1.156	76.9%	0.889	3,858	230	1.577	76.9%	1.213	3,894	312
82064	Marion County Utilities	Marion County Utilities	Spruce Creek Golf and Country Club	Large	Marion	1.533	89.3%	1.369	7,185	191	1.608	89.3%	1.436	7,185	200
82743	Silver City Oaks Inc	Silver City Oaks Inc		Small	Marion	0.014	95.4%	0.013	107	121	0.012	95.4%	0.011	108	102
82827	Marion County Utilities	Marion County Utilities	Spruce Creek South	Large	Marion	0.692	69.5%	0.481	3,394	142	0.321	69.5%	0.223	3,394	66
97447	Marion County Utilities	Marion County Utilities	Irish Acres	Small	Marion	0.006	100.0%	0.006	12	500	0.005	100.0%	0.005	12	417
102623	Marion County Utilities	Utopia	No Population or PWSID Yet. This is for a new proposed area.	Large	Marion	0.000	91.4%	0.000	0	0	0.000	91.4%	0.000	0	0
107292	Regatta Construction LLC	Oakwater Village		Small	Marion	0.000	80.3%	0.000	0	0	0.000	80.3%	0.000	0	0
112657	River Creek LLC	River Creek RV Resort		Small	Marion	0.000	97.9%	0.000	0	0	0.000	97.9%	0.000	0	0
		Marion Total				**20.251**	**66.8%**	**13.525**	**115,712**	**117**	**20.654**	**66.5%**	**13.728**	**114,604**	**120**
122	City of Fernandina Beach	City of Fernandina Beach		Large	Nassau	3.418	87.0%	2.974	18,603	160	3.464	87.0%	3.014	18,603	162
922	Town of Callahan	Town of Callahan		Large	Nassau	0.167	100.0%	0.167	1,609	104	0.170	100.0%	0.170	1,609	106
925	Bobby Dollison	Bobby Dollison	American Beach	Small	Nassau	0.001	100.0%	0.001	114	9	0.001	100.0%	0.001	114	9
948	Town of Hilliard	Town of Hilliard		Large	Nassau	0.298	65.0%	0.194	2,763	70	0.276	65.0%	0.179	2,763	65
50087	Nassau County Board of County Commissioners	Nassau Amelia Utilities	Amelia Island	Large	Nassau	1.398	100.0%	1.398	8,736	160	1.426	100.0%	1.426	8,788	162
88271	JEA	JEA	Nassau Regional	Large	Nassau	2.420	87.7%	2.122	11,359	187	2.296	87.7%	2.014	11,888	169
		Nassau Total				**7.702**	**89.0%**	**6.856**	**43,184**	**159**	**7.633**	**89.1%**	**6.804**	**43,765**	**155**
	Zellwood Station Community Assoc.	Zellwood Station Community Assoc.	Wholesale Importer of Apopka	Large	Orange	0.327	75.5%	0.247	2,242	110	0.320	75.5%	0.242	2,571	94
3159	Orlando Utilities Commission	Orlando Utilities Commission		Large	Orange	75.034	52.8%	39.618	242,484	163	76.636	52.8%	40.464	242,906	167
3203	Clarcona Resorts Condominium Association	Clarcona Resorts Condominium Association	Clarcona Resort	Large	Orange	0.116	89.4%	0.104	1,678	62	0.074	89.4%	0.066	1,678	39
3216	City of Ocoee	City of Ocoee		Large	Orange	5.409	75.0%	4.057	31,956	127	3.603	75.0%	2.702	31,882	85
3217, 3278	City of Apopka	City of Apopka		Large	Orange	9.933	75.5%	7.499	55,732	135	10.513	75.5%	7.937	55,933	142
3236	Ola Beach Improvement Assoc.	Ola Beach Improvement Assoc.		Small	Orange	0.020	86.6%	0.017	183	93	0.029	86.6%	0.025	183	137
3301	Zellwood Water Users Inc.	Zellwood Water Users Inc.		Large	Orange	0.085	100.0%	0.085	961	88	0.089	100.0%	0.089	958	93
3302	Wedgefield Utilities Inc.	Wedgefield Utilities Inc.		Large	Orange	0.341	83.7%	0.285	4,219	68	0.347	83.7%	0.290	4,219	69
3317	Orange County Public Utilities	Orange County Public Utilities		Large	Orange	39.713	100.0%	39.713	337,319	118	40.723	100.0%	40.723	353,218	115
3322	Forty Acres Holding Co	Orange Villas		Small	Orange	0.000	100.0%	0.000	0	0	0.003	100.0%	0.003	0	0
3347	Town of Oakland	Town of Oakland		Large	Orange	0.739	74.4%	0.550	2,728	202	0.499	74.4%	0.371	2,728	136
3368	City of Winter Garden	City of Winter Garden		Large	Orange	5.305	80.0%	4.244	32,226	132	5.982	80.0%	4.786	33,516	143
3370	Orange Blossom RV Resort LLC	Orange Blossom RV Resort LLC	Orange Blossom RV	Small	Orange	0.007	100.0%	0.007	296	24	0.003	100.0%	0.003	296	10
3383	Rock Springs Palm Isles MHC LLC	Rock Springs Palm Isles MHC	General Utilities Corp. runs the WTP	Large	Orange	0.321	86.8%	0.279	968	288	0.248	86.8%	0.215	1,338	161
3407	Town of Eatonville	Town of Eatonville		Large	Orange	0.308	51.0%	0.157	2,727	58	0.299	51.0%	0.152	2,727	56
4611	Valencia Estates Apopka LLC	Valencia Estates Apopka LLC	Valencia Estates MHP	Small	Orange	0.013	89.1%	0.012	322	37	0.014	89.1%	0.012	322	37
7624	City of Winter Park	City of Winter Park		Large	Orange	9.701	66.5%	6.451	58,279	111	10.031	66.5%	6.671	58,279	114
7673	The Valley Mobile Home Park	The Valley Mobile Home Park	Valley MHP	Small	Orange	0.056	99.0%	0.055	350	157	0.057	99.0%	0.056	391	143
50258	City of Maitland	City of Maitland		Large	Orange	2.808	52.0%	1.460	12,994	112	2.831	52.0%	1.472	12,994	113
51073	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Tangerine Park	Large	Orange	0.130	100.0%	0.130	851	153	0.075	100.0%	0.075	851	88
86536	Starlight Ranch MHP	Hometown America	Starlight Ranch MHP	Large	Orange	0.068	100.0%	0.068	2,067	33	0.055	100.0%	0.055	2,067	27
92244	Sun Communities Inc	Sun Communities Inc	Silver Star Village	Large	Orange	0.114	93.3%	0.106	580	183	0.101	93.3%	0.094	580	162
		OrangeTotal				**150.548**	**69.8%**	**105.144**	**791,162**	**133**	**152.532**	**69.8%**	**106.503**	**809,637**	**132**
3426	East Central Florida Services Inc.	East Central Florida Services Inc.	Deseret Ranch	Large	Osceola	0.031	100.0%	0.031	235	132	0.028	100.0%	0.028	235	119
		Osceola Total				**0.031**	**100.0%**	**0.031**	**235**	**132**	**0.028**	**100.0%**	**0.028**	**235**	**119**
	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Wootens MHP (PWSID 2541280), Beechers Point (2540070) do not hav	Small	Putnam	0.019	100.0%	0.019	205	93	0.021	100.0%	0.021	205	102
	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Pomona Park	Small	Putnam	0.032	100.0%	0.032	474	68	0.027	100.0%	0.027	476	57
	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	CUPs 7984 (Hermits Cove - PWSID 2540482) and 7988 (St Johns High	Small	Putnam	0.029	100.0%	0.029	215	135	0.035	100.0%	0.035	215	163
	Mr. W. Herrington	River Villas Inc	CUP 8129 was closed in 2003, no permit required.	Small	Putnam	0.006	100.0%	0.006	150	40	0.005	100.0%	0.005	150	33
1624, 8150	Town of Interlachen	Town of Interlachen		Large	Putnam	0.103	61.1%	0.063	926	68	0.088	61.1%	0.054	930	58
1627	City of Crescent City	City of Crescent City		Large	Putnam	0.343	51.0%	0.175	1,577	111	0.177	51.0%	0.090	1,524	59
7961	Melrose Water Association	Melrose Water Association		Large	Putnam	0.118	97.0%	0.114	469	243	0.110	97.0%	0.107	505	212
7981	River Park Utility Mgt. Assoc.	River Park Utilities Management Assoc.		Large	Putnam	0.042	100.0%	0.042	736	57	0.029	100.0%	0.029	736	39
7982	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	River Grove	Small	Putnam	0.015	89.0%	0.013	219	59	0.016	89.0%	0.014	219	64
7986	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Park Manor- Interlachen Lake Estates	Small	Putnam	0.031	91.7%	0.028	620	45	0.029	91.7%	0.027	622	43
8071	Hilltop Farms Inc	Kirkwood Estates		Small	Putnam	0.022	100.0%	0.022	47	468	0.009	100.0%	0.009	47	191
8072	Lake Como Water Assoc	Lake Como Water Assoc	Village of Lake Como	Small	Putnam	0.037	55.6%	0.021	373	56	0.028	55.6%	0.016	374	43
8114	City of Palatka	City of Palatka		Large	Putnam	1.673	51.4%	0.860	10,558	81	1.466	51.4%	0.754	10,522	72
8124	Hiawatha Management Inc	Hiawatha Management Inc	Hiawatha Management	Small	Putnam	0.010	86.8%	0.009	145	62	0.010	86.8%	0.009	145	62
8127	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Palm Port	Small	Putnam	0.012	100.0%	0.012	218	55	0.011	100.0%	0.011	218	50
8168	Town of Welaka	Town of Welaka		Large	Putnam	0.085	100.0%	0.085	1,100	77	0.077	100.0%	0.077	1,100	70
90227	St Johns Harbor Water Association	St Johns Harbor Water Association		Small	Putnam	0.027	100.0%	0.027	358	75	0.026	100.0%	0.026	360	72
92165	Putnam County BOCC	Putnam County BOCC	East Putnam County Water System. East Palatka & San Mateo	Large	Putnam	0.368	48.0%	0.177	2,277	78	0.405	48.0%	0.194	2,287	85
		Putnam Total				**2.972**	**58.3%**	**1.734**	**20,667**	**84**	**2.569**	**58.6%**	**1.505**	**20,635**	**73**
157	North Beach Utilities	North Beach Utilities		Large	St. Johns	0.368	88.0%	0.324	3,653	89	0.405	88.0%	0.356	3,295	108
324	Wildwood Water Company	Wildwood Water Company		Large	St. Johns	0.129	90.1%	0.116	878	132	0.067	90.1%	0.060	896	67
1142	St Johns County Utilities	St Johns County Utilities	Was previously Intercoastal Utilities CUP 1213	Large	St. Johns	4.746	85.2%	4.044	23,688	171	4.853	85.2%	4.135	23,973	172
1190	Pinkham Pacetti	Pinkham Pacetti	Pacetti's Marina & Campground	Small	St. Johns	0.019	100.0%	0.019	345	55	0.009	100.0%	0.009	401	22
1198	St Johns County Utilities	St Johns County Utilities	Serves Eagle Creek - PWSID interconnection 2554353	Large	St. Johns	6.700	82.0%	5.494	64,062	86	6.651	82.0%	5.454	67,697	81
1381	Comachee Cove Yacht Harbor	Comachee Cove Yacht Harbor		Small	St. Johns	0.038	21.1%	0.008	378	21	0.031	21.1%	0.007	386	18
1386	Homeowners Utilities	Homeowners Utilities	Porpoise Point	Small	St. Johns	0.069	99.8%	0.069	232	297	0.047	99.8%	0.047	237	198
1392	Town of Hastings	Town of Hastings		Large	St. Johns	0.088	42.7%	0.038	531	72	0.081	42.7%	0.035	639	55
1423	St Johns County Board of County Commissioners	Fruit Cove Utilities	Fruit Cove Oaks. Was previously owned by Fruit Cove Properties Joint Venture.	Small	St. Johns	0.031	95.0%	0.029	344	84	0.041	95.0%	0.039	351	111
50299	City of St. Augustine Utilities	City of St. Augustine Utilities		Large	St. Johns	3.227	58.4%	1.885	27,833	68	3.098	58.4%	1.809	26,233	69
		St. Johns Total				**15.415**	**78.0%**	**12.026**	**121,944**	**99**	**15.283**	**78.2%**	**11.951**	**124,108**	**96**
	Town and Country RV Resort	Town and Country RV Resort		Small	Seminole	0.018	100.0%	0.018	268	67	0.017	100.0%	0.017	265	64
	Spring Hammock MHP	Spring Hammock MHP		Small	Seminole	0.005	100.0%	0.005	86	58	0.004	100.0%	0.004	86	47
160	Sanlando Utilities Corp.	Sanlando Utilities Corp.		Large	Seminole	7.639	76.0%	5.806	26,215	221	6.778	76.0%	5.151	26,923	191
162	City of Sanford	City of Sanford		Large	Seminole	6.394	57.7%	3.689	50,186	74	6.181	57.7%	3.566	50,186	71

Table B-6b, Continued. 2010-2014 Residential Water Use and Five-Year Residential Per Capita Averages for All Public Supply Permittees in the St. Johns River Water Management District.

CUP Number	Owner	Utility	Alternate Name	Utility Category	County	2012 Water Use	2012 % Household	2012 Household Use	2012 Population	2012 Residential GPCD	2013 Water Use	2013 % Household	2013 Household Use	2013 Population	2013 Residential GPCD	2014 Water Use	2014 % Household	2014 Household Use	2014 Population	2014 Residential GPCD	2010-2014 Average Residential GPCD
3083	Lake Oklawaha RV Resort Inc.	Lake Oklawaha RV Resort Inc.	Lake Oklawaha RV Resort	Small	Marion	0.002	58.1%	0.001	399	3	0.002	58.1%	0.001	399	3	0.002	58.1%	0.001	399	3	4
3087	Tropicana Village Homeowners Assoc Inc	Tropicana Village Homeowners Assoc Inc	Tropicana Village	Small	Marion	0.017	100.0%	0.017	261	65	0.016	100.0%	0.016	261	61	0.018	100.0%	0.018	261	69	72
3092	Willow Reed Inc	Briar Patch MHC		Small	Marion	0.000	100.0%	0.000	80	0	0.005	100.0%	0.005	80	63	0.050	100.0%	0.050	80	625	163
3093	Sunshine Utilities	Sunshine Utilities	Winding Waters	Small	Marion	0.050	97.0%	0.049	407	120	0.046	97.0%	0.045	407	111	0.044	97.0%	0.043	433	99	109
3094	Marion Utilities Inc.	Marion Utilities Inc.	Fore Acres	Large	Marion	0.108	100.0%	0.108	1,126	96	0.095	100.0%	0.095	1,126	84	0.092	100.0%	0.092	1,126	82	104
3095	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Hawks Point	Small	Marion	0.023	100.0%	0.023	310	74	0.023	100.0%	0.023	310	74	0.021	100.0%	0.021	310	68	78
3101	Marion Utilities Inc.	Marion Utilities Inc.	Greenfields / Indian Pines	Large	Marion	0.131	100.0%	0.131	1,081	121	0.121	100.0%	0.121	1,081	112	0.117	100.0%	0.117	1,081	108	138
3127	Town of McIntosh	Town of McIntosh		Small	Marion	0.065	100.0%	0.065	588	111	0.059	100.0%	0.059	588	100	0.055	100.0%	0.055	588	94	109
3130	Sunshine Utilities	Sunshine Utilities	Sun Ray Estates	Large	Marion	0.154	100.0%	0.154	1,238	124	0.144	100.0%	0.144	1,238	116	0.141	100.0%	0.141	1,238	114	137
3131	Sunshine Utilities	Sunshine Utilities	Florida Heights	Small	Marion	0.019	100.0%	0.019	233	82	0.023	100.0%	0.023	233	99	0.023	100.0%	0.023	233	99	95
3132	Sunshine Utilities	Sunshine Utilities	Oakhurst	Small	Marion	0.031	97.7%	0.030	235	128	0.031	97.7%	0.030	235	128	0.031	97.7%	0.030	235	128	114
3137	City of Belleview	City of Belleview		Large	Marion	0.809	56.2%	0.455	7,945	57	0.829	56.2%	0.466	7,945	59	0.763	56.2%	0.429	8,453	51	56
4573	Forest Green Merchants and Homeowners Assoc Inc	Forest Green Merchants and Homeowners Assoc Inc	Forest Green Subdivision	Small	Marion	0.004	94.6%	0.004	181	22	0.006	94.6%	0.006	181	33	0.004	94.6%	0.004	181	22	30
4578	Marion County Utilities	Marion County Utilities	Silver Springs Regional Water & Sewer	Large	Marion	0.215	22.3%	0.048	1,659	29	0.330	76.4%	0.252	1,659	152	0.862	76.4%	0.659	1,659	397	129
4580	Marion Utilities Inc.	Marion Utilities Inc.	Turning Pointe	Small	Marion	0.014	95.9%	0.013	176	74	0.014	95.9%	0.013	176	74	0.013	95.9%	0.012	176	68	71
4581	Marion Utilities Inc.	Marion Utilities Inc.	Windgate Estates	Small	Marion	0.037	89.8%	0.033	338	98	0.034	89.8%	0.031	338	92	0.034	89.8%	0.031	338	92	94
4582	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Belleview Hills Estates	Small	Marion	0.051	88.1%	0.045	712	63	0.043	88.1%	0.038	712	53	0.053	88.1%	0.047	758	62	65
6850	Sunshine Utilities	Sunshine Utilities	Whispering Sands	Small	Marion	0.032	100.0%	0.032	668	48	0.030	100.0%	0.030	406	74	0.034	100.0%	0.034	406	84	64
6858	Smith Lake Shores Village	Smith Lake Shores Village		Small	Marion	0.024	97.7%	0.023	368	63	0.055	97.7%	0.054	368	147	0.043	97.7%	0.042	368	114	104
6893	Wilderness RV Park Estates LLC	Wilderness RV Park Estates LLC	Wilderness RV Park Estates	Small	Marion	0.020	88.1%	0.018	383	47	0.019	88.1%	0.017	383	44	0.015	88.1%	0.013	378	34	56
7017	Grand Lake RV & Golf Resort	Grand Lake RV & Golf Resort		Large	Marion	0.091	100.0%	0.091	150	607	0.020	100.0%	0.020	150	133	0.020	100.0%	0.020	417	48	308
7116	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Belleair / Quail Ridge	Small	Marion	0.040	100.0%	0.040	512	78	0.040	100.0%	0.040	512	78	0.040	100.0%	0.040	512	78	81
50324	City of Ocala	City of Ocala	CUP 51172 allocations were transferred to Ocala and the wells are inactive, Raven Hills is now served by Ocala.	Large	Marion	10.747	55.4%	5.954	50,924	117	10.386	55.4%	5.754	52,031	111	10.099	55.4%	5.595	51,367	109	114
50381	Marion County Utilities	Marion County Utilities	Deerpath	Large	Marion	0.230	80.0%	0.184	719	256	0.000	76.4%	0.000	0	0	0.000	76.4%	0.000	0	0	111
50425	Marion County Utilities	Marion County Utilities	South Lake Weir	Small	Marion	0.031	84.6%	0.026	966	27	0.015	76.4%	0.011	966	11	0.020	76.4%	0.015	966	16	21
51173	Marion County Utilities	Marion County Utilities	South Oak Subdivision	Large	Marion	0.190	83.0%	0.158	877	180	0.000	76.4%	0.000	0	0	0.000	76.4%	0.000	0	0	77
71676	Marion County Utilities	Marion County Utilities	Stonecrest	Large	Marion	1.053	76.9%	0.810	4,559	178	1.383	76.4%	1.057	8,754	121	0.895	76.4%	0.684	13,336	51	135
82064	Marion County Utilities	Marion County Utilities	Spruce Creek Golf and Country Club	Large	Marion	1.391	89.3%	1.242	7,943	156	1.313	76.4%	1.003	7,943	126	1.172	76.4%	0.895	7,943	113	156
82743	Silver City Oaks Inc	Silver City Oaks Inc		Small	Marion	0.011	95.4%	0.010	108	93	0.025	95.4%	0.024	108	222	0.008	95.4%	0.008	108	74	122
82827	Marion County Utilities	Marion County Utilities	Spruce Creek South	Large	Marion	0.353	69.5%	0.245	4,195	58	0.000	76.4%	0.000	0	0	0.000	76.4%	0.000	0	0	86
97447	Marion County Utilities	Marion County Utilities	Irish Acres	Small	Marion	0.005	100.0%	0.005	12	417	0.240	76.4%	0.183	12	15,250	0.008	76.4%	0.006	25	240	2808
102623	Marion County Utilities	Utopia	No Population or PWSID Yet. This is for a new proposed area.	Large	Marion	0.159	91.4%	0.145	0	0	0.000	76.4%	0.000	0	0	0.000	76.4%	0.000	0	0	0
107292	Regatta Construction LLC	Oakwater Village		Small	Marion	0.005	80.3%	0.004	0	0	0.000	80.3%	0.000	0	0	0.000	80.3%	0.000	0	0	0
112657	River Creek LLC	River Creek RV Resort		Small	Marion	0.000	97.9%	0.000	0	0	0.000	97.9%	0.000	0	0	0.000	97.9%	0.000	0	0	0
Marion Total						**19.454**	**66.4%**	**12.915**	**118,717**	**109**	**18.675**	**65.8%**	**12.279**	**122,137**	**101**	**18.083**	**65.7%**	**11.882**	**127,362**	**93**	**107**
122	City of Fernandina Beach	City of Fernandina Beach		Large	Nassau	3.295	87.0%	2.867	18,603	154	3.080	87.0%	2.680	18,661	144	3.061	87.0%	2.663	18,661	143	152
922	Town of Callahan	Town of Callahan		Large	Nassau	0.182	100.0%	0.182	1,609	113	0.160	100.0%	0.160	1,609	99	0.152	100.0%	0.152	1,609	94	103
925	Bobby Dollison	Bobby Dollison	American Beach	Small	Nassau	0.013	100.0%	0.013	114	114	0.013	100.0%	0.013	114	114	0.013	100.0%	0.013	114	114	72
948	Town of Hilliard	Town of Hilliard		Large	Nassau	0.259	65.0%	0.168	2,763	61	0.249	65.0%	0.162	2,763	59	0.221	65.0%	0.144	3,000	48	60
50087	Nassau County Board of County Commissioners	Nassau Amelia Utilities	Amelia Island	Large	Nassau	1.346	100.0%	1.346	8,788	153	1.316	100.0%	1.316	8,788	150	1.267	100.0%	1.267	8,946	142	153
88271	JEA	JEA	Nassau Regional	Large	Nassau	2.192	87.7%	1.922	11,850	162	2.011	87.7%	1.764	14,697	120	2.185	87.7%	1.916	14,697	130	151
Nassau Total						**7.287**	**89.2%**	**6.498**	**43,727**	**149**	**6.829**	**89.3%**	**6.095**	**46,632**	**131**	**6.899**	**89.2%**	**6.155**	**47,027**	**131**	**144**
	Zellwood Station Community Assoc.	Zellwood Station Community Assoc.	Wholesale Importer of Apopka	Large	Orange	0.320	75.5%	0.242	2,571	94	0.320	75.5%	0.242	2,571	94	0.320	75.5%	0.242	2,571	94	97
3159	Orlando Utilities Commission	Orlando Utilities Commission		Large	Orange	79.711	52.8%	42.087	243,328	173	74.743	52.8%	39.464	243,750	162	77.912	52.8%	41.138	244,172	168	167
3203	Clarcona Resorts Condominium Association	Clarcona Resorts Condominium Association	Clarcona Resort	Large	Orange	0.052	89.4%	0.046	1,678	27	0.113	89.4%	0.101	1,268	80	0.110	89.4%	0.098	1,268	77	55
3216	City of Ocoee	City of Ocoee		Large	Orange	3.364	75.0%	2.523	31,882	79	3.416	75.0%	2.562	27,481	93	3.290	75.0%	2.468	29,372	84	94
3217, 3278	City of Apopka	City of Apopka		Large	Orange	10.221	75.5%	7.717	56,966	135	9.152	75.5%	6.910	56,966	121	8.371	75.5%	6.320	56,966	111	129
3236	Ola Beach Improvement Assoc.	Ola Beach Improvement Assoc.		Small	Orange	0.036	86.6%	0.031	183	169	0.040	86.6%	0.035	145	241	0.023	86.6%	0.020	145	138	153
3301	Zellwood Water Users Inc.	Zellwood Water Users Inc.		Large	Orange	0.091	100.0%	0.091	1,047	87	0.077	100.0%	0.077	1,047	74	0.079	100.0%	0.079	1,047	75	83
3302	Wedgefield Utilities Inc.	Wedgefield Utilities Inc.		Large	Orange	0.358	83.7%	0.300	4,187	72	0.304	83.7%	0.254	4,187	61	0.280	83.7%	0.234	4,636	50	64
3317	Orange County Public Utilities	Orange County Public Utilities		Large	Orange	40.389	100.0%	40.389	373,206	108	39.441	100.0%	39.441	373,206	106	38.450	100.0%	38.450	373,206	103	110
3322	Forty Acres Holding Co	Orange Villas		Small	Orange	0.003	100.0%	0.003	0	0	0.000	100.0%	0.000	0	0	0.000	100.0%	0.000	0	0	0
3347	Town of Oakland	Town of Oakland		Large	Orange	0.465	74.4%	0.346	2,728	127	0.448	74.4%	0.333	2,828	118	0.409	74.4%	0.304	2,728	111	139
3368	City of Winter Garden	City of Winter Garden		Large	Orange	5.604	80.0%	4.483	34,856	129	5.011	80.0%	4.009	50,298	80	5.060	80.0%	4.048	35,778	113	116
3370	Orange Blossom RV Resort LLC	Orange Blossom RV Resort LLC	Orange Blossom RV	Small	Orange	0.004	100.0%	0.004	280	14	0.005	100.0%	0.005	280	18	0.004	100.0%	0.004	280	14	16
3383	Rock Springs Palm Isles MHC LLC	Rock Springs Palm Isles MHC	General Utilities Corp. runs the WTP	Large	Orange	0.289	86.8%	0.251	1,338	188	0.250	86.8%	0.217	1,338	162	0.238	86.8%	0.207	1,338	155	185
3407	Town of Eatonville	Town of Eatonville		Large	Orange	0.304	51.0%	0.155	2,727	57	0.283	51.0%	0.144	2,727	53	0.283	51.0%	0.144	2,727	53	55
4611	Valencia Estates Apopka LLC	Valencia Estates Apopka LLC	Valencia Estates MHP	Small	Orange	0.013	89.1%	0.012	320	38	0.013	89.1%	0.012	305	39	0.015	89.1%	0.013	305	43	39
7624	City of Winter Park	City of Winter Park		Large	Orange	10.257	66.5%	6.821	58,279	117	10.299	66.5%	6.849	61,586	111	9.564	66.5%	6.360	58,279	109	112
7673	The Valley Mobile Home Park	The Valley Mobile Home Park	Valley MHP	Small	Orange	0.063	99.0%	0.062	388	160	0.054	99.0%	0.053	388	137	0.056	99.0%	0.055	350	157	151
50258	City of Maitland	City of Maitland		Large	Orange	2.842	52.0%	1.478	12,994	114	2.671	52.0%	1.389	13,268	105	2.601	52.0%	1.353	12,994	104	110
51073	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Tangerine Park	Large	Orange	0.077	100.0%	0.077	851	90	0.070	100.0%	0.070	851	82	0.075	100.0%	0.075	851	88	100
86536	Starlight Ranch MHP	Hometown America	Starlight Ranch MHP	Large	Orange	0.094	100.0%	0.094	2,051	46	0.071	100.0%	0.071	2,051	35	0.071	100.0%	0.071	2,051	35	35
92244	Sun Communities Inc	Sun Communities Inc	Silver Star Village	Large	Orange	0.097	93.3%	0.091	580	157	0.070	93.3%	0.065	580	112	0.209	93.3%	0.195	580	336	190
Orange Total						**154.654**	**69.4%**	**107.303**	**832,440**	**129**	**146.851**	**69.7%**	**102.303**	**847,121**	**121**	**147.420**	**69.1%**	**101.878**	**831,644**	**123**	**127**
3426	East Central Florida Services Inc.	East Central Florida Services Inc.	Deseret Ranch	Large	Osceola	0.025	100.0%	0.025	235	106	0.027	100.0%	0.027	235	115	0.030	100.0%	0.030	235	128	120
Osceola Total						**0.025**	**100.0%**	**0.025**	**235**	**106**	**0.027**	**100.0%**	**0.027**	**235**	**115**	**0.030**	**100.0%**	**0.030**	**235**	**128**	**120**
	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Wootens MHP (PWSID 2541280), Beechers Point (2540070) do not hav	Small	Putnam	0.020	100.0%	0.020	205	98	0.017	100.0%	0.017	205	83	0.016	100.0%	0.016	205	78	91
	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Pomona Park	Small	Putnam	0.023	100.0%	0.023	467	49	0.022	100.0%	0.022	467	47	0.023	100.0%	0.023	467	49	54
	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	CUPs 7984 (Hermits Cove - PWSID 2540482) and 7988 (St Johns High	Small	Putnam	0.040	100.0%	0.040	215	186	0.039	100.0%	0.039	215	181	0.040	100.0%	0.040	215	186	170
	Mr. W. Herrington	River Villas Inc	CUP 8129 was closed in 2003, no permit required.	Small	Putnam	0.003	100.0%	0.003	164	18	0.005	100.0%	0.005	164	30	0.005	100.0%	0.005	150	33	31
1624, 8150	Town of Interlachen	Town of Interlachen		Large	Putnam	0.081	61.1%	0.049	1,054	46	0.059	61.1%	0.036	930	39	0.069	61.1%	0.042	930	45	51
1627	City of Crescent City	City of Crescent City		Large	Putnam	0.180	51.0%	0.092	1,522	60	0.171	51.0%	0.087	1,800	48	0.176	51.0%	0.090	1,800	50	65
7961	Melrose Water Association	Melrose Water Association		Large	Putnam	0.104	97.0%	0.101	505	200	0.099	97.0%	0.096	1,050	91	0.100	97.0%	0.097	585	166	165
7981	River Park Utility Mgt. Assoc.	River Park Utilities Management Assoc.		Large	Putnam	0.060	100.0%	0.060	736	82	0.040	100.0%	0.040	1,000	40	0.047	100.0%	0.047	1,000	47	52
7982	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	River Grove	Small	Putnam	0.015	89.0%	0.013	219	59	0.015	89.0%	0.013	265	49	0.015	89.0%	0.013	219	59	58
7986	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Park Manor- Interlachen Lake Estates	Small	Putnam	0.031	91.7%	0.028	622	45	0.035	91.7%	0.032	622	51	0.030	91.7%	0.028	622	45	46
8071	Hilltop Farms Inc	Kirkwood Estates		Small	Putnam	0.037	100.0%	0.037	47	787	0.037	100.0%	0.037	47	787	0.009	100.0%	0.009	45	200	489
8072	Lake Como Water Assoc	Lake Como Water Assoc	Village of Lake Como	Small	Putnam	0.046	55.6%	0.026	374	70	0.028	55.6%	0.016	374	43	0.052	55.6%	0.029	374	78	58
8114	City of Palatka	City of Palatka		Large	Putnam	1.525	51.4%	0.784	10,203	77	1.268	51.4%	0.652	11,900	55	1.327	51.4%	0.682	11,900	57	68
8124	Hiawatha Management Inc	Hiawatha Management Inc	Hiawatha Management	Small	Putnam	0.010	86.8%	0.009	145	62	0.010	86.8%	0.009	145	62	0.010	86.8%	0.009	145	62	62
8127	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Palm Port	Small	Putnam	0.010	100.0%	0.010	218	46	0.010	100.0%	0.010	265	38	0.010	100.0%	0.010	218	46	47
8168	Town of Welaka	Town of Welaka		Large	Putnam	0.094	100.0%	0.094	1,100	85	0.083	100.0%	0.083	1,780	47	0.094	100.0%	0.094	1,780	53	63
90227	St Johns Harbor Water Association	St Johns Harbor Water Association		Small	Putnam	0.022	100.0%	0.022	360	61	0.019	100.0%	0.019	360	53	0.019	100.0%	0.019	360	53	63
92165	Putnam County BOCC	Putnam County BOCC	East Putnam County Water System. East Palatka & San Mateo	Large	Putnam	0.412	48.0%	0.198	2,287	87	0.410	48.0%	0.197	2,393	82	0.416	48.0%	0.200	2,393	84	83
Putnam Total						**2.713**	**59.3%**	**1.609**	**20,443**	**79**	**2.367**	**59.6%**	**1.410**	**23,982**	**59**	**2.458**	**59.1%**	**1.453**	**23,408**	**62**	**71**
157	North Beach Utilities	North Beach Utilities		Large	St. Johns	0.412	88.0%	0.363	3,295	110	0.410	88.0%	0.361	3,295	110	0.416	88.0%	0.366	3,295	111	105
324	Wildwood Water Company	Wildwood Water Company		Large	St. Johns	0.062	90.1%	0.056	911	61	0.059	90.1%	0.053	848	63	0.061	90.1%	0.055	848	65	78
1142	St Johns County Utilities	St Johns County Utilities	Was previously Intercoastal Utilities CUP 1213	Large	St. Johns	4.435	85.2%	3.779	23,531	161	4.080	85.2%	3.476	23,531	148	3.671	85.2%	3.128	25,353	123	155
1190	Pinkham Pacetti	Pinkham Pacetti	Pacetti's Marina & Campground	Small	St. Johns	0.008	100.0%	0.008	388	21	0.008	100.0%	0.008	312	26	0.008	100.0%	0.008	312	26	30
1198	St Johns County Utilities	St Johns County Utilities	Serves Eagle Creek - PWSID interconnection 2554353	Large	St. Johns	6.706	82.0%	5.499	71,289	77	6.390	82.0%	5.240	71,289	74	6.827	82.0%	5.598	62,677	89	81
1381	Comachee Cove Yacht Harbor	Comachee Cove Yacht Harbor		Small	St. Johns	0.025	21.1%	0.005	411	12	0.023	21.1%	0.005	411	12	0.023	21.1%	0.005	378	13	15
1386	Homeowners Utilities	Homeowners Utilities	Porpoise Point	Small	St. Johns	0.043	99.8%	0.043	237	181	0.035	99.8%	0.035	237	148	0.036	99.8%	0.036	237	152	195
1392	Town of Hastings	Town of Hastings		Large	St. Johns	0.081	42.7%	0.035	639	55	0.081	42.7%	0.035	593	59	0.080	42.7%	0.034	593	57	59
1423	St Johns County Board of County Commissioners	Fruit Cove Utilities	Fruit Cove Oaks. Was previously owned by Fruit Cove Properties Joint Venture.	Small	St. Johns	0.045	95.0%	0.043	461	93	0.043	95.0%	0.041	461	89	0.042	95.0%	0.040	369	108	97
50299	City of St. Augustine Utilities	City of St. Augustine Utilities		Large	St. Johns	3.094	58.4%	1.807	26,233	69	2.902	58.4%	1.695	28,207	60	2.946	58.4%	1.720	28,207	61	65
St. Johns Total						**14.911**	**78.0%**	**11.638**	**127,395**	**91**	**14.031**	**78.0%**	**10.949**	**129,184**	**85**	**14.110**	**77.9%**	**10.990**	**122,269**	**90**	**92**
	Town and Country RV Resort	Town and Country RV Resort		Small	Seminole	0.015	100.0%	0.015	263	57	0.015	100.0%	0.015	263	57	0.014	100.0%	0.014	263	53	60
	Spring Hammock MHP	Spring Hammock MHP		Small	Seminole	0.005	100.0%	0.005	86	58	0.005	100.0%	0.005	86	58	0.005	100.0%	0.005	86	58	56
160	Sanlando Utilities Corp.	Sanlando Utilities Corp.		Large	Seminole	6.231	76.0%	4.736	26,712	177	5.822	76.0%	4.425	26,712	166	6.011	76.0%	4.568	26,712	171	185
162	City of Sanford	City of Sanford		Large	Seminole	7.034	57.7%	4.059	54,606	74	6.114	57.7%	3.528	55,414	64	6.468	57.7%	3.732	55,414	67	70

Table B-6b, Continued. 2010-2014 Residential Water Use and Five-Year Residential Per Capita Averages for All Public Supply Permittees in the St. Johns River Water Management District.

CUP Number	Owner	Utility	Alternate Name	Utility Category	County	2010 Water Use	2010 % Household	2010 Household Use	2010 Population	2010 Residential GPCD	2011 Water Use	2011 % Household	2011 Household Use	2011 Population	2011 Residential GPCD
3766, 3769, 8213, 8356, 8359, 8361, 50281, 95581	Seminole County Environmental Services	Seminole County Environmental Services	Druid Hills, NE/NW/SW/SE Service Areas, Lake Harriet, Meridith Manor, Apple Valley, Lake Brantley. There are five additional PWSABs that do not have associated CUPs (Chase Grove Plant 42, Black Hammock, Sun Shadow, Dol-Ray Manor - old CUP 3769, Fern Park - Old FWS CUP 8360).	Large	Seminole	17.051	78.0%	13.300	121,579	109	17.191	78.0%	13.409	123,146	109
8229	Lake Harney Water Assoc Inc	Lake Harney Water Assoc Inc		Small	Seminole	0.044	93.1%	0.041	485	85	0.052	93.1%	0.048	485	99
8238	City of Winter Springs	City of Winter Springs	Tuscawilla Trails plant 3591394 owned by Winter Springs.	Large	Seminole	3.820	87.2%	3.331	35,996	93	3.795	87.2%	3.309	35,996	92
8252	City of Oviedo	City of Oviedo		Large	Seminole	4.017	78.0%	3.133	33,342	94	4.034	78.0%	3.147	33,815	93
8266	Palm Valley Manufactured Home Community	Hometown America	Palm Valley MHC	Large	Seminole	0.084	83.0%	0.070	1,128	62	0.082	83.0%	0.068	1,128	60
8271	Mullet Lake Water Association Inc	Mullet Lake Water System		Large	Seminole	0.054	95.0%	0.051	720	71	0.060	95.0%	0.057	711	80
8274	City of Longwood	City of Longwood		Large	Seminole	2.111	78.9%	1.666	14,501	115	1.959	78.9%	1.546	14,754	105
8282	City of Lake Mary	City of Lake Mary		Large	Seminole	2.910	42.0%	1.222	13,822	88	3.124	42.0%	1.312	13,868	95
8284	City of Casselberry	City of Casselberry		Large	Seminole	4.843	88.3%	4.276	49,979	86	4.557	88.3%	4.024	49,979	81
8345	Utilities Inc. of Florida	Utilities Inc. of Florida	Oakland Shores	Large	Seminole	0.068	88.8%	0.060	521	115	0.057	88.8%	0.051	521	98
8346	Utilities Inc. of Florida	Utilities Inc. of Florida	Weathersfield	Large	Seminole	0.353	88.8%	0.313	3,109	101	0.213	88.8%	0.189	3,075	61
8347	Utilities Inc. of Florida	Utilities Inc. of Florida	Jansen	Small	Seminole	0.064	93.0%	0.060	590	102	0.062	93.0%	0.058	510	114
8348	Utilities Inc. of Florida	Utilities Inc. of Florida	Bear Lake	Small	Seminole	0.051	88.0%	0.045	565	80	0.024	88.0%	0.021	566	37
8349	Utilities Inc. of Florida	Utilities Inc. of Florida	Little Wekiva	Small	Seminole	0.015	86.0%	0.013	157	83	0.012	86.0%	0.010	156	64
8350, 8351	Utilities Inc. of Florida	Utilities Inc. of Florida	Crystal Lake / Phillips	Small	Seminole	0.059	84.1%	0.050	452	111	0.054	84.1%	0.045	444	101
8352	Utilities Inc. of Florida	Utilities Inc. of Florida	Ravenna Park	Large	Seminole	0.073	81.5%	0.059	875	67	0.075	81.5%	0.061	864	71
8353	Utilities Inc. of Florida	Utilities Inc. of Florida	Park Ridge	Small	Seminole	0.017	88.0%	0.015	260	58	0.018	88.0%	0.016	260	62
8357	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Harmony Homes	Small	Seminole	0.010	89.0%	0.009	173	52	0.010	89.0%	0.009	171	53
8362	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Chuluota	Large	Seminole	0.635	80.0%	0.508	3,563	143	0.480	80.0%	0.384	3,596	107
8372	City of Altamonte Springs	City of Altamonte Springs		Large	Seminole	5.031	71.0%	3.572	55,251	65	4.808	71.0%	3.414	55,251	62
8462	Seminole Woods Assoc	Seminole Woods Assoc		Small	Seminole	0.076	96.8%	0.074	575	129	0.085	96.8%	0.082	569	144
50932	Twelve Oaks RV Resort	Twelve Oaks RV Resort		Small	Seminole	0.024	78.0%	0.019	359	53	0.026	78.0%	0.020	359	56
Seminole Total						**55.466**	**74.6%**	**41.405**	**414,757**	**100**	**53.758**	**74.4%**	**40.018**	**417,684**	**96**
382	City of Lake Helen	City of Lake Helen		Large	Volusia	0.291	67.2%	0.196	3,020	65	0.272	67.2%	0.183	3,020	61
4244	Town of Pierson	Town of Pierson		Large	Volusia	0.166	87.0%	0.144	2,657	54	0.088	87.0%	0.077	2,657	29
4385	Meadowlea Deland LLC	Meadowlea Deland LLC	Meadowlea Estates	Small	Volusia	0.044	100.0%	0.044	454	97	0.028	100.0%	0.028	454	62
4391	Lake Beresford Water Assoc. Inc.	Lake Beresford Water Assoc. Inc.		Large	Volusia	0.251	100.0%	0.251	1,925	130	0.177	100.0%	0.177	1,540	115
8528	City of Holly Hill	City of Holly Hill		Large	Volusia	1.053	65.9%	0.694	13,134	53	1.141	65.9%	0.752	13,134	57
8595	City of Port Orange	City of Port Orange	Also serves the Town of Ponce Inlet.	Large	Volusia	5.583	60.3%	3.367	63,072	53	5.751	60.3%	3.468	63,072	55
8658	City of Deltona	City of Deltona	Deltona Lakes	Large	Volusia	9.552	79.0%	7.546	85,370	88	9.306	79.0%	7.352	85,233	86
8747	Utilities Commission of New Smyrna Beach	Utilities Commission of New Smyrna Beach	Sugar Mill Country Club & Estates	Large	Volusia	4.521	66.0%	2.984	37,364	80	4.973	66.0%	3.282	37,568	87
8834	City of Daytona Beach	City of Daytona Beach		Large	Volusia	11.799	82.4%	9.722	71,395	136	11.988	82.4%	9.878	72,774	136
8932	City of Ormond Beach	City of Ormond Beach	All wells are in Volusia County.	Large	Volusia	6.590	68.2%	4.494	48,137	93	7.063	68.2%	4.817	48,630	99
9157	City of Edgewater	City of Edgewater		Large	Volusia	1.961	85.2%	1.671	21,460	78	1.968	85.2%	1.677	23,243	72
9165	Lakes of Pine Run Condominimum Assoc.	Lakes of Pine Run Condominimum Assoc.	Village of Pine Run Utility	Small	Volusia	0.033	63.0%	0.021	375	56	0.019	63.0%	0.012	300	40
9373	City of Orange City	City of Orange City		Large	Volusia	1.584	55.9%	0.885	10,599	83	1.555	55.9%	0.869	11,130	78
9385	NHC-FL6 LP	NHC-FL6 LP	Encore Super Park	Small	Volusia	0.022	90.0%	0.020	427	47	0.030	90.0%	0.027	427	63
50116	City of DeLand	City of DeLand		Large	Volusia	5.480	86.0%	4.713	43,023	110	5.560	86.0%	4.782	43,345	110
50157, 50659, 86278	Volusia County Utilities	Volusia County Utilities		Large	Volusia	3.652	77.1%	2.816	37,266	76	3.735	77.1%	2.880	37,582	77
86903	Eldorado Estates LLC	Eldorado Estates LLC		Small	Volusia	0.021	77.0%	0.016	232	69	0.017	77.0%	0.013	292	45
112981	D & E Water Resources, LLC	D & E Water Resources, LLC	Heart Island Water System	Large	Volusia	0.000	93.0%	0.000	0	0	0.000	93.0%	0.000	0	0
120858	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Twin Rivers	Small	Volusia	0.023	81.5%	0.019	193	98	0.019	81.5%	0.015	200	75
120859	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Tomoka View	Small	Volusia	0.039	87.7%	0.034	418	81	0.037	87.7%	0.032	450	71
Volusia Total						**52.665**	**75.3%**	**39.637**	**440,521**	**90**	**53.727**	**75.0%**	**40.321**	**445,051**	**91**
SJRWMD Total						**586.458**	**68.8%**	**403.250**	**4,024,316**	**100**	**591.036**	**68.7%**	**406.033**	**4,081,553**	**99**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2010-2014 water use obtained from SJRWMD Estimated Water Use Survey and USGS data.
4.) 2010-2014 population obtained from Technical Staff Reports, BEBR estimates of population, DEP MOR and Base Facility Report Data, parcel data and permittee surveys.
5.) 2010-2014 % household source obtained from Technical Staff Reports.
6.) Any missing years data or erroneous was obtained from Technical Staff Reports.
7.) ECFS totals shown here for Osceola County only include the wells and pumpage for houses, hunt camps, visitor centers, etc and only include SJRWMD portion.
8.) OCU and OUC values only include SJRWMD portion.

Table B-6b, Continued. 2010-2014 Residential Water Use and Five-Year Residential Per Capita Averages for All Public Supply Permittees in the St. Johns River Water Management District.

CUP Number	Owner	Utility	Alternate Name	Utility Category	County	2012 Water Use	2012 % Household	2012 Household Use	2012 Population	2012 Residential GPCD	2013 Water Use	2013 % Household	2013 Household Use	2013 Population	2013 Residential GPCD	2014 Water Use	2014 % Household	2014 Household Use	2014 Population	2014 Residential GPCD	2010-2014 Average Residential GPCD
3766, 3769, 8213, 8356, 8359, 8361, 50281, 95581	Seminole County Environmental Services	Seminole County Environmental Services	Druid Hills, NE/NW/SW/SE Service Areas, Lake Harriet, Meridith Manor, Apple Valley, Lake Brantley. There are five additional PWSABs that do not have associated CUPs (Chase Grove Plant 42, Black Hammock, Sun Shadow, Dol-Ray Manor - old CUP 3769, Fern Park - Old FWS CUP 8360).	Large	Seminole	16.020	78.0%	12.496	125,167	100	16.507	78.0%	12.875	125,407	103	15.489	78.0%	12.081	125,447	96	103
8229	Lake Harney Water Assoc Inc	Lake Harney Water Assoc Inc		Small	Seminole	0.032	93.1%	0.030	506	59	0.033	93.1%	0.031	506	61	0.032	93.1%	0.030	506	59	72
8238	City of Winter Springs	City of Winter Springs	Tuscawilla Trails plant 3591394 owned by Winter Springs.	Large	Seminole	3.652	87.2%	3.185	35,996	88	3.562	87.2%	3.106	35,996	86	3.230	87.2%	2.817	35,996	78	87
8252	City of Oviedo	City of Oviedo		Large	Seminole	3.911	78.0%	3.051	34,573	88	3.761	78.0%	2.934	35,620	82	3.823	78.0%	2.982	35,620	84	88
8266	Palm Valley Manufactured Home Community	Hometown America	Palm Valley MHC	Large	Seminole	0.078	83.0%	0.065	1,128	58	0.075	83.0%	0.062	1,128	55	0.070	83.0%	0.058	1,128	51	57
8271	Mullet Lake Water Association Inc	Mullet Lake Water System		Large	Seminole	0.055	95.0%	0.052	706	74	0.050	95.0%	0.048	706	68	0.055	95.0%	0.052	920	57	69
8274	City of Longwood	City of Longwood		Large	Seminole	1.864	78.9%	1.471	14,639	100	1.759	78.9%	1.388	14,697	94	1.676	78.9%	1.322	14,697	90	101
8282	City of Lake Mary	City of Lake Mary		Large	Seminole	3.113	42.0%	1.307	13,937	94	2.993	42.0%	1.257	14,069	89	2.771	42.0%	1.164	14,069	83	90
8284	City of Casselberry	City of Casselberry		Large	Seminole	4.332	88.3%	3.825	49,979	77	4.144	88.3%	3.659	49,979	73	3.990	88.3%	3.523	49,979	70	77
8345	Utilities Inc. of Florida	Utilities Inc. of Florida	Oakland Shores	Large	Seminole	0.062	88.8%	0.055	521	106	0.065	88.8%	0.058	569	102	0.052	88.8%	0.046	521	88	102
8346	Utilities Inc. of Florida	Utilities Inc. of Florida	Weathersfield	Large	Seminole	0.230	88.8%	0.204	3,051	67	0.211	88.8%	0.187	3,051	61	0.209	88.8%	0.186	3,051	61	70
8347	Utilities Inc. of Florida	Utilities Inc. of Florida	Jansen	Small	Seminole	0.065	93.0%	0.060	627	96	0.063	93.0%	0.059	627	94	0.057	93.0%	0.053	627	85	97
8348	Utilities Inc. of Florida	Utilities Inc. of Florida	Bear Lake	Small	Seminole	0.052	88.0%	0.046	562	82	0.055	88.0%	0.048	562	85	0.044	88.0%	0.039	562	69	71
8349	Utilities Inc. of Florida	Utilities Inc. of Florida	Little Wekiva	Small	Seminole	0.014	86.0%	0.012	154	78	0.014	86.0%	0.012	154	78	0.014	86.0%	0.012	154	78	76
8350, 8351	Utilities Inc. of Florida	Utilities Inc. of Florida	Crystal Lake / Phillips	Small	Seminole	0.050	84.1%	0.042	440	95	0.041	84.1%	0.034	440	77	0.013	84.1%	0.011	440	25	82
8352	Utilities Inc. of Florida	Utilities Inc. of Florida	Ravenna Park	Large	Seminole	0.073	81.5%	0.059	858	69	0.073	81.5%	0.059	858	69	0.064	81.5%	0.052	858	61	67
8353	Utilities Inc. of Florida	Utilities Inc. of Florida	Park Ridge	Small	Seminole	0.021	88.0%	0.018	260	69	0.024	88.0%	0.021	246	85	0.016	88.0%	0.014	246	57	66
8357	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Harmony Homes	Small	Seminole	0.010	89.0%	0.009	170	53	0.010	89.0%	0.009	170	53	0.009	89.0%	0.008	170	47	52
8362	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Chuluota	Large	Seminole	0.469	80.0%	0.375	3,567	105	0.493	80.0%	0.394	3,567	110	0.406	80.0%	0.325	3,863	84	109
8372	City of Altamonte Springs	City of Altamonte Springs		Large	Seminole	5.180	71.0%	3.678	55,251	67	5.008	71.0%	3.556	55,251	64	5.148	71.0%	3.655	55,251	66	65
8462	Seminole Woods Assoc	Seminole Woods Assoc		Small	Seminole	0.054	96.8%	0.052	564	92	0.051	96.8%	0.049	564	87	0.059	96.8%	0.057	564	101	111
50932	Twelve Oaks RV Resort	Twelve Oaks RV Resort		Small	Seminole	0.021	78.0%	0.016	359	45	0.020	78.0%	0.016	359	45	0.020	78.0%	0.016	359	45	48
Seminole Total						**52.643**	**73.9%**	**38.923**	**424,682**	**92**	**50.968**	**74.2%**	**37.835**	**427,001**	**89**	**49.745**	**74.0%**	**36.822**	**427,503**	**86**	**92**
382	City of Lake Helen	City of Lake Helen		Large	Volusia	0.262	67.2%	0.176	3,020	58	0.243	67.2%	0.163	3,020	54	0.229	67.2%	0.154	2,700	57	59
4244	Town of Pierson	Town of Pierson		Large	Volusia	0.134	87.0%	0.117	2,657	44	0.131	87.0%	0.114	2,657	43	0.111	87.0%	0.097	2,657	37	41
4385	Meadowlea Deland LLC	Meadowlea Deland LLC	Meadowlea Estates	Small	Volusia	0.016	100.0%	0.016	454	35	0.028	100.0%	0.028	462	61	0.028	100.0%	0.028	438	64	64
4391	Lake Beresford Water Assoc. Inc.	Lake Beresford Water Assoc. Inc.		Large	Volusia	0.166	100.0%	0.166	1,540	108	0.127	100.0%	0.127	1,540	82	0.134	100.0%	0.134	1,857	72	102
8528	City of Holly Hill	City of Holly Hill		Large	Volusia	1.129	65.9%	0.744	13,134	57	1.246	65.9%	0.821	13,924	59	1.128	65.9%	0.743	13,924	53	56
8595	City of Port Orange	City of Port Orange	Also serves the Town of Ponce Inlet.	Large	Volusia	5.782	60.3%	3.487	63,072	55	5.797	60.3%	3.496	63,072	55	5.774	60.3%	3.482	66,913	52	54
8658	City of Deltona	City of Deltona	Deltona Lakes	Large	Volusia	8.422	79.0%	6.653	85,281	78	7.972	79.0%	6.298	76,293	83	7.230	79.0%	5.712	75,322	76	82
8747	Utilities Commission of New Smyrna Beach	Utilities Commission of New Smyrna Beach	Sugar Mill Country Club & Estates	Large	Volusia	4.499	66.0%	2.969	37,692	79	5.179	66.0%	3.418	37,692	91	4.658	66.0%	3.074	37,962	81	84
8834	City of Daytona Beach	City of Daytona Beach		Large	Volusia	12.024	82.4%	9.908	72,773	136	12.681	82.4%	10.449	74,068	141	13.091	82.4%	10.787	74,068	146	139
8932	City of Ormond Beach	City of Ormond Beach	All wells are in Volusia County.	Large	Volusia	7.033	68.2%	4.797	51,921	92	6.268	68.2%	4.275	50,852	84	5.728	68.2%	3.906	49,300	79	90
9157	City of Edgewater	City of Edgewater		Large	Volusia	1.884	85.2%	1.605	23,243	69	1.993	85.2%	1.698	23,243	73	1.858	85.2%	1.583	23,476	67	72
9165	Lakes of Pine Run Condominimum Assoc.	Lakes of Pine Run Condominimum Assoc.	Village of Pine Run Utility	Small	Volusia	0.024	63.0%	0.015	268	56	0.020	63.0%	0.013	268	49	0.019	63.0%	0.012	258	47	50
9373	City of Orange City	City of Orange City		Large	Volusia	1.581	55.9%	0.884	11,130	79	1.491	55.9%	0.833	11,684	71	1.795	55.9%	1.003	10,969	91	81
9385	NHC-FL6 LP	NHC-FL6 LP	Encore Super Park	Small	Volusia	0.018	90.0%	0.016	427	37	0.026	90.0%	0.023	427	54	0.021	90.0%	0.019	427	44	49
50116	City of DeLand	City of DeLand		Large	Volusia	4.925	86.0%	4.236	42,743	99	4.922	86.0%	4.233	48,195	88	4.686	86.0%	4.030	48,420	83	97
50157, 50659, 86278	Volusia County Utilities	Volusia County Utilities		Large	Volusia	3.467	77.1%	2.673	37,852	71	3.664	77.1%	2.825	37,852	75	3.863	77.1%	2.978	37,852	79	75
86903	Eldorado Estates LLC	Eldorado Estates LLC		Small	Volusia	0.021	77.0%	0.016	303	53	0.018	77.0%	0.014	303	46	0.019	77.0%	0.015	263	57	53
112981	D & E Water Resources, LLC	D & E Water Resources, LLC	Heart Island Water System	Large	Volusia	0.000	93.0%	0.000	0	0	0.000	93.0%	0.000	0	0	0.000	93.0%	0.000	0	0	0
120858	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Twin Rivers	Small	Volusia	0.009	81.5%	0.007	200	35	0.018	81.5%	0.015	200	75	0.019	81.5%	0.015	200	75	72
120859	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Tomoka View	Small	Volusia	0.032	87.7%	0.028	450	62	0.035	87.7%	0.031	450	69	0.040	87.7%	0.035	488	72	71
Volusia Total						**51.428**	**74.9%**	**38.513**	**448,160**	**86**	**51.859**	**75.0%**	**38.874**	**446,202**	**87**	**50.431**	**75.0%**	**37.807**	**447,494**	**84**	**88**
SJRWMD Total						**573.862**	**68.4%**	**392.586**	**4,132,000**	**95**	**552.795**	**68.6%**	**379.116**	**4,174,836**	**91**	**546.958**	**68.3%**	**373.702**	**4,120,309**	**91**	**95**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2010-2014 water use obtained from SJRWMD Estimated Water Use Survey and USGS data.
4.) 2010-2014 population obtained from Technical Staff Reports, BEBR estimates of population, DEP MOR and Base Facility Report Data, parcel data and permittee surveys.
5.) 2010-2014 % household source - I:\WSM\workspace\Water_Use\Water Use 2010\7-Population_2010\AWUS 2010 Population Figures_LATEST_August17-2011.
6.) Any missing years data or erroneous was obtained from Technical Staff Reports.
7.) ECFS totals shown here for Osceola County only include the wells and pumpage for houses, hunt camps, visitor centers, etc and only include SJRWMD portion.
8.) OCU and OUC values only include SJRWMD portion.

Table B-6c (NFRWSP). Small Public Supply Population Served and Water Use for 2010, Small Public Supply Population Projections 2015-2035, 5-in-10 Year Water Demand Projections for 2015-2035 and 1-in-10 Year Water Demand Projections for 2035 by County and Utility, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	Utility	CUP Number	Population Served	Population Projections					2010 % of County Total	Percent Change 2010-2035	Water Use			Demand Projections (5-in-10)															Percent Change 2010-2035	2010-2014 Avg GPCD	Demand Projections (1-in-10)		
											2010			2015			2020			2025			2030			2035					2035		
			2010	2015	2020	2025	2030	2035			GW	SW	Total	GW	SW	Total	GW	SW	Total	GW	SW	Total	GW	SW	Total	GW	SW	Total			GW	SW	Total
Alachua - SRWMD	Lake Alto Estates Association, Inc.	220503	192	195	205	214	222	231	0.44%	20%	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0%	55	0.01	0.00	0.01
	SRWMD Alachua Total		**192**	**195**	**205**	**214**	**222**	**231**	**N/A**	**20%**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0%**	**N/A**	**0.01**	**0.00**	**0.01**
Bradford - SRWMD	City of Hampton	220481	500	484	498	512	524	535	2.20%	7%	0.07	0.00	0.07	0.06	0.00	0.06	0.06	0.00	0.06	0.07	0.00	0.07	0.07	0.00	0.07	0.07	0.00	0.07	0%	127	0.07	0.00	0.07
	Town of Brooker	2-84-00541	338	328	337	347	355	362	1.49%	7%	0.05	0.00	0.05	0.04	0.00	0.04	0.05	0.00	0.05	0.05	0.00	0.05	0.05	0.00	0.05	0.05	0.00	0.05	0%	136	0.05	0.00	0.05
	SRWMD Baker Total		**838**	**812**	**835**	**859**	**879**	**897**	**N/A**	**7%**	**0.12**	**0.00**	**0.12**	**0.10**	**0.00**	**0.10**	**0.11**	**0.00**	**0.11**	**0.12**	**0.00**	**0.12**	**0.12**	**0.00**	**0.12**	**0.12**	**0.00**	**0.12**	**0%**	**N/A**	**0.12**	**0.00**	**0.12**
Clay - SJRWMD	Penney Retirement Community Inc	497	202	202	202	202	202	202	0.11%	N/A	0.05	0.00	0.05	0.05	0.00	0.05	0.05	0.00	0.05	0.05	0.00	0.05	0.05	0.00	0.05	0.05	0.00	0.05	N/A	238	0.05	0.00	0.05
	Penney Farms Water Utility Enterprise	509	488	525	584	642	698	750	0.26%	54%	0.04	0.00	0.04	0.04	0.00	0.04	0.04	0.00	0.04	0.05	0.00	0.05	0.05	0.00	0.05	0.06	0.00	0.06	50%	75	0.06	0.00	0.06
	Green Cove Springs LP	527	1,000	1,000	1,000	1,000	1,000	1,000	0.52%	0%	0.12	0.00	0.12	0.11	0.00	0.11	0.11	0.00	0.11	0.11	0.00	0.11	0.11	0.00	0.11	0.11	0.00	0.11	-8%	111	0.12	0.00	0.12
	SJRWMD Clay Total		**1,690**	**1,727**	**1,786**	**1,844**	**1,900**	**1,952**	**N/A**	**16%**	**0.21**	**0.00**	**0.21**	**0.20**	**0.00**	**0.20**	**0.20**	**0.00**	**0.20**	**0.21**	**0.00**	**0.21**	**0.21**	**0.00**	**0.21**	**0.22**	**0.00**	**0.22**	**5%**	**N/A**	**0.23**	**0.00**	**0.23**
Columbia - SRWMD	Town of Fort White	218347	567	**575**	**605**	**634**	**660**	**682**	**0.84%**	20%	0.09	0.00	0.09	0.08	0.00	0.08	0.09	0.00	0.09	0.09	0.00	0.09	0.10	0.00	0.10	0.10	0.00	0.10	11%	146	0.11	0.00	0.11
	SRWMD Columbia Total		**567**	**575**	**605**	**634**	**660**	**682**	**N/A**	**20%**	**0.09**	**0.00**	**0.09**	**0.08**	**0.00**	**0.08**	**0.09**	**0.00**	**0.09**	**0.09**	**0.00**	**0.09**	**0.10**	**0.00**	**0.10**	**0.10**	**0.00**	**0.10**	**11%**	**N/A**	**0.11**	**0.00**	**0.11**
Flagler - SJRWMD	Holiday Travel Park Co-op Inc	1979	369	369	369	369	369	369	0.39%	0%	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0%	26	0.01	0.00	0.01
	SJRWMD Flagler Total		**369**	**369**	**369**	**369**	**369**	**369**	**N/A**	**0%**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0%**	**N/A**	**0.01**	**0.00**	**0.01**
Nassau - SJRWMD	Bobby Dollison	925	114	123	135	147	159	169	0.16%	48%	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0%	72	0.01	0.00	0.01
	SJRWMD Nassau Total		**114**	**123**	**135**	**147**	**159**	**169**	**N/A**	**48%**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.01**	**0%**	**N/A**	**0.01**	**0.00**	**0.01**
Putnam - SJRWMD	Aqua Utilities of Florida, Inc.	7982	219	219	219	219	219	219	0.29%	0%	0.02	0.00	0.02	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	-50%	67	0.01	0.00	0.01
	Aqua Utilities of Florida, Inc.	7986	620	603	607	610	613	616	0.83%	-1%	0.03	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.03	0%	50	0.03	0.00	0.03
	Kirkwood Estates	8071	47	44	44	44	44	45	0.06%	-4%	0.02	0.00	0.02	0.02	0.00	0.02	0.02	0.00	0.02	0.02	0.00	0.02	0.02	0.00	0.02	0.02	0.00	0.02	0%	489	0.02	0.00	0.02
	Lake Como Water Assoc	8072	373	363	366	368	369	371	0.50%	-1%	0.04	0.00	0.04	0.04	0.00	0.04	0.04	0.00	0.04	0.04	0.00	0.04	0.04	0.00	0.04	0.04	0.00	0.04	0%	102	0.04	0.00	0.04
	Hiawatha Management Inc	8124	145	138	139	140	140	141	0.19%	-3%	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0%	69	0.01	0.00	0.01
	St Johns Harbor Water Association	90227	358	348	351	353	354	356	0.48%	-1%	0.01	0.00	0.01	0.02	0.00	0.02	0.02	0.00	0.02	0.02	0.00	0.02	0.02	0.00	0.02	0.02	0.00	0.02	100%	47	0.02	0.00	0.02
	Aqua Utilities of Florida, Inc.	8127	218	218	218	218	218	218	0.29%	0%	0.03	0.00	0.03	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	-67%	62	0.01	0.00	0.01
	Aqua Utilities of Florida, Inc.		205	203	205	206	207	208	0.28%	1%	0.02	0.00	0.02	0.02	0.00	0.02	0.02	0.00	0.02	0.02	0.00	0.02	0.02	0.00	0.02	0.02	0.00	0.02	N/A	91	0.02	0.00	0.02
	Aqua Utilities of Florida, Inc.		474	465	468	470	472	475	0.64%	0%	0.03	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.03	0%	54	0.03	0.00	0.03
	Aqua Utilities of Florida, Inc.		215	211	212	213	214	215	0.29%	0%	0.03	0.00	0.03	0.04	0.00	0.04	0.04	0.00	0.04	0.04	0.00	0.04	0.04	0.00	0.04	0.04	0.00	0.04	0%	170	0.04	0.00	0.04
	River Villas Inc		150	150	150	150	150	150	0.20%	0%	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-100%	31	0.00	0.00	0.00
	SJRWMD Putnam Total		**3,024**	**2,962**	**2,979**	**2,991**	**3,000**	**3,014**	**N/A**	**0%**	**0.25**	**0.00**	**0.25**	**0.23**	**0.00**	**0.23**	**0.23**	**0.00**	**0.23**	**0.23**	**0.00**	**0.23**	**0.23**	**0.00**	**0.23**	**0.23**	**0.00**	**0.23**	**-8%**	**N/A**	**0.24**	**0.00**	**0.24**
St. Johns - SJRWMD	Pinkham Pacetti	1190	345	345	345	345	345	345	0.18%	0%	0.02	0.00	0.02	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0%	30	0.01	0.00	0.01
	Comachee Cove Yacht Harbor	1381	378	378	378	378	378	378	0.20%	0%	0.04	0.00	0.04	0.03	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.03	-25%	71	0.03	0.00	0.03
	Homeowners Utilities	1386	232	258	278	278	278	278	0.12%	20%	0.07	0.00	0.07	0.05	0.00	0.05	0.05	0.00	0.05	0.05	0.00	0.05	0.05	0.00	0.05	0.05	0.00	0.05	-29%	195	0.05	0.00	0.05
	Fruit Cove Utilities	1423	344	369	369	369	369	369	0.18%	7%	0.03	0.00	0.03	0.04	0.00	0.04	0.04	0.00	0.04	0.04	0.00	0.04	0.04	0.00	0.04	0.04	0.00	0.04	33%	102	0.04	0.00	0.04
	SJRWMD St. Johns Total		**1,299**	**1,350**	**1,370**	**1,370**	**1,370**	**1,370**	**N/A**	**5%**	**0.16**	**0.00**	**0.16**	**0.13**	**0.00**	**0.13**	**0.13**	**0.00**	**0.13**	**0.13**	**0.00**	**0.13**	**0.13**	**0.00**	**0.13**	**0.13**	**0.00**	**0.13**	**-19%**	**N/A**	**0.14**	**0.00**	**0.14**
Suwannee - SRWMD	Wayne Frier Mobile Home Park & Sales	2-85-00149	295	295	295	295	295	295	0.71%	0%	0.03	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.03	0.03	0.00	0.03	0%	106	0.03	0.00	0.03
	SRWMD Suwannee Total		**295**	**295**	**295**	**295**	**295**	**295**	**N/A**	**0%**	**0.03**	**0.00**	**0.03**	**0.03**	**0.00**	**0.03**	**0.03**	**0.00**	**0.03**	**0.03**	**0.00**	**0.03**	**0.03**	**0.00**	**0.03**	**0.03**	**0.00**	**0.03**	**0%**	**N/A**	**0.03**	**0.00**	**0.03**
SJRWMD Region 1 Total			**6,496**	**6,531**	**6,639**	**6,721**	**6,798**	**6,874**	**N/A**	**6%**	**0.63**	**0.00**	**0.63**	**0.58**	**0.00**	**0.58**	**0.58**	**0.00**	**0.58**	**0.59**	**0.00**	**0.59**	**0.59**	**0.00**	**0.59**	**0.60**	**0.00**	**0.60**	**-5%**	**N/A**	**0.63**	**0.00**	**0.63**
SRWMD NFRWSP Total			**1,892**	**1,877**	**1,940**	**2,002**	**2,056**	**2,105**	**N/A**	**11%**	**0.25**	**0.00**	**0.25**	**0.22**	**0.00**	**0.22**	**0.24**	**0.00**	**0.24**	**0.25**	**0.00**	**0.25**	**0.26**	**0.00**	**0.26**	**0.26**	**0.00**	**0.26**	**4%**	**N/A**	**0.27**	**0.00**	**0.27**
NFRWSP Total			**8,388**	**8,408**	**8,579**	**8,723**	**8,854**	**8,979**	**N/A**	**7%**	**0.88**	**0.00**	**0.88**	**0.80**	**0.00**	**0.80**	**0.82**	**0.00**	**0.82**	**0.84**	**0.00**	**0.84**	**0.85**	**0.00**	**0.85**	**0.86**	**0.00**	**0.86**	**-2%**	**N/A**	**0.90**	**0.00**	**0.90**

Notes:

1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) Projected county population for years 2010 - 2035 are based on BEBR Medium Projections from Volume 48, Bulletin 171, Published April 2015.
4.) Population projections shown here are permanent population projections only and do not include any factors such as seasonal residents, tourist population or net commuter population.
5.) Per capita used to calculate demand projections is an average from 2010 - 2014 and is calculated as (Total Water Use / Total Estimated Population). This per capita is commonly referred to as a gross per capita, as it includes all uses within a utility.
6.) 1-in-10 rainfall year demand for 2035 calculated as an additional 6 percent of 2035 average demand.
7.) SW quantities were obtained from permits.

Table B-6d. (NFRWSP). 2010-2014 Water Use, Population Served and Five-Year Gross Per Capita Averages for Public Supply Permitted Smaller than 0.10 mgd in the St. Johns River Water Management District and Suwannee River Water Management District.

Cup Number	Owner	Utility	Alternate Name / Comments	County	Water Use 2010	Water Use 2011	Water Use 2012	Water Use 2013	Water Use 2014	Population 2010	Population 2011	Population 2012	Population 2013	Population 2014	2010-2014 Avg GPCD	Notes
220503	Lake Alto Estates Association Inc.	46		Alachua	0.012	0.012	0.011	0.010	0.009	192	196	200	200	200	55	
	SRWMD Alachua Total				**0.012**	**0.012**	**0.011**	**0.010**	**0.009**	**192**	**196**	**200**	**200**	**200**	55	
220481	City of Hampton	26		Bradford	0.072	0.073	0.072	0.052	0.042	500	490	477	492	497	127	
2-84-00541	Town of Brooker	541		Bradford	0.050	0.042	0.046	0.041	0.043	338	327	331	318	318	136	
	SRWMD Bradford Total				**0.122**	**0.115**	**0.118**	**0.093**	**0.085**	**838**	**817**	**808**	**810**	**815**	130	
497	Penney Retirement Community Inc	Penney Retirement Community Inc	Penney Retirement Community	Clay	0.050	0.051	0.052	0.044	0.043	202	202	202	202	202	238	
509	Penney Farms Water Utility Enterprise	Penney Farms Water Utility Enterprise	Town of Penney Farms	Clay	0.042	0.041	0.037	0.032	0.031	488	488	488	495	495	75	
527	Green Cove Springs LP	Green Cove Springs LP	St Johns Landing	Clay	0.122	0.129	0.132	0.107	0.082	1,000	1,000	1,087	1,084	1,000	111	
	SJRWMD Clay Total				**0.214**	**0.221**	**0.221**	**0.183**	**0.156**	**1,690**	**1,690**	**1,777**	**1,781**	**1,697**	**115**	
218347	Town of Fort White	87		Columbia	0.092	0.087	0.071	0.072	0.087	567	565	570	558	550	146	
	SRWMD Columbia Total				**0.092**	**0.087**	**0.071**	**0.072**	**0.087**	**567**	**565**	**570**	**558**	**550**	**146**	
1979	Holiday Travel Park Co-op Inc	Holiday Travel Park Co-op Inc	Holiday Travel Park	Flagler	0.012	0.011	0.005	0.010	0.010	369	369	369	380	380	26	
	SJRWMD Flager Total				**0.012**	**0.011**	**0.005**	**0.010**	**0.010**	**369**	**369**	**369**	**380**	**380**	26	
925	Bobby Dollison	Bobby Dollison	American Beach	Nassau	0.001	0.001	0.013	0.013	0.013	114	114	114	114	114	72	
	SJRWMD Nassau Total				**0.001**	**0.001**	**0.013**	**0.013**	**0.013**	**114**	**114**	**114**	**114**	**114**	**72**	
7982	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	River Grove	Putnam	0.015	0.016	0.015	0.015	0.015	219	219	219	265	219	67	
7986	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Park Manor- Interlachen Lake Estates	Putnam	0.031	0.029	0.031	0.035	0.030	620	622	622	622	622	50	
8071	Hilltop Farms Inc	Kirkwood Estates		Putnam	0.022	0.009	0.037	0.037	0.009	47	47	47	47	45	489	
8072	Lake Como Water Assoc	Lake Como Water Assoc	Village of Lake Como	Putnam	0.037	0.028	0.046	0.028	0.052	373	374	374	374	374	102	
8124	Hiawatha Management Inc	Hiawatha Management Inc	Hiawatha Management	Putnam	0.010	0.010	0.010	0.010	0.010	145	145	145	145	145	69	
8127	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Palm Port	Putnam	0.012	0.011	0.010	0.010	0.010	218	218	218	265	218	47	
90227	St Johns Harbor Water Association	St Johns Harbor Water Association	CUP # 90227 was in house, but never issued - "No permit required."	Putnam	0.027	0.026	0.022	0.019	0.018	358	360	360	360	360	62	
	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Wootens MHP (PWSID 2541280), Beechers Point (2540070) do not have any record of CUPs. Two other PWSABs have expired CUPs # 64974 (Silver Lake Oaks - PWSID 2544258) and 82918 (Saratoga - PWSIDs 2541008, 2541242).	Putnam	0.019	0.021	0.020	0.017	0.016	205	205	205	205	205	91	
	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Pomona Park	Putnam	0.032	0.027	0.023	0.022	0.023	474	476	467	467	467	54	
	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	CUPs 7984 (Hermits Cove - PWSID 2540482) and 7988 (St Johns Highlands / Hermits Cove - PWSID 2540482) expired in 1992 and were not renewed - "No permit required." St Johns River Club Utilities PWSID 2544266 does not have any record of a CUP.	Putnam	0.029	0.035	0.040	0.039	0.040	215	215	215	215	215	170	
	Mr. W. Herrington	River Villas Inc	CUP 8129 was closed in 2003, no permit required.	Putnam	0.006	0.005	0.003	0.005	0.005	150	150	164	164	150	31	
	SJRWMD Putnam Total				**0.240**	**0.217**	**0.257**	**0.237**	**0.228**	**3,024**	**3,031**	**3,036**	**3,129**	**3,020**	**77**	
1190	Pinkham Pacetti	Pinkham Pacetti	Pacetti's Marina & Campground	St. Johns	0.019	0.009	0.008	0.008	0.008	345	401	388	312	312	30	
1381	Comachee Cove Yacht Harbor	Comachee Cove Yacht Harbor		St. Johns	0.038	0.031	0.025	0.023	0.023	378	386	411	411	378	71	
1386	Homeowners Utilities	Homeowners Utilities	Porpoise Point	St. Johns	0.069	0.047	0.043	0.035	0.036	232	237	237	237	237	195	
1423	St Johns County Board of County Commis	Fruit Cove Utilities	Fruit Cove Oaks. Was previously owned by Fruit Cove Properties Joint Venture.	St. Johns	0.031	0.041	0.045	0.043	0.042	344	351	461	461	369	102	
	SJRWMD St. Johns Total				**0.157**	**0.128**	**0.121**	**0.109**	**0.109**	**1,299**	**1,375**	**1,497**	**1,421**	**1,296**	**91**	
2-85-00149	Wayne Frier Mobile Home Park & Sales	149		Suwannee	0.032	0.033	0.031	0.034	0.026	295	295	295	295	295	106	
	SRWMD Suwannee Total				**0.032**	**0.033**	**0.031**	**0.034**	**0.026**	**295**	**295**	**295**	**295**	**295**	**106**	
	SJRWMD Region 1 Total				**0.624**	**0.578**	**0.617**	**0.552**	**0.516**	**6,496**	**6,579**	**6,793**	**6,825**	**6,507**	**87**	
	SRWMD NFRWSP Total				**0.258**	**0.247**	**0.231**	**0.209**	**0.207**	**1,892**	**1,873**	**1,873**	**1,863**	**1,860**	**123**	
	NFRWSP Total				**0.882**	**0.825**	**0.848**	**0.761**	**0.723**	**8,388**	**8,452**	**8,666**	**8,688**	**8,367**	**95**	

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2010-2014 water use obtained from SJRWMD Estimated Water Use Survey, SJRWMD metered EN50 data, DEP MOR data and USGS data.
4.) 2010-2014 population obtained from Technical Staff Reports, BEBR estimates of population, DEP MOR and Base Facility Report Data, parcel data and permittee surveys.

Table B-7 (NFRWSP). Agricultural Irrigation Self-supply Water Use, Miscellaneous Agricultural Water Use and Acreage for 2010, 5-in-10 Year Water Demand Projections for 2015-2035, Acreage Projections for 2015-2035, 1-in-10 Year Water Demand Projections for 2035 by County, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Water Use			Demand Projections (5-in-10)															Percent Change	Acreage	Acreage Projections					Percent Change	Demand Projections (1-in-10)		
		2010			2015			2020			2025			2030			2035			2010-2035	2010	2015	2020	2025	2030	2035	2010-2035	2035		
		Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total									Ground	Surface	Total
Alachua	SJRWMD	2.54	0.01	2.55	3.60	0.01	3.61	4.07	0.02	4.09	4.28	0.02	4.30	4.77	0.02	4.79	5.35	0.02	5.37	111%	2,476	2,679	3,135	3,313	3,725	4,175	69%	6.09	0.02	6.11
Alachua	SRWMD	14.21	0.34	14.55	11.94	0.29	12.23	12.56	0.30	12.86	13.04	0.31	13.35	13.44	0.32	13.76	13.82	0.33	14.15	-3%	8,951	12,588	13,205	13,840	14,176	14,491	62%	15.84	0.38	16.22
Alachua	**Total**	**16.75**	**0.35**	**17.10**	**15.54**	**0.30**	**15.84**	**16.63**	**0.32**	**16.95**	**17.32**	**0.33**	**17.65**	**18.21**	**0.34**	**18.55**	**19.17**	**0.35**	**19.52**	**14%**	**11,427**	**15,267**	**16,340**	**17,153**	**17,901**	**18,666**	**63%**	**21.93**	**0.40**	**22.33**
Baker	SJRWMD	0.93	0.24	1.17	0.47	0.12	0.59	0.52	0.13	0.65	0.52	0.13	0.65	0.56	0.14	0.70	0.59	0.15	0.74	-37%	276	283	335	340	366	404	46%	0.59	0.15	0.74
Baker	SRWMD	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01	N/A	0	0	0	0	0	0	0%	0.01	0.00	0.01
Baker	**Total**	**0.93**	**0.24**	**1.17**	**0.48**	**0.12**	**0.60**	**0.53**	**0.13**	**0.66**	**0.53**	**0.13**	**0.66**	**0.57**	**0.14**	**0.71**	**0.60**	**0.15**	**0.75**	**-36%**	**276**	**283**	**335**	**340**	**366**	**404**	**46%**	**0.60**	**0.15**	**0.75**
Bradford	SJRWMD	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.08	0.00	0.08	0.08	0.00	0.08	0.08	0.00	0.08	N/A	0	0	69	69	69	69	N/A	0.09	0.00	0.09
Bradford	SRWMD	1.06	0.21	1.27	1.09	0.21	1.30	1.12	0.22	1.34	1.12	0.22	1.34	1.12	0.22	1.34	1.12	0.22	1.34	6%	716	1,030	1,064	1,064	1064	1,064	49%	1.26	0.25	1.51
Bradford	**Total**	**1.06**	**0.21**	**1.27**	**1.09**	**0.21**	**1.30**	**1.20**	**0.22**	**1.42**	**1.20**	**0.22**	**1.42**	**1.20**	**0.22**	**1.42**	**1.20**	**0.22**	**1.42**	**12%**	**716**	**1,030**	**1,133**	**1,133**	**1133**	**1,133**	**58%**	**1.35**	**0.25**	**1.60**
Clay	SJRWMD	0.62	0.27	0.89	1.03	0.45	1.48	1.32	0.58	1.90	1.54	0.67	2.21	1.69	0.73	2.42	1.99	0.86	2.85	220%	1,361	775	1,114	1,424	1,604	1,979	45%	2.26	0.99	3.25
Columbia	SRWMD	3.92	0.31	4.23	4.20	0.33	4.53	7.62	0.60	8.22	10.43	0.83	11.26	13.35	1.06	14.41	16.13	1.28	17.41	312%	3,778	5,010	8,081	10,831	13,577	16,479	336%	18.50	1.46	19.96
Duval	SJRWMD	1.32	2.10	3.42	0.67	1.06	1.73	0.56	0.90	1.46	0.47	0.74	1.21	0.32	0.52	0.84	0.15	0.23	0.38	-89%	1,298	1,288	1,008	776	528	260	-80%	0.16	0.26	0.42
Flagler	SJRWMD	8.20	0.60	8.80	11.91	0.87	12.78	10.04	0.73	10.77	8.52	0.62	9.14	7.06	0.52	7.58	5.55	0.41	5.96	-32%	6,127	10,907	9,153	7,487	5,818	4,167	-32%	6.38	0.47	6.85
Gilchrist	SRWMD	7.58	2.13	9.71	10.09	2.84	12.93	10.49	2.95	13.44	10.71	3.01	13.72	11.12	3.13	14.25	11.49	3.23	14.72	52%	8,235	13,378	13,877	14,140	14,535	14,947	82%	12.96	3.64	16.60
Hamilton	SRWMD	11.42	0.14	11.56	10.44	0.13	10.57	10.53	0.13	10.66	10.61	0.13	10.74	10.90	0.13	11.03	11.21	0.14	11.35	-2%	8,272	11,708	11,859	11,911	11,950	12,134	47%	12.86	0.16	13.02
Nassau	SJRWMD	0.44	0.17	0.61	0.75	0.29	1.04	0.56	0.21	0.77	0.22	0.09	0.31	0.21	0.08	0.29	0.21	0.08	0.29	-52%	883	825	604	8	0	0	-100%	0.21	0.08	0.29
Putnam	SJRWMD	18.96	1.74	20.70	14.41	1.32	15.73	12.61	1.16	13.77	11.30	1.04	12.34	10.09	0.93	11.02	8.67	0.80	9.47	-54%	11,728	11,943	10,550	9,198	7,855	6,487	-45%	9.93	0.91	10.84
St. Johns	SJRWMD	23.62	1.01	24.63	27.39	1.17	28.56	26.02	1.11	27.13	25.86	1.11	26.97	26.90	1.15	28.05	27.27	1.17	28.44	15%	24,889	24,050	22,989	22,174	21,261	20,432	-18%	31.35	1.34	32.69
Suwannee	SRWMD	28.51	1.65	30.16	27.39	1.58	28.97	28.97	1.68	30.65	32.01	1.85	33.86	34.81	2.01	36.82	37.51	2.17	39.68	32%	23,629	30,657	32,126	35,345	37,714	40,092	70%	42.77	2.48	45.25
Union	SRWMD	0.64	0.12	0.76	1.41	0.26	1.67	1.36	0.25	1.61	1.23	0.23	1.46	1.19	0.22	1.41	1.13	0.21	1.34	76%	1,206	1,242	1,166	1,050	990	927	-23%	1.30	0.24	1.54
SJRWMD Region 1 Total		**56.63**	**6.14**	**62.77**	**60.23**	**5.29**	**65.52**	**55.78**	**4.84**	**60.62**	**52.79**	**4.42**	**57.21**	**51.68**	**4.09**	**55.77**	**49.86**	**3.72**	**53.58**	**-15%**	**49,038**	**52,750**	**48,957**	**44,789**	**41,226**	**37,973**	**-23%**	**57.06**	**4.22**	**61.28**
SRWMD NFRWSP Total		**67.34**	**4.90**	**72.24**	**66.57**	**5.64**	**72.21**	**72.66**	**6.13**	**78.79**	**79.16**	**6.58**	**85.74**	**85.94**	**7.09**	**93.03**	**92.42**	**7.58**	**100.00**	**38%**	**54,787**	**75,613**	**81,378**	**88,181**	**94,006**	**100,134**	**83%**	**105.50**	**8.61**	**114.11**
NFRWSP Total		**123.97**	**11.04**	**135.01**	**126.80**	**10.93**	**137.73**	**128.44**	**10.97**	**139.41**	**131.95**	**11.00**	**142.95**	**137.62**	**11.18**	**148.80**	**142.28**	**11.30**	**153.58**	**14%**	**103,825**	**128,363**	**130,335**	**132,970**	**135,232**	**138,107**	**33%**	**162.56**	**12.83**	**175.39**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2010 estimated irrigated acres and water use derived from FSAID AG layer, deliverable dated 09/22/14 from The Balmoral Group as Florida Department of Agriculture and Consumer Services representative. 2010 values will not match published Annual Water Use Survey nor USGS data. 2010 estimates of water use for SJRWMD were updated from FSAID I values to reflect reported water use from permittees; water use for areas known to irrigate that did not have a permit was estimated via AFSIRS.
4.) 2010 SJRWMD acreages for Flagler County changed to Annual Water Use Survey values, due to 2010 FSAID values appearing erroneous. Respective 2010 water use recalculated using FSAID estimates of million gallons per day per acre.
5.) 2015-2035 acreage projections and 2015-2035 average and 1-in-10 water demand projections derived from FSAID II AG layer, deliverable dated 07/15/15 from The Balmoral Group as Florida Department of Agriculture and Consumer Services representative.
6.) SJRWMD 2010 groundwater / surface water split was estimated using the SJRWMD EN50 data and percent split of total permitted allocations for each county.
7.) SRWMD 2010 groundwater / surface water split was estimated using the percent split from derived from USGS data.
8.) 2015-2035 groundwater / surface water split estimated using 2010 ratios.

Table B-7a (NFRWSP). Agricultural Irrigation Self-supply Water Use (Including Miscellaneous Water Use) and Acreage for 2010, 5-in-10 Year Water Demand Projections and Acreage Projections for 2015-2035, 1-in-10 Year Water Demand Projections for 2035, by Crop Category by County, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	Crop Category	2010 Estimated Agriculture		2015 Projected Agriculture		2020 Projected Agriculture		2025 Projected Agriculture		2030 Projected Agriculture		2035 Projected Agriculture		Percent Change 2010 2035		2035 (1-in-10) Demand
		Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acreage	MGD	
	Citrus	20	0.05	20	0.02	20	0.02	20	0.02	20	0.02	20	0.02	0%	-60%	0.02
	Fruit (Non-Citrus)	473	1.68	1,153	1.73	1,153	1.72	1,176	1.75	1,588	2.23	2,038	2.81	331%	67%	3.23
	Potatoes	0	0.00	0	0.00	33	0.03	39	0.03	39	0.03	39	0.03	N/A	N/A	0.04
	Vegetables (Fresh Market)	681	0.16	157	0.24	291	0.40	358	0.46	358	0.46	358	0.46	-47%	188%	0.53
	Field Crops	223	0.01	256	0.18	256	0.18	256	0.18	256	0.18	256	0.18	15%	1700%	0.20
Alachua - SJRWMD	Greenhouse / Nursery	98	0.36	98	0.21	98	0.21	180	0.33	180	0.34	180	0.34	84%	-6%	0.39
	Hay	842	0.29	856	0.73	907	0.78	907	0.78	907	0.78	907	0.78	8%	169%	0.89
	Sod	139	0.00	139	0.14	377	0.39	377	0.39	377	0.39	377	0.39	171%	N/A	0.45
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	0.00	0	0.36	0	0.36	0	0.36	0	0.36	0	0.36	0%	N/A	0.36
	Total	**2,476**	**2.55**	**2,679**	**3.61**	**3,135**	**4.09**	**3,313**	**4.30**	**3,725**	**4.79**	**4,175**	**5.37**	**69%**	**111%**	**6.11**
	Citrus	7	0.02	14	0.02	14	0.02	14	0.02	14	0.02	14	0.03	100%	50%	0.03
	Fruit (Non-Citrus)	94	3.35	799	1.30	799	1.28	799	1.28	1,135	1.65	1,374	1.88	1362%	-44%	2.16
	Potatoes	0	0.00	0	0.00	98	0.08	600	0.42	600	0.42	676	0.49	N/A	N/A	0.57
	Vegetables (Fresh Market)	542	0.08	576	0.71	609	0.75	727	0.88	727	0.91	727	0.99	34%	1138%	1.14
	Field Crops	3,638	2.33	5,623	3.85	5,623	3.85	5,623	3.85	5,623	3.85	5,623	3.85	55%	65%	4.43
Alachua - SRWMD	Greenhouse / Nursery	843	4.67	928	1.94	942	1.97	957	1.99	957	2.00	957	2.00	14%	-57%	2.31
	Hay	3,827	3.55	4,469	3.83	4,469	3.83	4,469	3.83	4,469	3.83	4,469	3.83	17%	8%	4.40
	Sod	0	0.00	179	0.18	651	0.68	651	0.68	651	0.68	651	0.68	N/A	N/A	0.78
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.55	0	0.40	0	0.40	0	0.40	0	0.40	0	0.40	0%	-27%	0.40
	Total	**8,951**	**14.55**	**12,588**	**12.23**	**13,205**	**12.86**	**13,840**	**13.35**	**14,176**	**13.76**	**14,491**	**14.15**	**62%**	**-3%**	**16.22**
	Citrus	27	0.07	34	0.04	34	0.04	34	0.04	34	0.04	34	0.05	26%	-29%	0.05
	Fruit (Non-Citrus)	567	5.03	1,952	3.03	1,952	3.00	1,975	3.03	2,723	3.88	3,412	4.69	502%	-7%	5.39
	Potatoes	0	0.00	0	0.00	131	0.11	639	0.45	639	0.45	715	0.52	N/A	N/A	0.61
	Vegetables (Fresh Market)	1,223	0.24	733	0.95	900	1.15	1,085	1.34	1,085	1.37	1,085	1.45	-11%	504%	1.67
	Field Crops	3,861	2.34	5,879	4.03	5,879	4.03	5,879	4.03	5,879	4.03	5,879	4.03	52%	72%	4.63
Alachua - Total	Greenhouse / Nursery	941	5.03	1,026	2.15	1,040	2.18	1,137	2.32	1,137	2.34	1,137	2.34	21%	-53%	2.70
	Hay	4,669	3.84	5,325	4.56	5,376	4.61	5,376	4.61	5,376	4.61	5,376	4.61	15%	20%	5.29
	Sod	139	0.00	318	0.32	1,028	1.07	1,028	1.07	1,028	1.07	1,028	1.07	640%	N/A	1.23
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	0.55	0	0.76	0	0.76	0	0.76	0	0.76	0	0.76	0%	38%	0.76
	Total	**11,427**	**17.10**	**15,267**	**15.84**	**16,340**	**16.95**	**17,153**	**17.65**	**17,901**	**18.55**	**18,666**	**19.52**	**63%**	**14%**	**22.33**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-Citrus)	0	0.05	5	0.01	26	0.04	26	0.04	53	0.08	91	0.12	N/A	N/A	0.14
	Potatoes	0	0.00	0	0.00	24	0.02	24	0.02	36	0.04	36	0.04	N/A	N/A	0.04
	Vegetables (Fresh Market)	55	0.05	45	0.07	52	0.08	52	0.08	39	0.06	39	0.06	-29%	20%	0.07
	Field Crops	27	0.02	14	0.01	14	0.01	14	0.01	14	0.01	14	0.01	-48%	-50%	0.01
Baker - SJRWMD	Greenhouse / Nursery	121	1.04	178	0.37	178	0.37	183	0.37	183	0.38	183	0.38	51%	-63%	0.44
	Hay	73	0.01	41	0.04	41	0.04	41	0.04	41	0.04	41	0.04	-44%	300%	0.04
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	0.00	0	0.09	0	0.09	0	0.09	0	0.09	0	0.09	0%	N/A	0.00
	Total	**276**	**1.17**	**283**	**0.59**	**335**	**0.65**	**340**	**0.65**	**366**	**0.70**	**404**	**0.74**	**46%**	**-37%**	**0.74**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Fruit (Non-Citrus)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Vegetables (Fresh Market)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Field Crops	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
Baker - SRWMD	Greenhouse / Nursery	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Hay	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	0.00	0	0.01	0	0.01	0	0.01	0	0.01	0	0.01	0%	0%	0.01
	Total	**0**	**0.00**	**0**	**0.01**	**0**	**0.01**	**0**	**0.01**	**0**	**0.01**	**0**	**0.01**	**0%**	**0%**	**0.01**

Table B-7a (NFRWSP), Continued. Agricultural Irrigation Self-supply Water Use (Including Miscellaneous Water Use) and Acreage for 2010, 5-in-10 Year Water Demand Projections and Acreage Projections for 2015-2035, 1-in-10 Year Water Demand Projections for 2035, by Crop Category by County, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	Crop Category	2010 Estimated Agriculture		2015 Projected Agriculture		2020 Projected Agriculture		2025 Projected Agriculture		2030 Projected Agriculture		2035 Projected Agriculture		Percent Change 2010 2035		2035 (1-in-10) Demand
		Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acreage	MGD	
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Fruit (Non-Citrus)	0	0.05	5	0.01	26	0.04	26	0.04	53	0.08	91	0.12	N/A	N/A	0.14
	Potatoes	0	0.00	0	0.00	24	0.02	24	0.02	36	0.04	36	0.04	N/A	N/A	0.04
	Vegetables (Fresh Market)	55	0.05	45	0.07	52	0.08	52	0.08	39	0.06	39	0.06	-29%	20%	0.07
	Field Crops	27	0.02	14	0.01	14	0.01	14	0.01	14	0.01	14	0.01	-48%	-50%	0.01
Baker - Total	Greenhouse / Nursery	121	1.04	178	0.37	178	0.37	183	0.37	183	0.38	183	0.38	51%	-63%	0.44
	Hay	73	0.01	41	0.04	41	0.04	41	0.04	41	0.04	41	0.04	-44%	300%	0.04
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	0.00	0	0.10	0	0.10	0	0.10	0	0.10	0	0.10	0%	N/A	0.01
	Total	**276**	**1.17**	**283**	**0.60**	**335**	**0.66**	**340**	**0.66**	**366**	**0.71**	**404**	**0.75**	**46%**	**-36%**	**0.75**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Fruit (Non-Citrus)	0	0.00	0	0.00	23	0.03	23	0.03	23	0.03	23	0.03	N/A	N/A	0.04
	Potatoes	0	0.00	0	0.00	22	0.02	22	0.02	22	0.02	22	0.02	N/A	N/A	0.02
	Vegetables (Fresh Market)	0	0.00	0	0.00	13	0.02	13	0.02	13	0.02	13	0.02	N/A	N/A	0.02
	Field Crops	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
Bradford- SJRWMD	Greenhouse / Nursery	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Hay	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Sod	0	0.00	0	0.00	11	0.01	11	0.01	11	0.01	11	0.01	N/A	N/A	0.01
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Total	**0**	**0.00**	**0**	**0.00**	**69**	**0.08**	**69**	**0.08**	**69**	**0.08**	**69**	**0.08**	**N/A**	**N/A**	**0.09**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Fruit (Non-Citrus)	175	0.52	233	0.37	233	0.37	233	0.37	233	0.37	233	0.37	33%	-29%	0.42
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Vegetables (Fresh Market)	197	0.11	139	0.17	173	0.21	173	0.21	173	0.21	173	0.21	-12%	91%	0.24
	Field Crops	0	0.00	86	0.06	86	0.06	86	0.06	86	0.06	86	0.06	N/A	N/A	0.07
Bradford - SRWMD	Greenhouse / Nursery	0	0.00	2	0.01	2	0.01	2	0.01	2	0.01	2	0.01	N/A	N/A	0.01
	Hay	344	0.43	570	0.49	570	0.49	570	0.49	570	0.49	570	0.49	66%	14%	0.56
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	0.21	0	0.20	0	0.20	0	0.20	0	0.20	0	0.20	0%	-5%	0.21
	Total	**716**	**1.27**	**1,030**	**1.30**	**1,064**	**1.34**	**1,064**	**1.34**	**1,064**	**1.34**	**1,064**	**1.34**	**49%**	**6%**	**1.51**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Fruit (Non-Citrus)	175	0.52	233	0.37	256	0.40	256	0.40	256	0.40	256	0.40	46%	-23%	0.46
	Potatoes	0	0.00	0	0.00	22	0.02	22	0.02	22	0.02	22	0.02	N/A	N/A	0.02
	Vegetables (Fresh Market)	197	0.11	139	0.17	186	0.23	186	0.23	186	0.23	186	0.23	-6%	109%	0.26
	Field Crops	0	0.00	86	0.06	86	0.06	86	0.06	86	0.06	86	0.06	N/A	N/A	0.07
Bradford - Total	Greenhouse / Nursery	0	0.00	2	0.01	2	0.01	2	0.01	2	0.01	2	0.01	N/A	N/A	0.01
	Hay	344	0.43	570	0.49	570	0.49	570	0.49	570	0.49	570	0.49	66%	14%	0.56
	Sod	0	0.00	0	0.00	11	0.01	11	0.01	11	0.01	11	0.01	N/A	N/A	0.01
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	0.21	0	0.20	0	0.20	0	0.20	0	0.20	0	0.20	0%	-5%	0.21
	Total	**716**	**1.27**	**1,030**	**1.30**	**1,133**	**1.42**	**1,133**	**1.42**	**1,133**	**1.42**	**1,133**	**1.42**	**58%**	**12%**	**1.60**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Fruit (Non-Citrus)	0	0.00	0	0.00	11	0.02	11	0.02	191	0.23	566	0.66	N/A	N/A	0.76
	Potatoes	0	0.00	0	0.00	21	0.02	38	0.03	38	0.03	38	0.03	N/A	N/A	0.03
	Vegetables (Fresh Market)	0	0.00	0	0.00	133	0.16	421	0.45	421	0.45	421	0.45	N/A	N/A	0.52
	Field Crops	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
Clay - SJRWMD	Greenhouse / Nursery	425	0.88	484	1.01	532	1.10	537	1.11	537	1.11	537	1.11	26%	26%	1.28
	Hay	936	0.01	291	0.25	291	0.25	291	0.25	291	0.25	291	0.25	-69%	2400%	0.29
	Sod	0	0.00	0	0.00	126	0.13	126	0.13	126	0.13	126	0.13	N/A	N/A	0.15
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	0.00	0	0.22	0	0.22	0	0.22	0	0.22	0	0.22	0%	N/A	0.22
	Total	**1,361**	**0.89**	**775**	**1.48**	**1,114**	**1.90**	**1,424**	**2.21**	**1,604**	**2.42**	**1,979**	**2.85**	**45%**	**220%**	**3.25**

Table B-7a (NFRWSP), Continued. Agricultural Irrigation Self-supply Water Use (Including Miscellaneous Water Use) and Acreage for 2010, 5-in-10 Year Water Demand Projections and Acreage Projections for 2015-2035, 1-in-10 Year Water Demand Projections for 2035, by Crop Category by County, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	Crop Category	2010 Estimated Agriculture		2015 Projected Agriculture		2020 Projected Agriculture		2025 Projected Agriculture		2030 Projected Agriculture		2035 Projected Agriculture		Percent Change 2010-2035		2035 (1-in-10) Demand
		Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acreage	MGD	
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Fruit (Non-Citrus)	99	0.04	114	0.19	284	0.42	460	0.64	1,033	1.32	1,627	2.01	1543%	4925%	2.31
	Potatoes	0	0.00	0	0.00	555	0.46	1,237	0.92	3,195	3.16	5,503	5.47	N/A	N/A	6.29
	Vegetables (Fresh Market)	57	0.05	55	0.08	1,958	2.37	2,788	3.21	3,003	3.42	3,003	3.42	5168%	6740%	3.93
	Field Crops	1,326	0.86	3,151	2.16	3,165	2.17	3,206	2.19	3,206	2.19	3,206	2.19	142%	155%	2.51
Columbia - SRWMD	Greenhouse / Nursery	254	1.58	254	0.54	603	1.16	1,501	2.54	1,501	2.56	1,501	2.56	491%	62%	2.94
	Hay	2,042	1.38	1,352	1.16	1,370	1.17	1,370	1.17	1,370	1.17	1,370	1.17	-33%	-15%	1.35
	Sod	0	0.00	84	0.08	146	0.15	269	0.27	269	0.27	269	0.27	N/A	N/A	0.31
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	0.32	0	0.32	0	0.32	0	0.32	0	0.32	0	0.32	0%	0%	0.32
	Total	**3,778**	**4.23**	**5,010**	**4.53**	**8,081**	**8.22**	**10,831**	**11.26**	**13,577**	**14.41**	**16,479**	**17.41**	**336%**	**312%**	**19.96**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Fruit (Non-Citrus)	0	0.04	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Vegetables (Fresh Market)	6	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	-100%	0%	0.00
	Field Crops	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
Duval - SJRWMD	Greenhouse / Nursery	305	3.32	305	0.65	301	0.65	283	0.61	177	0.38	9	0.02	-97%	-99%	0.02
	Hay	5	0.02	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	-100%	0%	0.00
	Sod	982	0.04	982	0.97	707	0.70	493	0.49	351	0.35	251	0.25	-74%	525%	0.29
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	0.00	0	0.11	0	0.11	0	0.11	0	0.11	0	0.11	0%	N/A	0.11
	Total	**1,298**	**3.42**	**1,288**	**1.73**	**1,008**	**1.46**	**776**	**1.21**	**528**	**0.84**	**260**	**0.38**	**-80%**	**-89%**	**0.42**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Fruit (Non-Citrus)	7	0.02	23	0.04	23	0.04	23	0.04	23	0.04	7	0.01	0%	N/A	0.02
	Potatoes	2,404	1.72	3,627	4.63	3,185	4.07	2,576	3.51	2,998	4.41	2,284	3.69	-5%	115%	4.24
	Vegetables (Fresh Market)	1,607	2.06	2,118	2.71	1,563	1.97	1,329	1.70	131	0.20	131	0.20	-92%	-90%	0.23
	Field Crops	480	0.27	290	0.20	187	0.13	12	0.01	0	0.00	0	0.00	-100%	-100%	0.00
Flagler - SJRWMD	Greenhouse / Nursery	34	0.76	528	1.13	519	1.11	457	0.98	335	0.72	322	0.69	847%	-9%	0.79
	Hay	195	1.55	1,813	1.55	1,781	1.53	1,452	1.24	1,039	0.89	617	0.53	216%	-66%	0.61
	Sod	1,400	2.42	2,508	2.48	1,895	1.88	1,638	1.62	1,292	1.28	806	0.80	-42%	-67%	0.92
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	0.00	0	0.04	0	0.04	0	0.04	0	0.04	0	0.04	0%	N/A	0.04
	Total	**6,127**	**8.80**	**10,907**	**12.78**	**9,153**	**10.77**	**7,487**	**9.14**	**5,818**	**7.58**	**4,167**	**5.96**	**-32%**	**-32%**	**6.85**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Fruit (Non-Citrus)	59	0.41	59	0.09	59	0.09	103	0.14	103	0.14	103	0.14	75%	-66%	0.17
	Potatoes	0	0.00	0	0.00	219	0.18	244	0.20	639	0.65	1,051	1.06	N/A	N/A	1.22
	Vegetables (Fresh Market)	263	0.21	504	0.61	775	0.93	930	1.09	930	1.17	930	1.23	254%	486%	1.41
	Field Crops	2,279	1.56	7,064	4.85	7,064	4.84	7,064	4.84	7,064	4.84	7,064	4.84	210%	210%	5.57
Gilchrist - SRWMD	Greenhouse / Nursery	95	0.61	178	0.38	187	0.40	199	0.42	199	0.42	199	0.42	109%	-31%	0.48
	Hay	5,539	4.69	5,573	4.77	5,573	4.77	5,573	4.77	5,573	4.77	5,573	4.77	1%	2%	5.49
	Sod	0	0.00	0	0.00	0	0.00	27	0.03	27	0.03	27	0.03	N/A	N/A	0.03
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	2.23	0	2.23	0	2.23	0	2.23	0	2.23	0	2.23	0%	0%	2.23
	Total	**8,235**	**9.71**	**13,378**	**12.93**	**13,877**	**13.44**	**14,140**	**13.72**	**14,535**	**14.25**	**14,947**	**14.72**	**82%**	**52%**	**16.60**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Fruit (Non-Citrus)	32	0.04	54	0.08	54	0.08	54	0.08	54	0.08	54	0.08	69%	100%	0.10
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	39	0.04	223	0.23	N/A	N/A	0.26
	Vegetables (Fresh Market)	1,265	0.98	1,862	2.37	2,013	2.46	2,013	2.48	2,013	2.73	2,013	2.86	59%	192%	3.29
	Field Crops	4,603	4.08	6,068	4.16	6,068	4.16	6,068	4.16	6,068	4.16	6,068	4.16	32%	2%	4.78
Hamilton - SRWMD	Greenhouse / Nursery	474	3.27	485	1.04	485	1.04	506	1.07	506	1.07	506	1.07	7%	-67%	1.23
	Hay	1,898	3.06	3,239	2.78	3,239	2.78	3,239	2.78	3,239	2.78	3,239	2.78	71%	-9%	3.19
	Sod	0	0.00	0	0.00	0	0.00	31	0.03	31	0.03	31	0.03	N/A	N/A	0.03
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	0.13	0	0.14	0	0.14	0	0.14	0	0.14	0	0.14	0%	8%	0.14
	Total	**8,272**	**11.56**	**11,708**	**10.57**	**11,859**	**10.66**	**11,911**	**10.74**	**11,950**	**11.03**	**12,134**	**11.35**	**47%**	**-2%**	**13.02**

Table B-7a (NFRWSP), Continued. Agricultural Irrigation Self-supply Water Use (Including Miscellaneous Water Use) and Acreage for 2010, 5-in-10 Year Water Demand Projections and Acreage Projections for 2015-2035, 1-in-10 Year Water Demand Projections for 2035, by Crop Category by County, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	Crop Category	2010 Estimated Agriculture		2015 Projected Agriculture		2020 Projected Agriculture		2025 Projected Agriculture		2030 Projected Agriculture		2035 Projected Agriculture		Percent Change 2010-2035		2035 (1-in-10) Demand
		Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acreage	MGD	
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Fruit (Non-Citrus)	33	0.05	33	0.05	33	0.05	0	0.00	0	0.00	0	0.00	-100%	-100%	0.00
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Vegetables (Fresh Market)	18	0.01	18	0.03	0	0.00	0	0.00	0	0.00	0	0.00	-100%	-100%	0.00
	Field Crops	736	0.02	681	0.47	549	0.38	0	0.00	0	0.00	0	0.00	-100%	-100%	0.00
Nassau - SJRWMD	Greenhouse / Nursery	93	0.53	93	0.20	22	0.05	8	0.02	0	0.00	0	0.00	-100%	-100%	0.00
	Hay	3	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	-100%	0%	0.00
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	0.00	0	0.29	0	0.29	0	0.29	0	0.29	0	0.29	0%	N/A	0.29
	Total	**883**	**0.61**	**825**	**1.04**	**604**	**0.77**	**8**	**0.31**	**0**	**0.29**	**0**	**0.29**	**-100%**	**-52%**	**0.29**
	Citrus	295	1.01	284	0.29	264	0.27	216	0.22	193	0.20	133	0.14	-55%	-86%	0.16
	Fruit (Non-Citrus)	323	0.91	671	1.02	621	0.93	604	0.90	402	0.58	377	0.58	17%	-36%	0.67
	Potatoes	4,608	5.77	4,637	5.58	3,870	4.58	3,400	4.22	3,987	5.46	3,370	4.94	-27%	-14%	5.68
	Vegetables (Fresh Market)	1,298	1.24	1,365	1.84	1,331	1.79	1,206	1.61	19	0.03	13	0.02	-99%	-98%	0.02
	Field Crops	550	0.10	332	0.23	332	0.23	241	0.17	241	0.17	121	0.08	-78%	-20%	0.10
Putnam - SJRWMD	Greenhouse / Nursery	2,678	6.95	2,798	4.73	2,422	4.06	2,080	3.54	1,626	2.96	1,260	2.24	-53%	-68%	2.58
	Hay	1,691	1.01	1,575	1.35	1,429	1.22	1,252	1.07	1,226	1.05	1,072	0.92	-37%	-9%	1.06
	Sod	285	0.47	281	0.28	281	0.28	199	0.20	161	0.16	141	0.14	-51%	-70%	0.16
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	3.24	0	0.41	0	0.41	0	0.41	0	0.41	0	0.41	0%	-87%	0.41
	Total	**11,728**	**20.70**	**11,943**	**15.73**	**10,550**	**13.77**	**9,198**	**12.34**	**7,855**	**11.02**	**6,487**	**9.47**	**-45%**	**-54%**	**10.84**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Fruit (Non-Citrus)	0	0.08	12	0.01	12	0.01	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Potatoes	11,325	10.73	12,705	16.25	11,755	14.92	11,403	15.24	14,923	21.73	14,315	22.38	26%	109%	25.74
	Vegetables (Fresh Market)	3,821	5.06	4,155	5.26	4,155	5.26	4,033	5.10	0	0.00	0	0.00	-100%	-100%	0.00
	Field Crops	2,860	1.66	2,449	1.68	2,366	1.62	2,149	1.47	1,883	1.29	1,883	1.29	-34%	-22%	1.48
St. Johns - SJRWMD	Greenhouse / Nursery	1,002	3.10	855	1.72	845	1.70	799	1.61	717	1.53	663	1.41	-34%	-55%	1.62
	Hay	3,685	1.40	1,770	1.52	1,752	1.50	1,752	1.50	1,752	1.50	1,617	1.39	-56%	-1%	1.59
	Sod	2,196	2.60	2,104	2.09	2,104	2.09	2,038	2.02	1,986	1.97	1,954	1.94	-11%	-25%	2.23
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	0.00	0	0.03	0	0.03	0	0.03	0	0.03	0	0.03	0%	N/A	0.03
	Total	**24,889**	**24.63**	**24,050**	**28.56**	**22,989**	**27.13**	**22,174**	**26.97**	**21,261**	**28.05**	**20,432**	**28.44**	**-18%**	**15%**	**32.69**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Fruit (Non-Citrus)	448	0.24	860	1.12	961	1.24	1,262	1.61	1,262	1.79	1,262	1.84	182%	667%	2.12
	Potatoes	0	0.00	0	0.00	398	0.33	1,560	1.11	1,560	1.11	1,560	1.11	N/A	N/A	1.27
	Vegetables (Fresh Market)	3,498	2.81	2,535	3.40	3,114	4.06	3,960	4.92	4,792	5.81	4,827	6.05	38%	115%	6.96
	Field Crops	6,159	4.41	14,363	9.84	14,390	9.86	14,390	9.86	14,390	9.86	14,390	9.86	134%	124%	11.34
Suwannee - SRWMD	Greenhouse / Nursery	790	4.79	805	1.72	1,037	2.14	1,599	3.01	2,542	4.34	2,928	5.04	271%	5%	5.79
	Hay	12,445	15.40	11,948	10.24	12,010	10.29	12,029	10.31	12,125	10.37	12,261	10.48	-1%	-32%	12.05
	Sod	289	0.61	146	0.14	216	0.22	545	0.53	1,043	1.03	2,864	2.79	891%	357%	3.21
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	1.90	0	2.51	0	2.51	0	2.51	0	2.51	0	2.51	0%	32%	2.51
	Total	**23,629**	**30.16**	**30,657**	**28.97**	**32,126**	**30.65**	**35,345**	**33.86**	**37,714**	**36.82**	**40,092**	**39.68**	**70%**	**32%**	**45.25**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Fruit (Non-Citrus)	126	0.05	255	0.39	255	0.39	180	0.28	167	0.26	145	0.22	15%	340%	0.26
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Vegetables (Fresh Market)	609	0.28	609	0.85	609	0.85	609	0.85	562	0.82	524	0.79	-14%	182%	0.91
	Field Crops	0	0.00	46	0.03	46	0.03	46	0.03	46	0.03	46	0.03	N/A	N/A	0.04
Union - SRWMD	Greenhouse / Nursery	5	0.03	5	0.01	5	0.01	5	0.01	5	0.01	2	0.01	-60%	-67%	0.01
	Hay	466	0.29	327	0.28	251	0.22	210	0.18	210	0.18	210	0.18	-55%	-38%	0.21
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	0.11	0	0.11	0	0.11	0	0.11	0	0.11	0	0.11	0%	0%	0.11
	Total	**1,206**	**0.76**	**1,242**	**1.67**	**1,166**	**1.61**	**1,050**	**1.46**	**990**	**1.41**	**927**	**1.34**	**-23%**	**76%**	**1.54**

Table B-7a (NFRWSP), Continued. Agricultural Irrigation Self-supply Water Use (Including Miscellaneous Water Use) and Acreage for 2010, 5-in-10 Year Water Demand Projections and Acreage Projections for 2015-2035, 1-in-10 Year Water Demand Projections for 2035, by Crop Category by County, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	Crop Category	2010 Estimated Agriculture		2015 Projected Agriculture		2020 Projected Agriculture		2025 Projected Agriculture		2030 Projected Agriculture		2035 Projected Agriculture		Percent Change 2010-2035		2035 (1-in-10) Demand
		Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acreage	MGD	
	Citrus	315	1.06	304	0.31	284	0.29	236	0.24	213	0.22	153	0.16	-51%	-85%	0.18
	Fruit (Non-Citrus)	836	2.83	1,898	2.86	1,902	2.84	1,863	2.78	2,280	3.19	3,102	4.21	271%	49%	4.86
	Potatoes	18,337	18.22	20,969	26.46	18,910	23.66	17,502	23.07	22,043	31.72	20,104	31.13	10%	71%	35.79
	Vegetables (Fresh Market)	7,486	8.58	7,858	10.15	7,538	9.68	7,412	9.42	981	1.22	975	1.21	-87%	-86%	1.39
	Field Crops	4,876	2.08	4,022	2.77	3,704	2.55	2,672	1.84	2,394	1.65	2,274	1.56	-53%	-25%	1.79
SJRWMD Region 1 Total	Greenhouse / Nursery	4,756	16.94	5,339	10.02	4,917	9.25	4,527	8.57	3,755	7.42	3,154	6.19	-34%	-63%	7.12
	Hay	7,430	4.29	6,346	5.44	6,201	5.32	5,695	4.88	5,256	4.51	4,545	3.91	-39%	-9%	4.48
	Sod	5,002	5.53	6,014	5.96	5,501	5.48	4,882	4.86	4,304	4.29	3,666	3.66	-27%	-34%	4.21
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	3.24	0	1.55	0	1.55	0	1.55	0	1.55	0	1.55	0%	-52%	1.46
	Total	**49,038**	**62.77**	**52,750**	**65.52**	**48,957**	**60.62**	**44,789**	**57.21**	**41,226**	**55.77**	**37,973**	**53.58**	**-23%**	**-15%**	**61.28**
	Citrus	7	0.02	14	0.02	14	0.02	14	0.02	14	0.02	14	0.03	100%	50%	0.03
	Fruit (Non-Citrus)	1,033	4.65	2,374	3.54	2,645	3.87	3,091	4.40	3,987	5.61	4,798	6.54	364%	41%	7.54
	Potatoes	0	0.00	0	0.00	1,270	1.05	3,641	2.65	6,033	5.38	9,013	8.36	N/A	N/A	9.61
	Vegetables (Fresh Market)	6,431	4.52	6,280	8.19	9,251	11.63	11,200	13.64	12,200	15.07	12,197	15.55	90%	244%	17.88
	Field Crops	18,005	13.24	36,401	24.95	36,442	24.97	36,483	24.99	36,483	24.99	36,483	24.99	103%	89%	28.74
SRWMD NFRWSP Total	Greenhouse / Nursery	2,461	14.95	2,657	5.64	3,261	6.73	4,769	9.05	5,712	10.41	6,095	11.11	148%	-26%	12.77
	Hay	26,561	28.80	27,478	23.55	27,482	23.55	27,460	23.53	27,556	23.59	27,692	23.70	4%	-18%	27.25
	Sod	289	0.61	409	0.40	1,013	1.05	1,523	1.54	2,021	2.04	3,842	3.80	1229%	523%	4.36
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	5.45	0	5.92	0	5.92	0	5.92	0	5.92	0	5.92	0%	9%	5.93
	Total	**54,787**	**72.24**	**75,613**	**72.21**	**81,378**	**78.79**	**88,181**	**85.74**	**94,006**	**93.03**	**100,134**	**100.00**	**83%**	**38%**	**114.11**
	Citrus	322	1.08	318	0.33	298	0.31	250	0.26	227	0.24	167	0.19	-48%	-82%	0.21
	Fruit (Non-Citrus)	1,869	7.48	4,272	6.40	4,547	6.71	4,954	7.18	6,267	8.80	7,900	10.75	323%	44%	12.40
	Potatoes	18,337	18.22	20,969	26.46	20,180	24.71	21,143	25.72	28,076	37.10	29,117	39.49	59%	117%	45.40
	Vegetables (Fresh Market)	13,917	13.10	14,138	18.34	16,789	21.31	18,612	23.06	13,181	16.29	13,172	16.76	-5%	28%	19.27
	Field Crops	22,881	15.32	40,423	27.72	40,146	27.52	39,155	26.83	38,877	26.64	38,757	26.55	69%	73%	30.53
NFRWSP Total	Greenhouse / Nursery	7,217	31.89	7,996	15.66	8,178	15.98	9,296	17.62	9,467	17.83	9,249	17.30	28%	-46%	19.89
	Hay	33,991	33.09	33,824	28.99	33,683	28.87	33,155	28.41	32,812	28.10	32,237	27.61	-5%	-17%	31.73
	Sod	5,291	6.14	6,423	6.36	6,514	6.53	6,405	6.40	6,325	6.33	7,508	7.46	42%	21%	8.57
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0%	0%	0.00
	Miscellaneous	0	8.69	0	7.47	0	7.47	0	7.47	0	7.47	0	7.47	0%	-14%	7.39
	Total	**103,825**	**135.01**	**128,363**	**137.73**	**130,335**	**139.41**	**132,970**	**142.95**	**135,232**	**148.80**	**138,107**	**153.58**	**33%**	**14%**	**175.39**

Notes:

1.) All water use is shown in million gallons per day.

2.) Rounding errors account for nominal discrepancies.

3.) 2010 estimated irrigated acres and water use derived from FSAID AG layer, deliverable dated 09/22/14 from The Balmoral Group as Florida Department of Agriculture and Consumer Services representative. 2010 values will not match published Annual Water Use Survey nor USGS data. 2010 estimates of water use for SJRWMD were updated from FSAID I values to reflect reported water use from permittees; water use for areas known to irrigate that did not have a permit was estimated via AFSIRS.

4.) 2010 SJRWMD acreages for Flagler County changed to Annual Water Use Survey values, due to 2010 FSAID values appearing erroneous.

5.) 2015-2035 acreage projections and 2015-2035 average and 1-in-10 water demand projections derived from FSAID II AG layer, deliverable dated 07/15/15 from The Balmoral Group as Florida Department of Agriculture and Consumer Services representative.

Table B-7b (NFRWSP). Miscellaneous Agricultural Self-supply Water Use for 2010, 5-in-10 Year Demand Projections for 2015-2035 and 1-in-10 Year Demand Projections for 2035 by County, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	2010 Water Use				2015 - 2035 Water Demand Projections			
		Dairy	Livestock	Aquaculture	Total	Dairy	Livestock	Aquaculture	Total
Alachua	SJRWMD	0.00	0.00	0.00	**0.00**	0.12	0.24	0.00	**0.36**
Alachua	SRWMD	0.09	0.46	0.00	**0.55**	0.13	0.27	0.00	**0.40**
Alachua	**Total**	**0.09**	**0.46**	**0.00**	**0.55**	**0.25**	**0.51**	**0.00**	**0.76**
Baker	SJRWMD	0.00	0.00	0.00	**0.00**	0.03	0.06	0.00	**0.09**
Baker	SRWMD	0.00	0.00	0.00	**0.00**	0.00	0.01	0.00	**0.01**
Baker	**Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.03**	**0.07**	**0.00**	**0.10**
Bradford	SJRWMD	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
Bradford	SRWMD	0.10	0.11	0.00	**0.21**	0.10	0.10	0.00	**0.20**
Bradford	**Total**	**0.10**	**0.11**	**0.00**	**0.21**	**0.10**	**0.10**	**0.00**	**0.20**
Clay	SJRWMD	0.00	0.00	0.00	**0.00**	0.16	0.06	0.00	**0.22**
Columbia	SRWMD	0.00	0.32	0.00	**0.32**	0.00	0.32	0.00	**0.32**
Duval	SJRWMD	0.00	0.00	0.00	**0.00**	0.04	0.07	0.00	**0.11**
Flagler	SJRWMD	0.00	0.00	0.00	**0.00**	0.00	0.04	0.00	**0.04**
Gilchrist	SRWMD	1.95	0.28	0.00	**2.23**	1.95	0.28	0.00	**2.23**
Hamilton	SRWMD	0.03	0.10	0.00	**0.13**	0.03	0.11	0.00	**0.14**
Nassau	SJRWMD	0.00	0.00	0.00	**0.00**	0.23	0.06	0.00	**0.29**
Putnam	SJRWMD	0.10	2.81	0.33	**3.24**	0.10	0.10	0.21	**0.41**
St. Johns	SJRWMD	0.00	0.00	0.00	**0.00**	0.00	0.03	0.00	**0.03**
Suwannee	SRWMD	1.30	0.60	0.00	**1.90**	1.30	1.21	0.00	**2.51**
Union	SRWMD	0.00	0.11	0.00	**0.11**	0.00	0.11	0.00	**0.11**
SJRWMD Region 1 Total		**0.10**	**2.81**	**0.33**	**3.24**	**0.68**	**0.66**	**0.21**	**1.55**
SRWMD NFRWSP Total		**3.47**	**1.98**	**0.00**	**5.45**	**3.51**	**2.41**	**0.00**	**5.92**
NFRWSP Total		**3.57**	**4.79**	**0.33**	**8.69**	**4.19**	**3.07**	**0.21**	**7.47**

Notes:

1.) All water use is shown in million gallons per day.

2.) Rounding errors account for nominal discrepancies.

3.) 2010 SRWMD estimated water use derived from FSAID AG layer, deliverable dated 09/22/14 from The Balmoral Group as Florida Department of Agriculture and Consumer Services representative. 2010 SJRWMD water use obtained from SJRWMD EN50 reports. 2010 values will not match published Annual Water Use Survey nor USGS data.

4.) 2015-2035 projected water demand derived from FSAID II AG layer, deliverable dated 07/15/15 from The Balmoral Group as Florida Department of Agriculture and Consumer Services representative.

5.) FSAID II AG layer, deliverable dated 07/15/15 from The Balmoral Group as Florida Department of Agriculture and Consumer Services representative assumes no increase for 1-in-10 year drought conditions.

Table B-8 (NFRWSP). Landscape/Recreational/Aesthetic Self-supply Water Use and Acreage for 2010 and 5-in-10 Year Demand Projections for 2015-2035, Acreage Projections for 2015-2035, 1-in-10 Year Demand Projections for 2035 by County, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Water Use			Demand Projections (5-in-10)															Percent Change	Acreage	Acreage Projections					Percent Change	Demand Projections (1-in-10)		
		2010			2015			2020			2025			2030			2035											2035		
		Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	2010-2035	2010	2015	2020	2025	2030	2035	2010-2035	Ground	Surface	Total
Alachua	SJRWMD	0.46	0.67	**1.13**	0.46	0.68	**1.14**	0.48	0.69	**1.17**	0.49	0.71	**1.20**	0.50	0.73	**1.23**	0.51	0.75	**1.26**	12%	421	425	436	447	458	469	11%	1.09	1.59	**2.68**
Alachua	SRWMD	0.23	0.07	**0.30**	0.24	0.07	**0.31**	0.25	0.07	**0.32**	0.25	0.08	**0.33**	0.26	0.08	**0.34**	0.27	0.08	**0.35**	17%	180	186	192	198	204	210	17%	0.41	0.13	**0.54**
Alachua	**Total**	**0.69**	**0.74**	**1.43**	**0.70**	**0.75**	**1.45**	**0.73**	**0.76**	**1.49**	**0.74**	**0.79**	**1.53**	**0.76**	**0.81**	**1.57**	**0.78**	**0.83**	**1.61**	**13%**	**601**	**611**	**628**	**645**	**662**	**679**	**13%**	**1.50**	**1.72**	**3.22**
Baker	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0	0	0	0	0	0	N/A	0.00	0.00	**0.00**
Baker	SRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0	0	0	0	0	0	N/A	0.00	0.00	**0.00**
Baker	**Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**N/A**	**0**	**0**	**0**	**0**	**0**	**0**	**N/A**	**0.00**	**0.00**	**0.00**
Bradford	SJRWMD	0.10	0.00	**0.10**	0.00	0.00	**0.10**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	N/A	0	0	2	2	2	2	N/A	0.10	0.00	**0.10**
Bradford	SRWMD	0.06	0.02	**0.08**	0.06	0.02	**0.08**	0.06	0.02	**0.08**	0.06	0.02	**0.08**	0.06	0.02	**0.08**	0.06	0.02	**0.08**	0%	45	45	45	45	45	45	0%	0.13	0.05	**0.18**
Bradford	**Total**	**0.16**	**0.02**	**0.18**	**0.06**	**0.02**	**0.18**	**0.16**	**0.02**	**0.18**	**0.16**	**0.02**	**0.18**	**0.16**	**0.02**	**0.18**	**0.16**	**0.02**	**0.18**	**0%**	**45**	**45**	**47**	**47**	**47**	**47**	**4%**	**0.23**	**0.05**	**0.28**
Clay	SJRWMD	0.63	2.66	**3.29**	0.65	2.73	**3.38**	0.68	2.88	**3.56**	0.72	3.02	**3.74**	0.75	3.16	**3.91**	0.78	3.29	**4.07**	24%	310	318	335	352	368	383	24%	1.68	7.11	**8.79**
Columbia	SRWMD	0.29	0.09	**0.38**	0.29	0.09	**0.38**	0.31	0.09	**0.40**	0.32	0.10	**0.42**	0.34	0.10	**0.44**	0.34	0.11	**0.45**	18%	225	225	237	249	261	266	18%	0.40	0.12	**0.52**
Duval	SJRWMD	2.50	3.42	**5.92**	2.61	3.56	**6.17**	2.74	3.76	**6.50**	2.88	3.93	**6.81**	3.00	4.10	**7.10**	3.11	4.25	**7.36**	24%	1,438	1,499	1,579	1,654	1,725	1,788	24%	4.32	5.91	**10.23**
Flagler	SJRWMD	0.66	0.67	**1.33**	0.72	0.73	**1.45**	0.92	0.93	**1.85**	1.11	1.13	**2.24**	1.30	1.31	**2.61**	1.46	1.49	**2.95**	122%	1,169	1,274	1,626	1,969	2,294	2,593	122%	1.82	1.84	**3.66**
Gilchrist	SRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0	0	0	0	0	0	N/A	0.00	0.00	**0.00**
Hamilton	SRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0	0	0	0	0	0	N/A	0.00	0.00	**0.00**
Nassau	SJRWMD	1.68	1.28	**2.96**	1.75	1.34	**3.09**	1.91	1.46	**3.37**	2.07	1.58	**3.65**	2.22	1.70	**3.92**	2.36	1.80	**4.16**	41%	825	861	939	1,017	1,093	1,159	40%	2.83	2.16	**4.99**
Putnam	SJRWMD	0.34	0.07	**0.41**	0.32	0.07	**0.39**	0.33	0.07	**0.40**	0.34	0.07	**0.41**	0.34	0.07	**0.41**	0.35	0.07	**0.42**	2%	146	139	142	146	146	150	3%	1.38	0.29	**1.67**
St. Johns	SJRWMD	1.16	4.35	**5.51**	1.29	4.84	**6.13**	1.49	5.61	**7.10**	1.69	6.35	**8.04**	1.87	7.02	**8.89**	2.04	7.64	**9.68**	76%	1,561	1,737	2,011	2,278	2,519	2,742	76%	2.45	9.17	**11.62**
Suwannee	SRWMD	0.10	0.00	**0.10**	0.11	0.00	**0.11**	0.12	0.00	**0.12**	0.12	0.00	**0.12**	0.12	0.00	**0.12**	0.12	0.00	**0.12**	20%	45	50	54	54	54	54	20%	0.12	0.00	**0.12**
Union	SRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0	0	0	0	0	0	N/A	0.00	0.00	**0.00**
SJRWMD Region 1 Total		**7.53**	**13.12**	**20.65**	**7.80**	**13.95**	**21.85**	**8.65**	**15.40**	**24.05**	**9.40**	**16.79**	**26.19**	**10.08**	**18.09**	**28.17**	**10.71**	**19.29**	**30.00**	**45%**	**5,870**	**6,253**	**7,070**	**7,865**	**8,605**	**9,286**	**58%**	**15.67**	**28.07**	**43.74**
SRWMD NFRWSP Total		**0.68**	**0.18**	**0.86**	**0.70**	**0.18**	**0.88**	**0.74**	**0.18**	**0.92**	**0.75**	**0.20**	**0.95**	**0.78**	**0.20**	**0.98**	**0.79**	**0.21**	**1.00**	**16%**	**495**	**506**	**528**	**546**	**564**	**575**	**16%**	**1.06**	**0.30**	**1.36**
NFRWSP Total		**8.21**	**13.30**	**21.51**	**8.50**	**14.13**	**22.73**	**9.39**	**15.58**	**24.97**	**10.15**	**16.99**	**27.14**	**10.86**	**18.29**	**29.15**	**11.50**	**19.50**	**31.00**	**44%**	**6,365**	**6,759**	**7,598**	**8,411**	**9,169**	**9,861**	**55%**	**16.73**	**28.37**	**45.10**

Notes:

1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2010 water use and irrigated acreage obtained from SJRWMD Estimated Water Use Survey, golf course land coverage, EN-50 and USGS data.
4.) 2015-2035 projected surface water demand was interpolated based on 2010 percentages.
5.) 2015-2035 acreage projections estimated using 2010 acreage to 2010 water use ratio.
6.) 2035 1-in-10 rainfall year demands estimated using % above average from highest water year from 2006-2014.

Table B-8a (NFRWSP). 2006-2014 Water Use, Total County Population and Five-Year Gross Per Capita Averages for Landscape/Recreational/Aesthetic Self-supply and Landscape/Recreational/Aesthetic Self-supply Water Demand Increases, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Total County Water Use 2006	2007	2008	2009	2010	2011	2012	2013	2014	2006-2014 Average	High Year	% Above Average
Alachua	SJRWMD	0.53	0.51	0.43	0.30	1.13	0.67	0.36	0.35	0.49	0.53	1.13	113%
Alachua	SRWMD	0.62	0.56	0.51	0.45	0.30	0.27	0.24	0.22	0.20	0.40	0.62	55%
Alachua	**Total**	**1.15**	**1.07**	**0.94**	**0.75**	**1.43**	**0.94**	**0.60**	**0.57**	**0.69**	**0.90**	**1.15**	**28%**
Baker	SJRWMD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0%
Baker	SRWMD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A
Baker	**Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**N/A**
Bradford	SJRWMD	0.06	0.10	0.09	0.09	0.10	0.10	0.00	0.00	0.00	0.06	0.06	0%
Bradford	SRWMD	0.39	0.32	0.24	0.17	0.08	0.07	0.06	0.05	0.04	0.17	0.39	129%
Bradford	**Total**	**0.45**	**0.42**	**0.33**	**0.26**	**0.18**	**0.17**	**0.06**	**0.05**	**0.04**	**0.24**	**0.45**	**88%**
Clay	SJRWMD	2.43	1.58	0.97	0.67	3.29	1.14	0.41	0.15	3.03	1.52	3.29	116%
Columbia	SRWMD	0.50	0.50	0.50	0.50	0.38	0.36	0.34	0.32	0.30	0.43	0.50	16%
Duval	SJRWMD	6.01	5.79	4.40	4.14	5.92	7.17	6.29	4.98	8.14	5.87	8.14	39%
Flagler	SJRWMD	2.00	2.33	1.81	1.61	1.33	2.42	2.10	1.75	2.18	1.95	2.42	24%
Gilchrist	SRWMD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A
Hamilton	SRWMD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A
Nassau	SJRWMD	3.16	2.85	2.84	1.72	2.96	3.06	2.32	2.20	3.24	2.71	3.24	20%
Putnam	SJRWMD	0.31	0.22	0.25	0.22	0.41	2.62	0.27	0.26	1.42	0.66	2.62	297%
St. Johns	SJRWMD	5.43	4.45	3.94	2.93	5.51	5.32	4.62	3.57	5.44	4.58	5.51	20%
Suwannee	SRWMD	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0%
Union	SRWMD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A
SJRWMD Region 1 Total		**19.93**	**17.83**	**14.73**	**11.68**	**20.65**	**22.50**	**16.37**	**13.26**	**23.94**	**17.67**	**22.50**	**27%**
SRWMD NFRWSP Total		**1.62**	**1.49**	**1.36**	**1.23**	**0.86**	**0.80**	**0.74**	**0.69**	**0.64**	**1.16**	**1.62**	**40%**
NFRWSP Total		**21.55**	**19.32**	**16.09**	**12.91**	**21.51**	**23.30**	**17.11**	**13.95**	**24.58**	**18.83**	**24.12**	**28%**

County	District	County Population Within District 2006	2007	2008	2009	2010	2011	2012	2013	2014	2010-2014 Average GPCD
Alachua	SJRWMD	195,916	199,110	201,290	202,913	203,953	203,954	203,487	204,502	206,752	3
Alachua	SRWMD	41,673	42,352	42,816	43,161	43,383	43,383	43,283	43,500	43,978	6
Alachua	**Total**	**237,589**	**241,462**	**244,106**	**246,074**	**247,336**	**247,337**	**246,770**	**248,002**	**250,730**	**3**
Baker	SJRWMD	24,781	25,457	26,006	26,415	26,513	26,329	26,340	26,284	26,392	0
Baker	SRWMD	563	578	590	600	602	598	598	597	599	0
Baker	**Total**	**25,344**	**26,035**	**26,596**	**27,015**	**27,115**	**26,927**	**26,938**	**26,881**	**26,991**	**0**
Bradford	SJRWMD	5,742	5,836	5,860	5,883	5,781	5,810	5,521	5,517	5,538	7
Bradford	SRWMD	22,588	22,954	23,048	23,138	22,739	22,852	21,718	21,700	21,785	3
Bradford	**Total**	**28,330**	**28,790**	**28,908**	**29,021**	**28,520**	**28,662**	**27,239**	**27,217**	**27,323**	**4**
Clay	SJRWMD	178,025	185,427	187,657	188,814	190,865	191,143	192,071	192,843	197,403	8
Columbia	SRWMD	64,758	66,198	66,999	67,259	67,531	67,528	67,729	67,489	67,826	5
Duval	SJRWMD	839,090	847,384	853,077	858,291	864,263	864,601	869,729	876,075	890,066	7
Flagler	SJRWMD	84,717	90,604	93,430	94,600	95,696	96,241	97,160	97,483	99,121	20
Gilchrist	SRWMD	16,223	16,548	16,695	16,806	16,939	16,983	16,946	16,880	16,853	0
Hamilton	SRWMD	14,446	14,650	14,776	14,854	14,799	14,744	14,836	14,507	14,351	0
Nassau	SJRWMD	67,199	69,335	71,081	72,349	73,314	73,684	73,745	74,661	75,321	37
Putnam	SJRWMD	74,198	74,863	75,028	74,714	74,364	74,052	73,158	72,605	72,523	14
St. Johns	SJRWMD	167,360	176,032	182,504	186,383	190,039	192,852	196,071	201,541	207,443	25
Suwannee	SRWMD	39,084	40,109	40,959	41,097	41,551	43,215	43,796	43,873	44,168	2
Union	SRWMD	14,839	15,376	15,643	15,358	15,535	15,473	15,510	15,483	15,647	0
SJRWMD Region 1 Total		**1,637,028**	**1,674,048**	**1,695,933**	**1,710,362**	**1,724,788**	**1,728,666**	**1,737,282**	**1,751,511**	**1,780,559**	**10**
SRWMD NFRWSP Total		**214,174**	**218,765**	**221,526**	**222,273**	**223,079**	**224,776**	**224,416**	**224,029**	**225,207**	**6**
NFRWSP Total		**1,851,202**	**1,892,813**	**1,917,459**	**1,932,635**	**1,947,867**	**1,953,442**	**1,961,698**	**1,975,540**	**2,005,766**	**10**

County	District	County Population Projections Within District 2015	2020	2025	2030	2035	Increase in County Population Within District 2010-2015	2015-2020	2020-2025	2025-2030	2030-2035	Change in Recreational Self-supply Water Demand 2015	2020	2025	2030	2035
Alachua	SJRWMD	208,789	219,014	228,662	237,732	246,638	4,836	10,225	9,648	9,070	8,906	0.01	0.03	0.03	0.03	0.03
Alachua	SRWMD	44,411	46,586	48,638	50,568	52,462	1,028	2,175	2,052	1,930	1,894	0.01	0.01	0.01	0.01	0.01
Alachua	**Total**	**253,200**	**265,600**	**277,300**	**288,300**	**299,100**	**5,864**	**12,400**	**11,700**	**11,000**	**10,800**	**0.02**	**0.04**	**0.04**	**0.04**	**0.04**
Baker	SJRWMD	26,792	28,650	30,507	32,267	33,930	279	1,858	1,857	1,760	1,663	0.00	0.00	0.00	0.00	0.00
Baker	SRWMD	608	650	693	733	770	6	42	43	40	37	0.00	0.00	0.00	0.00	0.00
Baker	**Total**	**27,400**	**29,300**	**31,200**	**33,000**	**34,700**	**285**	**1,900**	**1,900**	**1,800**	**1,700**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Bradford	SJRWMD	5,595	5,757	5,919	6,061	6,182	-186	162	162	142	121	0.00	0.00	0.00	0.00	0.00
Bradford	SRWMD	22,005	22,643	23,281	23,839	24,318	-734	638	638	558	479	0.00	0.00	0.00	0.00	0.00
Bradford	**Total**	**27,600**	**28,400**	**29,200**	**29,900**	**30,500**	**-920**	**800**	**800**	**700**	**600**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Clay	SJRWMD	201,800	224,600	247,000	268,400	288,300	10,935	22,800	22,400	21,400	19,900	0.09	0.18	0.18	0.17	0.16
Columbia	SRWMD	68,400	72,000	75,500	78,600	81,200	869	3,600	3,500	3,100	2,600	0.00	0.02	0.02	0.02	0.01
Duval	SJRWMD	899,300	945,900	989,600	1,030,400	1,067,900	35,037	46,600	43,700	40,800	37,500	0.25	0.33	0.31	0.29	0.26
Flagler	SJRWMD	101,900	122,100	141,700	160,000	177,200	6,204	20,200	19,600	18,300	17,200	0.12	0.40	0.39	0.37	0.34
Gilchrist	SRWMD	16,900	17,800	18,600	19,400	20,100	-39	900	800	800	700	0.00	0.00	0.00	0.00	0.00
Hamilton	SRWMD	14,600	15,000	15,500	15,900	16,200	-199	400	500	400	300	0.00	0.00	0.00	0.00	0.00
Nassau	SJRWMD	76,800	84,400	91,900	99,100	105,700	3,486	7,600	7,500	7,200	6,600	0.13	0.28	0.28	0.27	0.24
Putnam	SJRWMD	72,600	73,100	73,500	73,800	74,200	-1,764	500	400	300	400	-0.02	0.01	0.01	0.00	0.01
St. Johns	SJRWMD	214,800	253,400	290,900	325,000	356,500	24,761	38,600	37,500	34,100	31,500	0.62	0.97	0.94	0.85	0.79
Suwannee	SRWMD	44,700	47,300	49,700	52,000	54,100	3,149	2,600	2,400	2,300	2,100	0.01	0.01	0.00	0.00	0.00
Union	SRWMD	15,900	16,400	16,900	17,400	17,900	365	500	500	500	500	0.00	0.00	0.00	0.00	0.00
SJRWMD Region 1 Total		**1,808,376**	**1,956,921**	**2,099,688**	**2,232,760**	**2,356,550**	**83,588**	**148,545**	**142,767**	**133,072**	**123,790**	**1.20**	**2.20**	**2.14**	**1.98**	**1.83**
SRWMD NFRWSP Total		**227,524**	**238,379**	**248,812**	**258,440**	**267,050**	**4,445**	**10,855**	**10,433**	**9,628**	**8,610**	**0.02**	**0.04**	**0.03**	**0.03**	**0.02**
NFRWSP Total		**2,035,900**	**2,195,300**	**2,348,500**	**2,491,200**	**2,623,600**	**88,033**	**159,400**	**153,200**	**142,700**	**132,400**	**1.22**	**2.24**	**2.17**	**2.01**	**1.85**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2006-2014 water use obtained from SJRWMD Estimated Water Use Survey, EN-50 and USGS data.
4.) 2006-2010 total county population obtained from BEBR Revised Annual Population Estimates, Special Population Reports 7, May 2011 and percentage within District applied.
5.) 2011-2014 total county population obtained from respective published BEBR Annual Population Estimates and percentage within District applied.
6.) 2015 to 2035 county population projections were obtained from BEBR Population Projections: Volume 48, Bulletin 171, Published April 2015.
7.) 2011-2014 SRWMD water use linearlly extrapolated from 2006-2010 data.

Table B-9 (NFRWSP). Commercial/Industrial/Institutional and Mining/Dewatering Self-supply Water Use for 2010, 5-in-10 Year Demand Projections for 2015-2035, by County, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Water Use			Demand Projections (5-in-10)															Percent Change
		2010			2015			2020			2025			2030			2035			
		Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	2010-2035
Alachua	SJRWMD	0.57	0.00	**0.57**	0.58	0.00	**0.58**	0.61	0.00	**0.61**	0.64	0.00	**0.64**	0.67	0.00	**0.67**	0.70	0.00	**0.70**	23%
Alachua	SRWMD	0.10	0.00	**0.10**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	0.10	0.00	**0.10**	0%
Alachua	**Total**	**0.67**	**0.00**	**0.67**	**0.68**	**0.00**	**0.68**	**0.71**	**0.00**	**0.71**	**0.74**	**0.00**	**0.74**	**0.77**	**0.00**	**0.77**	**0.80**	**0.00**	**0.80**	**19%**
Baker	SJRWMD	0.54	0.00	**0.54**	0.54	0.00	**0.54**	0.57	0.00	**0.57**	0.60	0.00	**0.60**	0.63	0.00	**0.63**	0.66	0.00	**0.66**	22%
Baker	SRWMD	0.21	0.00	**0.21**	0.21	0.00	**0.21**	0.22	0.00	**0.22**	0.24	0.00	**0.24**	0.25	0.00	**0.25**	0.26	0.00	**0.26**	24%
Baker	**Total**	**0.75**	**0.00**	**0.75**	**0.75**	**0.00**	**0.75**	**0.79**	**0.00**	**0.79**	**0.84**	**0.00**	**0.84**	**0.88**	**0.00**	**0.88**	**0.92**	**0.00**	**0.92**	**23%**
Bradford	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A
Bradford	SRWMD	1.07	0.00	**1.07**	1.04	0.00	**1.04**	1.07	0.00	**1.07**	1.10	0.00	**1.10**	1.13	0.00	**1.13**	1.15	0.00	**1.15**	7%
Bradford	**Total**	**1.07**	**0.00**	**1.07**	**1.04**	**0.00**	**1.04**	**1.07**	**0.00**	**1.07**	**1.10**	**0.00**	**1.10**	**1.13**	**0.00**	**1.13**	**1.15**	**0.00**	**1.15**	**7%**
Clay	SJRWMD	0.70	0.00	**0.70**	0.72	0.00	**0.72**	0.77	0.00	**0.77**	0.81	0.00	**0.81**	0.85	0.00	**0.85**	0.89	0.00	**0.89**	27%
Columbia	SRWMD	0.30	0.00	**0.30**	0.30	0.00	**0.30**	0.31	0.00	**0.31**	0.32	0.00	**0.32**	0.33	0.00	**0.33**	0.34	0.00	**0.34**	13%
Duval	SJRWMD	29.91	0.00	**29.91**	30.75	0.00	**30.75**	31.87	0.00	**31.87**	32.92	0.00	**32.92**	33.90	0.00	**33.90**	34.80	0.00	**34.80**	16%
Flagler	SJRWMD	1.84	0.00	**1.84**	1.97	0.00	**1.97**	2.39	0.00	**2.39**	2.80	0.00	**2.80**	3.18	0.00	**3.18**	3.54	0.00	**3.54**	N/A
Gilchrist	SRWMD	0.34	0.00	**0.34**	0.34	0.00	**0.34**	0.36	0.00	**0.36**	0.37	0.00	**0.37**	0.38	0.00	**0.38**	0.39	0.00	**0.39**	15%
Hamilton	SRWMD	25.82	0.00	**25.82**	25.52	0.00	**25.52**	26.13	0.00	**26.13**	26.90	0.00	**26.90**	27.51	0.00	**27.51**	27.97	0.00	**27.97**	8%
Nassau	SJRWMD	31.79	0.00	**31.79**	31.80	0.00	**31.80**	31.82	0.00	**31.82**	31.84	0.00	**31.84**	31.86	0.00	**31.86**	31.88	0.00	**31.88**	0%
Putnam	SJRWMD	4.68	20.25	**24.93**	4.67	20.20	**24.87**	4.67	20.22	**24.89**	4.67	20.23	**24.90**	4.68	20.23	**24.91**	4.68	20.24	**24.92**	0%
St. Johns	SJRWMD	0.31	0.73	**1.04**	0.32	0.77	**1.09**	0.35	0.82	**1.17**	0.37	0.88	**1.25**	0.39	0.93	**1.32**	0.41	0.97	**1.38**	33%
Suwannee	SRWMD	1.71	0.00	**1.71**	1.83	0.00	**1.83**	1.93	0.00	**1.93**	2.02	0.00	**2.02**	2.11	0.00	**2.11**	2.19	0.00	**2.19**	28%
Union	SRWMD	0.46	0.00	**0.46**	0.47	0.00	**0.47**	0.49	0.00	**0.49**	0.51	0.00	**0.51**	0.53	0.00	**0.53**	0.55	0.00	**0.55**	20%
SJRWMD Region 1 Total		**70.34**	**20.98**	**91.32**	**71.35**	**20.97**	**92.32**	**73.05**	**21.04**	**94.09**	**74.65**	**21.11**	**95.76**	**76.16**	**21.16**	**97.32**	**77.56**	**21.21**	**98.77**	**8%**
SRWMD NFRWSP Total		**30.01**	**0.00**	**30.01**	**29.81**	**0.00**	**29.81**	**30.61**	**0.00**	**30.61**	**31.56**	**0.00**	**31.56**	**32.34**	**0.00**	**32.34**	**32.95**	**0.00**	**32.95**	**10%**
NFRWSP Total		**100.35**	**20.98**	**121.33**	**101.16**	**20.97**	**122.13**	**103.66**	**21.04**	**124.70**	**106.21**	**21.11**	**127.32**	**108.50**	**21.16**	**129.66**	**110.51**	**21.21**	**131.72**	**9%**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2010 water use obtained from SJRWMD Estimated Water Use Surveys, EN-50 and USGS data.
4.) 2015-2035 projected surface water demand was interpolated based on 2010 percentages.

Table B-9a (NFRWSP). 2006-2014 Water Use, Total County Population and Five-Year Gross Per Capita Averages for Commercial/Industrial/Institutional and Mining/Dewatering Self-supply Water Demand Increases, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Total County Water Use									County Population Within District									2010-2014 Average GPCD
		2006	2007	2008	2009	2010	2011	2012	2013	2014	2006	2007	2008	2009	2010	2011	2012	2013	2014	
Alachua	SJRWMD	0.89	0.74	0.42	0.57	0.57	0.57	0.79	0.38	0.37	195,916	199,110	201,290	202,913	203,953	203,954	203,487	204,502	206,752	3
Alachua	SRWMD	0.23	0.20	0.17	0.14	0.10	0.09	0.08	0.07	0.06	41,673	42,352	42,816	43,161	43,383	43,383	43,283	43,500	43,978	2
Alachua	**Total**	**1.12**	**0.94**	**0.59**	**0.71**	**0.67**	**0.66**	**0.87**	**0.45**	**0.43**	**237,589**	**241,462**	**244,106**	**246,074**	**247,336**	**247,337**	**246,770**	**248,002**	**250,730**	**2**
Baker	SJRWMD	0.45	0.53	0.49	0.53	0.54	0.45	0.39	0.35	0.48	24,781	25,457	26,006	26,415	26,513	26,329	26,340	26,284	26,392	17
Baker	SRWMD	0.19	0.22	0.21	0.18	0.21	0.21	0.21	0.21	0.21	563	578	590	600	602	598	598	597	599	351
Baker	**Total**	**0.64**	**0.75**	**0.70**	**0.71**	**0.75**	**0.66**	**0.60**	**0.56**	**0.69**	**25,344**	**26,035**	**26,596**	**27,015**	**27,115**	**26,927**	**26,938**	**26,881**	**26,991**	**24**
Bradford	SJRWMD	0.50	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.01	5,742	5,836	5,860	5,883	5,781	5,810	5,521	5,517	5,538	0
Bradford	SRWMD	1.17	1.15	1.12	1.09	1.07	1.05	1.03	1.01	0.99	22,588	22,954	23,048	23,138	22,739	22,852	21,718	21,700	21,785	46
Bradford	**Total**	**1.67**	**1.42**	**1.12**	**1.09**	**1.07**	**1.05**	**1.03**	**1.01**	**1.00**	**28,330**	**28,790**	**28,908**	**29,021**	**28,520**	**28,662**	**27,239**	**27,217**	**27,323**	**37**
Clay	SJRWMD	1.60	1.34	1.27	0.95	0.70	0.55	0.48	0.25	0.27	178,025	185,427	187,657	188,814	190,865	191,143	192,071	192,843	197,403	2
Columbia	SRWMD	0.45	0.44	0.37	0.31	0.30	0.28	0.26	0.24	0.22	64,758	66,198	66,999	67,259	67,531	67,528	67,729	67,489	67,826	4
Duval	SJRWMD	22.79	23.18	23.32	19.47	29.91	20.59	18.69	17.02	17.15	839,090	847,384	853,077	858,291	864,263	864,601	869,729	876,075	890,066	24
Flagler	SJRWMD	7.33	5.46	2.53	1.95	1.84	2.10	1.97	1.70	2.49	84,717	90,604	93,430	94,600	95,696	96,241	97,160	97,483	99,121	21
Gilchrist	SRWMD	0.49	0.44	0.43	0.37	0.34	0.32	0.30	0.28	0.26	16,223	16,548	16,695	16,806	16,939	16,983	16,946	16,880	16,853	18
Hamilton	SRWMD	39.94	30.79	29.74	27.41	25.82	23.99	22.29	20.71	19.25	14,446	14,650	14,776	14,854	14,799	14,744	14,836	14,507	14,351	1530
Nassau	SJRWMD	0.20	0.27	0.83	0.16	0.13	0.42	0.21	0.14	0.15	67,199	69,335	71,081	72,349	73,314	73,684	73,745	74,661	75,321	3
Putnam	SJRWMD	3.60	2.55	2.38	2.44	1.17	2.39	2.49	3.11	3.08	74,198	74,863	75,028	74,714	74,364	74,052	73,158	72,605	72,523	33
St. Johns	SJRWMD	0.88	1.08	1.04	0.57	1.04	0.27	0.36	0.35	0.38	167,360	176,032	182,504	186,383	190,039	192,852	196,071	201,541	207,443	2
Suwannee	SRWMD	1.96	1.58	1.62	1.67	1.71	1.67	1.63	1.59	1.55	39,084	40,109	40,959	41,097	41,551	43,215	43,796	43,873	44,168	38
Union	SRWMD	0.38	0.33	0.46	0.44	0.46	0.48	0.50	0.52	0.54	14,839	15,376	15,643	15,358	15,535	15,473	15,510	15,483	15,647	32
SJRWMD Region 1 Total		**38.24**	**35.42**	**32.28**	**26.64**	**35.90**	**27.34**	**25.38**	**23.30**	**24.38**	**1,637,028**	**1,674,048**	**1,695,933**	**1,710,362**	**1,724,788**	**1,728,666**	**1,737,282**	**1,751,511**	**1,780,559**	**20**
SRWMD NFRWSP Total		**44.81**	**35.15**	**34.12**	**31.61**	**30.01**	**28.09**	**26.30**	**24.63**	**23.08**	**214,174**	**218,765**	**221,526**	**222,273**	**223,079**	**224,776**	**224,416**	**224,029**	**225,207**	**160**
NFRWSP Total		**83.05**	**70.57**	**66.40**	**58.25**	**65.91**	**55.43**	**51.68**	**47.93**	**47.46**	**1,851,202**	**1,892,813**	**1,917,459**	**1,932,635**	**1,947,867**	**1,953,442**	**1,961,698**	**1,975,540**	**2,005,766**	**36**

County	District	County Population Projections Within District					Increase in County Population Within District					Change in Commercial / Industrial / Institutional & Mining / Dewatering Self-supply Water Demand				
		2015	2020	2025	2030	2035	2010-2015	2015-2020	2020-2025	2025-2030	2030-2035	2015	2020	2025	2030	2035
Alachua	SJRWMD	208,789	219,014	228,662	237,732	246,638	4,836	10,225	9,648	9,070	8,906	0.01	0.03	0.03	0.03	0.03
Alachua	SRWMD	44,411	46,586	48,638	50,568	52,462	1,028	2,175	2,052	1,930	1,894	0.00	0.00	0.00	0.00	0.00
Alachua	**Total**	**253,200**	**265,600**	**277,300**	**288,300**	**299,100**	**5,864**	**12,400**	**11,700**	**11,000**	**10,800**	**0.01**	**0.03**	**0.03**	**0.03**	**0.03**
Baker	SJRWMD	26,792	28,650	30,507	32,267	33,930	279	1,858	1,857	1,760	1,663	0.00	0.03	0.03	0.03	0.03
Baker	SRWMD	608	650	693	733	770	6	42	43	40	37	0.00	0.01	0.02	0.01	0.01
Baker	**Total**	**27,400**	**29,300**	**31,200**	**33,000**	**34,700**	**285**	**1,900**	**1,900**	**1,800**	**1,700**	**0.00**	**0.04**	**0.05**	**0.04**	**0.04**
Bradford	SJRWMD	5,595	5,757	5,919	6,061	6,182	-186	162	162	142	121	0.00	0.00	0.00	0.00	0.00
Bradford	SRWMD	22,005	22,643	23,281	23,839	24,318	-734	638	638	558	479	-0.03	0.03	0.03	0.03	0.02
Bradford	**Total**	**27,600**	**28,400**	**29,200**	**29,900**	**30,500**	**-920**	**800**	**800**	**700**	**600**	**-0.03**	**0.03**	**0.03**	**0.03**	**0.02**
Clay	SJRWMD	201,800	224,600	247,000	268,400	288,300	10,935	22,800	22,400	21,400	19,900	0.02	0.05	0.04	0.04	0.04
Columbia	SRWMD	68,400	72,000	75,500	78,600	81,200	869	3,600	3,500	3,100	2,600	0.00	0.01	0.01	0.01	0.01
Duval	SJRWMD	899,300	945,900	989,600	1,030,400	1,067,900	35,037	46,600	43,700	40,800	37,500	0.84	1.12	1.05	0.98	0.90
Flagler	SJRWMD	101,900	122,100	141,700	160,000	177,200	6,204	20,200	19,600	18,300	17,200	0.13	0.42	0.41	0.38	0.36
Gilchrist	SRWMD	16,900	17,800	18,600	19,400	20,100	-39	900	800	800	700	0.00	0.02	0.01	0.01	0.01
Hamilton	SRWMD	14,600	15,000	15,500	15,900	16,200	-199	400	500	400	300	-0.30	0.61	0.77	0.61	0.46
Nassau	SJRWMD	76,800	84,400	91,900	99,100	105,700	3,486	7,600	7,500	7,200	6,600	0.01	0.02	0.02	0.02	0.02
Putnam	SJRWMD	72,600	73,100	73,500	73,800	74,200	-1,764	500	400	300	400	-0.06	0.02	0.01	0.01	0.01
St. Johns	SJRWMD	214,800	253,400	290,900	325,000	356,500	24,761	38,600	37,500	34,100	31,500	0.05	0.08	0.08	0.07	0.06
Suwannee	SRWMD	44,700	47,300	49,700	52,000	54,100	3,149	2,600	2,400	2,300	2,100	0.12	0.10	0.09	0.09	0.08
Union	SRWMD	15,900	16,400	16,900	17,400	17,900	365	500	500	500	500	0.01	0.02	0.02	0.02	0.02
SJRWMD Region 1 Total		**1,808,376**	**1,956,921**	**2,099,688**	**2,232,760**	**2,356,550**	**83,588**	**148,545**	**142,767**	**133,072**	**123,790**	**1.00**	**1.77**	**1.67**	**1.56**	**1.45**
SRWMD NFRWSP Total		**227,524**	**238,379**	**248,812**	**258,440**	**267,050**	**4,445**	**10,855**	**10,433**	**9,628**	**8,610**	**-0.20**	**0.80**	**0.95**	**0.78**	**0.61**
NFRWSP Total		**2,035,900**	**2,195,300**	**2,348,500**	**2,491,200**	**2,623,600**	**88,033**	**159,400**	**153,200**	**142,700**	**132,400**	**0.80**	**2.57**	**2.62**	**2.34**	**2.06**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2006-2014 water use obtained from SJRWMD Estimated Water Use Survey, EN-50 and USGS data.
4.) 2006-2010 total county population obtained from BEBR Revised Annual Population Estimates, Special Population Reports 7, May 2011 and percentage within District applied.
5.) 2011-2014 total county population obtained from respective published BEBR Annual Population Estimates and percentage within District applied.
6.) 2015 to 2035 county population projections were obtained from BEBR Population Projections: Volume 48, Bulletin 171, Published April 2015.
7.) 2011-2014 SRWMD water use linearlly extrapolated from 2006-2010 data.
8.) Nassau and Putnam Counties projections adjusted to hold pulp and paper mill quantities constant; total water use shown for calculations does not include pulp and paper mill quantities.

Table B-10 (NFRWSP). Thermoelectric Power Generation Self-supply Water use for 2010 and 5-in-10 Year Demand Projections for 2015-2035, by County, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Water Use			Demand Projections (5-in-10)															Percent Change	Non-consumptive Saline and Fresh Surface Water Use Cooling					
		2010			2015			2020			2025			2030			2035									
		Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	2010-2035	2010	2015	2020	2025	2030	2035
Alachua	SJRWMD	0.33	0.00	**0.33**	0.44	0.00	**0.44**	0.44	0.00	**0.44**	0.39	0.00	**0.39**	0.39	0.00	**0.39**	0.39	0.00	**0.39**	18%	0.00	0.00	0.00	0.00	0.00	0.00
Alachua	SRWMD	2.17	0.00	**2.17**	2.93	0.00	**2.93**	2.93	0.00	**2.93**	2.58	0.00	**2.58**	2.58	0.00	**2.58**	2.58	0.00	**2.58**	19%	0.00	0.00	0.00	0.00	0.00	0.00
Alachua	**Total**	**2.50**	**0.00**	**2.50**	**3.37**	**0.00**	**3.37**	**3.37**	**0.00**	**3.37**	**2.97**	**0.00**	**2.97**	**2.97**	**0.00**	**2.97**	**2.97**	**0.00**	**2.97**	**19%**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Baker	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00
Baker	SRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00
Baker	**Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**N/A**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Bradford	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00
Bradford	SRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00
Bradford	**Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**N/A**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Clay	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00
Columbia	SRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00
Duval	SJRWMD	7.22	12.56	**19.78**	6.38	11.24	**17.62**	7.06	7.64	**14.70**	7.32	7.97	**15.29**	7.77	8.51	**16.28**	8.23	9.10	**17.33**	-12%	628.04	562.12	381.83	398.12	425.60	455.04
Flagler	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00
Gilchrist	SRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00
Hamilton	SRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00
Nassau	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00
Putnam	SJRWMD	0.45	0.35	**0.80**	0.38	0.30	**0.68**	0.42	0.33	**0.75**	0.44	0.35	**0.79**	0.45	0.36	**0.81**	0.47	0.37	**0.84**	5%	17.26	14.97	16.40	17.44	17.93	18.44
St. Johns	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00
Suwannee	SRWMD	0.16	2.16	**2.32**	0.23	3.63	**3.86**	0.63	10.11	**10.74**	0.66	10.67	**11.33**	0.70	11.32	**12.02**	0.74	12.00	**12.74**	449%	108.06	181.48	505.42	533.46	565.81	600.09
Union	SRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00
SJRWMD Region 1 Total		**8.00**	**12.91**	**20.91**	**7.20**	**11.54**	**18.74**	**7.92**	**7.97**	**15.89**	**8.15**	**8.32**	**16.47**	**8.61**	**8.87**	**17.48**	**9.09**	**9.47**	**18.56**	**-11%**	**645.30**	**577.09**	**398.23**	**415.56**	**443.53**	**473.48**
SRWMD NFRWSP Total		**2.33**	**2.16**	**4.49**	**3.16**	**3.63**	**6.79**	**3.56**	**10.11**	**13.67**	**3.24**	**10.67**	**13.91**	**3.28**	**11.32**	**14.60**	**3.32**	**12.00**	**15.32**	**241%**	**108.06**	**181.48**	**505.42**	**533.46**	**565.81**	**600.09**
NFRWSP Total		**10.33**	**15.07**	**25.40**	**10.36**	**15.17**	**25.53**	**11.48**	**18.08**	**29.56**	**11.39**	**18.99**	**30.38**	**11.89**	**20.19**	**32.08**	**12.41**	**21.47**	**33.88**	**33%**	**753.36**	**758.57**	**903.65**	**949.02**	**1,009.34**	**1,073.57**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.

Table B-10a (NFRWSP). Thermoelectric Power Generation Self-supply water use for 2010 and 5-in-10 Year Demand Projections for 2015-2035, by County and Facility, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	Facility	District	Demand Projections (5-in-10)																		Percent Change 2010-2035	Non-consumptive Saline and Fresh Surface Water Use for Thermoelectric Cooling					
			2010			2015			2020			2025			2030			2035				2010	2015	2020	2025	2030	2035
			Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total							
Alachua	Gainesville Regional Utilities - JR Kelly (11374)	SJRWMD	0.33	0.00	**0.33**	0.44	0.00	**0.44**	0.44	0.00	**0.44**	0.39	0.00	**0.39**	0.39	0.00	**0.39**	0.39	0.00	**0.39**	18%	0.00	0.00	0.00	0.00	0.00	0.00
	Deerhaven Power Plant	SRWMD	2.17	0.00	**2.17**	2.93	0.00	**2.93**	2.93	0.00	**2.93**	2.58	0.00	**2.58**	2.58	0.00	**2.58**	2.58	0.00	**2.58**	19%	0.00	0.00	0.00	0.00	0.00	0.00
	Total		**2.50**	**0.00**	**2.50**	**3.37**	**0.00**	**3.37**	**3.37**	**0.00**	**3.37**	**2.97**	**0.00**	**2.97**	**2.97**	**0.00**	**2.97**	**2.97**	**0.00**	**2.97**	**19%**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Duval	JEA - Northside (721)	SJRWMD	0.59	11.64	**12.23**	0.32	10.39	**10.71**	0.20	6.60	**6.80**	0.21	6.88	**7.09**	0.23	7.35	**7.58**	0.24	7.86	**8.10**	-34%	582.06	519.72	329.77	343.84	367.57	393.00
	JEA - Southside (735)	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00
	JEA - Kennedy (737)	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00
	JEA - Brandy Branch (51629)	SJRWMD	1.20	0.00	**1.20**	1.83	0.00	**1.83**	1.89	0.00	**1.89**	1.97	0.00	**1.97**	2.11	0.00	**2.11**	2.25	0.00	**2.25**	88%	0.00	0.00	0.00	0.00	0.00	0.00
	SJR Power Park (*PA 81-13*)	SJRWMD	4.32	0.92	**5.24**	3.25	0.85	**4.10**	3.99	1.04	**5.03**	4.16	1.09	**5.25**	4.45	1.16	**5.61**	4.76	1.24	**6.00**	15%	45.98	42.40	52.06	54.28	58.03	62.04
	Cedar Bay Generating Facility (*PA 88-24G*)	SJRWMD	1.11	0.00	**1.11**	0.98	0.00	**0.98**	0.98	0.00	**0.98**	0.98	0.00	**0.98**	0.98	0.00	**0.98**	0.98	0.00	**0.98**	-12%	0.00	0.00	0.00	0.00	0.00	0.00
	Total		**7.22**	**12.56**	**19.78**	**6.38**	**11.24**	**17.62**	**7.06**	**7.64**	**14.70**	**7.32**	**7.97**	**15.29**	**7.77**	**8.51**	**16.28**	**8.23**	**9.10**	**17.33**	**-12%**	**628.04**	**562.12**	**381.83**	**398.12**	**425.60**	**455.04**
Putnam	Florida Power & Light - Palatka *(PA 74-01)*	SJRWMD	0.00	0.02	**0.02**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	-100%	0.90	0.00	0.00	0.00	0.00	0.00
	Seminole Electric Cooperative - Palatka (*PA 78-10*)	SJRWMD	0.45	0.33	**0.78**	0.38	0.30	**0.68**	0.42	0.33	**0.75**	0.44	0.35	**0.79**	0.45	0.36	**0.81**	0.47	0.37	**0.84**	8%	16.36	14.97	16.40	17.44	17.93	18.44
	Total		**0.45**	**0.35**	**0.80**	**0.38**	**0.30**	**0.68**	**0.42**	**0.33**	**0.75**	**0.44**	**0.35**	**0.79**	**0.45**	**0.36**	**0.81**	**0.47**	**0.37**	**0.84**	**5%**	**17.26**	**14.97**	**16.40**	**17.44**	**17.93**	**18.44**
Suwannee	Progress Energy - Ellaville (84-00698 & 84-00699)	SRWMD	0.16	2.16	**2.32**	0.23	3.63	**3.86**	0.63	10.11	**10.74**	0.66	10.67	**11.33**	0.70	11.32	**12.02**	0.74	12.00	**12.74**	449%	108.06	181.48	505.42	533.46	565.81	600.09
	Total		**0.16**	**2.16**	**2.32**	**0.23**	**3.63**	**3.86**	**0.63**	**10.11**	**10.74**	**0.66**	**10.67**	**11.33**	**0.70**	**11.32**	**12.02**	**0.74**	**12.00**	**12.74**	**449%**	**108.06**	**181.48**	**505.42**	**533.46**	**565.81**	**600.09**
SJRWMD Region 1 Total			**8.00**	**12.91**	**20.91**	**7.20**	**11.54**	**18.74**	**7.92**	**7.97**	**15.89**	**8.15**	**8.32**	**16.47**	**8.61**	**8.87**	**17.48**	**9.09**	**9.47**	**18.56**	**-11%**	**645.30**	**577.09**	**398.23**	**415.56**	**443.53**	**473.48**
SRWMD NFRWSP Total			**2.33**	**2.16**	**4.49**	**3.16**	**3.63**	**6.79**	**3.56**	**10.11**	**13.67**	**3.24**	**10.67**	**13.91**	**3.28**	**11.32**	**14.60**	**3.32**	**12.00**	**15.32**	**241%**	**108.06**	**181.48**	**505.42**	**533.46**	**565.81**	**600.09**
NFRWSP Total			**10.33**	**15.07**	**25.40**	**10.36**	**15.17**	**25.53**	**11.48**	**18.08**	**29.56**	**11.39**	**18.99**	**30.38**	**11.89**	**20.19**	**32.08**	**12.41**	**21.47**	**33.88**	**33%**	**753.36**	**758.57**	**903.65**	**949.02**	**1009.34**	**1073.57**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) Water use and demand projections shown are for consumptive uses.
4.) 2010 water use was obtained from SJRWMD EN-50 data, SJRWMD Survey data and USGS data.
5.) Non-consumptive water use shown for Florida Power & Light - Palatka is actually 2011 use; meter was broken during 2010.

Table B-10b (NFRWSP). 2006-2014 Water Use and Megawatts, Five-Year Gross Per Mega Watt Averages and 2015-2035 Demand Projections for Thermoelectric Power Generation Self-supply Water Demand Increases, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	Facility	District	Groundwater Water Use									Non-consumptive Saline and Fresh Surface Water Use									Notes
			2006	2007	2008	2009	2010	2011	2012	2013	2014	2006	2007	2008	2009	2010	2011	2012	2013	2014	
Alachua	Gainesville Regional Utilities - J R Kelly (11374)	SJRWMD	0.183	0.357	0.261	0.324	0.326	0.334	0.567	0.226	0.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	Gainesville Regional Utilities - Deerhaven Power Plant *(PA 74-04)*	SRWMD	2.484	2.488	2.492	2.496	2.174	2.120	2.067	2.015	1.965	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Groundwater use interpolated from USGS
	Total		**2.667**	**2.845**	**2.753**	**2.820**	**2.500**	**2.454**	**2.634**	**2.241**	**2.250**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	
Duval	JEA - Northside (721)	SJRWMD	0.170	0.594	0.760	0.665	0.591	0.270	0.236	0.278	0.307	262.628	586.112	665.822	597.071	582.055	575.747	469.401	445.822	603.587	
	JEA - Southside (735)	SJRWMD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Plant Closed
	JEA - Kennedy (737)	SJRWMD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Plant Closed
	JEA - Brandy Branch (51629)	SJRWMD	0.871	1.279	1.173	1.305	1.203	2.026	2.152	2.152	1.871	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	JEA - SJR Power Park (*PA 81-13*)	SJRWMD	3.946	4.038	3.733	3.699	4.315	2.979	2.453	3.288	3.711	45.297	45.297	38.718	43.539	45.976	43.415	39.884	45.060	44.010	Non-consumptive water use shown for 2006 is 2007 use; no records.
	Cedar Bay Generating Facility (*PA 88-24G*)	SJRWMD	1.153	1.164	1.100	0.660	1.108	1.226	0.962	0.803	0.780	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	Total		**6.140**	**7.075**	**6.766**	**6.329**	**7.217**	**6.501**	**5.803**	**6.521**	**6.669**	**307.925**	**631.409**	**704.540**	**640.610**	**628.031**	**619.162**	**509.285**	**490.882**	**647.597**	
Putnam	Florida Power & Light - Puntam *(PA 74-01)*	SJRWMD	1.195	0.176	0.164	0.000	0.002	0.152	0.108	0.078	0.155	1.189	1.060	1.084	0.903	0.903	0.903	0.746	0.547	0.556	Non-consumptive water use shown for 2010 is 2011 use; meter was broken during 2010. Plant decommissioned 2014.
	Seminole Electric Cooperative - Palatka (*PA 78-10*)	SJRWMD	0.211	0.523	0.383	0.409	0.453	0.459	0.384	0.384	0.418	21.956	19.749	13.432	11.442	16.360	17.273	15.978	15.978	15.866	
	Total		**1.406**	**0.699**	**0.547**	**0.409**	**0.455**	**0.611**	**0.492**	**0.462**	**0.573**	**23.145**	**20.809**	**14.516**	**12.345**	**17.263**	**18.176**	**16.724**	**16.525**	**16.422**	
Suwannee	Duke Energy - Ellaville (84-00698 & 84-00699)	SRWMD	0.103	0.117	0.122	0.120	0.155	0.171	0.188	0.207	0.228	57.507	67.502	76.607	46.700	108.060	127.059	149.398	175.664	206.548	
	Total		**0.103**	**0.117**	**0.122**	**0.120**	**0.155**	**0.171**	**0.188**	**0.207**	**0.228**	**57.507**	**67.502**	**76.607**	**46.700**	**108.060**	**127.059**	**149.398**	**175.664**	**206.548**	
SJRWMD Region 1 Total			**6.323**	**7.432**	**7.027**	**6.653**	**7.543**	**6.835**	**6.370**	**6.747**	**6.954**	**307.925**	**631.409**	**704.540**	**640.610**	**628.031**	**619.162**	**509.285**	**490.882**	**647.597**	
SRWMD NFRWSP Total			**2.587**	**2.605**	**2.614**	**2.616**	**2.329**	**2.291**	**2.255**	**2.222**	**2.193**	**57.507**	**67.502**	**76.607**	**46.700**	**108.060**	**127.059**	**149.398**	**175.664**	**206.548**	
NFRWSP Total			**8.910**	**10.037**	**9.641**	**9.269**	**9.872**	**9.126**	**8.625**	**8.969**	**9.147**	**365.432**	**698.911**	**781.147**	**687.310**	**736.091**	**746.221**	**658.683**	**666.546**	**854.145**	

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2006-2014 water use was obtained from SJRWMD EN-50 data, SJRWMD Survey data and USGS data.
4.) GRU 2010 Megawatts per plant interpolated from total using ratio of 2010 water use.
5.) GRU 2006-2014 historic and 2015-2024 future total capacity megawatts obtained from Schedule 3.1 and Schedule 7.2 in 2015 Ten-Year Site Plan.

6.) GRU Schedule 7.2, 2015 Ten-Year Site Plan indicates a decrease in megawatts from 2020 to 2024. Due to uncertaintity, projections were left constant after 2020. In addition, the Ten-Year Site Plan indicates a need of an additional 1.4 mgd, of which 0.4 mgd is anticipated to be met by reclaimed water.

7.) FPL 2006-2014 total historic and 2015-2023 future total capacity megawatts obtained from Schedule 3.1 in 2014 Ten-Year Site Plan. Megawatt distribution to individual plants estimated using plant specific capacity in Figure I.A.1.

8.) FPL 2025-2035 projected total megawatts and water demand estimated from historic and future customer growth rates determined via Ten-Year Site Plan Schedule 2.3. Megawatt distribution to individual plants estimated using plant specific capacity in figure I.A.1.

9.) JEA 2006-2014 total historic and 2015-2023 future total capacity megawatts obtained from Schedule 3.2 in 2014 Ten-Year Site Plan. Megawatt distribution to individual plants estimated using plant specific capacity in Schedule 1.

10.) JEA 2025-2035 projected total megawatts and water demand estimated from historic and future customer growth rates determined via Ten-Year Site Plan Schedule 2.2. Megawatt distribution to individual plants estimated using plant specific capacity in Schedule 1.

11.) SEC 2006-2014 total historic and 2015-2023 future total capacity megawatts obtained from Schedule 3.2.1 in 2014 Ten-Year Site Plan. Megawatt distribution to individual plants estimated using plant specific capacity in Schedule 1.1.

12.) SEC 2025-2035 projected total megawatts and water demand estimated from historic and future customer growth rates determined via Ten-Year Site Plan Schedule 2.3. Megawatt distribution to individual plants estimated using plant specific capacity in Figure I.A.1.

13.) Duke 2006-2014 total historic and 2015-2023 future total capacity megawatts obtained from Schedule 3.1 in 2014 Ten-Year Site Plan. Megawatt distribution to individual plants estimated using plant specific capacity in Schedule 1.

14.) Duke 2025-2035 projected total megawatts and water demand estimated from historic and future customer growth rates determined via Ten-Year Site Plan Schedule 2.3. Megawatt distribution to individual plants estimated using plant specific capacity in Schedule 1.
15.) 2011-2014 SRWMD water use linearlly extrapolated from 2006-2010 data.

Table B-10b (NFRWSP), Continued. 2006-2014 Water Use and Megawatts, Five-Year Gross Per Mega Watt Averages and 2015-2035 Demand Projections for Thermoelectric Power Generation Self-supply Water Demand Increases, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	Facility	District	Historic Megawatts									2010-2014 Gallons (Consumptive) Per Megawatt Average	2010-2014 Gallons (Non-Consumptive) Per Megawatt Average	Projected Megawatts				
			2006	2007	2008	2009	2010	2011	2012	2013	2014			2015	2020	2025	2030	2035
Alachua	Gainesville Regional Utilities - J R Kelly (11374)	SJRWMD	33.5	63.7	46.2	57.2	65.9	65.9	98.2	46.3	57.3	N/A	N/A	85.8	85.8	75.5	75.5	75.5
	Gainesville Regional Utilities - Deerhaven Power Plant *(PA 74-04)*	SRWMD	454.5	444.3	440.8	440.8	439.1	418.1	357.8	412.7	394.7	N/A	N/A	571.6	571.6	503.2	503.2	503.2
	Total		**488.0**	**508.0**	**487.0**	**498.0**	**505.0**	**484.0**	**456.0**	**459.0**	**452.0**	**0.00513**	**0.00000**	**657.4**	**657.4**	**578.7**	**578.7**	**578.7**
Duval	JEA - Northside (721)	SJRWMD	1,251.8	1,167.3	1,249.6	1,314.0	1,382.6	1,313.1	1,142.9	1,097.4	1,210.6	0.00027	0.43546	1,193.5	757.3	789.6	844.1	902.5
	JEA - Southside (735)	SJRWMD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	JEA - Kennedy (737)	SJRWMD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	JEA - Brandy Branch (51629)	SJRWMD	725.6	676.6	724.4	761.6	801.4	761.1	662.5	636.1	701.7	0.00264	0.00000	691.8	715.4	745.9	797.5	852.6
	JEA - SJR Power Park *(PA 81-13)*	SJRWMD	941.6	878.1	940.0	988.4	1,040.0	987.7	859.7	825.5	910.6	0.00362	0.04723	897.7	1,102.2	1,149.3	1,228.7	1,313.6
	Cedar Bay Generating Facility *(PA 88-24G)*	SJRWMD	258.0	258.0	258.0	258.0	258.0	258.0	258.0	258.0	258.0	0.00378	0.00000	258.0	258.0	258.0	258.0	258.0
	Total		**3,177.0**	**2,980.0**	**3,172.0**	**3,322.0**	**3,482.0**	**3,319.9**	**2,923.1**	**2,817.0**	**3,080.9**	**N/A**	**N/A**	**3,041.0**	**2,832.9**	**2,942.8**	**3,128.3**	**3,326.7**
Putnam	Florida Power & Light - Puntam *(PA 74-01)*	SJRWMD	450.1	453.1	434.5	461.1	459.1	446.0	442.3	445.1	0.0	0.00028	0.00204	0.0	0.0	0.0	0.0	0.0
	Seminole Electric Cooperative - Palatka (*PA 78-10*)	SJRWMD	2,456.6	2,575.6	2,891.1	3,079.6	2,633.0	2,390.7	2,262.0	1,977.0	2,179.6	0.00018	0.00712	2,102.7	2,302.9	2,449.4	2,518.3	2,589.2
	Total		**2,906.7**	**3,028.7**	**3,325.6**	**3,540.7**	**3,092.1**	**2,836.7**	**2,704.3**	**2,422.1**	**2,179.6**	**N/A**	**N/A**	**2,102.7**	**2,302.9**	**2,449.4**	**2,518.3**	**2,589.2**
Suwannee	Duke Energy - Ellaville (84-00698 & 84-00699)	SRWMD	102.5	115.0	127.7	148.5	118.3	98.0	87.7	91.9	120.8	0.00184	1.48390	122.3	340.6	359.5	381.3	404.4
	Total		**102.5**	**115.0**	**127.7**	**148.5**	**118.3**	**98.0**	**87.7**	**91.9**	**120.8**	**N/A**	**N/A**	**122.3**	**340.6**	**359.5**	**381.3**	**404.4**
SJRWMD Region 1 Total			**3,210.5**	**3,043.7**	**3,218.2**	**3,379.2**	**3,547.9**	**3,385.8**	**3,021.3**	**2,863.3**	**3,138.2**	**N/A**	**N/A**	**3,126.8**	**2,918.7**	**3,018.3**	**3,203.8**	**3,402.2**
SRWMD NFRWSP Total			**557.0**	**559.3**	**568.5**	**589.3**	**557.4**	**516.1**	**445.5**	**504.6**	**515.5**	**N/A**	**N/A**	**693.9**	**912.2**	**862.7**	**884.5**	**907.6**
NFRWSP Total			**3,767.5**	**3,603.0**	**3,786.7**	**3,968.5**	**4,105.3**	**3,901.9**	**3,466.8**	**3,367.9**	**3,653.7**	**N/A**	**N/A**	**3,820.7**	**3,830.9**	**3,881.0**	**4,088.3**	**4,309.8**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2006-2014 water use was obtained from SJRWMD EN-50 data, SJRWMD Survey data and USGS data.
4.) GRU 2010 Megawatts per plant interpolated from total using ratio of 2010 water use.
5.) GRU 2006-2014 historic and 2015-2024 future total capacity megawatts obtained from Schedule 3.1 and Schedule 7.2 in 2015 Ten-Year Site Plan.

6.) GRU Schedule 7.2, 2015 Ten-Year Site Plan indicates a decrease in megawatts from 2020 to 2024. Due to uncertaintity, projections were left constant after 2020. In addition, the Ten-Year Site Plan indicates a need of an additional 1.4 mgd, of which 0.4 mgd is anticipated to be met by reclaimed water.

7.) FPL 2006-2014 total historic and 2015-2023 future total capacity megawatts obtained from Schedule 3.1 in 2014 Ten-Year Site Plan. Megawatt distribution to individual plants estimated using plant specific capacity in Figure I.A.1.

8.) FPL 2025-2035 projected total megawatts and water demand estimated from historic and future customer growth rates determined via Ten-Year Site Plan Schedule 2.3. Megawatt distribution to individual plants estimated using plant specific capacity in figure I.A.1.

9.) JEA 2006-2014 total historic and 2015-2023 future total capacity megawatts obtained from Schedule 3.2 in 2014 Ten-Year Site Plan. Megawatt distribution to individual plants estimated using plant specific capacity in Schedule 1.

10.) JEA 2025-2035 projected total megawatts and water demand estimated from historic and future customer growth rates determined via Ten-Year Site Plan Schedule 2.2. Megawatt distribution to individual plants estimated using plant specific capacity in Schedule 1.

11.) SEC 2006-2014 total historic and 2015-2023 future total capacity megawatts obtained from Schedule 3.2.1 in 2014 Ten-Year Site Plan. Megawatt distribution to individual plants estimated using plant specific capacity in Schedule 1.1.

12.) SEC 2025-2035 projected total megawatts and water demand estimated from historic and future customer growth rates determined via Ten-Year Site Plan Schedule 2.3. Megawatt distribution to individual plants estimated using plant specific capacity in Figure I.A.1.

13.) Duke 2006-2014 total historic and 2015-2023 future total capacity megawatts obtained from Schedule 3.1 in 2014 Ten-Year Site Plan. Megawatt distribution to individual plants estimated using plant specific capacity in Schedule 1.

14.) Duke 2025-2035 projected total megawatts and water demand estimated from historic and future customer growth rates determined via Ten-Year Site Plan Schedule 2.3. Megawatt distribution to individual plants estimated using plant specific capacity in Schedule 1.
15.) 2011-2014 SRWMD water use linearlly extrapolated from 2006-2010 data.

Table B-10b (NFRWSP), Continued. 2006-2014 Water Use and Megawatts, Five-Year Gross Per Mega Watt Averages and 2015-2035 Demand Projections for Thermoelectric Power Generation Self-supply Water Demand Increases, in the St. Johns River Water Management District and Suwannee River Water Management District.

County	Facility	District	Projected Groundwater Demand					Projected Non-consumptive Saline and Fresh Surface Water Demand				
			2015	2020	2025	2030	2035	2015	2020	2025	2030	2035
Alachua	Gainesville Regional Utilities - J R Kelly (11374)	SJRWMD	0.440	0.440	0.387	0.387	0.387	0.000	0.000	0.000	0.000	0.000
	Gainesville Regional Utilities - Deerhaven Power Plant *(PA 74-04)*	SRWMD	2.932	2.932	2.581	2.581	2.581	0.000	0.000	0.000	0.000	0.000
	Total		**3.372**	**3.372**	**2.968**	**2.968**	**2.968**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Duval	JEA - Northside (721)	SJRWMD	0.322	0.204	0.213	0.228	0.244	519.722	329.774	343.839	367.572	393.003
	JEA - Southside (735)	SJRWMD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	JEA - Kennedy (737)	SJRWMD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	JEA - Brandy Branch (51629)	SJRWMD	1.826	1.889	1.969	2.105	2.251	0.000	0.000	0.000	0.000	0.000
	JEA - SJR Power Park (*PA 81-13*)	SJRWMD	3.250	3.990	4.160	4.448	4.755	42.398	52.057	54.281	58.032	62.041
	Cedar Bay Generating Facility (*PA 88-24G*)	SJRWMD	0.975	0.975	0.975	0.975	0.975	0.000	0.000	0.000	0.000	0.000
	Total		**6.373**	**7.058**	**7.317**	**7.756**	**8.225**	**562.120**	**381.831**	**398.120**	**425.604**	**455.044**
Putnam	Florida Power & Light - Puntam *(PA 74-01)*	SJRWMD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Seminole Electric Cooperative - Palatka (*PA 78-10*)	SJRWMD	0.378	0.415	0.441	0.453	0.466	14.971	16.397	17.440	17.930	18.435
	Total		**0.378**	**0.415**	**0.441**	**0.453**	**0.466**	**14.971**	**16.397**	**17.440**	**17.930**	**18.435**
Suwannee	Duke Energy - Ellaville (84-00698 & 84-00699)	SRWMD	0.225	0.627	0.661	0.702	0.744	181.481	505.416	533.462	565.811	600.089
	Total		**0.225**	**0.627**	**0.661**	**0.702**	**0.744**	**181.481**	**505.416**	**533.462**	**565.811**	**600.089**
SJRWMD Region 1 Total			**6.813**	**7.498**	**7.704**	**8.143**	**8.612**	**562.120**	**381.831**	**398.120**	**425.604**	**455.044**
SRWMD NFRWSP Total			**3.157**	**3.559**	**3.242**	**3.283**	**3.325**	**181.481**	**505.416**	**533.462**	**565.811**	**600.089**
NFRWSP Total			**9.970**	**11.057**	**10.946**	**11.426**	**11.937**	**743.601**	**887.247**	**931.582**	**991.415**	**1055.133**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2006-2014 water use was obtained from SJRWMD EN-50 data, SJRWMD Survey data and USGS data.
4.) GRU 2010 Megawatts per plant interpolated from total using ratio of 2010 water use.
5.) GRU 2006-2014 historic and 2015-2024 future total capacity megawatts obtained from Schedule 3.1 and Schedule 7.2 in 2015 Ten-Year Site Plan.
6.) GRU Schedule 7.2, 2015 Ten-Year Site Plan indicates a decrease in megawatts from 2020 to 2024. Due to uncertaintity, projections were left constant after 2020. In addition, the Ten-Year Site Plan indicates a need of an additional 1.4 mgd, of which 0.4 mgd is anticipated to be met by reclaimed water.
7.) FPL 2006-2014 total historic and 2015-2023 future total capacity megawatts obtained from Schedule 3.1 in 2014 Ten-Year Site Plan. Megawatt distribution to individual plants estimated using plant specific capacity in Figure I.A.1.
8.) FPL 2025-2035 projected total megawatts and water demand estimated from historic and future customer growth rates determined via Ten-Year Site Plan Schedule 2.3. Megawatt distribution to individual plants estimated using plant specific capacity in figure I.A.1.
9.) JEA 2006-2014 total historic and 2015-2023 future total capacity megawatts obtained from Schedule 3.2 in 2014 Ten-Year Site Plan. Megawatt distribution to individual plants estimated using plant specific capacity in Schedule 1.
10.) JEA 2025-2035 projected total megawatts and water demand estimated from historic and future customer growth rates determined via Ten-Year Site Plan Schedule 2.2. Megawatt distribution to individual plants estimated using plant specific capacity in Schedule 1.
11.) SEC 2006-2014 total historic and 2015-2023 future total capacity megawatts obtained from Schedule 3.2.1 in 2014 Ten-Year Site Plan. Megawatt distribution to individual plants estimated using plant specific capacity in Schedule 1.1.
12.) SEC 2025-2035 projected total megawatts and water demand estimated from historic and future customer growth rates determined via Ten-Year Site Plan Schedule 2.3. Megawatt distribution to individual plants estimated using plant specific capacity in Figure I.A.1.
13.) Duke 2006-2014 total historic and 2015-2023 future total capacity megawatts obtained from Schedule 3.1 in 2014 Ten-Year Site Plan. Megawatt distribution to individual plants estimated using plant specific capacity in Schedule 1.
14.) Duke 2025-2035 projected total megawatts and water demand estimated from historic and future customer growth rates determined via Ten-Year Site Plan Schedule 2.3. Megawatt distribution to individual plants estimated using plant specific capacity in Schedule 1.
15.) 2011-2014 SRWMD water use linearlly extrapolated from 2006-2010 data.

Table B-11 (NFRWSP). Public Supply and Domestic Self-supply and Small Public Supply 2010 Water Use and 2015-2035 Demand Projections, by County, in the St. Johns River Water Management District and Suwannee River Water Management District.

		2010 Water Use			2015 Demand Projections (5-in-10)			2020 Demand Projections (5-in-10)			2025 Demand Projections (5-in-10)			2030 Demand Projections (5-in-10)			2035 Demand Projections (5-in-10)			Percent Change 2010-2035			2035 Demand Projections (1-in-10)		
County	**District**	**Public Supply**	**Domestic Self-Supply and Small Public Supply**	**Total**	**Public Supply**	**Domestic Self-Supply and Small Public Supply**	**Total**	**Public Supply**	**Domestic Self-Supply and Small Public Supply**	**Total**	**Public Supply**	**Domestic Self-Supply and Small Public Supply**	**Total**	**Public Supply**	**Domestic Self-Supply and Small Public Supply**	**Total**	**Public Supply**	**Domestic Self-Supply and Small Public Supply**	**Total**	**Public Supply**	**Domestic Self-Supply and Small Public Supply**	**Total**	**Public Supply**	**Domestic Self-Supply and Small Public Supply**	**Total**
Alachua	SJRWMD	23.00	0.73	**23.73**	23.34	0.75	**24.09**	24.47	0.79	**25.26**	25.55	0.83	**26.38**	26.55	0.86	**27.41**	27.55	0.90	**28.45**	20%	23%	**20%**	29.20	0.95	**30.15**
Alachua	SRWMD	2.46	2.80	**5.26**	2.31	1.54	**3.85**	2.43	1.62	**4.05**	2.53	1.69	**4.22**	2.62	1.76	**4.38**	2.73	1.82	**4.55**	11%	-35%	**-13%**	2.90	1.93	**4.83**
Alachua Total		**25.46**	**3.53**	**28.99**	**25.65**	**2.29**	**27.94**	**26.90**	**2.41**	**29.31**	**28.08**	**2.52**	**30.60**	**29.17**	**2.62**	**31.79**	**30.28**	**2.72**	**33.00**	**19%**	**-23%**	**14%**	**32.10**	**2.88**	**34.98**
Baker	SJRWMD	1.00	2.97	**3.97**	0.98	2.30	**3.28**	1.06	2.44	**3.50**	1.15	2.59	**3.74**	1.23	2.73	**3.96**	1.31	2.86	**4.17**	31%	-4%	**5%**	1.39	3.03	**4.42**
Baker	SRWMD	0.00	0.04	**0.04**	0.00	0.07	**0.07**	0.00	0.07	**0.07**	0.00	0.08	**0.08**	0.00	0.08	**0.08**	0.00	0.09	**0.09**	N/A	125%	**125%**	0.00	0.10	**0.10**
Baker Total		**1.00**	**3.01**	**4.01**	**0.98**	**2.37**	**3.35**	**1.06**	**2.51**	**3.57**	**1.15**	**2.67**	**3.82**	**1.23**	**2.81**	**4.04**	**1.31**	**2.95**	**4.26**	**31%**	**-2%**	**6%**	**1.39**	**3.13**	**4.52**
Bradford	SJRWMD	0.11	0.09	**0.20**	0.09	0.40	**0.49**	0.10	0.41	**0.51**	0.10	0.42	**0.52**	0.10	0.43	**0.53**	0.10	0.44	**0.54**	-9%	389%	**170%**	0.11	0.47	**0.58**
Bradford	SRWMD	1.00	1.70	**2.70**	0.92	1.38	**2.30**	0.94	1.43	**2.37**	0.97	1.47	**2.44**	0.99	1.50	**2.49**	1.02	1.53	**2.55**	2%	-10%	**-6%**	1.08	1.61	**2.69**
Bradford Total		**1.11**	**1.79**	**2.90**	**1.01**	**1.78**	**2.79**	**1.04**	**1.84**	**2.88**	**1.07**	**1.89**	**2.96**	**1.09**	**1.93**	**3.02**	**1.12**	**1.97**	**3.09**	**1%**	**10%**	**7%**	**1.19**	**2.08**	**3.27**
Clay	SJRWMD	15.10	4.32	**19.42**	14.22	5.84	**20.06**	15.94	6.41	**22.35**	17.55	7.04	**24.59**	19.08	7.62	**26.70**	20.54	8.17	**28.71**	36%	89%	**48%**	21.78	8.66	**30.44**
Columbia	SRWMD	3.48	3.72	**7.20**	3.49	4.48	**7.97**	3.67	4.72	**8.39**	3.85	4.95	**8.80**	4.01	5.16	**9.17**	4.14	5.32	**9.46**	19%	43%	**31%**	4.39	5.64	**10.03**
Duval	SJRWMD	109.22	12.06	**121.28**	108.86	12.61	**121.47**	115.06	13.02	**128.08**	120.90	13.38	**134.28**	126.44	13.67	**140.11**	131.58	13.89	**145.47**	20%	15%	**20%**	139.47	14.72	**154.19**
Flagler	SJRWMD	10.12	0.16	**10.28**	9.71	0.18	**9.89**	11.51	0.29	**11.80**	13.25	0.42	**13.67**	14.85	0.54	**15.39**	16.33	0.66	**16.99**	61%	313%	**65%**	17.30	0.70	**18.00**
Gilchrist	SRWMD	0.23	1.29	**1.52**	0.23	1.42	**1.65**	0.23	1.50	**1.73**	0.23	1.58	**1.81**	0.23	1.65	**1.88**	0.23	1.72	**1.95**	0%	33%	**28%**	0.24	1.82	**2.06**
Hamilton	SRWMD	0.86	0.74	**1.60**	0.89	0.95	**1.84**	0.91	0.98	**1.89**	0.94	1.01	**1.95**	0.96	1.04	**2.00**	0.97	1.06	**2.03**	13%	43%	**27%**	1.02	1.12	**2.14**
Nassau	SJRWMD	7.71	6.87	**14.58**	7.17	4.55	**11.72**	7.77	5.12	**12.89**	8.35	5.68	**14.03**	8.92	6.21	**15.13**	9.28	6.82	**16.10**	20%	-1%	**10%**	9.83	7.23	**17.06**
Putnam	SJRWMD	2.73	4.76	**7.49**	2.22	3.95	**6.17**	2.24	3.98	**6.22**	2.25	4.00	**6.25**	2.25	4.01	**6.26**	2.27	4.03	**6.30**	-17%	-15%	**-16%**	2.39	4.27	**6.66**
St. Johns	SJRWMD	19.91	2.96	**22.87**	22.90	3.03	**25.93**	27.05	3.54	**30.59**	31.09	4.05	**35.14**	33.99	4.89	**38.88**	36.63	5.72	**42.35**	84%	93%	**85%**	38.83	6.07	**44.90**
Suwannee	SRWMD	1.09	2.74	**3.83**	1.30	3.43	**4.73**	1.38	3.63	**5.01**	1.44	3.82	**5.26**	1.50	4.00	**5.50**	1.57	4.16	**5.73**	44%	52%	**50%**	1.67	4.41	**6.08**
Union	SRWMD	0.37	1.16	**1.53**	0.33	1.33	**1.66**	0.33	1.38	**1.71**	0.33	1.42	**1.75**	0.33	1.47	**1.80**	0.33	1.52	**1.85**	-11%	31%	**21%**	0.35	1.61	**1.96**
SJRWMD Region 1 Total		**188.90**	**34.92**	**223.82**	**189.49**	**33.61**	**223.10**	**205.20**	**36.00**	**241.20**	**220.19**	**38.41**	**258.60**	**233.41**	**40.96**	**274.37**	**245.59**	**43.49**	**289.08**	**30%**	**25%**	**29%**	**260.30**	**46.10**	**306.40**
SRWMD NFRWSP Total		**9.49**	**14.19**	**23.68**	**9.47**	**14.60**	**24.07**	**9.89**	**15.33**	**25.22**	**10.29**	**16.02**	**26.31**	**10.64**	**16.66**	**27.30**	**10.99**	**17.22**	**28.21**	**16%**	**21%**	**19%**	**11.65**	**18.24**	**29.89**
NFRWSP Total		**198.39**	**49.11**	**247.50**	**198.96**	**48.21**	**247.17**	**215.09**	**51.33**	**266.42**	**230.48**	**54.43**	**284.91**	**244.05**	**57.62**	**301.67**	**256.58**	**60.71**	**317.29**	**29%**	**24%**	**28%**	**271.95**	**64.34**	**336.29**

Notes:

1.) All water use is shown in million gallons per day.

2.) Rounding errors account for nominal discrepancies.

3.) Public water supply utility service areas often include residences that derive their water supply from privately owned (domestic self-supply) wells. Typically, these domestic self-supply water uses existed prior to their locations becoming part of public water supply service areas. For public water supply service areas, the Districts do not have sufficient information to separate the population served by public supply systems from those served by domestic self-supply wells. Therefore, public water supply population estimated by the Districts often include some domestic self-supply population.

Table B-12 (NFRWSP). 2035 Reclaimed Water Projections Using 75 Percent Utilization Rate for the NFRWSP area of the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Waste Water Treatment Facility Name	Reuse System Name	WAFR ID	PAA	2010 Treatment	Associated Permit	2010 Total Facility Treatment Flow	2010 Total Beneficial Reuse	Potential Existing Additional Reclaimed Water for Reuse	2010 Population	2035 Population	2035 Additional Population Hooked up to Sewer System	2035 New Waste Water Flow	2035 Potential New Additional Reclaimed Water for Reuse	2035 Total Potential Additional Reclaimed Water for Reuse	2035 Total Facility Treatment Flow
Alachua	SJRWMD	Hawthorne WWTF	Hawthorne	FLA011291	No	Basic	1674	0.12	0.12	0.00	1,495	1,800	290	0.02	0.02	0.02	0.14
Alachua	SJRWMD	GRU - Kanapaha (#5) WRF	GRU - Kanapaha	FL0112895	Yes	High	11339	9.74	9.74	0.00	189,495	229,151	37,673				
Alachua	SJRWMD	GRU - Main Street (#1 & #2) WRF	GRU - Main Street	FL0027251	No	Basic	11339	6.52	6.52	0.00	N/A	N/A	N/A	3.16	2.37	2.37	12.90
Alachua	SJRWMD	University of Florida WRF	UF - Lake Alice	FLA011322	Yes	High	N/A	2.42	0.71	1.28	N/A	N/A	N/A	0.00	0.00	1.28	2.42
			Alachua County - SJRWMD Total					18.80	17.09	1.28	190,990	230,951	37,963	3.19	2.39	3.67	21.99
Alachua	SRWMD	Alachua	Alachua	FLA011290	Yes	High	87	0.62	0.03	0.44	9,059	10,954	1,800	0.15	0.11	0.56	0.77
Alachua	SRWMD	High Springs WWTF	High Springs WWTF	FLA286095	No	Basic	836	0.13	0.00	0.10	5,350	6,469	1,063	0.09	0.07	0.16	0.22
Alachua	SRWMD	Newberry WWTF	Newberry WWTF	FLA011292	No	Basic	133	0.22	0.00	0.17	4,950	5,986	984	0.08	0.06	0.23	0.30
Alachua	SRWMD	Waldo, City of WWTF	Waldo, City of WWTF	FL0042242	No	Basic	1186	0.09	0.00	0.07	1,015	1,228	202	0.02	0.01	0.08	0.11
			Alachua County - SRWMD Total					1.06	0.03	0.77	20,374	24,637	4,050	0.34	0.26	1.03	1.40
			Alachua County Total					19.86	17.12	2.06	211,364	255,588	42,013	3.53	2.65	4.70	23.39
Baker	SJRWMD	City of Macclenny WWTF	City of Macclenny WWTF	FL0040495	No	Basic	15	0.72	0.00	0.54	6,042	8,372	2,214	0.19	0.14	0.68	0.91
Baker	SJRWMD	Baker Correctional Institution	Baker Correctional Institution	FLA011332	No	Basic	N/A	0.24	0.00	0.18	N/A	N/A	N/A	0.00	0.00	0.18	0.24
			Baker County - SJRWMD Total					0.96	0.00	0.72	6,042	8,372	2,214	0.19	0.14	0.86	1.15
Bradford	SRWMD	Florida State Prison WWTF	Florida State Prison WWTF	FLA113450	No	Basic	N/A	1.06	0.00	0.80	N/A	N/A	N/A	0.00	0.00	0.80	1.06
Bradford	SRWMD	Starke, City of	Starke, City of	FL0028126	No	Basic	545	0.33	0.07	0.20	5,449	5,827	359	0.03	0.02	0.22	0.36
			Bradford County - SRWMD Total					1.39	0.07	0.99	5,449	5,827	359	0.03	0.02	1.01	1.42
Clay	SJRWMD	Town of Orange Orange Park WWTF	Town of Orange Orange Park WWTF	FL0023922	No	Basic	453	0.76	0.00	0.57	8,421	9,669	1,186	0.10	0.07	0.64	0.86
Clay	SJRWMD	Green Cove Springs - Harbor Road	Green Cove Springs - Harbor Road WWTP	FL0020915	Yes	High	499	0.49	0.21	0.21	6,908	10,790	3,688				
Clay	SJRWMD	City of Green Cove Springs South	City of Green Cove Springs South	FL0030210	No	Basic	499	0.21	0.00	0.16	N/A	N/A	N/A	0.31	0.23	0.60	1.01
Clay	SJRWMD	CCUA-Fleming Island Regional WWTF	CCUA - Fleming Island	FL0043834	Yes	High	416, 431	2.73	1.85	0.66	104,706	164,485	56,790				
Clay	SJRWMD	CCUA-Fleming Oaks WWTF	CCUA - Fleming Island	FL0032875	No	Basic	416, 431	0.00	0.00	0.00	N/A	N/A	N/A				
Clay	SJRWMD	CCUA - Mid-Clay Regional WWTF	CCUA - Mid-Clay Regional	FLA011377	Yes	High	416, 431	0.42	0.42	0.00	N/A	N/A	N/A				
Clay	SJRWMD	CCUA-Miller Street WWTF	CCUA-Miller Street WWTF	FL0025151	Yes	High	416, 431	2.49	0.00	1.87	N/A	N/A	N/A				
Clay	SJRWMD	CCUA - Ravines	CCUA - Ravines	FLA011371	No	Basic	416, 431	0.00	0.00	0.00	N/A	N/A	N/A				
Clay	SJRWMD	CCUA - Ridaught Landing WWTF	CCUA - Ridaught Landing (Fleming Island)	FL0039721	Yes	High	416, 431	1.06	0.54	0.39	N/A	N/A	N/A				
Clay	SJRWMD	CCUA - Spencer WWTP	CCUA - Spencer	FL0173371	Yes	High	416, 431	2.21	1.81	0.30	N/A	N/A	N/A	4.77	3.58	6.80	13.68
Clay	SJRWMD	Fang - Camp Blanding WWTF	Fang - Camp Blanding WWTF	FL0022853	No	Basic	N/A	0.09	0.00	0.07	N/A	N/A	N/A	0.00	0.00	0.07	0.09
			Clay County - SJRWMD Total					10.46	4.83	4.22	120,035	184,944	61,664	5.18	3.88	8.11	15.64
Columbia	SRWMD	Columbia Correctional Institution	Columbia Correctional Institution	FLA011418	Yes	High & Basic	N/A	0.35	0.17	0.14	N/A	N/A	N/A	0.00	0.00	0.14	0.35
Columbia	SRWMD	Lake City WWTF	Lake City WWTF	FLA113956	No	Intermediate	37	2.41	0.00	1.81	21,242	25,546	4,089	0.34	0.26	2.07	2.75
			Columbia County - SRWMD Total					2.76	0.17	1.94	21,242	25,546	4,089	0.34	0.26	2.20	3.10
Duval	SJRWMD	Town of Baldwin WWTF	Town of Baldwin WWTF	FL0027812	No	Basic	784	0.27	0.00	0.20	1,901	2,349	426	0.04	0.03	0.23	0.31
Duval	SJRWMD	Jacksonville Beach	Jacksonville Beach	FL0020231	Yes	High	793	1.78	0.49	0.97	25,518	25,518	0	0.00	0.00	0.97	1.78
Duval	SJRWMD	City of Atlantic Beach (Buccaneer)	City of Atlantic Beach (Buccaneer)	FL0038776	No	Basic	810	1.52	0.00	1.14	N/A	N/A	N/A				
Duval	SJRWMD	City of Atlantic Beach WWTF - Main	City of Atlantic Beach WWTF - Main	FL0023248	No	Basic	810	0.57	0.00	0.43	26,172	26,172	0	0.00	0.00	1.57	2.09
Duval	SJRWMD	Neptune Beach WWTF	Neptune Beach WWTF	FL0020427	No	Basic	842	0.50	0.00	0.38	7,673	7,673	0	0.00	0.00	0.38	0.50
Duval	SJRWMD	Normandy Village Utility	Normandy Village Utility	FLA011517	No	Basic	50293	0.29	0.00	0.22	3,305	4,058	715	0.06	0.05	0.26	0.35
Duval	SJRWMD	Beacon Hills Subdivision WWTF	Beacon Hills Subdivision WWTF	FL0026778	No	Basic	88271	0.64	0.00	0.48	N/A	N/A	N/A				
Duval	SJRWMD	JEA - Arlington East	JEA - South Grid	FL0026441	Yes	High	88271	0.00	0.00	0.00	N/A	N/A	N/A				
Duval	SJRWMD	JEA - District II WWTF	JEA - District II (Cedar Bay)	FL0026450	Yes	High & Basic	88271	4.07	1.37	2.03	N/A	N/A	N/A				
Duval	SJRWMD	JEA - Blacks Ford	JEA - South Grid	FL0174441	Yes	High	88271	22.38	3.95	13.82	N/A	N/A	N/A				
Duval	SJRWMD	JEA - Buckman Street WWTF	JEA - Buckman Street	FL0026000	No	Basic	88271	24.79	3.13	16.25	N/A	N/A	N/A				
Duval	SJRWMD	JEA - Jacksonville Heights	JEA - Jacksonville Heights	FL0023671	No	Basic	88271	0.96	0.00	0.72	N/A	N/A	N/A				
Duval	SJRWMD	JEA - Mandarin	JEA - South Grid	FL0023493	Yes	High	88271	0.00	0.00	0.00	N/A	N/A	N/A				
Duval	SJRWMD	JEA - Monterey WWTF	JEA - Monterey WWTF	FL0023604	No	Basic	88271	1.54	0.00	1.16	N/A	N/A	N/A				
Duval	SJRWMD	JEA - Royal Lakes WRF	JEA - Royal Lakes WRF	FL0026751	No	Basic	88271	1.79	0.00	1.34	N/A	N/A	N/A				
Duval	SJRWMD	JEA - San Jose WRF	JEA - San Jose WRF	FL0023663	No	Basic	88271	1.31	0.00	0.98	N/A	N/A	N/A				
Duval	SJRWMD	JEA - Southwest District WWTF	JEA - Southwest District	FL0026468	No	Basic	88271	9.35	0.43	6.69	644,850	851,429	196,250	16.49	12.36	55.83	83.32
Duval	SJRWMD	USN Mayport NS WWTF	USN Mayport NS WWTF	FL0000922	No	Basic	N/A	0.70	0.00	0.53	N/A	N/A	N/A	0.00	0.00	0.53	0.70
Duval	SJRWMD	USN NAS Jacksonville	USN NAS Jacksonville	FL0000957	Yes	High	N/A	0.68	0.13	0.41	N/A	N/A	N/A	0.00	0.00	0.41	0.68
			Duval County - SJRWMD Total					73.14	9.50	47.73	709,419	917,199	197,391	16.58	12.44	60.17	89.72
Flagler	SJRWMD	City of Flagler Beach WWTF	City of Flagler Beach WWTF	FL0026611	No	Basic	59	0.60	0.00	0.45	4,484	8,125	3,459	0.29	0.22	0.67	0.89
Flagler	SJRWMD	Matanzas Shores	Matanzas Shores	FLA011599	No	Basic	1947	0.07	0.00	0.05	N/A	N/A	N/A				
Flagler	SJRWMD	Palm Coast WWTF	Palm Coast	FL0116009	Yes	High	1947	5.10	2.56	1.91	76,831	142,274	62,171	5.22	3.92	5.87	10.39
Flagler	SJRWMD	Plantation Bay WWTF	Plantation Bay WWTP	FLA011597	Yes	High	1960	0.12	0.12	0.00	1,247	2,304	1,004	0.08	0.06	0.06	0.20
Flagler	SJRWMD	City of Bunnell - Micheal J. Mikulk	City of Bunnell	FL0020907	Yes	High	1982	0.34	0.20	0.11	2,676	4,962	2,172	0.18	0.14	0.24	0.52
Flagler	SJRWMD	Bulow Village WWTF	Bulow Village	FLA011601	No	Basic	2002	0.03	0.00	0.02	1,354	1,377	22	0.00	0.00	0.02	0.03
Flagler	SJRWMD	Dunes CDD WWTF	Dunes CDD	FLA011602	Yes	High	51136	1.88	1.88	0.00	5,051	5,722	637	0.05	0.04	0.04	1.93
			Flagler County - SJRWMD Total					8.14	4.76	2.54	91,643	164,764	69,465	5.84	4.38	6.91	13.98
Gilchrist	SRWMD	Lancaster Correctional Institution WWTP	Lancaster Correctional Institution	FLA011620	No	Basic	N/A	0.12	0.00	0.09	N/A	N/A	N/A	0.00	0.00	0.09	0.12
Gilchrist	SRWMD	Trenton	Trenton WWTF	FLA011615	No	Basic	134	0.11	0.00	0.08	1,999	1,999	0	0.00	0.00	0.08	0.11
			Gilchrist County - SRWMD Total					0.23	0.00	0.17	1,999	1,999	0	0.00	0.00	0.17	0.23
Hamilton	SRWMD	Jasper, City of WWTF	Jasper, City of WWTF	FL0027880	No	Basic	13	0.70	0.00	0.53	2,936	3,214	264	0.02	0.02	0.54	0.72
Hamilton	SRWMD	Jennings, Town of WWTP	Jennings	FLA011623	No	Basic	1143	0.13	0.00	0.10	878	961	79	0.01	0.00	0.10	0.14
Hamilton	SRWMD	White Springs WWTF	White Springs WWTF	FLA116220	No	Basic	546	0.05	0.00	0.04	777	851	70	0.01	0.00	0.04	0.06
			Hamilton County - SRWMD Total					0.88	0.00	0.66	4,591	5,026	413	0.03	0.03	0.69	0.91

Table B-12 (NFRWSP), Continued. 2035 Reclaimed Water Projections Using 75 Percent Utilization Rate for the NFRWSP area of the St. Johns River Water Management District and Suwannee River Water Management Dist

County	District	Waste Water Treatment Facility Name	Reuse System Name	WAFR ID	PAA	2010 Treatment	Associated Permit	2010 Total Facility Treatment Flow	2010 Total Beneficial Reuse	Potential Existing Additional Reclaimed Water for Reuse	2010 Population	2035 Population	2035 Additional Population Hooked up to Sewer System	2035 New Waste Water Flow	2035 Potential New Additional Reclaimed Water for Reuse	2035 Total Potential Additional Reclaimed Water for Reuse	2035 Total Facility Treatment Flow
Nassau	SJRWMD	City of Fernandina Beach WWTF	City of Fernandina Beach WWTF	FL0027260	No	Basic	122	1.62	0.00	1.22	18,603	25,910	6,942	0.58	0.44	**1.65**	2.20
Nassau	SJRWMD	Town of Callahan WWTF	Town of Callahan WWTF	FL0038407	No	Basic	922	0.13	0.00	0.10	1,609	1,609	0	0.00	0.00	**0.10**	0.13
Nassau	SJRWMD	Town of Hilliard WWTF	Town of Hilliard WWTF	FL0043079	No	Basic	948	0.28	0.00	0.21	2,763	3,985	1,161	0.10	0.07	**0.28**	0.38
Nassau	SJRWMD	Amelia Island WWTF	Nassau Amelia Utilities - Amelia Island	FLA011688	Yes	High	50087	0.49	0.49	0.00	8,736	8,955	208	0.02	0.01	**0.01**	0.51
Nassau	SJRWMD	Nassau Regional (Sun Ray)(JEA)	Nassau Regional (Sun Ray)	FL0116793	Yes	High	88271	0.94	0.42	0.39	11,359	17,754	6,075	0.51	0.38	**0.77**	1.45
Nassau County - SJRWMD Total								**3.46**	**0.91**	**1.91**	**43,070**	**58,213**	**14,386**	**1.21**	**0.91**	**2.82**	**4.67**
Putnam	SJRWMD	City of Crescent City	City of Crescent City	FL0021610	No	Basic	1627	0.10	0.10	0.00	1,577	1,573	-4	0.00	0.00	**0.00**	0.10
Putnam	SJRWMD	River Park MHP	River Park MHP	FLA117218	Yes	High	7981	0.03	0.03	0.00	736	735	-1	0.00	0.00	**0.00**	0.03
Putnam	SJRWMD	City of Palatka	City of Palatka	FL0040061	Yes	High & Basic	8114	1.77	0.34	1.07	10,558	10,536	-21	0.00	0.00	**1.07**	1.77
Putnam County - SJRWMD Total								**1.90**	**0.47**	**1.07**	**12,871**	**12,844**	**-26**	**0.00**	**0.00**	**1.07**	**1.90**
St. Johns	SJRWMD	North Beach Utilities	North Beach Utilities	FLA011765	No	Basic	157	0.20	0.00	0.15	3,653	6,556	2,758	0.23	0.17	**0.32**	0.43
St. Johns	SJRWMD	Town of Hastings WWTF	Town of Hastings WWTF	FL0042315	No	Basic	1392	0.08	0.00	0.06	531	1,164	601	0.05	0.04	**0.10**	0.13
St. Johns	SJRWMD	St. Augustine WWTF # 1	City of St. Augustine # 1	FL0021938	No	Basic	50299	3.25	0.22	2.27	27,833	53,184	24,083	2.02	1.52	**3.79**	5.27
St. Johns	SJRWMD	JEA - Ponce De Leon WRF	JEA - Ponce De Leon	FLA011773	No	Basic	88271	0.84	0.83	0.01	N/A	N/A	N/A				
St. Johns	SJRWMD	JEA - Julington Creek	JEA - South Grid	FL0043591	Yes	High	88271	0.00	0.00	0.00	39,933	75,970	34,235				
St. Johns	SJRWMD	JEA - Ponte Vedra WWTF	Ponte Vedra	FL0117951	Yes	High	88271	0.59	0.50	0.07	N/A	N/A	N/A	2.88	2.16	**2.23**	4.31
St. Johns	SJRWMD	Anastasia	St. Johns Co. - Anastasia	FL0038831	Yes	High	1142, 1198	3.01	0.31	2.03	N/A	N/A	N/A				
St. Johns	SJRWMD	St. Johns Co. - Innlet Beach WWTF	St. Johns Co. - Innlet Beach	FL0044237	Yes	High	1142, 1198	0.22	0.20	0.02	87,714	156,483	65,331				
St. Johns	SJRWMD	St. Johns Co. - Mainland (S.R. 207)	St. Johns Co. - Mainland (S.R. 207)	FL0117471	Yes	High	1142, 1198	0.12	0.12	0.00	N/A	N/A	N/A				
St. Johns	SJRWMD	St. Johns Co. - Marsh Landing WWTF	St. Johns Co. - Marsh Landing @ Ponte Vedra Lakes	FL0044253	Yes	High	1142, 1198	0.51	0.26	0.19	N/A	N/A	N/A				
St. Johns	SJRWMD	St. Johns Co. - Players Club South	St. Johns Co. - Players Club South	FL0044245	Yes	High	1142, 1198	0.39	0.22	0.13	N/A	N/A	N/A				
St. Johns	SJRWMD	St. Johns Co. - Sawgrass WWTF	St. Johns Co. - Sawgrass	FL0117897	Yes	High	1142, 1198	0.88	0.43	0.34	N/A	N/A	N/A				
St. Johns	SJRWMD	St. Johns Co. - SR16 WWTP	St. Johns Co. - SR16	FL0043109	Yes	High	1142, 1198	0.97	0.55	0.32	N/A	N/A	N/A	5.49	4.12	**7.12**	11.59
St. Johns County - SJRWMD Total								**11.06**	**3.64**	**5.57**	**159,664**	**293,357**	**127,008**	**10.67**	**8.00**	**13.57**	**21.73**
Suwannee	SRWMD	Advent Christian Village	Advent Christian Home	FLA011819	No	Basic	N/A	0.06	0.00	0.05	N/A	N/A	N/A	0.00	0.00	**0.05**	0.06
Suwannee	SRWMD	Branford	Branford	FLA011806	No	Basic	549	0.07	0.00	0.05	712	910	188	0.02	0.01	**0.06**	0.09
Suwannee	SRWMD	Live Oak, City of WWTF	Live Oak, City of	FLA011805	Yes	High	36	0.70	0.00	0.53	6,850	8,921	1,967	0.17	0.12	**0.65**	0.87
Suwannee County - SRWMD Total								**0.83**	**0.00**	**0.62**	**7,562**	**9,831**	**2,156**	**0.18**	**0.14**	**0.76**	**1.01**
Union	SRWMD	Lake Butler WWTF	Lake Butler	FLA118338	No	Basic	310	0.49	0.00	0.37	1,897	1,925	27	0.00	0.00	**0.37**	0.49
Union County - SRWMD Total								**0.49**	**0.00**	**0.37**	**1,897**	**1,925**	**27**	**0.00**	**0.00**	**0.37**	**0.49**
SJRWMD Region 1 Total								**127.92**	**41.20**	**65.04**	**1,333,734**	**1,870,644**	**510,065**	**42.85**	**32.13**	**97.17**	**170.77**
SRWMD NFRWSP Total								**7.64**	**0.27**	**5.53**	**63,114**	**74,791**	**11,093**	**0.93**	**0.70**	**6.23**	**8.57**
NFRWSP Total								**135.56**	**41.47**	**70.57**	**1,396,848**	**1,945,435**	**521,158**	**43.78**	**32.83**	**103.40**	**179.34**

Notes:
1.) All estimates of reclaimed water and reuse flow are shown in million gallons per day.
2.) Rounding anomalies account for nominal discrepancies.
3.) 2010 Total facility treatment flow obtained from DEP 2010 Annual Reuse Inventory.
4.) Beneficial reuse for SJRWMD consists of uses in which reclaimed water takes the place of a pre-existing or potential use of higher quality water for which reclaimed water is suitable and as such does not match DEP's broader definition of reuse.
5.) Potential existing additional reclaimed water for reuse calculated as 75 percent of the 2010 total fa
6.) Additional population hooked up to the sewer system calculated as 95 percent of the additional population growth within a service area from 2010 to 2035.
7.) New waste water flow calculated as additional population hooked up to the sewer system times 84 gpcd (69.3 gpcd for residential flow, AWWA indoor standard and 14.7 gpcd for commercial flow, National Engineering Handbook per employee).
8.) Potential new additional reclaimed water for reuse calculated as 75 percent of the new waste water flow.
9.) Total potential additional reclaimed water for reuse calcualted as potential existing additional reclaimed water for reuse plus potential new additional reclaimed water for reuse.
10.) 2035 Total facility treatment flow calculated as 2010 total facility treatment flow plus 2035 new waste water flow.
11.) Projections are grouped by population expected to growth within a public supply service area. Therefore, the projections by wastewater facility (WWTF) may not be specific to the WWTF, but as the region as a whole.
12.) Projections are not included for those service areas that do not currently have waste water treatment facilities.

Table B-13 (NFRWSP). 2035 Reclaimed Water Projections Using 2010 Percent Beneficial Utilization for the NFRWSP area of the St. Johns River Water Management District and Suwannee River Water Management District (Us

County	District	Waste Water Treatment Facility Name	Reuse System Name	WAFR ID	PAA	2010 Treatment	Associated CUP	2010 Total Facility Treatment Flow	2010 Total Beneficial Reuse	Potential Existing Additional Reclaimed Water for Reuse	2010 Population	2035 Population	2035 Additional Population Hooked up to Sewer System	2035 New Waste Water Flow	2035 Potential New Additional Reclaimed Water for Reuse	2035 Total Potential Additional Reclaimed Water for Reuse	2035 Total Facility Treatment Flow	2010 Percent Utilization
Alachua	SJRWMD	Hawthorne WWTF	Hawthorne	FLA011291	No	Basic	1674	0.12	0.12	0.00	1,495	1,800	290	0.02	0.02	0.02	0.14	100%
Alachua	SJRWMD	GRU - Kanapaha (#5) WRF	GRU - Kanapaha	FL0112895	Yes	High	11339	9.74	9.74	0.00	189,495	229,151	37,673					
Alachua	SJRWMD	GRU - Main Street (#1 & #2) WRF	GRU - Main Street	FL0027251	No	Basic	11339	6.52	6.52	0.00	N/A	N/A	N/A	3.16	3.16	3.16	12.90	100%
Alachua	SJRWMD	University of Florida WRF	UF - Lake Alice	FLA011322	Yes	High	N/A	2.42	0.71	0.50	N/A	N/A	N/A	0.00	0.00	0.50	2.42	29%
			Alachua County - SJRWMD Total					**18.80**	**17.09**	**0.50**	**190,990**	**230,951**	**37,963**	**3.19**	**3.19**	**3.69**	**21.99**	**91%**
Alachua	SRWMD	Alachua	Alachua	FLA011290	Yes	High	87	0.62	0.03	0.03	9,059	10,954	1,800	0.15	0.01	0.04	0.77	5%
Alachua	SRWMD	High Springs WWTF	High Springs WWTF	FLA286095	No	Basic	836	0.13	0.00	0.00	5,350	6,469	1,063	0.09	0.00	0.00	0.22	0%
Alachua	SRWMD	Newberry WWTF	Newberry WWTF	FLA011292	No	Basic	133	0.22	0.00	0.00	4,950	5,986	984	0.08	0.00	0.00	0.30	0%
Alachua	SRWMD	Waldo, City of WWTF	Waldo, City of WWTF	FL0042242	No	Basic	1186	0.09	0.00	0.00	1,015	1,228	202	0.02	0.00	0.00	0.11	0%
			Alachua County - SRWMD Total					**1.06**	**0.03**	**0.03**	**20,374**	**24,637**	**4,050**	**0.34**	**0.01**	**0.04**	**1.40**	**3%**
			Alachua County Total					**19.86**	**17.12**	**0.53**	**211,364**	**255,588**	**42,013**	**3.53**	**3.20**	**3.73**	**23.39**	**86%**
Baker	SJRWMD	City of Macclenny WWTF	City of Macclenny WWTF	FL0040495	No	Basic	15	0.72	0.00	0.00	6,042	8,372	2,214	0.19	0.00	0.00	0.91	0%
Baker	SJRWMD	Baker Correctional Institution	Baker Correctional Institution	FLA011332	No	Basic	N/A	0.24	0.00	0.00	N/A	N/A	N/A	0.00	0.00	0.00	0.24	0%
			Baker County - SJRWMD Total					**0.96**	**0.00**	**0.00**	**6,042**	**8,372**	**2,214**	**0.19**	**0.00**	**0.00**	**1.15**	**0%**
Bradford	SRWMD	Florida State Prison WWTF	Florida State Prison WWTF	FLA113450	No	Basic	N/A	1.06	0.00	0.00	N/A	N/A	N/A	0.00	0.00	0.00	1.06	0%
Bradford	SRWMD	Starke, City of	Starke, City of	FL0028126	No	Basic	545	0.33	0.07	0.06	5,449	5,827	359	0.03	0.01	0.06	0.36	21%
			Bradford County - SRWMD Total					**1.39**	**0.07**	**0.06**	**5,449**	**5,827**	**359**	**0.03**	**0.01**	**0.06**	**1.42**	**5%**
Clay	SJRWMD	Town of Orange Orange Park WWTF	Town of Orange Orange Park WWTF	FL0023922	No	Basic	453	0.76	0.00	0.00	8,421	9,669	1,186	0.10	0.00	0.00	0.86	0%
Clay	SJRWMD	Green Cove Springs - Harbor Road	Green Cove Springs - Harbor Road WWTP	FL0020915	Yes	High	499	0.49	0.21	0.08	6,908	10,790	3,688					
Clay	SJRWMD	City of Green Cove Springs South	City of Green Cove Springs South	FL0030210	No	Basic	499	0.21	0.00	0.06	N/A	N/A	N/A	0.31	0.09	0.24	1.01	30%
Clay	SJRWMD	CCUA-Fleming Island Regional WWTF	CCUA - Fleming Island	FL0043834	Yes	High	416, 431	2.73	1.85	0.46	104,706	164,485	56,790					
Clay	SJRWMD	CCUA-Fleming Oaks WWTF	CCUA - Fleming Island	FL0032875	No	Basic	416, 431	0.00	0.00	0.00	N/A	N/A	N/A					
Clay	SJRWMD	CCUA - Mid-Clay Regional WWTF	CCUA - Mid-Clay Regional	FLA011377	Yes	High	416, 431	0.42	0.42	0.00	N/A	N/A	N/A					
Clay	SJRWMD	CCUA-Miller Street WWTF	CCUA-Miller Street WWTF	FL0025151	Yes	High	416, 431	2.49	0.00	1.29	N/A	N/A	N/A					
Clay	SJRWMD	CCUA - Ravines	CCUA - Ravines	FLA011371	No	Basic	416, 431	0.00	0.00	0.00	N/A	N/A	N/A					
Clay	SJRWMD	CCUA - Ridaught Landing WWTF	CCUA - Ridaught Landing (Fleming Island)	FL0039721	Yes	High	416, 431	1.06	0.54	0.27	N/A	N/A	N/A					
Clay	SJRWMD	CCUA - Spencer WWTP	CCUA - Spencer	FL0173371	Yes	High	416, 431	2.21	1.81	0.21	N/A	N/A	N/A	4.77	2.47	4.70	13.68	52%
Clay	SJRWMD	Fang - Camp Blanding WWTF	Fang - Camp Blanding WWTF	FL0022853	No	Basic	N/A	0.09	0.00	0.00	N/A	N/A	N/A	0.00	0.00	0.00	0.09	0%
			Clay County - SJRWMD Total					**10.46**	**4.83**	**2.37**	**120,035**	**184,944**	**61,664**	**5.18**	**2.57**	**4.94**	**15.64**	**46%**
Columbia	SRWMD	Columbia Correctional Institution	Columbia Correctional Institution	FLA011418	Yes	High & Basic	N/A	0.35	0.17	0.09	N/A	N/A	N/A	0.00	0.00	0.09	0.35	49%
Columbia	SRWMD	Lake City WWTF	Lake City WWTF	FLA113956	No	Intermediate	37	2.41	0.00	0.00	21,242	25,546	4,089	0.34	0.00	0.00	2.75	0%
			Columbia County - SRWMD Total					**2.76**	**0.17**	**0.09**	**21,242**	**25,546**	**4,089**	**0.34**	**0.00**	**0.09**	**3.10**	**6%**
Duval	SJRWMD	Town of Baldwin WWTF	Town of Baldwin WWTF	FL0027812	No	Basic	784	0.27	0.00	0.00	1,901	2,349	426	0.04	0.00	0.00	0.31	0%
Duval	SJRWMD	Jacksonville Beach	Jacksonville Beach	FL0020231	Yes	High	793	1.78	0.49	0.36	25,518	25,518	0	0.00	0.00	0.36	1.78	28%
Duval	SJRWMD	City of Atlantic Beach (Buccaneer)	City of Atlantic Beach (Buccaneer)	FL0038776	No	Basic	810	1.52	0.00	0.00	N/A	N/A	N/A					
Duval	SJRWMD	City of Atlantic Beach WWTF - Main	City of Atlantic Beach WWTF - Main	FL0023248	No	Basic	810	0.57	0.00	0.00	26,172	26,172	0	0.00	0.00	0.00	2.09	0%
Duval	SJRWMD	Neptune Beach WWTF	Neptune Beach WWTF	FL0020427	No	Basic	842	0.50	0.00	0.00	7,673	7,673	0	0.00	0.00	0.00	0.50	0%
Duval	SJRWMD	Normandy Village Utility	Normandy Village Utility	FLA011517	No	Basic	50293	0.29	0.00	0.00	3,305	4,058	715	0.06	0.00	0.00	0.35	0%
Duval	SJRWMD	Beacon Hills Subdivision WWTF	Beacon Hills Subdivision WWTF	FL0026778	No	Basic	88271	0.64	0.00	0.09	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Arlington East	JEA - South Grid	FL0026441	Yes	High	88271	0.00	0.00	0.00	N/A	N/A	N/A					
Duval	SJRWMD	JEA - District II WWTF	JEA - District II (Cedar Bay)	FL0026450	Yes	High & Basic	88271	4.07	1.37	0.36	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Blacks Ford	JEA - South Grid	FL0174441	Yes	High	88271	22.38	3.95	2.45	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Buckman Street WWTF	JEA - Buckman Street	FL0026000	No	Basic	88271	24.79	3.13	2.88	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Jacksonville Heights	JEA - Jacksonville Heights	FL0023671	No	Basic	88271	0.96	0.00	0.13	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Mandarin	JEA - South Grid	FL0023493	Yes	High	88271	0.00	0.00	0.00	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Monterey WWTF	JEA - Monterey WWTF	FL0023604	No	Basic	88271	1.54	0.00	0.20	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Royal Lakes WRF	JEA - Royal Lakes WRF	FL0026751	No	Basic	88271	1.79	0.00	0.24	N/A	N/A	N/A					
Duval	SJRWMD	JEA - San Jose WRF	JEA - San Jose WRF	FL0023663	No	Basic	88271	1.31	0.00	0.17	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Southwest District WWTF	JEA - Southwest District	FL0026468	No	Basic	88271	9.35	0.43	1.19	644,850	851,429	196,250	16.49	2.19	9.89	83.32	13%
Duval	SJRWMD	USN Mayport NS WWTF	USN Mayport NS WWTF	FL0000922	No	Basic	N/A	0.70	0.00	0.00	N/A	N/A	N/A	0.00	0.00	0.00	0.70	0%
Duval	SJRWMD	USN NAS Jacksonville	USN NAS Jacksonville	FL0000957	Yes	High	N/A	0.68	0.13	0.11	N/A	N/A	N/A	0.00	0.00	0.11	0.68	19%
			Duval County - SJRWMD Total					**73.14**	**9.50**	**8.16**	**709,419**	**917,199**	**197,391**	**16.58**	**2.19**	**10.35**	**89.72**	**13%**
Flagler	SJRWMD	City of Flagler Beach WWTF	City of Flagler Beach WWTF	FL0026611	No	Basic	59	0.60	0.00	0.00	4,484	8,125	3,459	0.29	0.00	0.00	0.89	0%
Flagler	SJRWMD	Matanzas Shores	Matanzas Shores	FLA011599	No	Basic	1947	0.07	0.00	0.01	N/A	N/A	N/A					
Flagler	SJRWMD	Palm Coast WWTF	Palm Coast	FL0116009	Yes	High	1947	5.10	2.56	0.24	76,831	142,274	62,171	5.22	0.49	0.74	10.39	9%
Flagler	SJRWMD	Plantation Bay WWTF	Plantation Bay WWTP	FLA011597	Yes	High	1960	0.12	0.12	0.00	1,247	2,304	1,004	0.08	0.08	0.08	0.20	100%
Flagler	SJRWMD	City of Bunnell - Micheal J. Mikulk	City of Bunnell	FL0020907	Yes	High	1982	0.34	0.20	0.08	2,676	4,962	2,172	0.18	0.11	0.19	0.52	59%
Flagler	SJRWMD	Bulow Village WWTF	Bulow Village	FLA011601	No	Basic	2002	0.03	0.00	0.00	1,354	1,377	22	0.00	0.00	0.00	0.03	0%
Flagler	SJRWMD	Dunes CDD WWTF	Dunes CDD	FLA011602	Yes	High	51136	1.88	1.88	0.00	5,051	5,722	637	0.05	0.05	0.05	1.93	100%
			Flagler County - SJRWMD Total					**8.14**	**4.76**	**0.33**	**91,643**	**164,764**	**69,465**	**5.84**	**0.74**	**1.07**	**13.98**	**58%**
Gilchrist	SRWMD	Lancaster Correctional Institution WWTP	Lancaster Correctional Institution	FLA011620	No	Basic	N/A	0.12	0.00	0.00	N/A	N/A	N/A	0.00	0.00	0.00	0.12	0%
Gilchrist	SRWMD	Trenton	Trenton WWTF	FLA011615	No	Basic	134	0.11	0.00	0.00	1,999	1,999	0	0.00	0.00	0.00	0.11	0%
			Gilchrist County - SRWMD Total					**0.23**	**0.00**	**0.00**	**1,999**	**1,999**	**0**	**0.00**	**0.00**	**0.00**	**0.23**	**0%**
Hamilton	SRWMD	Jasper, City of WWTF	Jasper, City of WWTF	FL0027880	No	Basic	13	0.70	0.00	0.00	2,936	3,214	264	0.02	0.00	0.00	0.72	0%
Hamilton	SRWMD	Jennings, Town of WWTP	Jennings	FLA011623	No	Basic	1143	0.13	0.00	0.00	878	961	79	0.01	0.00	0.00	0.14	0%
Hamilton	SRWMD	White Springs WWTF	White Springs WWTF	FLA116220	No	Basic	546	0.05	0.00	0.00	777	851	70	0.01	0.00	0.00	0.06	0%
			Hamilton County - SRWMD Total					**0.88**	**0.00**	**0.00**	**4,591**	**5,026**	**413**	**0.03**	**0.00**	**0.00**	**0.91**	**0%**

Table B-13 (NFRWSP), Continued. 2035 Reclaimed Water Projections Using 2010 Percent Beneficial Utilization for the NFRWSP area of the St. Johns River Water Management District and Suwannee River Water Management District (Using 2010 Percent Beneficial Utilization).

County	District	Waste Water Treatment Facility Name	Reuse System Name	WAFR ID	PAA	2010 Treatment	Associated CUP	2010 Total Facility Treatment Flow	2010 Total Beneficial Reuse	Potential Existing Additional Reclaimed Water for Reuse	2010 Population	2035 Population	2035 Additional Population Hooked up to Sewer System	2035 New Waste Water Flow	2035 Potential New Additional Reclaimed Water for Reuse	2035 Total Potential Additional Reclaimed Water for Reuse	2035 Total Facility Treatment Flow	2010 Percent Utilization
Nassau	SJRWMD	City of Fernandina Beach WWTF	City of Fernandina Beach WWTF	FL0027260	No	Basic	122	1.62	0.00	0.00	18,603	25,910	6,942	0.58	0.00	**0.00**	2.20	0%
Nassau	SJRWMD	Town of Callahan WWTF	Town of Callahan WWTF	FL0038407	No	Basic	922	0.13	0.00	0.00	1,609	1,609	0	0.00	0.00	**0.00**	0.13	0%
Nassau	SJRWMD	Town of Hilliard WWTF	Town of Hilliard WWTF	FL0043079	No	Basic	948	0.28	0.00	0.00	2,763	3,985	1,161	0.10	0.00	**0.00**	0.38	0%
Nassau	SJRWMD	Amelia Island WWTF	Nassau Amelia Utilities - Amelia Island	FLA011688	Yes	High	50087	0.49	0.49	0.00	8,736	8,955	208	0.02	0.02	**0.02**	0.51	100%
Nassau	SJRWMD	Nassau Regional (Sun Ray)(JEA)	Nassau Regional (Sun Ray)	FL0116793	Yes	High	88271	0.94	0.42	0.23	11,359	17,754	6,075	0.51	0.23	**0.46**	1.45	45%
Nassau County - SJRWMD Total								**3.46**	**0.91**	**0.23**	**43,070**	**58,213**	**14,386**	**1.21**	**0.25**	**0.48**	**4.67**	**26%**
Putnam	SJRWMD	City of Crescent City	City of Crescent City	FL0021610	No	Basic	1627	0.10	0.10	0.00	1,577	1,573	-4	0.00	0.00	**0.00**	0.10	100%
Putnam	SJRWMD	River Park MHP	River Park MHP	FLA117218	Yes	High	7981	0.03	0.03	0.00	736	735	-1	0.00	0.00	**0.00**	0.03	100%
Putnam	SJRWMD	City of Palatka	City of Palatka	FL0040061	Yes	High & Basic	8114	1.77	0.34	0.27	10,558	10,536	-21	0.00	0.00	**0.27**	1.77	19%
Putnam County - SJRWMD Total								**1.90**	**0.47**	**0.27**	**12,871**	**12,844**	**-26**	**0.00**	**0.00**	**0.27**	**1.90**	**25%**
St. Johns	SJRWMD	North Beach Utilities	North Beach Utilities	FLA011765	No	Basic	157	0.20	0.00	0.00	3,653	6,556	2,758	0.23	0.00	**0.00**	0.43	0%
St. Johns	SJRWMD	Town of Hastings WWTF	Town of Hastings WWTF	FL0042315	No	Basic	1392	0.08	0.00	0.00	531	1,164	601	0.05	0.00	**0.00**	0.13	0%
St. Johns	SJRWMD	St. Augustine WWTF # 1	City of St. Augustine # 1	FL0021938	No	Basic	50299	3.25	0.22	0.21	27,833	53,184	24,083	2.02	0.14	**0.34**	5.27	7%
St. Johns	SJRWMD	JEA - Ponce De Leon WRF	JEA - Ponce De Leon	FLA011773	No	Basic	88271	0.84	0.83	0.01	N/A	N/A	N/A					
St. Johns	SJRWMD	JEA - Julington Creek	JEA - South Grid	FL0043591	Yes	High	88271	0.00	0.00	0.00	39,933	75,970	34,235					
St. Johns	SJRWMD	JEA - Ponte Vedra WWTF	Ponte Vedra	FL0117951	Yes	High	88271	0.59	0.50	0.08	N/A	N/A	N/A	2.88	2.67	**2.77**	4.31	93%
St. Johns	SJRWMD	Anastasia	St. Johns Co. - Anastasia	FL0038831	Yes	High	1142, 1198	3.01	0.31	0.93	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - Innlet Beach WWTF	St. Johns Co. - Innlet Beach	FL0044237	Yes	High	1142, 1198	0.22	0.20	0.01	87,714	156,483	65,331					
St. Johns	SJRWMD	St. Johns Co. - Mainland (S.R. 207)	St. Johns Co. - Mainland (S.R. 207)	FL0117471	Yes	High	1142, 1198	0.12	0.12	0.00	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - Marsh Landing WWTF	St. Johns Co. - Marsh Landing @ Ponte Vedra Lakes	FL0044253	Yes	High	1142, 1198	0.51	0.26	0.09	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - Players Club South	St. Johns Co. - Players Club South	FL0044245	Yes	High	1142, 1198	0.39	0.22	0.06	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - Sawgrass WWTF	St. Johns Co. - Sawgrass	FL0117897	Yes	High	1142, 1198	0.88	0.43	0.15	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - SR16 WWTP	St. Johns Co. - SR16	FL0043109	Yes	High	1142, 1198	0.97	0.55	0.14	N/A	N/A	N/A	5.49	1.88	**3.25**	11.59	34%
St. Johns County - SJRWMD Total								**11.06**	**3.64**	**1.67**	**159,664**	**293,357**	**127,008**	**10.67**	**4.69**	**6.36**	**21.73**	**33%**
Suwannee	SRWMD	Advent Christian Village	Advent Christian Home	FLA011819	No	Basic	N/A	0.06	0.00	0.00	N/A	N/A	N/A	0.00	0.00	**0.00**	0.06	0%
Suwannee	SRWMD	Branford	Branford	FLA011806	No	Basic	549	0.07	0.00	0.00	712	910	188	0.02	0.00	**0.00**	0.09	0%
Suwannee	SRWMD	Live Oak, City of WWTF	Live Oak, City of	FLA011805	Yes	High	36	0.70	0.00	0.00	6,850	8,921	1,967	0.17	0.00	**0.00**	0.87	0%
Suwannee County - SRWMD Total								**0.83**	**0.00**	**0.00**	**7,562**	**9,831**	**2,156**	**0.18**	**0.00**	**0.00**	**1.01**	**0%**
Union	SRWMD	Lake Butler WWTF	Lake Butler	FLA118338	No	Basic	310	0.49	0.00	0.00	1,897	1,925	27	0.00	0.00	**0.00**	0.49	0%
Union County - SRWMD Total								**0.49**	**0.00**	**0.00**	**1,897**	**1,925**	**27**	**0.00**	**0.00**	**0.00**	**0.49**	**0%**
SJRWMD Region 1 Total								**127.92**	**41.20**	**13.54**	**1,333,734**	**1,870,644**	**510,065**	**42.85**	**13.62**	**27.16**	**170.77**	**32%**
SRWMD NFRWSP Total								**7.64**	**0.27**	**0.17**	**63,114**	**74,791**	**11,093**	**0.93**	**0.01**	**0.18**	**8.57**	**4%**
NFRWSP Total								**135.56**	**41.47**	**13.71**	**1,396,848**	**1,945,435**	**521,158**	**43.78**	**13.63**	**27.35**	**179.34**	**31%**

Notes:
1.) All estimates of reclaimed water and reuse flow are shown in million gallons per day.
2.) Rounding anomalies account for nominal discrepancies.
3.) 2010 Total facility treatment flow obtained from DEP 2010 Annual Reuse Inventory.
4.) Beneficial reuse for SJRWMD consists of uses in which reclaimed water takes the place of a pre-existing or potential use of higher quality water for which reclaimed water is suitable and as such does not match DEP's broader definition of reuse.
5.) Potential existing additional reclaimed water for reuse calculated using the 2010 percent beneficial utilization of the 2010 total facility treatment flow minus the 2010 total beneficial reuse.
6.) Additional population hooked up to the sewer system calculated as 95 percent of the additional population growth within a service area from 2010 to 2035.
7.) New waste water flow calculated as additional population hooked up to the sewer system times 84 gpcd (69.3 gpcd for residential flow, AWWA indoor standard and 14.7 gpcd for commercial flow, National Engineering Handbook per employee).
8.) Potential new additional reclaimed water for reuse calculated using the 2010 percent beneficial utilization of the new waste water flow.
9.) Total potential additional reclaimed water for reuse calcualted as potential existing additional reclaimed water for reuse plus potential new additional reclaimed water for reuse.
10.) 2035 Total facility treatment flow calculated as 2010 total facility treatment flow plus 2035 new waste water flow.
11.) Projections are grouped by population expected to growth within a public supply service area. Therefore, the projections by wastewater facility (WWTF) may not be specific to the WWTF, but as the region as a whole.
12.) Projections are not included for those service areas that do not currently have waste water treatment facilities.

Table B-14 (NFRWSP). 2035 Reclaimed Water Projections for the NFRWSP area of the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Estimates Using WWTF 2010 Percent Beneficial Utilization Rate							Estimates Using DEP Beneficial Utilization Rate of 75 Percent						
		2010 Total Facility Treatment Flow	2010 Total Beneficial Reuse	Potential Existing Additional Reclaimed Water for Reuse	2035 New Waste Water Flow	2035 Potential New Additional Reclaimed Water for Reuse	2035 Total Potential Additional Reclaimed Water for Reuse	2035 Total Facility Treatment Flow	2010 Total Facility Treatment Flow	2010 Total Beneficial Reuse	Potential Existing Additional Reclaimed Water for Reuse	2035 New Waste Water Flow	2035 Potential New Additional Reclaimed Water for Reuse	2035 Total Potential Additional Reclaimed Water for Reuse	2035 Total Facility Treatment Flow
Alachua	SJRWMD	18.80	17.09	0.50	3.19	3.19	3.69	21.99	18.80	17.09	1.28	3.19	2.39	3.67	21.99
Alachua	SRWMD	1.06	0.03	0.03	0.34	0.01	0.04	1.40	1.06	0.03	0.77	0.34	0.26	1.03	1.40
Alachua	**Total**	**19.86**	**17.12**	**0.53**	**3.53**	**3.20**	**3.73**	**23.39**	**19.86**	**17.12**	**2.06**	**3.53**	**2.65**	**4.70**	**23.39**
Baker	SJRWMD	0.96	0.00	0.00	0.19	0.00	0.00	1.15	0.96	0.00	0.72	0.19	0.14	0.86	1.15
Baker	SRWMD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Baker	**Total**	**0.96**	**0.00**	**0.00**	**0.19**	**0.00**	**0.00**	**1.15**	**0.96**	**0.00**	**0.72**	**0.19**	**0.14**	**0.86**	**1.15**
Bradford	SJRWMD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bradford	SRWMD	1.39	0.07	0.06	0.03	0.01	0.06	1.42	1.39	0.07	0.99	0.03	0.02	1.01	1.42
Bradford	**Total**	**1.39**	**0.07**	**0.06**	**0.03**	**0.01**	**0.06**	**1.42**	**1.39**	**0.07**	**0.99**	**0.03**	**0.02**	**1.01**	**1.42**
Clay	SJRWMD	10.46	4.83	2.37	5.18	2.57	4.94	15.64	10.46	4.83	4.22	5.18	3.88	8.11	15.64
Columbia	SRWMD	2.76	0.17	0.09	0.34	0.00	0.09	3.10	2.76	0.17	1.94	0.34	0.26	2.20	3.10
Duval	SJRWMD	73.14	9.50	8.16	16.58	2.19	10.35	89.72	73.14	9.50	47.73	16.58	12.44	60.17	89.72
Flagler	SJRWMD	8.14	4.76	0.33	5.84	0.74	1.07	13.98	8.14	4.76	2.54	5.84	4.38	6.91	13.98
Gilchrist	SRWMD	0.23	0.00	0.00	0.00	0.00	0.00	0.23	0.23	0.00	0.17	0.00	0.00	0.17	0.23
Hamilton	SRWMD	0.88	0.00	0.00	0.03	0.00	0.00	0.91	0.88	0.00	0.66	0.03	0.03	0.69	0.91
Nassau	SJRWMD	3.46	0.91	0.23	1.21	0.25	0.48	4.67	3.46	0.91	1.91	1.21	0.91	2.82	4.67
Putnam	SJRWMD	1.90	0.47	0.27	0.00	0.00	0.27	1.90	1.90	0.47	1.07	0.00	0.00	1.07	1.90
St. Johns	SJRWMD	11.06	3.64	1.67	10.67	4.69	6.36	21.73	11.06	3.64	5.57	10.67	8.00	13.57	21.73
Suwannee	SRWMD	0.83	0.00	0.00	0.18	0.00	0.00	1.01	0.83	0.00	0.62	0.18	0.14	0.76	1.01
Union	SRWMD	0.49	0.00	0.00	0.00	0.00	0.00	0.49	0.49	0.00	0.37	0.00	0.00	0.37	0.49
SJRWMD Region 1 Total		**127.92**	**41.20**	**13.54**	**42.85**	**13.62**	**27.16**	**170.77**	**127.92**	**41.20**	**65.04**	**42.85**	**32.13**	**97.17**	**170.77**
SRWMD NFRWSP Total		**7.64**	**0.27**	**0.17**	**0.93**	**0.01**	**0.18**	**8.57**	**7.64**	**0.27**	**5.53**	**0.93**	**0.70**	**6.23**	**8.57**
NFRWSP Total		**135.56**	**41.47**	**13.71**	**43.78**	**13.63**	**27.35**	**179.34**	**135.56**	**41.47**	**70.57**	**43.78**	**32.83**	**103.40**	**179.34**

Notes:
1.) All estimates of reclaimed water and reuse flow are shown in million gallons per day.
2.) Rounding anomalies account for nominal discrepancies.
3.) 2010 Total facility treatment flow obtained from DEP 2010 Annual Reuse Inventory.
4.) Beneficial reuse for SJRWMD and SRWMD consists of uses in which reclaimed water takes the place of a pre-existing or potential use of higher quality water for which reclaimed water is suitable and as such does not match DEP's broader definition of reuse.
5.) Total potential additional reclaimed water for reuse calcualted as potential existing additional reclaimed water for reuse plus potential new additional reclaimed water for reuse.
6.) 2035 Total facility treatment flow calculated as 2010 total facility treatment flow plus 2035 new waste water flow.
7.) Projections are not included for those service areas that do not currently have waste water treatment facilities.

Table B-15 (1-Region 1). Average Gross Per Capita Scenario for Potential Public Supply Conservation in the St. Johns River Water Management District.

County	Utility	Permit Number	2035 Population Projection	2035 Demand Projection	2010-2014 Average Gross Per Capita	2010-2014 Average Gross Per Capita for Region 1	New 2035 Demand if Existing Average Gross Per Capita Greater than 131 GPCD	Potential Reduction in 2035 Demand	Potential Reduction in 2035 Demand (Percent)
Alachua	City of Hawthorne	1674	1,800	0.22	123	131	0.22	0.00	0.0%
	Gainesville Regional Utilities (includes SRWMD)	11339	229,151	27.04	118	131	27.04	0.00	0.0%
	Kincaid Hills Water Company	11343	606	0.09	153	131	0.08	-0.01	-11.1%
	Town of Micanopy	11356	1,036	0.08	76	131	0.08	0.00	0.0%
	Arredondo Utility Co / Aqua Source Utilities	11364	1,061	0.12	110	131	0.12	0.00	0.0%
	Total		**233,654**	**27.55**	**N/A**	**N/A**	**27.54**	**-0.01**	**0.0%**
Baker	City of Macclenny	15	8,372	1.27	152	131	1.10	-0.17	-13.4%
	Town of Glen St Mary	24	502	0.04	70	131	0.04	0.00	0.0%
	Total		**8,874**	**1.31**	**N/A**	**N/A**	**1.14**	**-0.17**	**-13.0%**
Bradford	Clay County Utility Authority	431	967	0.10	106	131	0.10	0.00	0.0%
	Total		**967**	**0.10**	**N/A**	**N/A**	**0.10**	**0.00**	**0.0%**
Clay	Clay County Utility Authority	416, 431	164,485	17.44	106	131	17.44	0.00	0.0%
	Town of Orange Park	453	9,669	1.02	105	131	1.02	0.00	0.0%
	City of Green Cove Springs	499	10,790	1.60	148	131	1.41	-0.19	-11.9%
	JEA (Also in Duval, Nassau, St. Johns)	88271	3,258	0.48	147	131	0.43	-0.05	-10.4%
	Total		**188,202**	**20.54**	**N/A**	**N/A**	**20.30**	**-0.24**	**-1.2%**
Duval	Neighborhood Utilities, Inc.	756	1,281	0.11	85	131	0.11	0.00	0.0%
	City of Baldwin	784	2,349	0.38	162	131	0.31	-0.07	-18.4%
	City of Jacksonville Beach	793	25,518	2.48	97	131	2.48	0.00	0.0%
	Atlantic Beach Utility	810	26,172	2.20	84	131	2.20	0.00	0.0%
	City of Neptune Beach	842	7,673	0.87	113	131	0.87	0.00	0.0%
	St Johns County Utilities / Intercoastal (Also in St. Johns)	1142	36	0.01	181	131	0.00	-0.01	-100.0%
	Normandy Villages Utilities	50293	4,058	0.37	91	131	0.37	0.00	0.0%
	JEA (Also in Clay, Nassau, St. Johns)	88271	851,429	125.16	147	131	111.54	-13.62	-10.9%
	Total		**918,516**	**131.58**	**N/A**	**N/A**	**117.88**	**-13.70**	**-10.4%**
Flagler	City of Flagler Beach	59	8,125	1.27	156	131	1.06	-0.21	-16.5%
	City of Palm Coast	1947	142,274	13.52	95	131	13.52	0.00	0.0%
	Plantation Bay Utility Company (Also in Volusia)	1960	2,304	0.15	66	131	0.15	0.00	0.0%
	City of Bunnell	1982	4,962	0.54	109	131	0.54	0.00	0.0%
	Manufactured Home Communities	2002	1,377	0.08	59	131	0.08	0.00	0.0%
	City of Ormond Beach (Also in Volusia)	8932	0	0.00	131	131	0.00	0.00	0.0%
	Volusia County Utilities (Also in Volusia)	50157, 50659, 86278	1,189	0.19	156	131	0.16	-0.03	-15.8%
	Dunes Community Development District	51136	5,722	0.56	97	131	0.56	0.00	0.0%
	D & E Water Resources , LLC / Heart Island (Also in Volusia)	112981	151	0.02	128	131	0.02	0.00	0.0%
	Total		**166,104**	**16.33**	**N/A**	**N/A**	**16.09**	**-0.24**	**-1.5%**
Nassau	City of Fernandina Beach	122	25,910	4.53	175	131	3.39	-1.14	-25.2%
	Town of Callahan	922	1,609	0.17	103	131	0.17	0.00	0.0%
	Town of Hilliard	948	3,985	0.37	93	131	0.37	0.00	0.0%
	Nassau Amelia Utilities	50087	8,955	1.37	153	131	1.17	-0.20	-14.6%
	JEA (Also in Clay, Duval, St. Johns / Old 942)	88271	17,754	2.84	160	131	2.33	-0.51	-18.0%
	Total		**58,213**	**9.28**	**N/A**	**N/A**	**7.43**	**-1.85**	**-19.9%**
Putnam	Town of Interlachen	1624, 8150	928	0.08	84	131	0.08	0.00	0.0%
	City of Crescent City	1627	1,573	0.20	127	131	0.20	0.00	0.0%
	Melrose Water Association	7961	467	0.10	204	131	0.06	-0.04	-40.0%
	River Park Utilities Management Assoc.	7981	735	0.04	52	131	0.04	0.00	0.0%
	City of Palatka	8114	10,536	1.39	132	131	1.38	-0.01	-0.7%
	Town of Welaka	8168	1,098	0.07	63	131	0.07	0.00	0.0%
	Putnam County BOCC	92165	2,271	0.39	173	131	0.39	0.00	0.0%
	Total		**17,608**	**2.27**	**N/A**	**N/A**	**2.14**	**-0.13**	**-5.7%**
St. Johns	North Beach Utilities	157	6,556	0.78	119	131	0.78	0.00	0.0%
	Wildwood Water Company	324	1,069	0.09	86	131	0.09	0.00	0.0%
	St Johns County Utilities / Intercoastal (Also in Duval)	1142	36,271	6.57	181	131	4.75	-1.82	-27.7%
	St Johns County Utilities	1198	120,176	11.90	99	131	11.90	0.00	0.0%
	Town of Hastings	1392	1,164	0.16	137	131	0.15	-0.01	-6.3%
	City of St. Augustine Utilities	50299	53,184	5.96	112	131	5.96	0.00	0.0%
	JEA (Also in Clay, Duval, Nassau)	88271	75,970	11.17	147	131	9.95	-1.22	-10.9%
	Total		**294,390**	**36.63**	**N/A**	**N/A**	**33.58**	**-3.05**	**-8.3%**
Region 1 Total			**1,886,528**	**245.59**	**N/A**	**N/A**	**226.20**	**-19.39**	**-7.9%**
		Region 1 2010-2014 Average Gross Per Capita			**131**				

Table B-15 (2-SRWMD NFRWSP Area). Average Gross Per Capita Scenario for Potential Public Supply Conservation in the Suwannee River Water Management District Portion of the North Florida Regional Water Supply Planning Area.

County	Utility	CUP Number	2035 Population Projection	2035 Demand Projection	2010-2014 Average Gross Per Capita	2010-2014 Average Gross Per Capita for SRWMD NFRWSP Area	New 2035 Demand if Existing Average Gross Per Capita Greater than 142	Potential Reduction in 2035 Demand	Potential Reduction in 2035 Demand (Percent)
Alachua - SRWMD	City Of Alachua	220667	10,954	1.46	133	142	1.46	0.00	0.0%
	City Of Newberry	216450	5,986	0.57	96	142	0.57	0.00	0.0%
	City Of Archer	216647	1,354	0.12	90	142	0.12	0.00	0.0%
	City Of High Springs Water Plant	216833	6,469	0.49	76	142	0.49	0.00	0.0%
	City Of Waldo	217300	1,228	0.09	70	142	0.09	0.00	0.0%
	SRWMD Alachua Total		**25,991**	**2.73**	**N/A**	**N/A**	**2.73**	**0.00**	**0.0%**
Bradford - SRWMD	City of Lawtey	218998	781	0.20	250	142	0.11	-0.09	-45.0%
	City of Starke	216650	5,827	0.82	140	142	0.82	0.00	0.0%
	SRWMD Bradford Total		**6,608**	**1.02**	**N/A**	**N/A**	**0.93**	**-0.09**	**-8.8%**
Columbia - SRWMD	City of Lake City	217754	25,546	4.14	162	142	3.63	-0.51	-12.3%
	Columbia County Board of Commissioners	2-07-00122	0	0.00	156	142	0.00	0.00	0.0%
	Clayton Smith Wells	2-86-00138	0	0.00	N/A	142	0.00	0.00	0.0%
	Melton Bishop Wells	2-86-00143	0	0.00	N/A	142	0.00	0.00	0.0%
	SRWMD Columbia Total		**25,546**	**4.14**	**N/A**	**N/A**	**3.63**	**-0.51**	**-12.3%**
Gilchrist - SRWMD	City of Trenton Water Treatment Plant	216453	1,999	0.23	117	142	0.23	0.00	0.0%
	SRWMD Gilchrist Total		**1,999**	**0.23**	**N/A**	**N/A**	**0.23**	**0.00**	**0.0%**
Hamilton - SRWMD	City of Jasper	220463	3,214	0.71	222	142	0.46	-0.25	-35.2%
	Hamilton County Water Facilities	2-08-00093	55	0.05	902	142	0.01	-0.04	-80.0%
	Town of White Springs	216651	851	0.06	73	142	0.06	0.00	0.0%
	Town of Jennings	216567	961	0.15	160	142	0.14	-0.01	-6.7%
	SRWMD Hamilton Total		**5,081**	**0.97**	**N/A**	**N/A**	**0.67**	**-0.30**	**-30.9%**
Suwannee - SRWMD	City of Live Oak	220612	8,921	1.42	159	142	1.27	-0.15	-10.6%
	Wellborn	216507	466	0.04	91	142	0.04	0.00	0.0%
	Town of Branford	216658	910	0.11	118	142	0.11	0.00	0.0%
	SRWMD Suwannee Total		**10,297**	**1.57**	**N/A**	**N/A**	**1.42**	**-0.15**	**-9.6%**
Union - SRWMD	City of Lake Butler	2-85-00310	1,925	0.33	169	142	0.27	-0.06	-18.2%
	SRWMD Union Total		**1,925**	**0.33**	**N/A**	**N/A**	**0.27**	**-0.06**	**-18.2%**
SRWMD NFRWSP Total			**77,447**	**10.99**	**N/A**	**N/A**	**9.88**	**-1.11**	**-10.1%**
	SRWMD NFRWSP Area 2010-2014 Average Gross Per Capita				**142**				

Notes:
1.) Projected 2035 demand and potential reducation is shown in million gallons per day.

Table B-16. Average Gross Per Capita Scenario for Potential Public Supply Conservation

Area	2035 Population Projection	2035 Demand Projection	2010-2014 Average Gross Per Capita	New 2035 Demand if Existing Average Gross Per Capita Greater than Regional Average	Potential Reduction in 2035 Demand	% Potential Reduction in 2035 Demand
SJRWMD Region 1	1,886,528	245.59	131	226.20	-19.39	-7.9%
SRWMD NFRWSP Area	77,447	10.99	142	9.88	-1.11	-10.1%
Total	**1,963,975**	**256.58**	**N/A**	**236.08**	**-20.50**	**-8.0%**

NFRWSP Area Total	1,963,975	256.58	N/A	236.08	-20.50	-8.0%

Notes:
1.) Projected 2035 demand and potential reducation is shown in million gallons per day.

Table B-17. Range of Potential Conservation for the North Florida Regional Water Supply Planning Area

Category	Projected 2035 Demand	High Range		Low Range	
		Percent Conservation	Projected 2035 Conservation	Percent Conservation	Projected 2035 Conservation
Public Supply	256.58	8.0%	20.50	4.1%	10.52
Domestic Self-supply	60.71	8.0%	4.86	4.1%	2.49
Commercial/Industrial/Institutional Self-supply	131.72	1.2%	1.58	1.2%	1.58
Landscape/Recreation/Aesthetic Self-supply	31.00	2.8%	0.87	2.8%	0.87
Power Generation Self-supply	33.88	1.2%	0.41	1.2%	0.41
Agriculture	153.58	16.1%	24.80	16.1%	24.80
Total	**667.47**	**7.9%**	**53.02**	**6.1%**	**40.67**

Notes:

1.) Low Range - Percent of potential conservation for domestic self-supply and public supply is based on the average of the Conserve Florida EZ Guide results for public supply residential indoor and outdoor uses.

2.) Low and High Range - Percent of potential conservation for commercial/industrial/institutional self-supply and for power generation Self-supply are based on Conserve Florida EZ Guide results for public supply commercial/industrial/institutional.

3.) Low and High Range - Percent of potential conservation for landscape/recreation/aesthetic self-supply is based on Conserve Florida EZ Guide results for public supply outdoor water use.

4.) Low and High Range - Agriculture is based from the Florida Department of Agriculture and Consumer Services Florida Statewide Agricultural Irrigation Demand II Balmoral deliverable.

5.) High Range - Public supply is based on savings achieved if SJRWMD Region 1 2010-2014 average gross per capita rate was met by respective utilities and SRWMD NFRWSP area 2010-2014 average gross per capita rate was met by respective utilities.

6.) Projected 2035 demand and 2035 conservation potential is shown in million gallons per day.

Table B-18 (1-NFRWSP). 2015 Beneficial Reclaimed Water Utilization and Disposal Flow in the North Florida Regional Water Supply Planning Area for the St. Johns and Suwannee River Water Management Districts.

WAFR_FACIL	FACILITY_I	FACILITY_N	DESIGN_CAP	COUNTY_NAM	LONG_MM	Name	RW_System	WAFR_ID	TotTreatedFlo	ActualUtiliz	DisposalFlo	ID
11819	FLA011819	Advent Christian Village WWTF	0.21	Suwannee	14	Advent Christian Village	Advent Christian Home	FLA011819	0.06	0.00	0.06	1
11290	FLA011290	Alachua, City of WWTF	0.94	Alachua	28	Alachua	Alachua	FLA011290	0.61	0.46	0.15	2
11688	FLA011688	Amelia Island WWTF	0.95	Nassau	27	Amelia Island WWTF	Nassau Amelia Utilities - Amelia Island	FLA011688	0.60	0.60	0.00	3
11746	FL0038831	Anastasia Island WWTF	4.00	St. Johns	17	Anastasia	*	FL0038831	2.64	0.16	2.48	4
11332	FLA011332	Baker Correctional WWTF	0.29	Baker	22	Baker Correctional Institution	Baker Correctional Institution	FLA011332	0.23	0.03	0.20	5
26778	FL0026778	Beacon Hills Subdivision WWTF	1.30	Duval	31	Beacon Hills Subdivision WWTF	Beacon Hills Subdivision WWTF	FL0026778	0.00	0.00	0.00	6
11806	FLA011806	Branford, Town of WWTF	0.12	Suwannee	54	Branford	Branford	FLA011806	0.06	0.00	0.06	7
11601	FLA011601	Bulow Plantation	0.09	Flagler	9	Bulow Village WWTF	Bulow Village	FLA011601	0.04	0.00	0.04	8
11354	FL0043834	Fleming Island Regional WWTF	4.00	Clay	43	CCUA-Fleming Island Regional WWTF	CCUA - Fleming Island	FL0043834	3.83	1.94	1.89	9
11348	FL0032875	Fleming Oaks WWTF	0.49	Clay	42	CCUA-Fleming Oaks WWTF	CCUA - Fleming Island	FL0032875	0.00	0.00	0.00	10
11359	FL0025151	Clay County Utility Authority Miller St. Wwtp	5.00	Clay	42	CCUA-Miller Street WWTF	CCUA-Miller Street WWTF	FL0025151	0.00	0.00	0.00	11
36274	FLA362743	Keystone Heights WWTF	0.10	Clay	2	CCUA - Keystone Heights WWTF	CCUA - Keystone Heights WWTF	FLA362743	0.02	0.00	0.02	12
11377	FLA011377	Mid - Clay Regional WWTF	0.38	Clay	47	CCUA - Mid-Clay Regional WWTF	CCUA - Mid-Clay Regional	FLA011377	0.00	0.00	0.00	13
32784	FLA327841	Peter's Creek WWTF (fka Green Cove West)	0.10	Clay	45	CCUA - Peter's Creek WWTF	CCUA - Peter's Creek WWTF	FLA327841	0.02	0.00	0.02	14
11371	FLA011371	Ravines WWTF	0.25	Clay	50	CCUA - Ravines	CCUA - Ravines	FLA011371	0.00	0.00	0.00	15
11360	FL0039721	Ridaught Landing WWTF	1.88	Clay	47	CCUA - Ridaught Landing WWTF	CCUA - Ridaught Landing (Fleming Island)	FL0039721	0.00	0.00	0.00	16
17337	FL0173371	Spencer WWTF	0.25	Clay	48	CCUA - Spencer WWTP	CCUA - Spencer	FL0173371	3.01	1.93	1.08	17
11438	FL0038776	Atlantic Beach, City of - WWTF	3.00	Duval	24	City of Atlantic Beach (Buccaneer)	City of Atlantic Beach (Buccaneer)	FL0038776	0.00	0.00	0.00	18
11434	FL0023248	Atlantic Beach, City of - Buccaneer WWTF (Main)	1.90	Duval	24	City of Atlantic Beach WWTF - Main	City of Atlantic Beach WWTF - Main	FL0023248	1.73	0.00	1.73	19
11591	FL0020907	Bunnell, City of WWTF	0.60	Flagler	15	City of Bunnell - Micheal J. Mikulk	City of Bunnell	FL0020907	0.32	0.21	0.11	20
11703	FL0021610	Crescent City, City of WWTF	0.25	Putnam	30	City of Crescent City	City of Crescent City	FL0021610	0.08	0.08	0.00	21
11671	FL0027260	Fernandina Beach, City of WWTF	3.50	Nassau	27	City of Fernandina Beach WWTF	City of Fernandina Beach WWTF	FL0027260	1.77	0.00	1.77	22
11590	FL0026611	Flagler Beach, City of WWTF	1.00	Flagler	8	City of Flagler Beach WWTF	City of Flagler Beach WWTF	FL0026611	0.57	0.00	0.57	23
11366	FL0030210	Green Cove Springs, City of - South WWTF	0.50	Clay	40	City of Green Cove Springs South	City of Green Cove Springs South	FL0030210	0.23	0.00	0.23	24
11327	FL0040495	Macclenny, City of WWTF	1.30	Baker	7	City of Macclenny WWTF	City of Macclenny WWTF	FL0040495	0.64	0.00	0.64	25
11704	FL0040061	Palatka, City of WWTF	3.00	Putnam	39	City of Palatka	City of Palatka	FL0040061	1.51	1.48	0.03	26
11418	FLA011418	Columbia Correctional Institution WWTF	0.35	Columbia	29	Columbia Correctional Institution	Columbia Correctional Institution	FLA011418	0.43	0.20	0.23	27
11602	FLA011602	Dunes Community Development District	0.50	Flagler	11	Dunes CDD WWTF	Dunes CDD	FLA011602	1.87	1.87	0.00	28
11392	FL0022853	Fang - Camp Blanding WWTF	0.90	Clay	57	Fang - Camp Blanding WWTF	Fang - Camp Blanding WWTF	FL0022853	0.12	0.00	0.12	29
11345	FLA113450	Florida State Prison WWTF	2.50	Bradford	11	Florida State Prison WWTF	Florida State Prison WWTF	FLA113450	0.92	0.00	0.92	30
11364	FL0020915	Green Cove Springs, City of - Harbor Road WWTF	0.75	Clay	41	Green Cove Springs - Harbor Road	Green Cove Springs - Harbor Road WWTP	FL0020915	0.48	0.17	0.31	31
11289	FL0112895	GRU - Kanapaha WRF	10.00	Alachua	24	GRU - Kanapaha (#5) WRF	GRU - Kanapaha	FL0112895	10.79	10.79	0.00	32
11287	FL0027251	GRU - Main St WRF	7.50	Alachua	19	GRU - Main Street (#1 & #2) WRF	GRU - Main Street	FL0027251	6.88	6.88	0.00	33
11291	FLA011291	Hawthorne, City of WWTF	0.15	Alachua	4	Hawthorne WWTF	Hawthorne	FLA011291	0.06	0.06	0.00	34
28609	FLA286095	High Springs, City of WWTF	0.24	Alachua	36	High Springs WWTF	High Springs	FLA286095	0.15	0.00	0.15	35
11437	FL0020231	Jacksonville Beach WWTP	4.50	Duval	23	Jacksonville Beach	Jacksonville Beach	FL0020231	3.47	0.41	3.06	36
11621	FL0027880	Jasper, City of - WWTF	1.20	Hamilton	56	Jasper, City of WWTF	Jasper, City of WWTF	FL0027880	0.66	0.00	0.66	37
11432	FL0026441	JEA Arlington East Wastewater Treatment Plant	15.00	Duval	32	JEA - Arlington East	JEA - South Grid	FL0026441	0.00	0.00	0.00	38
17444	FL0174441	Blacks Ford WRF	1.50	St. Johns	35	JEA - Blacks Ford	JEA - South Grid	FL0174441	32.25	7.94	24.31	39
11443	FL0026000	Buckman RMF	52.50	Duval	37	JEA - Buckman Street WWTF	JEA - Buckman Street	FL0026000	34.13	3.34	30.79	40
11442	FL0026450	District 2 Water Reclamation	10.00	Duval	37	JEA - District II WWTF	JEA - District II (Cedar Bay)	FL0026450	4.92	0.22	4.70	41
11507	FL0023671	Jacksonville Heights WRF	2.50	Duval	45	JEA - Jacksonville Heights	JEA - Jacksonville Heights	FL0023671	0.00	0.00	0.00	42
11771	FL0043591	Julington Creek WRF	1.00	Duval	37	JEA - Julington Creek	JEA - South Grid	FL0043591	0.00	0.00	0.00	43
11771	FL0043591	Julington Creek WRF	1.00	St. Johns	37	JEA - Julington Creek	JEA - South Grid	FL0043591	0.00	0.00	0.00	44
11444	FL0023493	Mandarin Water Reclamation Facility	7.50	Duval	37	JEA - Mandarin	JEA - South Grid	FL0023493	0.00	0.00	0.00	45
11495	FL0023604	Monterey WRF	3.60	Duval	36	JEA - Monterey WWTF	JEA - Monterey WWTF	FL0023604	1.86	0.00	1.86	46
11773	FLA011773	Ponce De Leon WWTF	0.35	St. Johns	18	JEA - Ponce De Leon WRF	JEA - Ponce De Leon	FLA011773	0.09	0.00	0.09	47
11795	FL0117951	Ponte Vedra WWTF	0.50	St. Johns	23	JEA - Ponte Vedra WWTF	Ponte Vedra	FL0117951	0.62	0.29	0.33	48
11570	FL0026751	Royal Lakes WRF	3.50	Duval	33	JEA - Royal Lakes WRF	JEA - Royal Lakes WRF	FL0026751	0.00	0.00	0.00	49
11501	FL0023663	JEA - San Jose WRF	2.25	Duval	37	JEA - San Jose WRF	JEA - San Jose WRF	FL0023663	0.00	0.00	0.00	50
11445	FL0026468	Southwest Water Reclamation	10.00	Duval	43	JEA - Southwest District WWTF	JEA - Southwest District	FL0026468	11.01	0.36	10.65	51
11623	FLA011623	Jennings, Town of WWTF	0.25	Hamilton	6	Jennings, Town of WWTP	Jennings	FLA011623	0.12	0.00	0.12	52
11833	FLA118338	Lake Butler, City of WWTF	0.70	Union	22	Lake Butler WWTF	Lake Butler	FLA118338	0.47	0.00	0.47	53
11395	FLA113956	Lake City, City of - WWTF	3.00	Columbia	38	Lake City WWTF	Lake City WWTF	FLA113956	2.18	0.00	2.18	54
11620	FLA011620	Lancaster Correctional Institution WWTF	0.12	Gilchrist	52	Lancaster Correctional Institution WWTP	Lancaster Correctional Institution	FLA011620	0.10	0.00	0.10	55
11805	FLA011805	Live Oak, City of WWTF	1.25	Suwannee	59	Live Oak, City of WWTF	Live Oak, City of	FLA011805	1.09	0.21	0.88	56

Table B-18, Continued (1-NFRWSP). 2015 Beneficial Reclaimed Water Utilization and Disposal Flow in the North Florida Regional Water Supply Planning Area for the St. Johns and Suwannee River Water Management Districts.

WAFR_FACIL	FACILITY_I	FACILITY_N	DESIGN_CAP	COUNTY_NAM	LONG_MM	Name	RW_System	WAFR_ID	TotTreatedFlo	ActualUtiliz	DisposalFlo	ID
11599	FLA011599	Matanzas Shores WWTF	0.32	Flagler	12	Matanzas Shores	Matanzas Shores	FLA011599	0.09	0.00	0.09	57
11679	FL0116793	Nassau Regional WWTF	0.50	Nassau	33	Nassau Regional (Sun Ray)(JEA)	Nassau Regional (Sun Ray)	FL0116793	1.41	0.62	0.79	58
11439	FL0020427	Neptune Beach, City of WWTF	1.50	Duval	25	Neptune Beach WWTF	Neptune Beach WWTF	FL0020427	0.59	0.00	0.59	59
11292	FLA011292	Newberry, City of WWTF	0.42	Alachua	37	Newberry WWTF	Newberry WWTF	FLA011292	0.22	0.00	0.22	60
11517	FLA011517	Normandy Village WWTF	0.40	Duval	46	Normandy Village Utility	Normandy Village Utility	FLA011517	0.25	0.00	0.25	61
11765	FLA011765	North Beach Utilities WWTF	0.15	St. Johns	18	North Beach Utilities	North Beach Utilities	FLA011765	0.20	0.00	0.20	62
16009	FL0116009	Palm Coast WTP #3 - Membrane Concentrate Disposal	0.00	Flagler	12	Palm Coast WWTF	Palm Coast	FL0116009	5.99	2.87	3.12	63
11597	FLA011597	Plantation Bay WWTF	0.48	Flagler	10	Plantation Bay WWTF	Plantation Bay WWTP	FLA011597	0.10	0.10	0.00	64
11721	FLA117218	River Park Mobile Home Park WWTF	0.03	Putnam	38	River Park MHP	River Park MHP	FLA117218	0.03	0.03	0.00	65
64916	FLA649163	SR - 6/I-75 WWTF	0.00	Hamilton	5	SR-6/I-75 WWTF*	SR-6/I-75 WWTF	FLA649163	0.02	0.00	0.02	66
11753	FL0021938	St. Augustine, City of - #1 WWTF	5.00	St. Johns	18	St. Augustine WWTF # 1	City of St. Augustine # 1	FL0021938	4.03	0.20	3.83	67
11757	FL0044237	Innlet Beach WWTF	0.50	St. Johns	23	St. Johns Co. - Innlet Beach WWTF	St. Johns Co. - Innlet Beach	FL0044237	0.24	0.21	0.03	68
11747	FL0117471	SR-207 WWTF	0.25	St. Johns	22	St. Johns Co. - Mainland (S.R. 207)	St. Johns Co. - Mainland (S.R. 207)	FL0117471	0.15	0.15	0.00	69
11770	FL0044253	Marsh Landing WWTF	0.80	St. Johns	23	St. Johns Co. - Marsh Landing WWTF	St. Johns Co. - Marsh Landing @ Ponte Vedra Lakes	FL0044253	0.54	0.18	0.36	70
11774	FL0044245	Players Club South WWTF	0.70	St. Johns	23	St. Johns Co. - Players Club South	St. Johns Co. - Players Club South	FL0044245	0.42	0.16	0.26	71
11789	FL0117897	Sawgrass WWTF	1.50	St. Johns	22	St. Johns Co. - Sawgrass WWTF	St. Johns Co. - Sawgrass	FL0117897	0.81	0.25	0.56	72
11748	FL0043109	SR-16 WWTF	1.50	St. Johns	23	St. Johns Co. - SR16 WWTP	St. Johns Co. - SR16	FL0043109	1.18	0.75	0.43	73
11335	FL0028126	Starke, City of WWTF	1.65	Bradford	6	Starke, City of	Starke, City of	FL0028126	0.89	0.03	0.86	74
11448	FL0027812	Baldwin WWTF	0.40	Duval	58	Town of Baldwin WWTF	Town of Baldwin WWTF	FL0027812	0.23	0.00	0.23	75
11672	FL0038407	Callahan, Town of WWTF	0.30	Nassau	49	Town of Callahan WWTF	Town of Callahan WWTF	FL0038407	0.16	0.00	0.16	76
11751	FL0042315	Hastings, Town of WWTF	0.12	St. Johns	30	Town of Hastings WWTF	Town of Hastings WWTF	FL0042315	0.09	0.00	0.09	77
11673	FL0043079	Hilliard, Town of WWTF	0.32	Nassau	55	Town of Hilliard WWTF	Town of Hilliard WWTF	FL0043079	0.27	0.00	0.27	78
11365	FL0023922	Orange Park, Town of - WWTF	2.50	Clay	42	Town of Orange Orange Park WWTF	Town of Orange Orange Park WWTF	FL0023922	0.78	0.00	0.78	79
11615	FLA011615	Trenton WWTF	0.20	Gilchrist	48	Trenton	Trenton WWTF	FLA011615	0.11	0.00	0.11	80
11322	FLA011322	University of Florida WWTF	3.10	Alachua	20	University of Florida WRF	UF - Lake Alice	FLA011322	1.84	0.87	0.97	81
11427	FL0000922	Navy Fuel Depot	2.00	Duval	24	USN Mayport NS WWTF	USN Mayport NS WWTF	FL0000922	0.64	0.00	0.64	82
11429	FL0000957	NAS Jacksonville WWTF	3.00	Duval	41	USN NAS Jacksonville	USN NAS Jacksonville	FL0000957	0.53	0.23	0.30	83
11622	FLA116220	White Springs, Town of WWTF	0.15	Hamilton	44	White Springs, Town of WWTF*	White Springs, Town of	FLA116220	0.08	0.08	0.00	84
							NFRWSP Area Total		**154.53**	**46.36**	**108.17**	
							SJRWMD Region 1 Total		**146.13**	**45.35**	**100.78**	
							SRWMD NFRWSP Area Total		**8.40**	**1.01**	**7.39**	

Notes:

1.) All design and flow values are shown in million gallons per day.
2.) WAFR_FACIL - Unique sequence identifier (key) for the facility record.
3.) FACILITY_I = Unique Permit ID of the wastewater treatment facility.
4.) FACILITY_N = Name of the wastewater treatment facility.
5.) DESIGN_Cap = Permitted design capacity of the wastewater treatment facility.
6.) COUNTY_NAM = Name of county where wastewater treatment facility is located.
7.) LONG_MM = ESRI feature geometry.
8.) Name = Name of owner and wastewater treatment facility.
9.) RW_System = Name of owner and service area of wastewater treatment facility.
10.) WAFR_ID = Water Facilities Regulation Identification, unique to each wastewater facility.
11.) TotTreatedFlo = Total wastewater flow.
12.) ActualUtiliz = Total flow used beneficially by District standards.
13.) DisposalFlo = Total flow not used for beneficial purposes; disposal.
14.) ID = Unique ID assigend by the Districts to reflect map locations in the NFRWSP Figure.

2015 for NFRWSP Area				
District	**WWTF Flow**	**Beneficial Reuse**	**Disposal Flow**	**% Beneficially Reused**
SJRWMD	146.13	45.35	100.78	31%
SRWMD	8.40	1.01	7.39	12%
Total	**154.53**	**46.36**	**108.17**	**30%**

Appendix C

Simulated Change in the Potentiometric Surface within the North Florida-Southeast Georgia Regional Groundwater Flow Model Area

Technical Memorandum
North Florida Regional Water Supply Plan
Simulated Change in the Potentiometric Surface
within the
North Florida-Southeast Georgia Regional Groundwater Flow Model Area
January 6, 2017

Changes in the potentiometric surface of the Floridan aquifer resulting from projected 2035 groundwater withdrawals, were simulated with the North Florida-Southeast Georgia regional groundwater flow model (NFSEG). The following figures depict simulated changes in the Upper Floridan aquifer levels for the following scenarios.

- Figure C1: Differences between 2009 estimated water withdrawals and 2035 projected water demands within the North Florida regional water supply planning boundary area with pumping held at 2009 levels outside the planning area
- Figure C2: Same as the scenario represented in Figure C1 but with water resource development (WRD) projects included in the simulation
- Figure C3: Differences between 2009 estimated water withdrawals and 2035 projected water demand within the entire NFSEG domain
- Figure C4: Same as the scenario represented in Figure C3 but with WRD projects included in the simulation

A decrease (drawdown) of the simulated potentiometric surface is indicated by the blue colors or positive numbers while the increase (rebound) in the simulated potentiometric surface is indicated by the yellow and green colors or negative numbers.

Figure C1: Change in Upper Floridan aquifer from 2035 withdrawals within the North Florida regional water supply planning boundary.

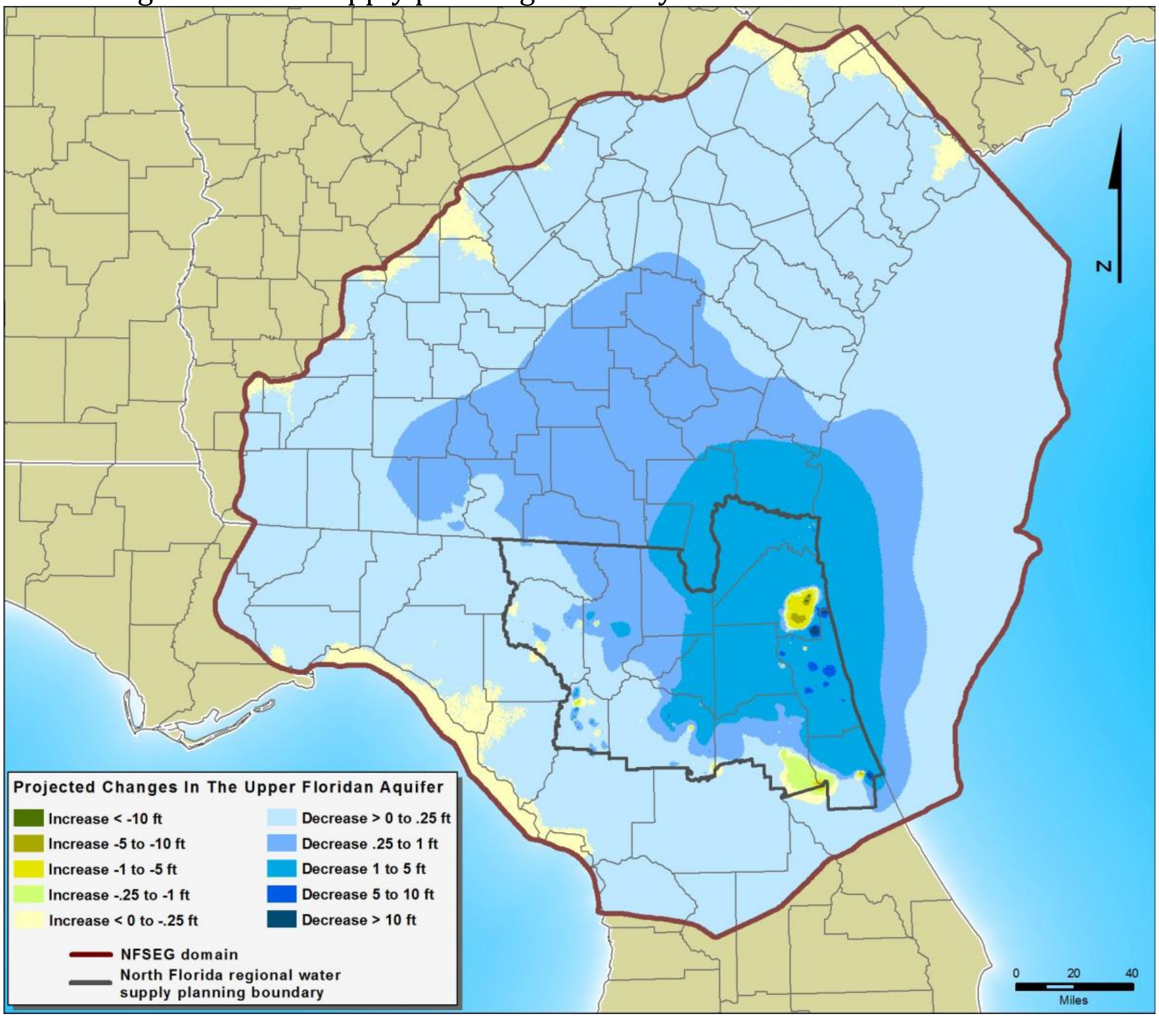


Figure C2: Change in Upper Floridan aquifer from 2035 withdrawals with water resource development projects included within the North Florida regional water supply planning boundary.

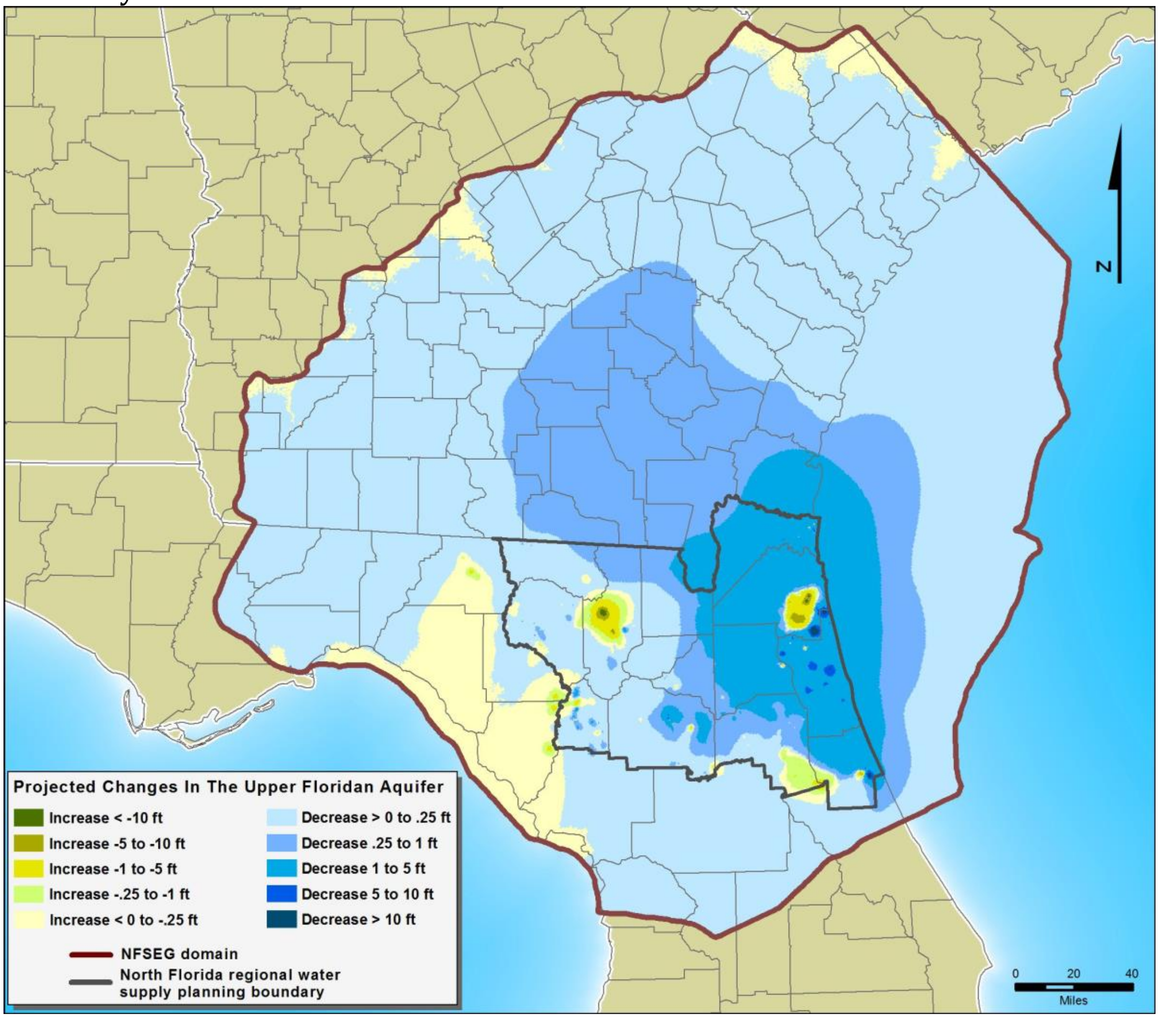


Figure C3: Change in Upper Floridan aquifer from 2035 withdrawals within the NFSEG domain.

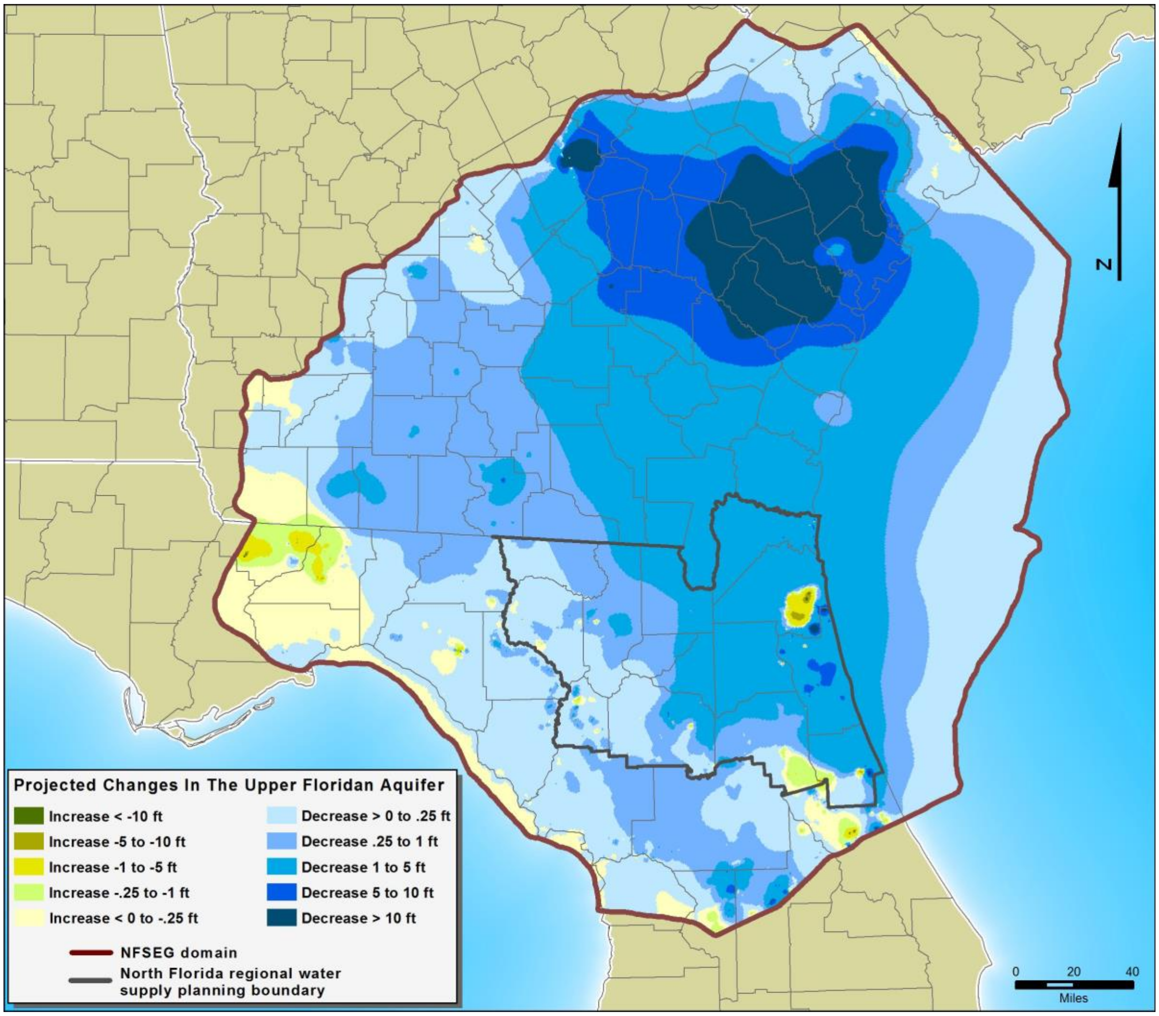
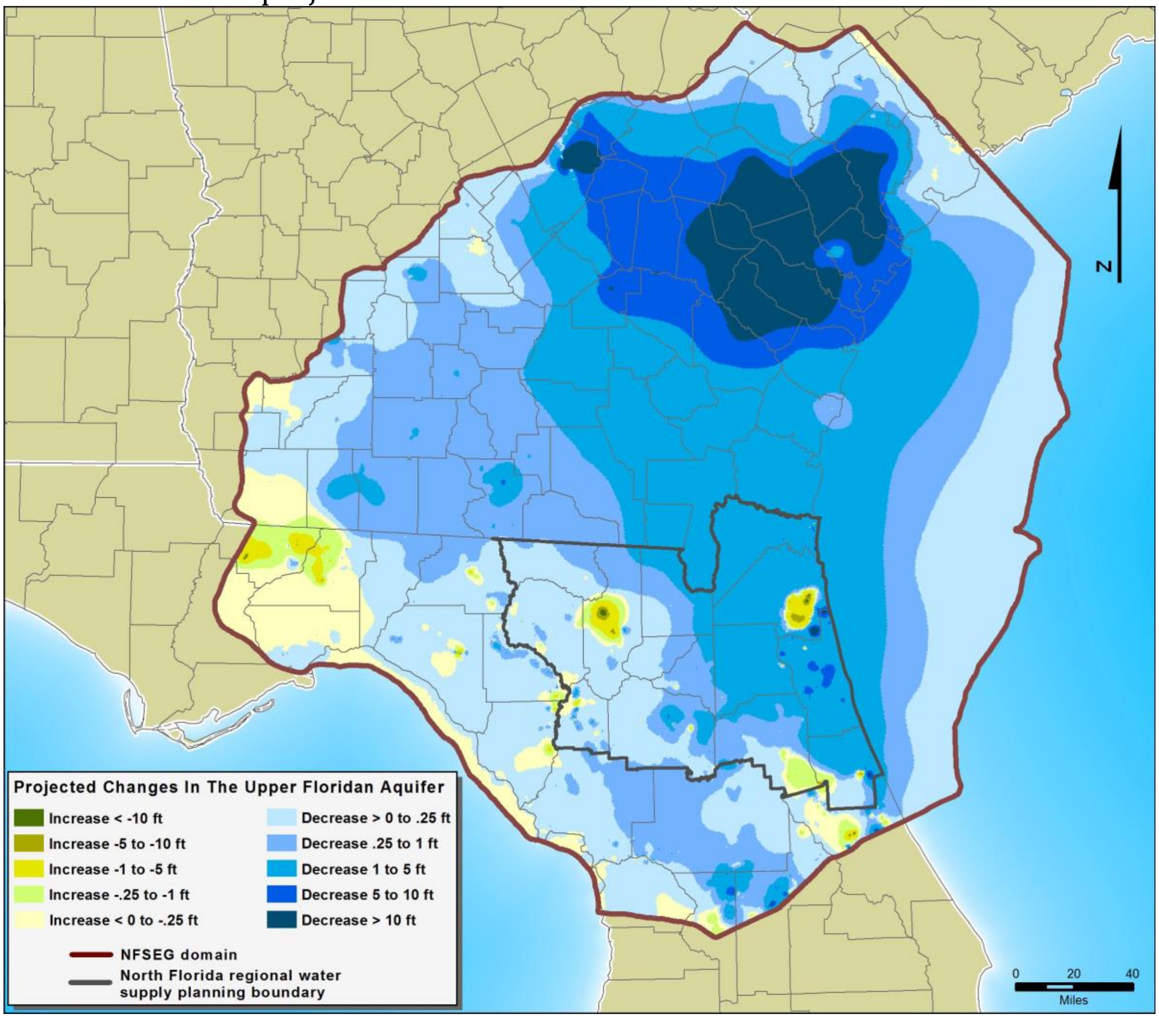


Figure C4: Change in Upper Floridan aquifer from 2035 withdrawals within the NFSEG domain with WRD projects.



Appendix D

Evaluation of the Potential for Groundwater Quality Degradation Due to Saline Water Intrusion

Technical Memorandum
Joint North Florida Regional Water Supply Plan
Evaluation of the Potential for Groundwater Quality Degradation Due to Saline Water Intrusion
August 24, 2016

Executive Summary

The purpose of this evaluation was to identify wells within the North Florida Regional Water Supply Plan (NFRWSP) area where degradation of groundwater quality (GWQ) due to saline water intrusion (SWI) has been observed. The NFRWSP area encompasses 14 counties under the jurisdiction of the St. Johns River and Suwannee River Water Management Districts (SJRWMD and SRWMD, respectively). Groundwater quality degradation due to SWI is a consideration for the NFRWSP because degrading water quality can affect productivity of existing infrastructure, resulting in increased treatment cost, backplugging, well inactivation and replacement and moving withdrawal points. Although GWQ degradation poses a challenge for all affected water users, the issue is particularly acute for smaller utilities and water users that may have fewer options for infrastructure modifications.

There are approximately 2,370 permitted, active water supply wells within the SJRWMD portion of the NFRWSP area, and 406 of these wells are monitored for GWQ as a conditional requirement of a consumptive use permit (CUP). The 75 CUPs with GWQ monitoring requirements represent a cross-section of different uses including agriculture irrigation (6), aquaculture (1), commercial/industrial (11), golf course irrigation (10), household (2), landscape irrigation (3), nursery irrigation (1), power generation (2), public supply (35), and recreational (4). Suwannee River Water Management District monitors GWQ in an observation well network (OWN) consisting of 23 monitoring wells distributed throughout six counties. Collectively, these 429 wells (Figure D1) monitor GWQ in the Surficial Aquifer System (SAS) and Floridan Aquifer System (FAS).

Statistically significant trends in groundwater chloride concentration were identified at 133 wells, of which 92 were increasing (degrading) and 41 decreasing (improving). Thirty-three wells exhibiting degradation had calculated chloride increases of greater than 3 milligrams per liter per year (mg/L/yr; Table D4) and 35 wells had calculated increases at rates between 1 and 3 mg/L/yr (Figure D2; Table D5). In addition, 24 wells had calculated increases at rates of less than 1 mg/L/yr (Table D6), so while statistically calculated as a trend, the magnitude of the trend is relatively insignificant. It is important to note that although wells may exhibit a statistically significant decrease in water quality, the majority of these wells have low chloride and/or Total Dissolved Solids (TDS) concentrations indicative of fresh groundwater.

In order to understand the meaning of these trends, consideration of the actual chloride concentration in relation to the Florida Department of Environmental Protection (FDEP) Secondary Drinking Water Standard (SDWS) of 250 milligrams per liter (mg/L) for chloride is a key consideration. Among the 68 wells that exhibited a higher rate of chloride increase (greater than 1 mg/L/yr), the SDWS was exceeded prior to the year 2015 at only six wells

and was projected to be exceeded by 2035 at only 11 additional wells (Table D1; Figure D3). Thus, of these 68 wells, 75% (51 wells) were projected to remain below the SDWS throughout the planning period.

Table D1: Analyzed Wells with Trends in Chloride Concentration Projected to Exceed 250 mg/L by 2035

Chloride Trend Category	Wells that Currently Exceed 125 mg/L		Wells that Currently Exceed 250 mg/L		Additional Wells Projected to Exceed 250 mg/L by 2035	
	Number	County	Number	County	Number	County
High Rate of Change (33 wells)	9	Duval, Flagler, St. Johns	5	St. Johns	11	Duval, Flagler, Nassau, St. Johns
Medium Rate of Change (35 wells)	1	Duval	0	—	1	Duval
Low Rate of Change (24 wells)	0					

Statistically significant trends in TDS and groundwater geochemistry were consistent with the results of the chloride trend analyses. The FDEP SDWS of 500 mg/L for TDS was exceeded prior to 2015 at 20 wells and was projected to be exceeded by 2035 at four additional wells. The groundwater geochemistry was transitioning from characteristics of fresh water to saline water at 18 wells.

Some wells exhibiting patterns of GWQ degradation could not be quantified as statistically significant due to an inadequate period of record (POR), inconsistent sampling and/or ambiguous or limited laboratory chemical analytical results. The number of wells exhibiting GWQ degradation due to SWI may increase or decrease from the numbers reported in this evaluation as additional time series chemical data are collected, thereby improving test statistics. Additionally, the rate of degradation due to SWI in groundwater has been reduced at some water supply wells through backplugging of deeper zones containing more mineralized groundwater. The 68 wells with a higher rate of chloride increase occurred within four counties (Duval, Flagler, Nassau, and St Johns) in the SJRWMD portion of the NFRWSP area and are generally clustered along the St. Johns River and the Atlantic coastline (Figure D2). Sixty-five of these wells were FAS water supply wells and three were SAS water supply wells.

When viewed in total, the primary conclusion of this analysis is that GWQ may only constrain the availability of fresh groundwater in a relatively limited geographic area within the NFRWSP area – portions of Duval, Flagler, Nassau, and St. Johns counties – east of the St. Johns River. Based on the groundwater chemistry analyses performed as part of this study, the changes in these wells are primarily caused by localized upconing and not wide-scale lateral movement of seawater. Saltwater intrusion from upconing is likely a response to withdrawals of groundwater from the water supply well and/or combined withdrawals of groundwater from the wellfield. The SJRWMD is working directly with the users of the affected wells to reduce these trends through a variety of techniques such as well backplugging and individual well pumping restrictions.

Introduction

Chloride, TDS and groundwater geochemistry are useful chemical indicators of GWQ degradation due to SWI. Chloride was used as the "tracer" for SWI because it is one of the principal chemical constituents in seawater and is unaffected by ion exchange (as is sodium, the other principal component). TDS and groundwater geochemistry encompass a suite of additional chemical constituents that reflect overall changes in GWQ. Trends in time series chemical data for these indicators were quantified and interpreted based upon the results of nonparametric and multivariate statistical tests described in the following section.

Groundwater samples collected at permitted wells in support of GWQ monitoring requirements were submitted for laboratory chemical analyses of selected or all major ions (calcium, magnesium, potassium, sodium, bicarbonate, chloride, and sulfate). Sampling frequencies varied from quarterly to biannual and annual schedules. At some wells, GWQ has been monitored for several decades over the POR.

Of the 429 wells evaluated, 54 were completed into the SAS (all in Flagler County) and 375 into the FAS. Of the 375 FAS water supply wells, 255 were completed into the upper Floridan aquifer (UFA) and 114 were multi-zone completed into the UFA and the lower Floridan aquifer (LFA). Construction information was not available for six FAS water supply wells to identify the hydrogeologic zone(s).

Unlike monitoring wells that characterize GWQ over a discrete hydrogeologic interval, water supply wells produce a blend of GWQ from multiple flow zones throughout the vertical column in the FAS. If a FAS water supply well exhibits degradation, then it is intuitive that the chemical indicators in the hydrologic zone(s) responsible for the salinity are increasing at rates greater than measured in the "blended" water produced from the water supply well.

Method

A common deterministic component in a time series is a trend, which is the tendency for successive values to increase or decrease over time. Trends in chloride concentration were quantified and interpreted using nonparametric Mann-Kendall regression (MKR) and Sen's test statistical methods. Nonparametric statistical tests do not depend on distributional assumptions regarding data and are resistant to outliers, missing data and non-detects. Test statistics generated using these methods included median slope of the trend in mg/L/yr, Kendall's correlation coefficient (τ), 2-tailed probability value ($\alpha/2$) and significance level (SL). The 95% SL was used to identify groundwater with statistically significant trends in chloride concentration.

A time series plot of chloride concentration and Mann-Kendall regression (MKR) relative to the average rate of withdrawal (based upon available data) for each station was visually interpreted to assess the presence of break points over the POR. Break points are inflection points in a time series where the slope of the trend changes sign (for example, from increasing to decreasing) or relative magnitude (for example, from gentle to steep). A time series with no interpreted break points was evaluated as a single segment over the entire POR (Figure D4); and a time series with an interpreted break point(s) was evaluated in piecewise segments (Figure D5). The most recent segment of a piecewise solution was used to evaluate a potential trend in chloride concentration.

A relative trend magnitude was assigned for statistically significant trends in chloride concentration ≥ 95% SL to quantify the potential for SWI or continued SWI:

≥ +3.0 mg/L/yr – high rate

< +3.0 mg/L/yr, ≥ +1.0 mg/L/yr – medium rate

< +1.0 mg/L/yr, > 0 mg/L/yr – low rate

< 0 mg/L/yr – freshening

A linear equation derived for the MKR was projected forward 20 years into the future (2035) to estimate the year that the chloride concentration might equal or exceed 250 mg/L for trends in chloride concentration ≥ 95% SL in the high and medium trend rates. Assuming anthropogenic and meteorological stressors influencing hydrologic conditions remain relatively unchanged, a chloride concentration increasing at a rate of 5 mg/L/yr would project to increase by 100 mg/L in 20 years. The chloride concentration for the lowest increasing trend magnitude and decreasing trends were not projected forward because chloride concentrations were generally low and the estimated rates of change were very small or decreasing (becoming more like fresh water).

Trends in TDS concentration were quantified using MKR and Sen's test statistical methods for wells with trends in chloride concentration ≥ 95% SL at the high and medium trend rates, with an additional constraint that the medium trend rate included only wells with predicted chloride concentrations projected to exceed 250 mg/L through the year 2035. Total Dissolved Solids concentrations were projected forward 20 years into the future for wells with statistically significant (≥ 95% SL) trends to predict the year that TDS concentrations would equal or exceed 500 mg/L.

Trends in groundwater geochemistry were quantified and visually interpreted using Piper-trilinear diagrams for all wells with increasing trends in chloride concentration ≥ 95% SL. Time series major ion chemical data used for groundwater geochemical trend analyses were selected at random intervals for sampling events coincident with chloride concentrations plotting on or near the chloride MKR. Preference was given to sampling events with major ion data passing quality assurance test balances ≤ 5% difference (but not > 10% difference unless due to limited data).

Groundwater geochemistry was quantified based upon the relative percentages of equivalent concentration for the four major cations (calcium, magnesium, potassium, and sodium) and the three major anions (bicarbonate, chloride and sulfate). Groundwater with a dominant ion pair has a cation and an anion present in equivalent concentrations ≥ 50% (for example, calcium–bicarbonate and sodium chloride). Groundwater without a dominant (< 50%) ion pair has a mixture of cations and/or anions (for example, calcium–

bicarbonate/chloride and calcium/sodium–chloride). Trilinear diagrams were used to graphically represent equivalent concentration for the major cations and anions relative to each other on different axes in separate triangular grids, and define the groundwater geochemistry (Figures D6a and D6b).

Piper diagrams were used to graphically represent percentages of equivalent concentration for major ion pairs relative to parallel axes that increase in opposite directions in a four-sided rectilinear (diamond) grid. Frazee (1982) represented geochemical boundaries for various UFA source groundwater on a Piper diagram to graphically illustrate patterns for major ion pairs indicative of degradation due to SWI. Groundwater with dominant major ion pairs such as calcium-bicarbonate and calcium-sulfate that are generally indicative of fresh water, plot on the left region of the Piper in fields classified as Fresh Recharge Water (FRW) and Formation Water (FW); a sodium-chloride geochemical type of groundwater indicative of saline water, plots on the right region in fields classified as Connate Water (CW) and sea water (SW); mixtures exhibiting geochemical characteristics of fresh and saline water plot in the central regions in fields classified as Transitional Water (TW) and Transitional Connate Water (TCW).

Results

Time series chemical data for 429 wells were evaluated for trends in chloride concentration, TDS concentration and geochemistry. Four hundred six (406) of these wells are monitored for GWQ as a conditional requirement of the CUP issued by SJRWMD. Suwannee River Water Management District monitors GWQ in an OWN consisting of 23 monitoring wells distributed throughout six counties.

Statistically significant trends in chloride concentration were identified in groundwater at 133 wells of which 92 were increasing (degrading) and 41 decreasing (improving). Thirty-three wells exhibiting degradation had calculated SWI increases of greater than 3 mg/L/yr (Table D4); 35 wells had calculated increases at rates between 1 and 3 mg/L/yr (Table D5); 24 wells had calculated increases at rates of less than 1 mg/L/yr; (Table D6) and 41 wells had decreasing chloride concentrations (Table D7).

Among the 68 wells that exhibited a rate of chloride increase greater than 1 mg/L/yr, the maximum contaminant level was exceeded prior to the year 2015 at only six wells and was projected to be exceeded by 2035 at only 11 additional wells. Thus, of these 68 wells, 75% (51 wells) were projected to remain below the SDWS through the planning period.

Statistically significant trends in TDS concentration were identified in groundwater at twenty-four wells exhibiting statistically significant chloride trends at the high (33) and medium (1) trend rates. The FDEP SDWS of 500 mg/L for TDS was exceeded prior to the year 2015 at 20 wells and was projected to be exceeded during the 20-year planning horizon at four wells. Forward projections could not be made for nine wells exhibiting trends in TDS concentration that were not statistically significant at the ≥ 95% SL.

The groundwater geochemistry was transitioning from characteristics of fresh water to saline water at 18 of the 92 wells with statistically significant trends in chloride concentration. All of the wells were water supply wells completed into the UFA (13) and multi-zone completed into the UFA and LFA (5). The groundwater geochemistry could not be evaluated for eight wells because they were not sampled for laboratory chemical analyses of the major ion suite.

The rate of degradation due to SWI in groundwater has been reduced at some water supply wells through back-plugging of zones containing more mineralized groundwater that are responsible for salinity impacts (Figure D5). However, backplugging may eliminate higher transmissivity flow zones from the producing interval and result in reduced yields from affected water supply wells.

Conclusion

Statistically significant trends in chloride concentration, TDS concentration and groundwater geochemistry can be one factor to indicate the presence of groundwater degradation due to SWI. Thirty-three wells had an increasing chloride concentration at rates ≥ 3 mg/L/yr, and 35 wells had an increasing chloride concentration at rates within the range < 3 and ≥ 1 mg/L/yr. The sixty-eight wells with rates greater than 1 mg/L/yr occurred within four counties (Duval, Flagler, Nassau and St. Johns) in the SJRWMD portion of the NFRWSP area and were generally clustered along the St. Johns River and the Atlantic coastline (Figure D3). Sixty-five of these wells were FAS water supply wells and three were SAS water supply wells. SWI appears to be localized due to upconing in response to withdrawals of groundwater from wells and/or combined withdrawals from multiple wells.

When viewed in total, the primary conclusion of this analysis is that groundwater quality may constrain the availability of fresh groundwater in a relatively limited geographic area within the NFRWSP planning area – portions of Duval, Flagler, Nassau and St. Johns counties. Of the wells assessed, 75% of the wells identified as having increasing trends in chloride greater than 1 mg/L/yr were projected to still meet SDWS in 2035. For the remaining 25% of wells, GWQ could present a constraint on the availability of fresh groundwater. However, these concerns may be able to be managed through appropriate well construction and/or pumping operations because it is related to upconing and not lateral saltwater intrusion.

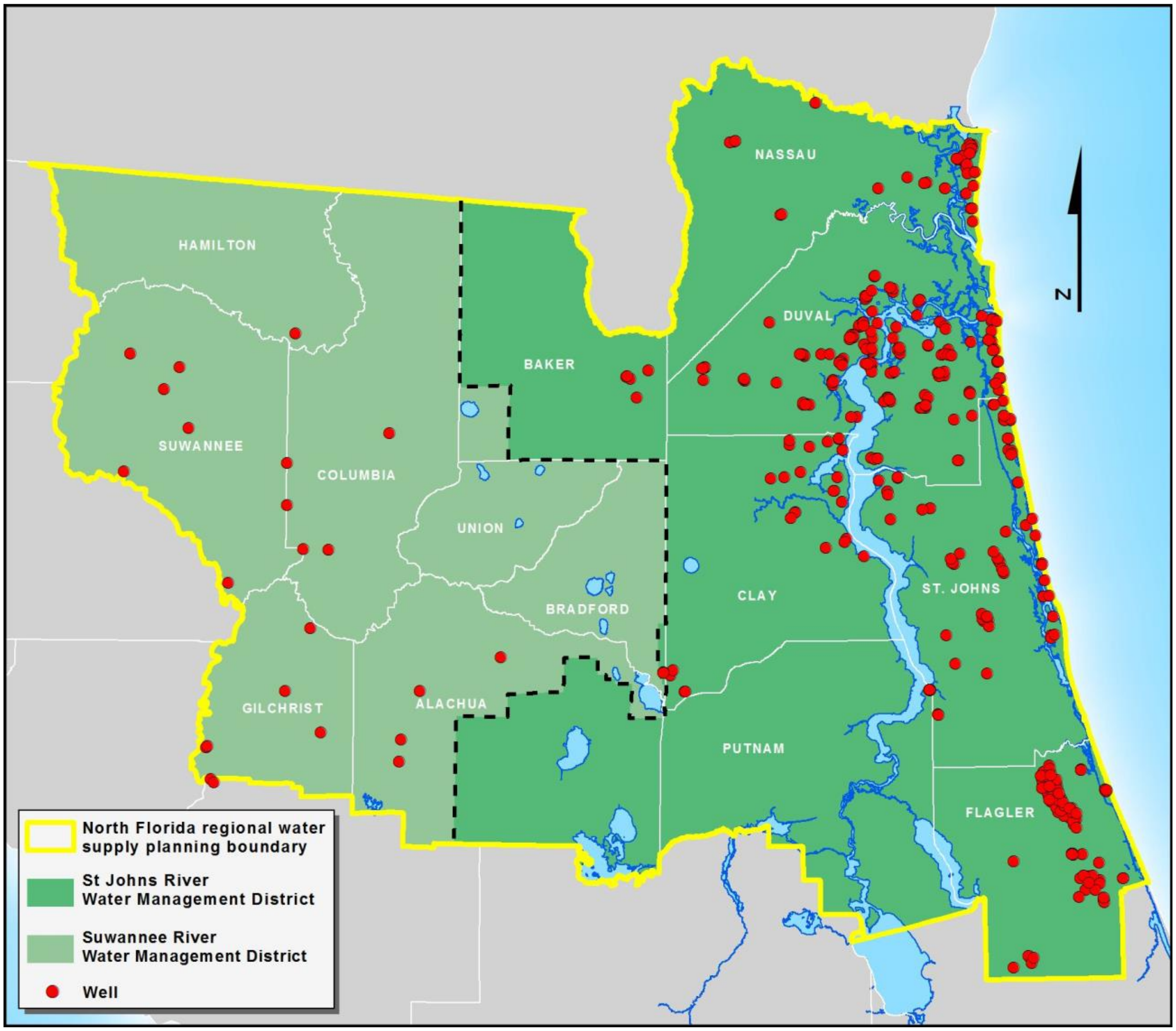


Figure D1: Wells Included in the North Florida Regional Water Supply Plan Groundwater Quality Analysis

Table D2: Summary of SJRWMD Consumptive Use Permits with Groundwater Quality Monitoring in the NFRWSP Area

County	CUP #	CUP Name	Main Use	Wellfield	Stations	Aquifer
Baker	15-11	Macclenny	Public Supply	Enterprise	1	UFA
				Knabb	1	UFA
				M-East	1	UFA
				M-West	2	UFA
Clay	416-48	Clay County Utility	Public Supply	Industrial	1	UFA LFA
				Green Cove Springs	1	UFA LFA
				Mid-Clay	1	UFA LFA
				Jennings	1	UFA LFA
				Orange Park	2	UFA LFA
				Pace Flemming	2	UFA LFA
	431-11	Clay County Utility Authority	Public Supply	Keystone Club	2	UFA
				Postmaster Village	2	UFA
				Keystone Heights	2	UFA
	453-6	Orange Park	Public Supply	Ash	2	UFA LFA
				Milwaukee	2	UFA LFA
	499-5	Green Cove Springs	Public Supply	Harbor Road	1	UFA
				Reynolds	1	UFA
	51227-7	Clay County Utility Authority Reuse	Public Supply	Flemming Island	1	UFA
					1	UFA LFA
				Mid-Clay	1	UFA
					1	UFA LFA
				Old Jennings Road	1	UFA LFA
				OPCC	1	UFA
				Spencer's Crossing	1	UFA LFA
	527-3	St Johns Landing	Household	NA	1	UFA
Duval	535-7	RockTenn	Commercial Industrial	NA	2	UFA LFA
	589-5	Mayport NAS	Public Supply	NA	4	UFA
	653-7	Reichhold Chemicals	Commercial Industrial	NA	1	UFA LFA
	716-5	Renessenz	Commercial Industrial	NA	5	UFA
	721-6	JEA NGS	Power Generation	NA	4	UFA LFA
	793-3	Jacksonville Beach	Public Supply	NA	2	UFA
				NA	1	UFA LFA
	810-7	Atlantic Beach	Public Supply	Buccaneer	3	UFA
				WTP 1	1	UFA
				WTP 2	2	UFA
				WWTP 1	1	UFA
	861-2	US Gypsum	Commercial Industrial	NA	1	UFA
	913-2	Anheuser-Bush	Commercial Industrial	NA	1	UFA
	50247-6	NAS Jacksonville	Public Supply	NA	2	UFA LFA

Table D2: Summary of SJRWMD Consumptive Use Permits with Groundwater Quality Monitoring in the NFRWSP Area

County	CUP #	CUP Name	Main Use	Wellfield	Stations	Aquifer
Duval (cont.)	51629-1	JEA Brandy Branch	Power Generation	NA	3	UFA LFA
	88271-12	JEA	Public Supply	Lofton Oaks	1	UFA
				Nassau Regional	2	UFA
				Otter Run	2	UFA
				West Nassau Regional	1	UFA LFA
				Mayport	2	UFA LFA
				Cecil Commerce	3	UFA LFA
				Fairfax	6	UFA LFA
				Highlands	6	UFA LFA
				Lakeshore	5	UFA LFA
				Main Street	7	UFA LFA
				Marietta	4	UFA LFA
				McDuff	5	UFA LFA
				Norwood	4	UFA LFA
				Southwest	5	UFA LFA
				Westlake	1	UFA
				A1A	2	UFA
				Ponce de Leon	2	UFA
				Corona	2	UFA
				Ponte Vedra North	1	UFA
				9A-9B	2	UFA LFA
				Arlington	4	UFA
					1	UFA LFA
				Beacon Hills	2	UFA LFA
				Brierwood	1	UFA
					4	UFA LFA
				Community Hall	3	UFA
					1	UFA LFA
				Deerwood 3	6	UFA
					2	UFA LFA
				Hendricks	8	UFA LFA
				Julington Creek	2	UFA
				Lovegrove	3	UFA
				Monument	2	UFA
				Oakridge	5	UFA
					1	UFA LFA
				Power Park	6	FAS
				Ridenour	7	UFA
				Royal Lakes	2	UFA LFA
				Southeast	3	UFA
				St Johns Forest	2	UFA
				St Johns North	3	UFA
				Woodmere	1	UFA
	90722-1	Jacksonville University	Public Supply	NA	1	UFA

Table D2: Summary of SJRWMD Consumptive Use Permits with Groundwater Quality Monitoring in the NFRWSP Area

County	CUP #	CUP Name	Main Use	Wellfield	Stations	Aquifer
Duval (cont.)	38-7	Dee Dot Timberlands	Recreational	Fort Davis Lake	1	UFA LFA
				Skinner Lake	1	UFA LFA
	647-6	CertainTeed Gypsum	Commercial Industrial	NA	1	UFA
	702-10	Hidden Hills	Golf Course Irrigation	NA	1	UFA
				NA	1	UFA LFA
	708-6	Bacardi	Commercial Industrial	NA	2	UFA LFA
	756-4	Neighborhood Utilities	Public Supply	NA	1	UFA
	784-4	Baldwin	Public Supply	NA	3	UFA
	804-3	Jacksonville Beach Golf Course	Golf Course Irrigation	NA	1	UFA
	842-5	Neptune Beach	Public Supply	NA	4	UFA LFA
	862-4	Swisher	Commercial Industrial	NA	1	UFA
	863-7	Gerdau Ameristeel	Commercial Industrial	NA	1	UFA
	867-2	Evergreen Cemetary	Landscape Irrigation	NA	1	UFA
	892-3	Eastcoast Oils	Landscape Irrigation	NA	1	UFA
	903-3	Simplex	Household	NA	1	UFA LFA
	50124-8	Queens Harbor Yacht & Country Club	Golf Course Irrigation	NA	1	UFA
	50333-4	Jacksonville Zoological Gardens	Recreational	NA	1	UFA
Flagler	59-4	Flagler Beach	Public Supply	NA	3	UFA
	65-4	Shannon Strickland Sod	Agriculture Irrigation	NA	1	UFA
	1947-6	Palm Coast	Public Supply	WTP 1	31	SAS
				WTP 2	8	UFA
				WTP 3	20	SAS
	1982-5	Bunnell	Public Supply	NA	3	SAS
				NA	3	UFA
	12247-2	Pro-Gro Turf Farm	Agriculture Irrigation	NA	1	UFA
	1960-7	Plantation Bay	Public Supply	NA	4	UFA
	1984-9	Flagler County Nursery	Nursery Irrigation	NA	5	UFA
	2002-2	Bulow Village Campground	Public Supply	NA	3	UFA
	51136-3	Dunes CDD	Public Supply	NA	6	UFA
	70714-4	Hammock Dunes	Golf Course Irrigation	NA	2	UFA

Table D2: Summary of SJRWMD Consumptive Use Permits with Groundwater Quality Monitoring in the NFRWSP Area

County	CUP #	CUP Name	Main Use	Wellfield	Stations	Aquifer
Nassau	102129-1	Seay Farm	Agriculture Irrigation	NA	1	UFA
	122-6	Fernandina Beach	Public Supply	WTP 1	2	UFA LFA
				WTP 2	2	UFA LFA
				WTP 3	2	UFA
	915-4	Rayonier	Commercial Industrial	NA	10	UFA
	948-7	Hilliard	Public Supply	NA	4	UFA
	955-8	White Oak Plantation	Public Supply	NA	1	UFA
	970-6	Amelia River Golf Club	Golf Course Irrigation	NA	1	UFA
	50077-6	RockTenn	Commercial Industrial	NA	7	UFA
	50087-7	Amelia Island	Public Supply	NA	3	UFA
	50272-8	Amelia Island Plantation	Golf Course Irrigation	NA	1	UFA
	922-5	Callahan	Public Supply	NA	2	UFA
	930-3	Fernandina Beach Municipal Golf Course	Golf Course Irrigation	NA	1	UFA
Putnam	7963-6	Anguilla Fish Farm	Aquaculture	NA	7	UFA
St Johns	157-5	North Beach	Public Supply	NA	1	UFA
	1142-14	SJCUD Ponte Vedra	Public Supply	Inlet Beach	4	UFA
				Marsh Landing	2	UFA
				Plantation	4	UFA
				Sawgrass	2	UFA
	1198-3	SJCUD Tillman Ridge & Northwest	Public Supply	NA	3	UFA
				NA	8	UFA
	50299-5	St Augustine	Public Supply	NA	7	UFA
	1092-4	J Leighton Middleton	Agriculture Irrigation	NA	1	UFA
	1158-7	St Augustine Alligator Farm	Recreational	NA	1	UFA
	1309-4	Beach Farms	Agriculture Irrigation	NA	1	UFA
	1314-5	Cookman, Shop & New Ground Farm	Agriculture Irrigation	NA	1	UFA
	1358-5	Guana River WMA	Recreational	NA	2	UFA
	1360-10	Cimarrone Golf & Country Club	Golf Course Irrigation	NA	1	UFA
	1381-4	Camachee Island	Public Supply	NA	2	UFA
	1386-6	Porpoise Point	Public Supply	NA	1	UFA
	1392-4	Town of Hastings	Public Supply	NA	2	UFA
	1422-6	Slammer & Squire Golf Course	Golf Course Irrigation	NA	1	UFA
	1423-3	Fruit Cove Oaks	Public Supply	NA	1	UFA

Table D2: Summary of SJRWMD Consumptive Use Permits with Groundwater Quality Monitoring in the NFRWSP Area

County	CUP #	CUP Name	Main Use	Wellfield	Stations	Aquifer
St Johns (cont.)	1498-2	Marsh Creek Owner's Association	Public Supply	NA	3	UFA
	50827-4	Palencia Club & Golf Course	Golf Course Irrigation	NA	1	UFA
	65726-2	Bartram Tail HS	Landscape Irrigation	NA	1	UFA

Table D3: Summary of SRWMD Observation Well Network with Groundwater Quality Monitoring in the NFRWSP Area

County	Station Name	Station Number	Aquifer
Alachua	Betty Truluck	S101713003	UFA
	Ernest Bliss	S081912004	UFA
	George Yates	S081833003	UFA
	Leo Hines	S091736001	UFA
Columbia	DOT SR47	S061610001	UFA
	Ichetucknee SP	S061607001	UFA
	Lake City	S031734011	UFA
	S&S Food #44	S051511002	UFA
	William Mosley	S041523001	UFA
Gilchrist	DOT Maint Office	S071630002	UFA
	Loncala	S091628005	UFA
	Otter Springs 4	S101406011	UFA
	Otter Springs P1	S101405004	UFA
	Rayonier WACCA	S081535002	UFA
Hamilton	Bullock Tower	S011535004	UFA
Levy	Fanning Springs 2	S101429021	UFA
	Fanning Springs 4	S101429023	UFA
Suwannee	Bill Hadden	S041227001	UFA
	Carrol Hall	S061434006	UFA
	DOT SR129	S031335002	UFA
	Leroy Hurst	S031305005	UFA
	Richard Brown Jr	S021215001	UFA
	Suwannee Co CC	S021322008	UFA

Table D4: Results of Groundwater Quality Analyses for Wells Demonstrating an Increasing Chloride Trend of >3mg/L/year at a 95% Significance Level

County	CUP #	CUP Name	Station	Aquifer	Segment	POR	Analyte	Sample Size	Min (mg/L)	Max (mg/L)	Median (mg/L)	Mode	Median Slope (mg/L/yr)	τ	p-value	SL	DWS	Groundwater Geochemistry	
Duval	88271-12	JEA	PW 3 (14728)	UFA	1	2002.00 2014.50	Cl^-	44	15.8	141	113	Quarterly	3.0	0.379	0.0002	99%	>2035	$(Ca,Mg)(HCO_3,SO_4,Cl)$	T
							TDS	43	369	920	575	Quarterly	1.2	0.055	0.6100	NS	NA		
Duval	88271-12	JEA	PW 1 (6033)	UFA LFA	1	2004.50 2014.50	Cl^-	30	64.6	147	88.5	Quarterly	3.1	0.457	0.0002	99%	>2035	$(Ca,Mg)(HCO_3,SO_4,Cl)$	T
							TDS	30	428	597	482	Quarterly	3.0	0.228	0.0802	80%	NA		
Duval	88271-12	JEA	PW 2 (6034)	UFA LFA	1	2004.50 2014.50	Cl^-	30	61.3	334	130	Quarterly	13.6	0.531	0.0002	99%	2019	$(Ca,Mg,Na)(HCO_3,SO_4,Cl)$	T
							TDS	30	439	956	568	Quarterly	24.9	0.483	0.0002	99%	<2015		
Duval	88271-12	JEA	PW 6004 (22525)	UFA LFA	3	2012.00 2014.50	Cl^-	11	95.7	157	150	Quarterly	9.1	0.545	0.0238	95%	2024	$(Ca,Mg)(SO_4,Cl)$	
							TDS	11	675	812	740	Quarterly	49.3	0.582	0.0156	95%	<2015		
Duval	88271-12	JEA	PW 5703 (6099)	UFA	2	2004.50 2014.50	Cl^-	30	46.1	109	79.6	Quarterly	5.5	0.706	0.0002	99%	>2035	$(Ca,Mg)(HCO_3,SO_4,Cl)$	
							TDS	30	449	685	577	Quarterly	14.5	0.598	0.0002	99%	<2015		
Duval	88271-12	JEA	PW 5704 (6100)	UFA	3	2007.75 2014.50	Cl^-	24	37.5	108	97.5	Quarterly	4.0	0.591	0.0002	99%	>2035	$(Ca,Mg)(HCO_3,SO_4,Cl)$	
							TDS	24	456	654	578	Quarterly	13.5	0.580	0.0002	99%	<2015		
Duval	88271-12	JEA	PW 5701 (6097)	UFA LFA	1	1998.00 2014.50	Cl^-	43	14.0	184	95.2	Quarterly	8.2	0.856	0.0002	99%	2026	$(Ca,Mg)(SO_4,Cl)$	T
							TDS	43	200	780	612	Quarterly	16.7	0.668	0.0002	99%	<2015		
Duval	88271-12	JEA	PW 5706 (22540)	UFA LFA	2	2006.75 2014.50	Cl^-	32	14.8	173	67.7	Quarterly	14.1	0.837	0.0002	99%	2023	$(Ca,Mg)(HCO_3,SO_4,Cl)$	T
							TDS	32	421	676	495	Quarterly	27.5	0.744	0.0002	99%	<2015		
Duval	88271-12	JEA	PW 2 (5894)	UFA	3	2007.00 2014.50	Cl^-	27	136	352	212	Quarterly	22.9	0.718	0.0002	99%	<2015	$(Ca,Mg,Na)Cl$	T
							TDS	27	201	954	721	Quarterly	34.4	0.681	0.0002	99%	<2015		
Duval	88271-12	JEA	PW 5301 (6060)	UFA	4	2009.50 2014.50	Cl^-	21	48.9	126	89.6	Quarterly	15.0	0.719	0.0002	99%	2022	$(Ca,Mg,Na)(HCO_3,SO_4,Cl)$	T
							TDS	21	432	612	521	Quarterly	22.9	0.629	0.0002	99%	<2015		
Duval	88271-12	JEA	PW 5304 (6063)	UFA LFA	1	1998.00 2014.50	Cl^-	51	15.9	235	130	Quarterly	7.1	0.705	0.0002	99%	2025	$(Ca,Mg,Na)(HCO_3,SO_4,Cl)$	T
							TDS	51	305	737	564	Quarterly	11.3	0.614	0.0002	99%	<2015		

Table D4: Results of Groundwater Quality Analyses for Wells Demonstrating an Increasing Chloride Trend of >3mg/L/year at a 95% Significance Level

County	CUP #	CUP Name	Station	Aquifer	Segment	POR	Analyte	Sample Size	Min (mg/L)	Max (mg/L)	Median (mg/L)	Mode	Median Slope (mg/L/yr)	τ	p-value	SL	DWS	Groundwater Geochemistry	
Duval	88271-12	JEA	PW 5902 (22568)	UFA	3	2007.50 2014.50	Cl^-	14	63.1	106	76.1	Quarterly	6.2	0.527	0.0098	95%	>2035	$(Ca,Mg)(HCO_3,SO_4,Cl)$	T
							TDS	14	450	566	497	Quarterly	17.3	0.538	0.0086	95%	<2015		
Duval	88271-12	JEA	PW 5905 (34485)	UFA	2	2005.25 2013.50	Cl^-	28	16.5	73.9	32.3	Quarterly	4.7	0.526	0.0002	99%	>2035	$Ca(HCO_3,SO_4)$	
							TDS	28	378	468	422	Quarterly	8.7	0.593	0.0002	99%	2018		
Duval	88271-12	JEA	PW 5907 (34487)	UFA	1	2008.25 2014.50	Cl^-	23	24.9	70.4	40.0	Quarterly	4.0	0.601	0.0002	99%	>2035	$Ca(HCO_3,SO_4)$	
							TDS	23	353	481	428	Quarterly	11.0	0.605	0.0002	99%	2018		
Duval	88271-12	JEA	PW A (5946)	UFA LFA	2	2005.75 2014.50	Cl^-	33	36.0	76.1	54.7	Quarterly	3.3	0.489	0.0002	99%	>2035	$(Ca,Mg)SO_4$	
							TDS	33	310	674	590	Quarterly	6.5	0.322	0.0088	95%	<2015		
Duval	702-10	Hidden Hills	PW ARL13 (6212)	UFA	1	2004.75 2014.50	Cl^-	15	50.0	140	100	Quarterly	6.4	0.648	0.0008	99%	2034	$(Ca,Mg)(HCO_3,SO_4,Cl)$	T
							TDS	14	400	556	511	Quarterly	8.6	0.297	0.1528	NS	NA		
Flagler	59-4	Flagler Beach	PW 10 (34525)	UFA	1	2009.00 2014.25	Cl^-	22	28.0	660	99.5	Quarterly	28.4	0.810	0.0002	99%	2016	NA	NA
							TDS	22	410	1100	550	Quarterly	60.0	0.766	0.0002	99%	<2015		
Flagler	59-4	Flagler Beach	PW 11 (34526)	UFA	1	2009.00 2014.25	Cl^-	22	31.0	340	100	Quarterly	30.9	0.926	0.0002	99%	2016	NA	NA
							TDS	22	410	680	575	Quarterly	52.6	0.848	0.0002	99%	<2015		
Flagler	1947-6	Palm Coast	PW LW23 (35373)	UFA	1	2006.75 2014.00	Cl^-	30	77	130	100	Quarterly	4.4	0.575	0.0002	99%	>2035	NA	NA
							TDS	30	460	600	550	Quarterly	9.2	0.409	0.0014	99%	<2015		
Flagler	1947-6	Palm Coast	PW LW31 (6640)	UFA	2	2004.75 2014.00	Cl^-	38	43	290	142	Quarterly	18.9	0.701	0.0002	99%	2015	NA	NA
							TDS	32	410	1000	665	Quarterly	51.5	0.613	0.0002	99%	<2015		
Flagler	1947-6	Palm Coast	PW 3 (6916)	UFA	1	2005.25 2013.25	Cl^-	13	14.8	86.0	48.5	Quarterly	5.1	0.487	0.0238	95%	>2035	$Ca(HCO_3)_2$	
							TDS	13	262	500	366	Quarterly	13.4	0.321	0.1416	NS	NA		
Nassau	50077-6	RockTenn	PW 4 (11386)	UFA	3	2012.75 2014.25	Cl^-	7	32.6	40.0	38.8	Quarterly	3.4	0.810	0.0108	95%	>2035	$(Ca,Mg)(SO_4,HCO_3)$	
							TDS	7	469	610	494	Quarterly	24.0	0.524	0.1360	NS	NA		

Table D4: Results of Groundwater Quality Analyses for Wells Demonstrating an Increasing Chloride Trend of >3mg/L/year at a 95% Significance Level

County	CUP #	CUP Name	Station	Aquifer	Segment	POR	Analyte	Sample Size	Min (mg/L)	Max (mg/L)	Median (mg/L)	Mode	Median Slope (mg/L/yr)	τ	p-value	SL	DWS	Groundwater Geochemistry	
Nassau	50077-6	RockTenn	PW 9 (11380)	UFA	3	2013.25 2014.25	Cl^-	5	55.2	88.0	64.8	Quarterly	32.4	1.000	0.0166	95%	2019	$(Ca,Mg)(SO_4,HCO_3)$	
							TDS	5	490	610	495	Quarterly	38.0	0.200	0.8160	NS	NA		
Nassau	930-3	Fernandina Beach Municipal Golf Course	PW B (11434)	UFA	1	2003.75 2014.25	Cl^-	20	25.1	110	78.0	Quarterly	5.4	0.653	0.0002	99%	>2035	$(Ca,Mg,Na)(HCO_3,SO_4,Cl)$	T
							TDS	20	472	611	530	Quarterly	8.6	0.600	0.0002	99%	<2015		
St Johns	1142-14	SJCUD Ponte Vedra	PW IB2 (14818)	UFA	2	2008.75 2014.00	Cl^-	20	27.0	66.6	45.3	Quarterly	5.4	0.668	0.0002	99%	>2035	$(Ca,Mg)(HCO_3,SO_4)$	
							TDS	20	400	1130	449	Quarterly	12.5	0.484	0.0030	99%	2015		
St Johns	1142-14	SJCUD Ponte Vedra	PW IB4 (33882)	UFA	1	2002.25 2014.00	Cl^-	36	18.0	69.9	35.0	Quarterly	3.1	0.625	0.0002	99%	>2035	$(Ca,Mg)(SO_4,HCO_3)$	
							TDS	36	328	1190	454	Quarterly	6.1	0.359	0.0022	99%	2016		
St Johns	1142-14	SJCUD Ponte Vedra	PW SG1 (14640)	UFA	2	2009.25 2013.25	Cl^-	13	20.5	51.0	28.2	Quarterly	4.3	0.538	0.0124	95%	>2035	$(Ca,Mg)(SO_4,HCO_3)$	
							TDS	12	356	476	444	Quarterly	17.0	0.500	0.0278	90%	NA		
St Johns	1198-3	SJCUD Northwest & Tillman Ridge	PW NW2 (34245)	UFA	2	2008.75 2014.25	Cl^-	23	23.8	49.5	35.4	Quarterly	3.0	0.474	0.0016	99%	>2035	$(Ca,Mg)SO_4$	
							TDS	23	406	600	534	Quarterly	4.0	0.079	0.6170	NS	NA		
St Johns	1198-3	SJCUD Northwest & Tillman Ridge	PW TR42 (14780)	UFA	3	2010.75 2014.25	Cl^-	12	244	327	271	Quarterly	18.1	0.773	0.0006	99%	<2015	(Ca,Mg,Na)Cl	T
							TDS	12	914	1010	962	Quarterly	24.0	0.515	0.0232	95%	<2015		
St Johns	1198-3	SJCUD Northwest & Tillman Ridge	PW TR43 (34240)	UFA	1	2004.75 2014.25	Cl^-	39	267	463	368	Quarterly	18.3	0.749	0.0002	99%	<2015	(Ca,Mg,Na)Cl	T
							TDS	39	932	1500	1120	Quarterly	15.4	0.429	0.0002	99%	<2015		
St Johns	1198-3	SJCUD Northwest & Tillman Ridge	PW TR45 (34242)	UFA	1	2007.25 2014.25	Cl^-	29	250	555	346	Quarterly	27.9	0.569	0.0002	99%	<2015	(Ca,Mg,Na)Cl	T
							TDS	29	804	1870	1100	Quarterly	40.0	0.384	0.0036	99%	<2015		
St Johns	1198-3	SJCUD Northwest & Tillman Ridge	PW TR46 (34243)	UFA	2	2012.00 2014.25	Cl^-	10	198	412	290	Quarterly	79.2	0.778	0.0010	99%	<2015	(Ca,Mg,Na)Cl	T
							TDS	10	866	1080	990	Quarterly	81.8	0.578	0.0226	95%	<2015		
St Johns	1198-3	SJCUD Northwest & Tillman Ridge	PW TR48 (38399)	UFA	1	2009.25 2014.25	Cl^-	18	200	314	256	Quarterly	12.7	0.542	0.0018	99%	<2015	(Ca,Mg,Na)Cl	T
							TDS	18	710	992	931	Quarterly	5.3	0.150	0.4066	NS	NA		

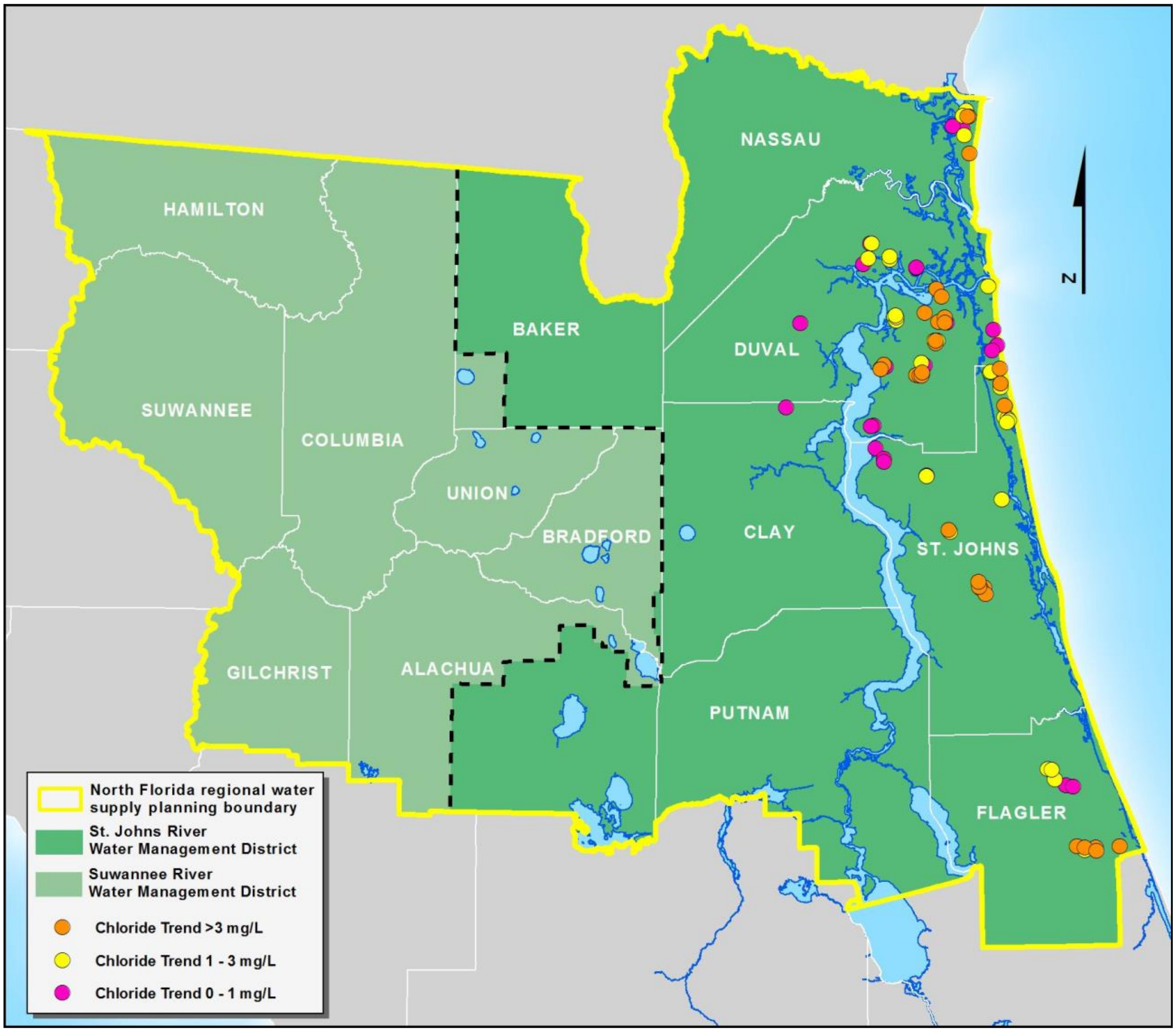


Figure D2: Subset of Analyzed Wells that Showed Statistically Significant Increasing Chloride Concentration Trends

Table D5: Results of Groundwater Quality Analyses for Wells Demonstrating an Increasing Chloride Trend of <3mg/L/year and >1mg/L/year at a 95% Significance Level

County	CUP #	CUP Name	Station	Aquifer	Segment	POR	Analyte	Sample Size	Min (mg/L)	Max (mg/L)	Median (mg/L)	Mode	Median Slope (mg/L/yr)	τ	p-value	SL	DWS	Groundwater Geochemistry	
Duval	535-7	RockTenn	PW 7 (5801)	UFA LFA	1	2003.00 2010.00	Cl^-	14	34.0	51.5	44.6	Quarterly	2.4	0.857	0.0002	99%	>2035	$Ca(HCO_3,SO_4)$	
Duval	535-7	RockTenn	PW 9 (5803)	UFA LFA	2	2007.25 2014.25	Cl^-	14	33.0	52.5	39.6	Quarterly	2.1	0.780	0.0002	99%	>2035	$Ca(HCO_3,SO_4)$	
Duval	589-5	Mayport NAS	PW 3 (5924)	UFA	2	2008.00 2014.00	Cl^-	45	19.5	36.0	24.0	Yearly	2.8	0.810	0.0108	95%	>2035	$(Ca,Mg)(SO_4,HCO_3)$	
Duval	913-2	Anheuser-Bush	PW 3 (6570)	UFA	1	2003.75 2010.75	Cl^-	14	23.0	34.0	26.0	Quarterly	1.2	0.747	0.0002	99%	>2035	$(Ca,Mg)(HCO_3)_2$	
Duval	88271-12	JEA	PW 5402 (6085)	UFA	3	2007.00 2012.75	Cl^-	24	56.3	93.5	76.2	Quarterly	2.9	0.359	0.0150	95%	>2035	$Ca(HCO_3,SO_4,Cl)$	
Duval	88271-12	JEA	PW 5403 (6086)	UFA LFA	2	1998.50 2014.50	Cl^-	46	84.0	177	115	Quarterly	2.3	0.635	0.0002	99%	>2035	$(Ca,Mg)(HCO_3,SO_4,Cl)$	
Duval	88271-12	JEA	PW 5404 (6087)	UFA	2	1999.50 2014.50	Cl^-	46	99.9	210	193	Quarterly	2.4	0.500	0.0002	99%	2032	$(Ca,Mg)Cl_2$	T
							TDS	46	430	810	665	Quarterly	8.0	0.390	0.0002	99%	<2015		
Duval	88271-12	JEA	PW 5405 (6088)	UFA	1	1998.25 2013.75	Cl^-	41	25.0	111	86.8	Quarterly	2.8	0.691	0.0002	99%	>2035	$Ca(HCO_3,SO_4,Cl)$	
Duval	88271-12	JEA	PW 5406 (34488)	UFA	1	2010.00 2014.50	Cl^-	19	32.5	41.8	35.3	Quarterly	1.8	0.801	0.0002	99%	>2035	$(Ca,Mg)(SO_4,HCO_3)$	
Duval	88271-12	JEA	PW 5705 (22539)	UFA	3	2011.50 2014.50	Cl^-	13	44.4	50.8	48.0	Quarterly	1.4	0.526	0.0146	95%	>2035	$(Ca,Mg)(SO_4,HCO_3)$	
Duval	88271-12	JEA	PW 5707 (35645)	UFA	1	2005.25 2014.50	Cl^-	34	14.5	80.4	21.5	Quarterly	1.3	0.676	0.0002	99%	>2035	$(Ca,Mg)SO_4$	
Duval	88271-12	JEA	PW 5302 (6061)	UFA	3	2004.50 2014.50	Cl^-	36	12.9	77.2	39.0	Quarterly	2.7	0.516	0.0002	99%	>2035	$(Ca,Mg)(SO_4,HCO_3)$	
Duval	88271-12	JEA	PW 5305 (6064)	UFA	5	2010.50 2014.50	Cl^-	16	53.7	65.5	59.2	Quarterly	1.9	0.475	0.0118	95%	>2035	$Ca(SO_4,HCO_3)$	
Duval	88271-12	JEA	PW 5904 (34484)	UFA	1	2004.00 2013.50	Cl^-	32	13.7	37.2	22.3	Quarterly	1.5	0.526	0.0002	99%	>2035	$Ca(HCO_3,SO_4)$	
Duval	88271-12	JEA	PW 5906 (34486)	UFA	1	2006.25 2014.50	Cl^-	30	14.3	40.4	18.4	Quarterly	1.1	0.632	0.0002	99%	>2035	$Ca(HCO_3,SO_4)$	
Duval	88271-12	JEA	PW B (5947)	UFA LFA	2	2005.75 2014.50	Cl^-	33	25.8	109	39.0	Quarterly	1.0	0.491	0.0002	99%	>2035	$CaSO_4$	
Duval	88271-12	JEA	PW 1D (15112)	UFA	1	2002.75 2014.50	Cl^-	38	19.9	44.3	33.8	Quarterly	1.9	0.700	0.0002	99%	>2035	$CaSO_4$	
Duval	708-6	Bacardi	PW 1 (6213)	UFA LFA	3	2006.75 2014.25	Cl^-	13	19.0	29.5	23.0	Quarterly	1.1	0.577	0.0068	95%	>2035	$Ca(HCO_3)_2$	
Flagler	1947-6	Palm Coast	PW SW60	SAS	1	1995.00 2014.50	Cl^-	77	14.0	130	102	Quarterly	1.9	0.389	0.0002	99%	>2035	NA	NA
Flagler	1947-6	Palm Coast	PW SW62	SAS	1	1995.00 2014.50	Cl^-	74	11.0	91.0	72.5	Quarterly	1.3	0.431	0.0002	99%	>2035	NA	NA

Table D5: Results of Groundwater Quality Analyses for Wells Demonstrating an Increasing Chloride Trend of <3mg/L/year and >1mg/L/year at a 95% Significance Level

County	CUP #	CUP Name	Station	Aquifer	Segment	POR	Analyte	Sample Size	Min (mg/L)	Max (mg/L)	Median (mg/L)	Mode	Median Slope (mg/L/yr)	τ	p-value	SL	DWS	Groundwater Geochemistry	
Flagler	1947-6	Palm Coast	PW SW114	SAS	1	1995.00 2014.50	Cl^-	76	15	130	86.5	Quarterly	2.7	0.600	0.0002	99%	>2035	NA	NA
Flagler	1947-6	Palm Coast	PW LW21	UFA	4	2007.00 2014.00	Cl^-	29	25	62	34.0	Quarterly	2.0	0.502	0.0002	99%	>2035	NA	NA
Nassau	915-4	Rayonier	PW 6 (11392)	UFA	1	1993.50 2014.25	Cl^-	79	25.0	180.0	55.0	Quarterly	1.8	0.590	0.0002	99%	>2035	$Ca(HCO_3,SO_4)$	
Nassau	50077-6	RockTenn	PW 6 (11385)	UFA	1	2006.00 2013.25	Cl^-	28	44.0	73.0	61.0	Quarterly	2.9	0.667	0.0002	99%	>2035	$(Ca,Mg)(SO_4,HCO_3)$	
Nassau	50077-6	RockTenn	PW 8 (11379)	UFA	1	2006.50 2014.25	Cl^-	32	36.0	83.3	52.2	Quarterly	1.6	0.542	0.0002	99%	>2035	$(Ca,Mg)(SO_4,HCO_3)$	
St Johns	1142-14	SJCUD Ponte Vedra	PW IB3 (14820)	UFA	1	2000.50 2014.00	Cl^-	43	16.9	58.2	29.0	Quarterly	1.3	0.507	0.0002	99%	>2035	$(Ca,Mg)(SO_4,HCO_3)$	
St Johns	1142-14	SJCUD Ponte Vedra	PW ML1 (34049)	UFA	2	2004.50 2014.00	Cl^-	30	9.70	52.9	31.8	Quarterly	2.8	0.743	0.0002	99%	>2035	$(Ca,Mg)(SO_4,HCO_3)$	
St Johns	1142-14	SJCUD Ponte Vedra	PW ML2 (14822)	UFA	2	2005.75 2013.75	Cl^-	25	8.50	36.4	20.0	Quarterly	1.5	0.477	0.0010	99%	>2035	$(Ca,Mg)SO_4$	
St Johns	1142-14	SJCUD Ponte Vedra	PW PL1 (14641)	UFA	1	2003.00 2014.00	Cl^-	35	13.0	59.0	26.0	Quarterly	1.8	0.568	0.0002	99%	>2035	$(Ca,Mg)(SO_4,HCO_3)$	
St Johns	1142-14	SJCUD Ponte Vedra	PW PL2 (14642)	UFA	1	2003.00 2014.00	Cl^-	38	8.50	49.0	23.0	Quarterly	1.8	0.563	0.0002	99%	>2035	$(Ca,Mg)(SO_4,HCO_3)$	
St Johns	1142-14	SJCUD Ponte Vedra	PW PL3 (24083)	UFA	1	2003.00 2014.00	Cl^-	39	17.5	53.7	25.0	Quarterly	1.6	0.641	0.0002	99%	>2035	$(Ca,Mg)SO_4$	
St Johns	1142-14	SJCUD Ponte Vedra	PW PL4 (24084)	UFA	1	2003.00 2014.00	Cl^-	37	13.7	40.4	21.0	Quarterly	1.3	0.626	0.0002	99%	>2035	$(Ca,Mg)SO_4$	
St Johns	1142-14	SJCUD Ponte Vedra	PW SG2 (15110)	UFA	1	2003.00 2014.00	Cl^-	37	16.7	54.8	28.3	Quarterly	1.5	0.517	0.0002	99%	>2035	$(Ca,Mg)SO_4$	
St Johns	1198-3	SJCUD Tillman Ridge & NW	PW NW1 (34244)	UFA	2	2008.75 2014.25	Cl^-	22	26.5	51.1	36.9	Quarterly	2.7	0.429	0.0056	95%	>2035	$(Ca,Mg)SO_4$	
St Johns	50827-4	Palencia Club & Golf	PW 1 (31899)	UFA	1	2001.75 2013.75	Cl^-	25	71.0	89.0	78.0	Quarterly	1.0	0.627	0.0002	99%	>2035	$(Ca,Mg,Na)(HCO_3,SO_4,Cl)$	T

Table D6: Results of Groundwater Quality Analyses for Wells Demonstrating an Increasing Chloride Trend of <1mg/L/year at a 95% Significance Level

County	CUP #	CUP Name	Station	Aquifer	Segment	POR	Analyte	Sample Size	Min (mg/L)	Max (mg/L)	Median (mg/L)	Mode	Median Slope (mg/L/yr)	τ	p-value	SL	DWS	Groundwater Geochemistry	
Clay	416-48	Clay County Utility	PW SC-3 (35195)	UFA LFA	1	2004.00 2014.25	Cl^-	23	1.50	9.30	4.70	Quarterly	0.27	0.474	0.0016	99%	>2035	$(Ca,Mg)(HCO_3)_2$	
Duval	721-6	JEA NGS	PW 2 (6237)	UFA LFA	1	1984.00 2014.50	Cl^-	115	15.0	47.8	21.9	Quarterly	0.1	0.245	0.0002	99%	>2035	$Ca(HCO_3)_2$	
Duval	721-6	JEA NGS	PW 3 (6238)	UFA LFA	1	1984.00 1997.00	Cl^-	114	19.5	61.9	30.1	Quarterly	0.5	0.205	0.0012	99%	>2035	$(Ca,Mg)(HCO_3)_2$	
Duval	793-3	Jacksonville Beach	PW 15 (6345)	UFA	1	2002.50 2014.25	Cl^-	41	9.20	13.0	12.0	Quarterly	0.2	0.357	0.0006	99%	>2035	$(Ca,Mg)SO_4$	
Duval	51629-1	JEA Brandy Branch	PW 3 (22280)	UFA LFA	1	2005.75 2014.25	Cl^-	33	6.96	9.90	8.59	Quarterly	0.11	0.333	0.0068	95%	>2035	$Ca(HCO_3)_2$	
Duval	88271-12	JEA	PW 601 (6125)	UFA LFA	1	1998.00 2014.25	Cl^-	33	15.6	28.0	19.8	Quarterly	0.1	0.236	0.0104	95%	>2035	$Ca(HCO_3)_2$	
Duval	88271-12	JEA	PW 702 (6149)	UFA LFA	1	1998.00 2014.50	Cl^-	54	8.10	56.1	9.49	Quarterly	0.05	0.232	0.0136	95%	>2035	$Ca(SO_4,HCO_3)$	
Duval	88271-12	JEA	PW 6002 (22523)	UFA LFA	1	1999.75 2014.50	Cl^-	51	11.9	19.0	14.9	Quarterly	0.2	0.482	0.0002	99%	>2035	$CaSO_4$	
Duval	88271-12	JEA	PW 6003 (22524)	UFA LFA	1	2000.00 2014.50	Cl^-	48	12.0	81.9	15.6	Quarterly	0.4	0.597	0.0002	99%	>2035	$CaSO_4$	
Duval	88271-12	JEA	PW M503 (6093)	UFA LFA	1	1998.00 2014.50	Cl^-	54	8.65	14.2	10.1	Quarterly	0.05	0.282	0.0026	99%	>2035	$Ca(HCO_3,SO_4)$	
Duval	88271-12	JEA	PW M504 (6094)	UFA	1	1998.00 2005.00	Cl^-	57	8.18	13.4	9.44	Quarterly	0.07	0.331	0.0002	99%	>2035	$Ca(HCO_3,SO_4)$	
Duval	88271-12	JEA	PW 5708 (38533)	UFA	1	2006.25 2014.50	Cl^-	26	12.9	51.3	19.3	Quarterly	0.5	0.345	0.0142	95%	>2035	$CaSO_4$	
Duval	88271-12	JEA	PW 5901 (22567)	UFA	1	1998.25 2014.50	Cl^-	51	12.3	38.5	17.0	Quarterly	0.2	0.305	0.0016	99%	>2035	$Ca(HCO_3,SO_4)$	
Duval	88271-12	JEA	PW 2D (15114)	UFA	1	2003.00 2014.50	Cl^-	41	13.5	42.8	24.1	Quarterly	0.7	0.480	0.0002	99%	>2035	$CaSO_4$	
Duval	88271-12	JEA	PW 3 (22058)	UFA	1	2002.50 2014.50	Cl^-	43	11.8	24.6	15.5	Quarterly	0.4	0.520	0.0002	99%	>2035	$(Ca,Mg)SO_4$	
Duval	88271-12	JEA	PW 4 (22059)	UFA	1	2002.50 2014.50	Cl^-	43	11.0	23.4	13.3	Quarterly	0.2	0.433	0.0002	99%	>2035	$(Mg,Ca)SO_4$	
Duval	708-6	Bacardi	PW 2 (33092)	UFA LFA	2	2006.75 2014.25	Cl^-	16	19.0	35.0	24.0	Quarterly	0.8	0.583	0.0016	99%	>2035	$Ca(HCO_3)_2$	
Duval	804-3	Jacksonville Beach Golf	PW 1 (6363)	UFA	1	2001.00 2014.25	Cl^-	52	9.70	14.4	12.0	Quarterly	0.1	0.244	0.0090	95%	>2035	$(Ca,Mg)SO_4$	
Duval	842-5	Neptune Beach	PW 4D (6416)	UFA LFA	2	2004.25 2014.50	Cl^-	39	31.0	46.0	35.0	Quarterly	0.7	0.641	0.0002	99%	>2035	$(Ca,Mg)(HCO_3,SO_4)$	
Flagler	1947-6	Palm Coast	PW SW14 (6655)	SAS	1	1995.00 2014.50	Cl^-	73	13.0	76.0	51	Quarterly	0.6	0.339	0.0002	99%	>2035	NA	
Flagler	1947-6	Palm Coast	PW SW29-29R (104677)	SAS	1	1995.00 2014.50	Cl^-	75	11	54	26	Quarterly	0.3	0.299	0.0002	99%	>2035	NA	

Table D6: Results of Groundwater Quality Analyses for Wells Demonstrating an Increasing Chloride Trend of <1mg/L/year at a 95% Significance Level

County	CUP #	CUP Name	Station	Aquifer	Segment	POR	Analyte	Sample Size	Min (mg/L)	Max (mg/L)	Median (mg/L)	Mode	Median Slope (mg/L/yr)	τ	p-value	SL	DWS	Groundwater Geochemistry	
Nassau	915-4	Rayonier	PW 7 (11393)	UFA	1	1993.50 2014.25	Cl^-	79	24.0	44.0	32.0	Quarterly	0.3	0.394	0.0002	99%	>2035	$(Ca,Mg)(HCO_3,SO_4)$	
Nassau	915-4	Rayonier	PW 15 (11401)	UFA	1	1993.50 2014.25	Cl^-	79	28.0	95.0	38.0	Quarterly	0.5	0.195	0.0114	95%	>2035	$(Ca,Mg)(HCO_3,SO_4)$	
St Johns	1423-3	Fruit Cove Oaks	PW 1 (15202)	UFA	1	2000.75 2013.75	Cl^-	23	10.0	32.2	16.0	Quarterly	0.9	0.684	0.0002	99%	>2035	$(Mg,Ca)SO_4$	

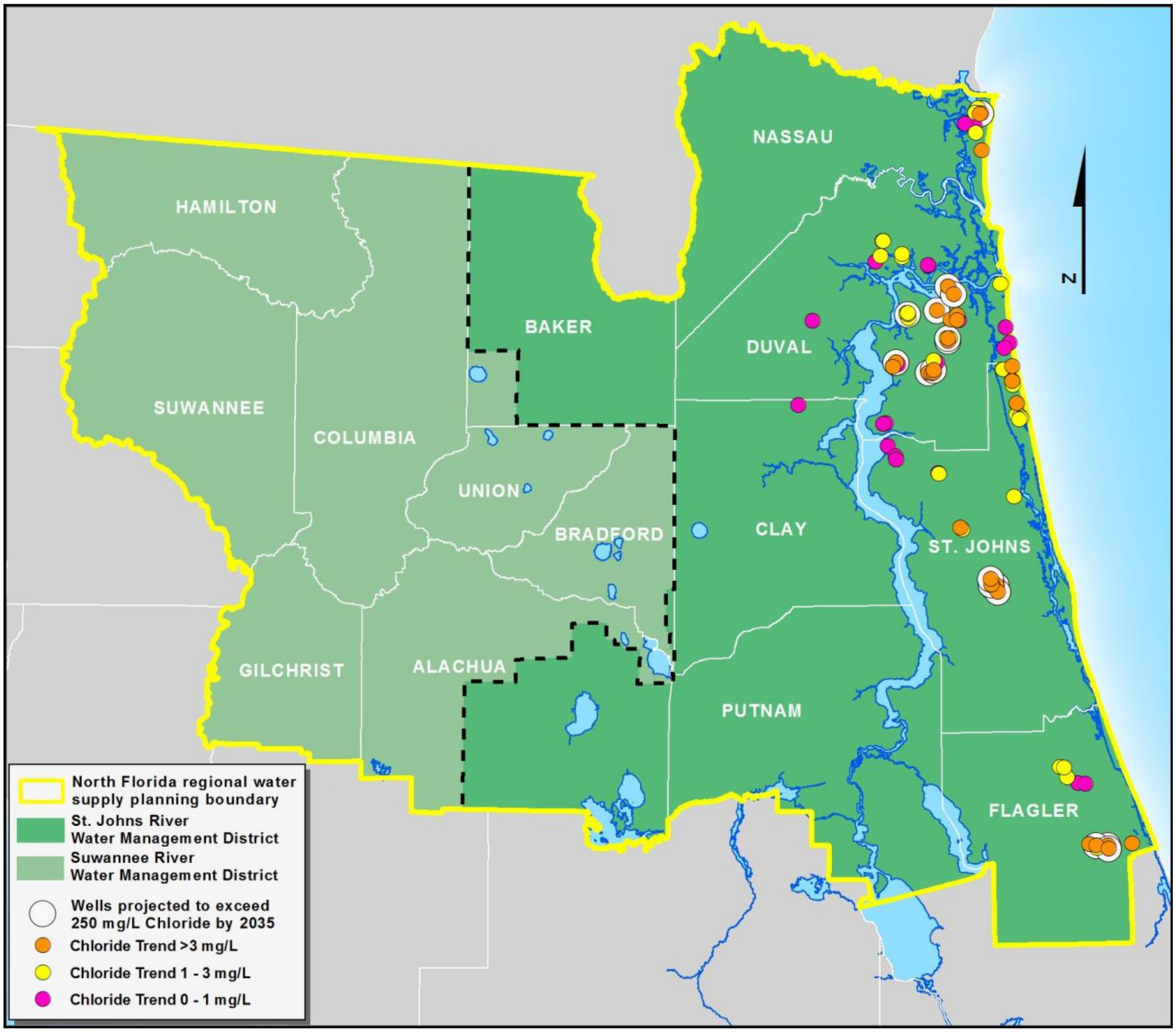
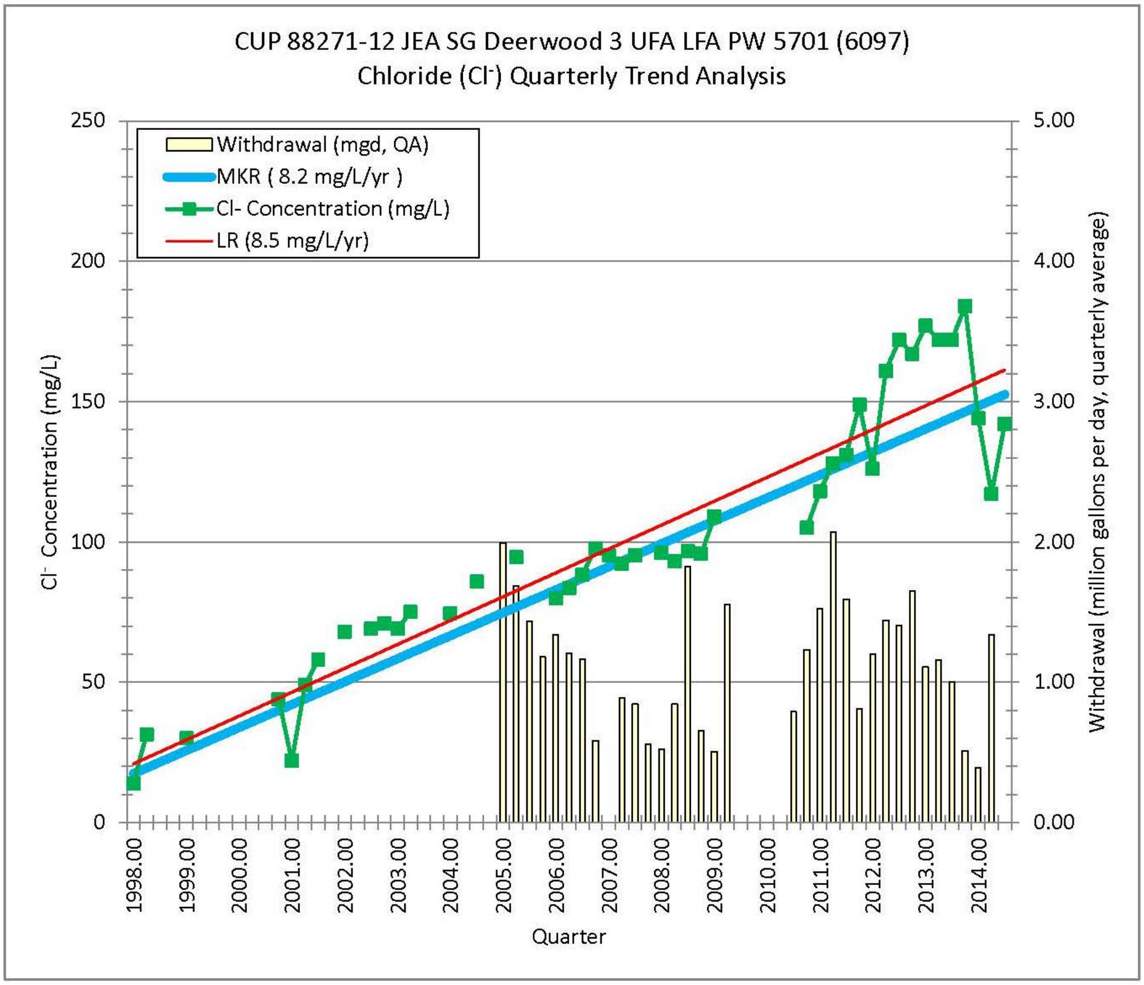


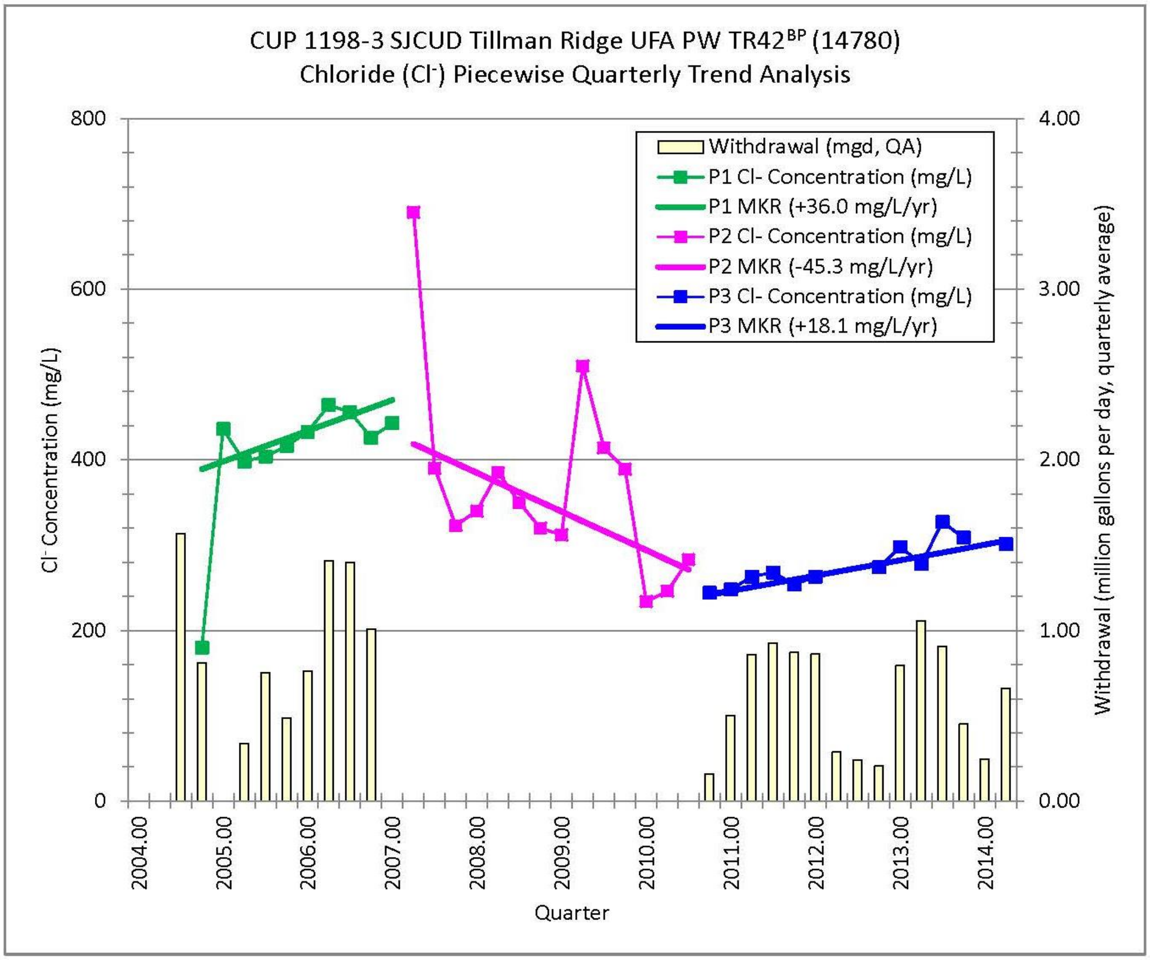
Figure D3: Wells with Trends in Chloride Concentration Projected to Exceed 250 mg/L Chloride by 2035



POR	Minimum (mg/L)	Maximum (mg/L)	Mode	Median Slope (mg/L/yr)	τ	p-value	Significance Level
1998.00 2014.50	14.0	184	Quarterly	8.2	0.856	0.0002	99%

Significance Level	One-Tailed p-Value α	Two-Tailed p-value α/2	Comments
99%	0.01	0.005	Very confident about trend
95%	0.05	0.025	Confident about trend
90%	0.10	0.050	A trend probably exists
80%	0.20	0.100	Watch
NS	>0.20	>0.100	Not significant

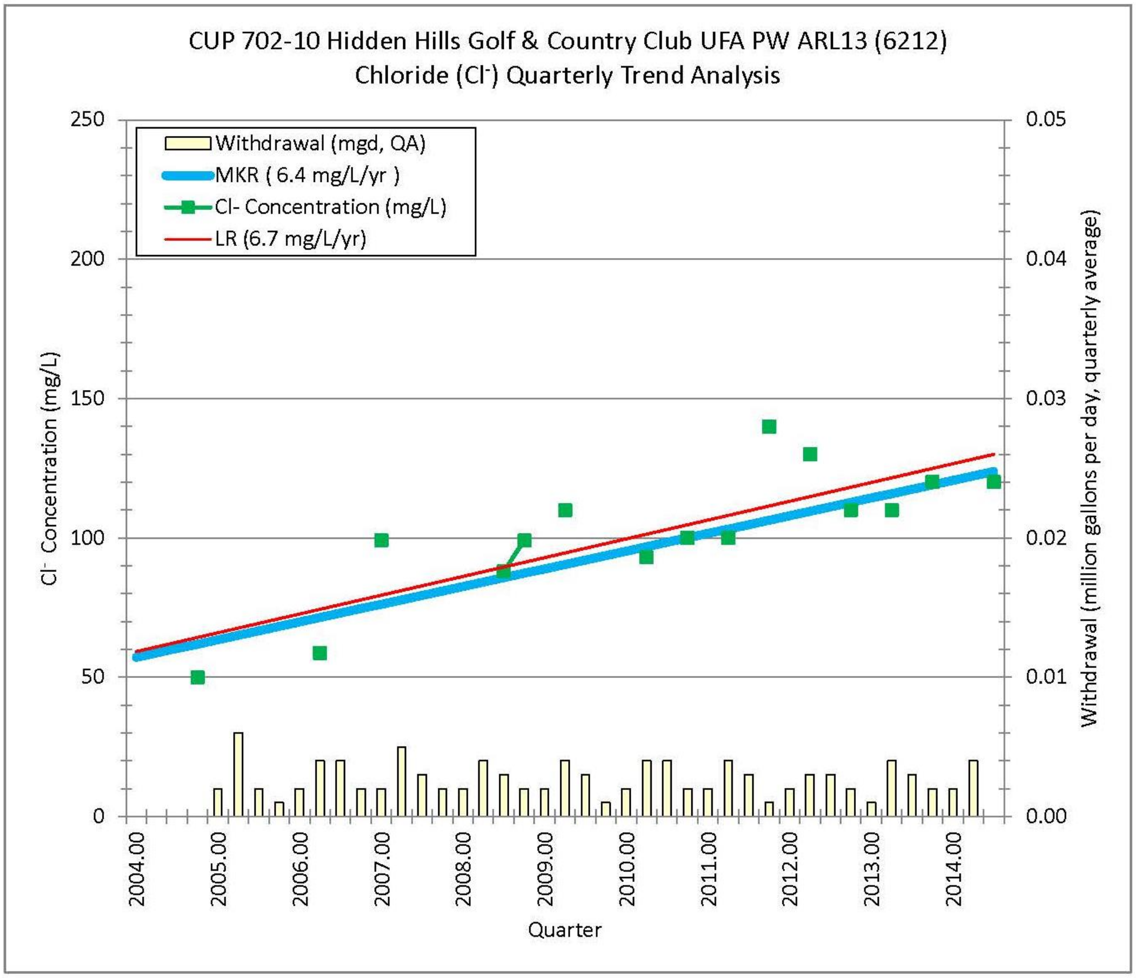
Figure D4: Time-Series Chloride Trend in a Jacksonville Electric Authority Production Well



POR	Minimum (mg/L)	Maximum (mg/L)	Mode	Median Slope (mg/L/yr)	τ	p-value	Significance Level
2004.75 2007.00	180	464	Quarterly	36.0	0.511	0.0460	90%
2007.25 2010.50	234	690	Quarterly	-45.3	-0.385	0.0628	80%
2010.75 2014.25	244	327	Quarterly	18.1	0.773	0.0006	99%

Significance Level	One-Tailed p-Value α	Two-Tailed p-value α/2	Comments
99%	0.01	0.005	Very confident about trend
95%	0.05	0.025	Confident about trend
90%	0.10	0.050	A trend probably exists
80%	0.20	0.100	Watch
NS	>0.20	>0.100	Not significant

Figure D5: Time-Series Chloride Trend in a St. Johns County Production Well



POR	Minimum (mg/L)	Maximum (mg/L)	Mode	Median Slope (mg/L/yr)	τ	p-value	Significance Level
2004.75 2014.50	50.0	140	Quarterly	6.4	0.648	0.0008	99%

Significance Level	One-Tailed p-Value α	Two-Tailed p-value α/2	Comments
99%	0.01	0.005	Very confident about trend
95%	0.05	0.025	Confident about trend
90%	0.10	0.050	A trend probably exists
80%	0.20	0.100	Watch
NS	>0.20	>0.100	Not significant

Figure D6a: Time-Series Chloride Trend in a Hidden Hills Golf and Country Club Well

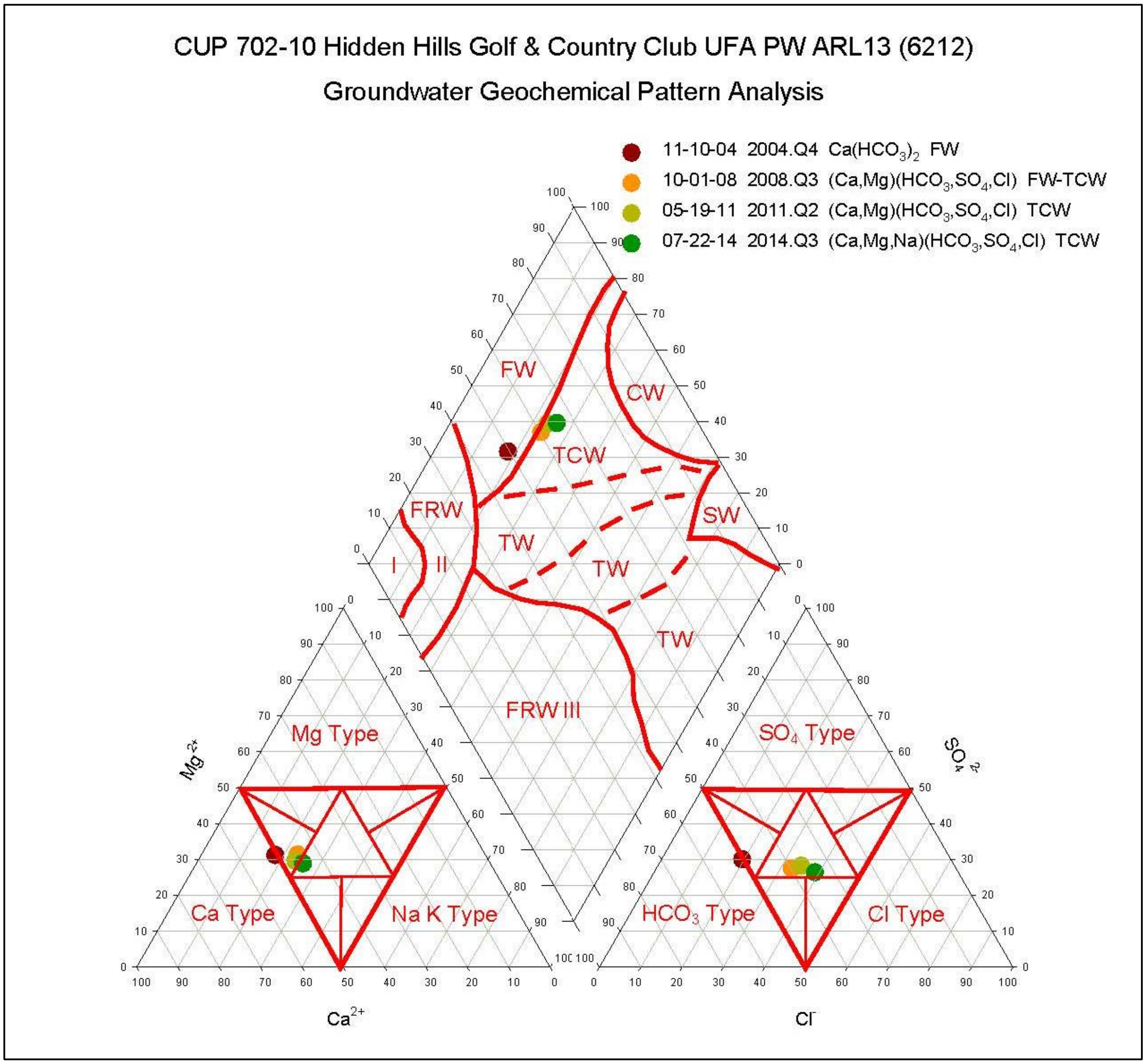


Figure D6b: Piper-trilinear Diagram for Groundwater Geochemical Pattern Analysis for a Hidden Hill Golf and Country Club Production Well

Table D7: Results of Groundwater Quality Analyses for Wells Demonstrating a Decreasing Chloride Trend at a 95% Significance Level

County	CUP #	CUP Name	Station	Aquifer	Segment	POR	Cl^- Min (mg/L)	Cl^- Max (mg/L)	Mode	Cl^- Median Slope (mg/L/yr)	τ	p-value	SL
Alachua	NA	Ernest Bliss	MW S081912004	UFA	5	2010.25 2012.25	8.90	13.0	Quarterly	-2.1	-1.000	0.0028	99%
Columbia	NA	DOT SR47	MW S061610001	UFA	1	2000.75 2013.75	4.00	7.70	Quarterly	-0.09	-0.270	0.0052	95%
Duval	589-5	Mayport NAS	PW 1R (33450)	UFA	3	2007.25 2014.25	13.0	38.0	Quarterly	-2.3	-0.478	0.0002	99%
Duval	810-7	Atlantic Beach	PW 2 (6377)	UFA	1	2003.25 2014.25	11.6	130	Quarterly	-3.9	-0.524	0.0010	99%
Duval	88271-12	JEA	PW 8A03 (6208)	UFA LFA	1	1998.25 2014.50	13.8	21.5	Quarterly	-0.1	-0.340	0.0006	99%
Duval	88271-12	JEA	PW 501 (6117)	UFA LFA	1	1998.00 2014.50	7.20	44.2	Quarterly	-0.04	-0.266	0.0104	95%
Duval	88271-12	JEA	PW 503 (6120)	UFA LFA	1	1998.25 2014.50	7.23	20.0	Quarterly	-0.08	-0.246	0.0094	95%
Duval	88271-12	JEA	PW 505 (6115)	UFA LFA	1	1998.00 2014.50	6.37	20.0	Quarterly	-0.08	-0.237	0.0102	95%
Duval	88271-12	JEA	PW 5201 (6052)	UFA	4	2008.75 2014.50	22.4	30.0	Quarterly	-0.8	-0.533	0.0002	99%
Duval	88271-12	JEA	PW 5204 (6055)	UFA	3	2007.50 2014.50	13.5	19.9	Quarterly	-0.3	-0.470	0.0010	99%
Duval	88271-12	JEA	PW A	FA	3	1996.50 2014.50	21.1	74.4	Quarterly	-0.3	-0.520	0.0002	99%
Duval	88271-12	JEA	PW B	FA	2	1996.25 2014.50	22.0	65.3	Quarterly	-0.8	-0.492	0.0002	99%
Duval	88271-12	JEA	PW C	FA	2	1996.50 2014.50	21.5	81.5	Quarterly	-0.6	-0.407	0.0024	99%
Flagler	1947-6	Palm Coast	PW SW5-SW5R (105005)	SAS	1	1995.00 2014.50	14	62	Quarterly	-0.5	-0.385	0.0002	99%
Flagler	1947-6	Palm Coast	PW SW7 (6652)	SAS	1	1995.00 2014.50	22	88	Quarterly	-0.9	-0.328	0.0002	99%
Flagler	1947-6	Palm Coast	PW SW27 (6656)	SAS	1	1995.00 2014.50	15	53	Quarterly	-1.0	-0.605	0.0002	99%
Flagler	1947-6	Palm Coast	PW SW30 (6659)	SAS	1	1995.00 2014.50	17	65	Quarterly	-1.3	-0.473	0.0002	99%
Flagler	1947-6	Palm Coast	PW SW31 (6660)	SAS	1	1995.00 2014.50	10	51	Quarterly	-0.4	-0.282	0.0002	99%
Flagler	1947-6	Palm Coast	PW SW32 (6661)	SAS	1	1995.00 2014.50	9.0	78.0	Quarterly	-1.5	-0.626	0.0002	99%
Flagler	1947-6	Palm Coast	PW SW33 (6662)	SAS	1	1995.00 2014.50	8.0	55.0	Quarterly	-0.3	-0.277	0.0002	99%
Flagler	1947-6	Palm Coast	PW SW35 (6664)	SAS	1	1995.00 2014.50	4	58	Quarterly	-0.6	-0.371	0.0002	99%
Flagler	1947-6	Palm Coast	PW SW36 (6665)	SAS	1	1995.00 2014.50	8.0	101	Quarterly	-0.3	-0.258	0.0008	99%

Table D7: Results of Groundwater Quality Analyses for Wells Demonstrating a Decreasing Chloride Trend at a 95% Significance Level

County	CUP #	CUP Name	Station	Aquifer	Segment	POR	Cl^- Min (mg/L)	Cl^- Max (mg/L)	Mode	Cl^- Median Slope (mg/L/yr)	τ	p-value	SL
Flagler	1947-6	Palm Coast	PW SW42 (6647)	SAS	1	2004.00 2014.50	20	47	Quarterly	-0.5	-0.432	0.0002	99%
Flagler	1947-6	Palm Coast	PW SW43 (6620)	SAS	1	2001.75 2014.50	20	62	Quarterly	-0.6	-0.323	0.0008	99%
Flagler	1947-6	Palm Coast	PW SW59 (6667)	SAS	1	1995.00 2014.50	7	73	Quarterly	-1.1	-0.407	0.0002	99%
Flagler	1947-6	Palm Coast	PW SW61 (6668)	SAS	1	1995.00 2014.50	10	78	Quarterly	-1.1	-0.363	0.0002	99%
Flagler	1947-6	Palm Coast	PW SW83 (6628)	SAS	1	2005.00 2014.50	24	45	Quarterly	-0.7	-0.438	0.0002	99%
Flagler	1947-6	Palm Coast	PW SW38 (35378)	SAS	1	2007.50 2014.25	21	28	Quarterly	-0.7	-0.538	0.0002	99%
Flagler	1982-5	Bunnell	PW W3 (6832)	SAS	1	2005.00 2014.00	21.4	140	Quarterly	-0.7	-0.526	0.0012	99%
Flagler	1982-5	Bunnell	PW W4 (6833)	SAS	1	2005.00 2014.00	23.0	378	Quarterly	-6.8	-0.356	0.0188	95%
Flagler	1960-7	Plantation Bay	PW 2 (6748)	UFA	1	2006.25 2013.75	19.6	32.3	Quarterly	-0.6	-0.689	0.0046	99%
Nassau	122-6	Fernandina Beach	PW 6 (54)	UFA LFA	1	2001.25 2014.25	28.0	148	Quarterly	-1.5	-0.335	0.0174	95%
Nassau	122-6	Fernandina Beach	PW 7 (55)	UFA LFA	1	2001.25 2014.25	29.0	370	Quarterly	-1.4	-0.332	0.0182	95%
Nassau	915-4	Rayonier	PW 5 (11391)	UFA	1	1993.50 2014.25	26.0	52.0	Quarterly	-0.2	-0.381	0.0002	99%
Nassau	915-4	Rayonier	PW 9 (11395)	UFA	1	2005.00 2014.25	25.0	53.0	Quarterly	-0.5	-0.451	0.0002	99%
Nassau	915-4	Rayonier	PW 11 (11397)	UFA	1	1993.50 2014.25	25.0	36.0	Quarterly	-0.2	-0.433	0.0002	99%
Nassau	915-4	Rayonier	PW 12 (11398)	UFA	2	2005.50 2014.25	24.0	29.0	Quarterly	-0.2	-0.294	0.0110	95%
Nassau	915-4	Rayonier	PW 14 (11400)	UFA	1	2000.50 2014.25	29.0	90.3	Quarterly	-1.0	-0.532	0.0002	99%
Nassau	50087-7	Amelia Island	PW 1 (11419)	UFA	1	2004.25 2014.25	17.0	31.0	Quarterly	-0.4	-0.351	0.0024	99%
Nassau	50087-7	Amelia Island	PW 2 (11420)	UFA	1	2004.25 2014.25	20.0	32.0	Quarterly	-0.3	-0.303	0.0090	95%
Suwannee	NA	Carrol Hall	MW S061434006	UFA	1	2004.25 2013.75	9.90	17.7	Quarterly	-0.46	-0.472	0.0002	99%

Appendix E

Minimum Flows and Minimum Levels – Adopted and Priority Lists

Technical Memorandum
North Florida Regional Water Supply Plan
Minimum Flows and Minimum Levels – Adopted and Priority Lists
August 18, 2016

Adopted Minimum Flows and Minimum Levels

Minimum Flows and Minimum Levels (MFLs) are the minimum water flows and/or minimum levels adopted by water management district Governing Boards or the Florida Department of Environmental Protection (FDEP) to prevent significant harm to the water resources or the ecological structure and function of an area resulting from groundwater or surface water withdrawals. MFLs characterize water resource values (WRVs) for individual waterbodies and define the duration and frequency of critical flooding and drying events necessary to protect these WRVs from significant harm. MFLs inform decisions regarding water use permitting, water shortages, assessments of water supply sources, and development of water resource and water supply projects.

Establishing MFLs is required pursuant to section (s.) 373.042(2), Florida Statutes (F.S.). Adoption is typically a four- to six-month process that involves public workshops, review by FDEP and publication in the Florida Administrative Weekly. MFLs are to be reviewed periodically and revised as necessary under s. 373.0421(3), F.S.

As of May 2016, the St. Johns River Water Management District (SJRWMD), Suwannee River Water Management District (SRWMD) and FDEP have established 67 MFLs in the North Florida Regional Water Supply Plan (NFRWSP) area; 47 lakes in the SJRWMD and 16 springs and three rivers (four reaches) in the SRWMD (Table E1). The full list of adopted MFLs within the SJRWMD and SRWMD can be found in chapters 40C-8 and 40B-8, respectively, and section 62-42.300, Florida Administrative Code. Adopted MFLs located outside of the NFRWSP area, but within the SJRWMD and SRWMD, are listed in Tables E2 and E3, respectively. Although there are 47 lakes with MFLs in the SJRWMD portion of the NFRWSP area, only 19 were assessed in the NFRWSP. The SJRWMD lake MFL assessment methodology only applies to lakes that have a significant connection to the Floridan aquifer. Lakes without such a connection (six total within the NFRWSP area) are noted in Table E1 as having "no significant Floridan aquifer connection" (NSFAC). The remaining non-assessed lakes (22 total) lacked sufficient data for assessment at the time of analysis. For the majority of these systems, surface water models have not yet been developed to assess whether MFLs are being met. Surface water models for Star Lake (Putnam County) and Lake Wauberg (Alachua County) were developed in 2015, but assessment had not yet been completed at the time of NFRWSP development. The SJRWMD is working to develop surface water models for all systems with MFLs that currently lack them. In south Putnam County, where many of these non-assessed lakes are located, surface water models have been developed and MFLs assessed for nearby lakes help ensure regional protection of water resources from consumptive use impacts.

MFLs Priority Lists

Each year, the Districts' Governing Boards approve and submit to FDEP an updated MFLs Priority List and Schedule. The MFLs list identifies the waterbodies and year in which MFLs will be developed for the upcoming five years. These lists are updated and resubmitted annually. The 2016 MFLs Priority List and Schedule shows the planned year for completion of new MFLs and reevaluations for the years 2016 through 2020. The Districts' Governing Boards approved their respective 2016 MFLs Priority List and Schedule on November 10, 2015 (SJRWMD), and November 12, 2015 (SRWMD). The 2016 MFLs Priority List and Schedule for each District is provided in Tables E4 and E5.

Table E1: SJRWMD and SRWMD Adopted MFLs within the NFRWSP Area

Water Body	Water Body Name	County/Basin	WMD	Assessed in NFRWSP
Lake	Argenta	Putnam	SJR	No – Insufficient data
Lake	Banana	Putnam	SJR	Yes
Lake	Bell	Putnam	SJR	Yes
Lake	Bird Pond	Putnam	SJR	No – Insufficient data
Lake	Blue Pond	Clay	SJR	No – NSFAC
Lake	Brooklyn	Clay	SJR	Yes
Lake	Broward	Putnam	SJR	Yes
Lake	Clear	Putnam	SJR	No – Insufficient data
Lake	Como	Putnam	SJR	Yes
Lake	Cowpen	Putnam	SJR	Yes
Lake	Crystal/Baker/Ida	Putnam	SJR	No – Insufficient data
Lake	Deep	Putnam	SJR	No – Insufficient data
Lake	Disston	Flagler	SJR	No – NSFAC
Lake	Dream Pond	Putnam	SJR	Yes
Lake	Echo	Putnam	SJR	No – Insufficient data
Lake	English/Nettles	Putnam	SJR	No – NSFAC
Lake	Estella	Putnam	SJR	No – Insufficient data
Lake	Geneva	Clay	SJR	Yes
Lake	Georges	Putnam	SJR	Yes
Lake	Gore	Flagler	SJR	Yes
Lake	Grandin	Putnam	SJR	Yes
Lake	Howell	Putnam	SJR	No – Insufficient data
Lake	Little Como	Putnam	SJR	Yes
Lake	Little Mall	Putnam	SJR	No – Insufficient data
Lake	Lizzie	Putnam	SJR	No – Insufficient data

Table E1: SJRWMD and SRWMD Adopted MFLs within the NFRWSP Area

Water Body	Water Body Name	County/Basin	WMD	Assessed in NFRWSP
Lake	Lowry/Sand Hill	Clay	SJR	No – NSFAC
Lake	Magnolia	Clay	SJR	No – NSFAC
Lake	Margaret	Putnam	SJR	No – Insufficient data
Lake	Marvin	Putnam	SJR	No – Insufficient data
Lake	McGrady	Putnam	SJR	No – Insufficient data
Lake	McKasel	Putnam	SJR	No – Insufficient data
Lake	Melrose	Putnam	SJR	No – NSFAC
Lake	North Como Park	Putnam	SJR	No – Insufficient data
Lake	Omega	Putnam	SJR	No – Insufficient data
Lake	Orio	Putnam	SJR	Yes
Lake	Pam	Putnam	SJR	No – Insufficient data
Lake	Prior	Putnam	SJR	No – Insufficient data
Lake	Sand	Putnam	SJR	No – Insufficient data
Lake	Silver	Putnam	SJR	Yes
Lake	South Como Park	Putnam	SJR	No – Insufficient data
Lake	Star	Putnam	SJR	No – Insufficient data
Lake	Stella	Putnam	SJR	Yes
Lake	Swan	Putnam	SJR	Yes
Lake	Tarhoe	Putnam	SJR	Yes
Lake	Trone	Putnam	SJR	Yes
Lake	Tuscawilla	Alachua	SJR	Yes
Lake	Wauberg	Alachua	SJR	No – Insufficient data
River	Ichetucknee	Santa Fe	SR	Yes
River	Lower Santa Fe	Santa Fe	SR	Yes
River	Upper Santa Fe @ Graham	Santa Fe	SR	Yes
River	Upper Santa Fe @ Worthington Springs	Santa Fe	SR	Yes
Spring	ALA 112971 (Treehouse)[2]	Santa Fe	SR	Yes
Spring	Blue Hole[1]	Santa Fe	SR	Yes
Spring	COL 101974 (Unnamed)[2]	Santa Fe	SR	Yes
Spring	Columbia[2]	Santa Fe	SR	Yes
Spring	Devil's Ear (Ginnie Group)[2]	Santa Fe	SR	Yes

Table E1: SJRWMD and SRWMD Adopted MFLs within the NFRWSP Area

Water Body	Water Body Name	County/Basin	WMD	Assessed in NFRWSP
Spring	Devil's Eye[1]	Santa Fe	SR	Yes
Spring	GIL 1012973 (Siphon Creek Falls)[2]	Santa Fe	SR	Yes
Spring	Grassy Hole[1]	Santa Fe	SR	Yes
Spring	Hornsby[2]	Santa Fe	SR	Yes
Spring	Ichetucknee Head[1]	Santa Fe	SR	Yes
Spring	July[2]	Santa Fe	SR	Yes
Spring	Mill Pond[1]	Santa Fe	SR	Yes
Spring	Mission[1]	Santa Fe	SR	Yes
Spring	Poe[2]	Santa Fe	SR	Yes
Spring	Rum Island[2]	Santa Fe	SR	Yes
Spring	Santa Fe Rise[2]	Santa Fe	SR	Yes

NSFAC = No significant Floridan aquifer connection
[1] Ichetucknee River Priority Spring
[2] Lower Santa Fe River Priority Spring

Table E2: SJRWMD Adopted MFLs Outside the NFRWSP Area

Water Body Type	Water Body Name	County
Lake	Apshawa North	Lake
Lake	Apshawa South	Lake
Lake	Ashby	Volusia
Lake	Big	Volusia
Lake	Boggy Marsh	Lake
Lake	Bowers	Marion
Lake	Brantley	Seminole
Lake	Burkett	Orange
Lake	Charles	Marion
Lake	Cherry	Lake
Lake	Colby	Volusia
Lake	Coon Pond	Volusia
Lake	Cow Pond	Volusia
Lake	Daugharty	Volusia
Lake	Davis	Volusia
Lake	Dias	Volusia
Lake	Dorr	Lake
Lake	Drudy	Volusia
Lake	Emma	Lake
Lake	Emporia	Volusia
Lake	Fox	Brevard
Lake	Gertie	Volusia
Lake	Halfmoon	Marion
Lake	Helen	Volusia
Lake	Hires	Volusia
Lake	Hokey	Volusia
Lake	Hopkins Prairie	Marion
Lake	Howell	Seminole
Lake	Indian	Volusia
Lake	Irma	Orange
Lake	Kerr	Marion
Lake	Louisa	Lake
Lake	Lower Lake Louise	Volusia
Lake	Lucy	Lake

Table E2: SJRWMD Adopted MFLs Outside the NFRWSP Area

Water Body Type	Water Body Name	County
Lake	Martha	Orange
Lake	Mills	Seminole
Lake	Minneola	Lake
Lake	Monroe	Seminole/Volusia
Lake	Nicotoon	Marion
Lake	Norris	Lake
Lake	North Talmadge	Volusia
Lake	Pearl	Orange
Lake	Pierson	Volusia
Lake	Pine Island	Lake
Lake	Prevatt	Orange
Lake	Purdom	Volusia
Lake	Savannah	Volusia
Lake	Scoggin	Volusia
Lake	Shaw	Volusia
Lake	Smith	Marion
Lake	South	Brevard
Lake	Sunset	Lake
Lake	Sylvan	Seminole
Lake	Three Island Lakes	Volusia
Lake	Trout	Volusia
Lake	Upper Lake Louise	Volusia
Lake	Washington	Brevard
Lake	Weir	Marion
Lake	Winnemisett	Volusia
Lake	Winona	Volusia
River	Black Water Creek @ SR 44	Lake
River	St. Johns 1.5 miles downstream of Lake Washington Weir	Brevard
River	St. Johns @ SR 44	Volusia
River	Taylor Creek 1.7 miles downstream of S-164	Orange
River	St. Johns @ SR 50	Orange/Brevard
River	Wekiva @SR 46	Seminole/Lake
Spring	Blue	Volusia

Table E2: SJRWMD Adopted MFLs Outside the NFRWSP Area

Water Body Type	Water Body Name	County
Spring	Messant	Lake
Spring	Miami	Seminole
Spring	Palm	Seminole
Spring	Rock	Orange
Spring	Sanlando	Seminole
Spring	Seminole	Lake
Spring	Starbuck	Seminole
Spring	Wekiwa	Orange
Water Management Area	Blue Cypress WMA	Indian River

Table E3: SRWMD Adopted MFLs Outside the NFRWSP Area

Water Body Type	Water Body Name	Basin
River	Aucilla	Aucilla
River	Econfina	Econfina
River	Lower Suwannee	Lower Suwannee
River	Waccasassa	Waccasassa
River	Wacissa	Aucilla
Spring	Fanning	Lower Suwannee
Spring	Levy (Bronson) Blue	Waccasassa
Spring	Little Fanning	Lower Suwannee
Spring	Madison Blue	Withlacoochee
Spring	Manatee	Lower Suwannee
Spring	Nutall Rise	Aucilla
Spring	Wacissa group	Aucilla

Table E4: SJRWMD 2015 MFLs Priority List and Schedule

Year	Water Body Type	Water Body Name	County	Within NFRWSP Area
2016	Lake	Cowpen (Re-eval)	Putnam	Yes
	Spring	De Leon	Volusia	No
2017	Lake	Apopka	Lake, Orange	No
	Lake	Brooklyn (Re-eval)	Clay	Yes
	Lake	Geneva (Re-eval)	Clay	Yes
	Lake	Griffin	Lake	No
	Lake	Harris Chain of Lakes	Lake	No
	River	Alexander Springs Creek	Lake	No
	River	Silver	Marion	No
	Spring	Alexander	Lake	No
	Spring	Silver Glen	Marion, Lake	No
	Spring	Silver	Marion	No
2018	Lake	Apshawa South (Re-eval)	Lake	No
	Lake	Johns	Orange	No
	Lake	Prevatt (Re-eval)	Orange	No
	Lake	Sylvan (Re-eval)	Seminole	No
	River	Ocklawaha at SR40	Marion	No
	River/Spring System	Wekiva at SR 46 Bridge and associated springs (Re-eval)	Seminole, Lake	No
2019	Lake	Butler	Volusia	No
	Lake	East Crystal	Seminole	No
	Lake	Hodge	Seminole	No
	Spring	Bugg	Lake	No
2020	Lake	Lochloosa/Orange	Alachua	Yes

Table E5: SRWMD 2016 MFLs Priority List and Schedule

Year	Water Body Type	Water Body Name (Basin)	Basin	Within NFRWSP Area
2016	Lake	Hampton	Santa Fe	Yes
	Lake	Butler	Santa Fe	Yes
	River	Middle Suwannee River	Middle Suwannee	No
	River	Steinhatchee River	Steinhatchee	No
	River	Upper Suwannee River	Upper Suwannee	Yes
	Spring	Bell	Middle Suwannee	No
	Spring	Otter	Middle Suwannee	No
	Spring	Hart	Middle Suwannee	No
	Spring	Rock Sink	Middle Suwannee	No
	Spring	Guaranto	Middle Suwannee	No
	Spring	Pothole	Middle Suwannee	No
	Spring	Turtle	Middle Suwannee	No
	Spring	Branford	Middle Suwannee	No
	Spring	Little River	Middle Suwannee	No
	Spring	Ruth/Little Sulfur	Middle Suwannee	No
	Spring	Troy	Middle Suwannee	No
	Spring	Royal	Middle Suwannee	No
	Spring	Peacock	Middle Suwannee	No
	Spring	Bonnet	Middle Suwannee	No
	Spring	Lafayette Blue	Middle Suwannee	No
	Spring	Allen Mill Pond	Middle Suwannee	No
	Spring	Charles	Middle Suwannee	No
	Spring	Anderson	Middle Suwannee	No

Table E5: SRWMD 2016 MFLs Priority List and Schedule

Year	Water Body Type	Water Body Name (Basin)	Basin	Within NFRWSP Area
2016 (cont)	Spring	Falmouth	Middle Suwannee	No
	Spring	Lime	Middle Suwannee	No
	Spring	Lime Run Sink	Middle Suwannee	No
	Spring	Steinhatchee Rise	Steinhatchee	No
	Spring	TAY76992 – Unnamed	Steinhatchee	No
	Spring	White	Upper Suwannee	Yes
	Spring	SUW923973 – Stevenson	Upper Suwannee	Yes
	Spring	Alapaha Rise	Upper Suwannee	Yes
	Spring	Holton Creek Rise	Upper Suwannee	Yes
	Spring	SUW1017972 – Unnamed	Upper Suwannee	Yes
	Spring	Suwannee	Upper Suwannee	Yes
	Spring	Suwanacoochee	Withlacoochee	No
2017	Lake	Santa Fe	Santa Fe	Yes
	Lake	Altho	Santa Fe	Yes
	Lake	Cherry	Withlacoochee	No
	River	Alapaha River	Alapaha	Yes
	River	Withlacoochee River	Withlacoochee	No
	Spring	Pot	Withlacoochee	No
2018	Lake	Ocean Pond	Santa Fe	Yes
	Lake	Palestine	Santa Fe	Yes
	Lake	Rowell	Santa Fe	Yes
	Lake	Crosby	Santa Fe	Yes
	Lake	Sampson	Santa Fe	Yes

Appendix F

Minimum Flows and Minimum Levels – Assessment

Technical Memorandum
North Florida Regional Water Supply Plan
Minimum Flows and Minimum Levels – Assessment
September 9, 2016

Minimum Flows and Minimum Levels (MFLs) were evaluated during the North Florida Regional Water Supply Plan (NFRWSP) process in order to determine whether established flows and/or levels would be achieved with projected groundwater withdrawals at the 20-year planning horizon (2035) in the NFRWSP area alone and within the entire North Florida-Southeast Georgia regional groundwater flow model (NFSEG) boundary. This document reviews the basic methodology used to assess MFLs status for the different types of waterbodies evaluated within the NFRWSP area followed by a summary of the assessment results.

Lake MFLs Assessment

Within the NFRWSP area, there are 47 lakes with adopted MFLs, all of which are located in the St. Johns River Water Management District (SJRWMD). Nineteen of those lakes were assessed in the NFRWSP. Of the 28 non-assessed MFL lakes, six show no significant connection to the Floridan aquifer and, therefore are minimally influenced by groundwater withdrawals. The remaining 22 lakes lacked sufficient data for assessment at the time of analysis (see Appendix E for additional details).

For each of the 19 assessed lakes, a freeboard value corresponding to the lake's surface water model year provided the amount of drawdown in the Floridan aquifer allowed before the most constraining MFL for each lake would no longer be achieved. Double mass analyses were performed using Floridan aquifer levels in a nearby long-term well and vicinity rainfall to determine if the aquifer level-rainfall relationship had changed during the time between the surface water model year and 2008 (or 2011 and 2012 for lakes Gore and Tuscawilla, respectively). Such a change may signify potential impacts from groundwater pumping. These analyses revealed no significant changes in the aquifer level-rainfall relationships and the conclusion was made that the freeboard values could be brought forward to 2008 (or 2011 and 2012 for lakes Gore and Tuscawilla, respectively).

The North Florida-Southeast Georgia groundwater flow model was used to derive predicted aquifer drawdowns beneath each MFL lake from 2009 (the calibrated baseline condition) to 2035. The assumption was made that freeboard values would not have changed significantly between 2008 and 2009 (or between 2011 and 2009 for Lake Gore and 2012 and 2009 for Lake Tuscawilla). The drawdown values were then compared to the starting freeboard values to determine current and future compliance with the MFL. A positive freeboard indicates that the MFL is being met and additional Floridan aquifer withdrawals are available. A negative freeboard indicates that the MFL is currently not being achieved (recovery status) or will not be achieved during the planning horizon (prevention status).

Based on the additional predicted drawdown at 2035 conditions within the NFRWSP area (with the remainder of the NFSEG domain kept at baseline, or 2009, conditions), all the evaluated lakes had freeboard available at 2035 indicating that their MFLs were met. The same was true for 2035 conditions within the NFSEG domain – all lake MFLs were achieved with various amounts of remaining freeboard.

River and Spring MFLs Assessment

The Lower Santa Fe and Ichetucknee rivers and associated priority springs were determined to be in recovery in reference to their MFLs. The analyses to support this determination can be found within the MFL document for these waterbodies (Appendix G). Under 2010 conditions, the analysis showed a flow deficit of 17 cubic feet per second (cfs) at the Santa Fe River near Ft. White and a flow deficit of 3 cfs at the Ichetucknee River at U.S. Highway 27. The impact of demand projections within the NFRWSP area through the 20-year planning horizon was evaluated by comparing the NFSEG 2009 calibrated baseline condition with the simulated withdrawal conditions at the 2035 planning horizon. Any modeled decrease in discharge relative to the 2009 model run was added to the estimated flow deficits. This planning evaluation is separate from the re-evaluation of the established MFLs that will occur prior to the end of 2019 (subsection 62-42.300(1)(e), Florida Administrative Code). The additional predicted flow reduction associated with 2035 projected water use within the NFRWSP area (with the remainder of the NFSEG domain kept at 2009 conditions) was 21.1 cfs for Santa Fe River and 12.6 cfs for the Ichetucknee River. Using 2035 pumping conditions for the entire NFSEG domain results in a further reduction in predicted flow of 4.4 cfs for the Santa Fe River and 0.6 cfs for the Ichetucknee River.

The Upper Santa Fe River MFLs were established in 2007 (WRA, 2007). The reference condition for these MFLs was evaluated using the NFSEG no pumping scenario. Flows at the Graham and Worthington Springs gages under the reference condition were compared to the modeled flows under the 2035 simulated withdrawal condition. The changes in flow at both gages were compared to the water available the reference condition as determined by the MFLs. Results indicate that the Upper Santa Fe River MFLs are met based on the total predicted reduction in flow at the Santa Fe River from the reference condition to 2035 conditions within the NFRWSP area (with the remainder of the NFSEG domain kept at baseline, or 2009, conditions) and to 2035 conditions within the entire NFSEG domain.

Table F1: NFRWSP MFLs Assessment Summary

Type	Name	County/Basin	WMD	Reference Year Freeboard[1] (ft or cfs)	MFL Status at Reference Year	MFL Status at 2035 conditions (NFRWSP Area)[2]	MFL Status at 2035 conditions (NFSEG Domain)[3]
Lake	Banana	Putnam	SJR	0.5	Met	Met	Met
Lake	Bell	Putnam	SJR	1.5	Met	Met	Met
Lake	Brooklyn	Clay	SJR	Under re-evaluation			
Lake	Broward	Putnam	SJR	1.8	Met	Met	Met
Lake	Como	Putnam	SJR	0.5	Met	Met	Met
Lake	Cowpen	Putnam	SJR	Under re-evaluation			
Lake	Dream Pond	Putnam	SJR	1.5	Met	Met	Met
Lake	Geneva	Clay	SJR	Under re-evaluation			
Lake	Georges	Putnam	SJR	2.0	Met	Met	Met
Lake	Gore	Flagler	SJR	2.9	Met	Met	Met
Lake	Grandin	Putnam	SJR	1.6	Met	Met	Met
Lake	Little Como	Putnam	SJR	1.3	Met	Met	Met
Lake	Orio	Putnam	SJR	0.6	Met	Met	Met
Lake	Silver	Putnam	SJR	0.6	Met	Met	Met
Lake	Stella	Putnam	SJR	1.4	Met	Met	Met
Lake	Swan	Putnam	SJR	2.7	Met	Met	Met
Lake	Tarhoe	Putnam	SJR	0.4	Met	Met	Met
Lake	Trone	Putnam	SJR	1.6	Met	Met	Met
Lake	Tuscawilla	Alachua	SJR	1.0	Met	Met	Met
River	Upper Santa Fe at Graham	Santa Fe	SR	1.0	Met	Met	Met
River	Upper Santa Fe at Worthington Springs	Santa Fe	SR	16.5	Met	Met	Met
River/Spring System	Ichetucknee River and Priority Springs	Santa Fe	SR	-3	Recovery	Recovery	Recovery
River/Spring System	Lower Santa Fe River and Priority Springs	Santa Fe	SR	-17	Recovery	Recovery	Recovery

[1] Freeboard reference year for Gore = 2011, Tuscawilla = 2012, all other SJRWMD MFL lakes = 2008; Reference year for Ichetucknee and Lower Santa Fe = 2010, Upper Santa Fe = Pumps off

[2] Groundwater modeling scenario simulated 2035 projected withdrawals within the NFRWSP area, with areas outside the NFRWSP area set to 2009 conditions

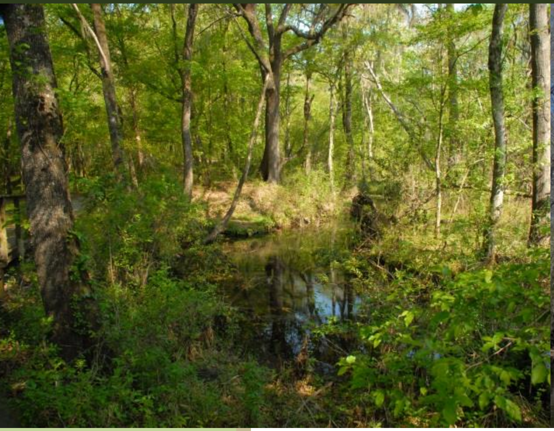
[3] Groundwater modeling scenario simulated 2035 projected withdrawals within the entire NFSEG domain

References

Water Resource Associates, Inc (WRA). 2007. *Technical Report: MFL Establishment for the Upper Santa Fe River*. Suwannee River Water Management District. Live Oak, FL.

Appendix G

Recovery Strategy: Lower Santa Fe River Basin



Recovery Strategy:

Lower Santa Fe River Basin

Lower Santa Fe and Ichetucknee Rivers and
Priority Springs
Minimum Flows and Levels

April 8, 2014

Recovery Strategy:

Lower Santa Fe River Basin

Lower Santa Fe and Ichetucknee Rivers and Priority Springs Minimum Flows and Levels

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April 8, 2014

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Appendices

1.0 INTRODUCTION

This Recovery Strategy for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs presents the methods and approaches intended to recover and maintain the streamflows and springflows in the Lower Santa Fe River Basin to the Minimum Flows and Levels (MFLs) adopted by the Florida Department of Environmental Protection (Department) in coordination with the Suwannee River Water Management District (SRWMD or District) and the St. John's River Water Management District (SJRWMD) on DATE. This introductory chapter provides the statutory background relevant to establishing MFLs, a general description of the Lower Santa Fe River Basin, and the basis for creating the Recovery Strategy.

1.1 MFL PROGRAM OVERVIEW

The State of Florida's Water Resource Act of 1972 requires the five Water Management Districts (WMDs) of the State to establish MFLs to ensure that water bodies do not experience significant harm as a result of water withdrawals. Specifically, Section 373.042, Florida Statutes [F.S.], states that minimum flows are to be established at "the limit at which further withdrawals would be significantly harmful to the water resources and ecology of the area." Once established, MFLs provide a metric to guide the WMDs water use planning and permitting processes for the protection and sustainable use of Florida's water resources.

Subsection 373.0421(2), F.S., specifies that an MFL Prevention or Recovery Strategy be undertaken under the following conditions concerning an established MFL:

> *(2) If the existing flow or level in a water body is below, or is projected to fall within 20 years below, the applicable minimum flow or level established pursuant to s. 373.042, the department or governing board, as part of the regional water supply plan described in s. 373.709, shall expeditiously implement a recovery or prevention strategy, which includes the development of additional water supplies and other actions, consistent with the authority granted by this chapter, to:*
>
> *(a) Achieve recovery to the established minimum flow or level as soon as practicable; or*
> *(b) Prevent the existing flow or level from falling below the established minimum flow or level.*
>
> *The recovery or prevention strategy shall include phasing or a timetable which will allow for the provision of sufficient water supplies for all existing and projected reasonable-beneficial uses, including development of additional water supplies and implementation of conservation and other efficiency measures concurrent with, to the extent practical, and to offset, reductions in permitted withdrawals, consistent with the provisions of this chapter.*

The Lower Santa Fe and Ichetucknee Rivers and Priority Springs MFLs and Recovery Strategy were developed by the SRWMD, in conjunction with the Department and SJRWMD, pursuant to these statutory directives.

1.2 ESTABLISHMENT OF THE BASIN RECOVERY STRATEGY

In May 2013, the SRWMD presented a draft technical report to establish MFLs for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs, (see **Table 2-3.** MFLs for Priority Springs on the Lower Santa Fe and Ichetucknee Rivers, for a listing of priority springs). The District elected to have the proposed MFLs voluntarily peer reviewed by the University of Florida Water Institute, and in November 2013, the District utilized the findings and recommendations of the peer review panel to develop the final proposed MFLs for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs. The MFLs are briefly summarized in Section 2 of this report, and are discussed in detail in “Minimum Flows and Levels for the Lower Santa Fe and Ichetucknee Rivers,” published by the District, and dated November 22, 2013. The SRWMD assessed the streamflows observed in the recent historical record and recent trends in the flow regime, and concluded that the Lower Santa Fe River MFL as measured at the Fort White Gage and Ichetucknee River MFL as measured at the US Highway 27 Gage are not currently being met. Based on this circumstance and the legislative directive established in Section 373.0421, F.S., the SRWMD and the Department have determined that the Lower Santa Fe and Ichetucknee Rivers and their priority springs are in recovery and will require a Recovery Plan to restore their stream and springflows to the proposed MFLs.

To fulfill the legislative directive to restore the stream and springflows on the Lower Santa Fe and Ichetucknee Rivers to the proposed MFLs, the SRWMD, in conjunction with the Department and the SJRWMD, has developed this Recovery Strategy for the Lower Santa Fe River Basin. This Recovery Strategy is designed to implement preliminary regulatory measures to initiate the MFL recovery process, and provide a path forward to implement long-term water management strategies to restore and maintain minimum flows in the Lower Santa Fe and Ichetucknee Rivers and their priority springs while providing for adequate water supplies to meet current and future water use needs.

1.3 BACKGROUND

This Section provides a brief summary of the recent water resource analysis and planning actions that preceded the development of the MFLs for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs.

Water Supply Planning

In December 2010, the SRWMD Governing Board accepted the District’s 2010 Water Supply Assessment (Assessment) in accordance with Section 373.036, F.S. The Assessment concluded that groundwater levels in the Upper Floridan aquifer had declined significantly during the past 75 years as a result of regional groundwater withdrawals in both the Suwannee River and St. Johns River Water Management Districts, and southeast Georgia. The Assessment also concluded that the water resources in the northeastern portion of the SRWMD are declining, or predicted to decline, during the 2010–2030 planning period. As a result, the northeast portion of the SRWMD was subdivided into four Water Supply Planning Regions, which included the Lower Santa Fe River Basin planning region. The analysis conducted in the Assessment indicated that unacceptable impacts to flows in the Lower Santa Fe River and springs were predicted for the 2010–2030 planning period. Pursuant to Rule 62-40.520(2), Florida Administrative Code [F.A.C.], the SRWMD Governing Board designated the four Water Supply Planning Regions (including the Upper and Lower Santa Fe River Basins) as Water Resource Caution Areas (WRCAs) on October 11, 2011.

Rule 62-40.531, F.A.C., specifies that a Regional Water Supply Plan should be developed for each Water Supply Planning Region. Based on the unique geology of the District, and the fact that the impacts to springflows and springfed rivers are linked to regional groundwater trends, both within and outside of the SRWMD, District staff concluded that water supply planning for the Lower Santa Fe Basin should be conducted as part of a broader multi-region planning effort with the SJRWMD.

Upper Santa Fe River MFLs

On December 10, 2007, the SRWMD established and adopted MFLs for the Upper Santa Fe River. At that time, the SRWMD determined that streamflows in the Upper Santa Fe River had not fallen below the established MFL. For the purpose of establishing that MFL, the SRWMD defined the Upper Santa Fe as the Santa Fe River upstream of the USGS Worthington Springs Gage. The SRWMD currently monitors the status of streamflows in the Upper Santa Fe River, and continues to evaluate its status with regard to its established minimum flows.

Existing Agreements

To better protect and manage the shared water resources of north Florida, on September 13, 2011 the SRWMD, SJRWMD, and the Department entered into an agreement to formalize the coordination of regional water resource management. This Interagency Agreement (IAA) resulted in the creation of the North Florida Regional Water Supply Partnership (NFRWSP), which includes the two water management districts, the Department, the Florida Department of Agriculture and Consumer Services (FDACS), as well as local elected officials and area stakeholders. The NFRWSP works to develop joint water resource protection strategies and focuses on communication with stakeholders across district boundaries during the preparation of a joint regional water supply plan between the SRWMD and SJRWMD.

A major element of the IAA is the North Florida Regional Water Supply Plan (Plan), which is scheduled for draft completion in late 2015. The Plan study area includes the four WRCAs in the SRWMD and the northern nine counties of the SJRWMD. Observed impacts to water resources in the Lower Santa Fe and Ichetucknee Rivers and their priority springs will be discussed in the Plan, as well as solutions to mitigate those impacts and recover the region’s water resources. The Plan is discussed in greater detail in Section 5 of this report.

Recent Legislative Developments

In the 2013 Florida Legislative Session, the State Legislature passed Senate Bill 244 (SB244), which primarily relates to the adoption of MFLs and the associated Recovery and Prevention strategies. SB244 was approved by the Governor of Florida on June 28, 2013, and subsequently adopted into law as Chapter 2013-229, Laws of Florida. This law amended s. 373.042, F.S. so that any MFL and related recovery or prevention strategy adopted by the Department shall be applied by all relevant WMDs without the need for further rulemaking. Additionally, Chapter 2013-229 expands the ability of the WMDs to coordinate management efforts and jointly fund recovery strategies and projects to address regional water resource issues. The addition of this legislation to the MFL program provides an important mechanism for the State’s WMDs to establish MFLs in a manner that addresses regional impacts to water resources. This is particularly significant in the protection of groundwater-based resources, such as springs and springflow dominated rivers, as the impacts to these systems can be regional in nature, and may extend across district boundaries. This legislation provides a basis to further expand the partnership between the SRWMD and SJRWMD to better address regional trends in the Upper Floridan aquifer and to achieve MFL targets where cross-boundary effects have been identified. This will also achieve water supply goals in the joint planning area of both districts.

MFL and Recovery Strategy Rule Adoption

In light of the new provisions provided in SB244, now codified in 373.042, F.S., and the regional nature in the management of groundwater systems, the SRWMD Governing Board requested in June 2013 that the Department adopt both the Lower Santa Fe and Ichetucknee Rivers and Priority Springs MFLs and the Lower Santa Fe and Ichetucknee Rivers and Priority Springs Recovery Strategy. As such, the Department will adopt the MFLs, as well as the regulatory portion of the Recovery Strategy by rule, which will thereafter be implemented by the WMDs with no further rulemaking required. The remaining non-rule portions of the Recovery Strategy will then be implemented jointly and cooperatively by the WMDs.

1.4 SANTA FE RIVER BASIN

The following sections provide a brief overview of the Santa Fe River Basin's general setting, hydrogeology, and the regional and local water use regime, which form the foundation upon which the Recovery Strategy was developed. The information contained in these sections is generally derived from the District's Technical Report, "Minimum Flows and Levels for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs" (SRWMD, 2013).

General Setting

The Santa Fe River Basin is located in the easternmost portion of the SRWMD, and primarily lies in Alachua, Columbia, Union, Bradford, and Gilchrist Counties, as well as smaller portions of Suwannee, Baker, Clay, and Putnam Counties. These areas are mostly rural in nature, with several small municipalities and communities located within the basin. The more developed and populated communities of Lake City and Gainesville, which are located to the north and south of the watershed boundaries, play a significant role in regional water demand and hydrology. The City of Gainesville and the associated metropolitan area have experienced significant growth and development in recent decades, driven by the presence of the University of Florida and its associated institutions.

The Santa Fe River Basin features several popular recreational areas containing springs, swallets, and river rises, including Ichetucknee Springs State Park, O'Leno State Park, and River Rise State Park. Several significant springs are also present in the basin, including Ichetucknee Head Springs, Blue Hole, Cedar, Mission, Grassy, Mill Pond, and Coffee Springs on the Ichetucknee River, and Ginnie, Poe, Hornsby, Rum Island, Devil's Eye, and Gilchrist Blue Springs along the Santa Fe River. Recreational uses of the Santa Fe and Ichetucknee Rivers and their associated springs, which include tubing, snorkeling, fishing, cave diving, and the use of small watercraft, represent an important economic resource in the region.

For the development of the proposed Lower Santa Fe and Ichetucknee MFLs, the Lower Santa Fe River Basin study area was defined as: Olustee Creek, the Santa Fe River downstream from the mouth of Olustee Creek, the Ichetucknee River, and the watersheds associated with these streams, as shown in **Figure 1-1.** This area includes the Lower Santa Fe River and its tributaries downstream of the USGS Worthington Springs Gage, which was the lower extent of the presently adopted Upper Santa Fe River MFLs.

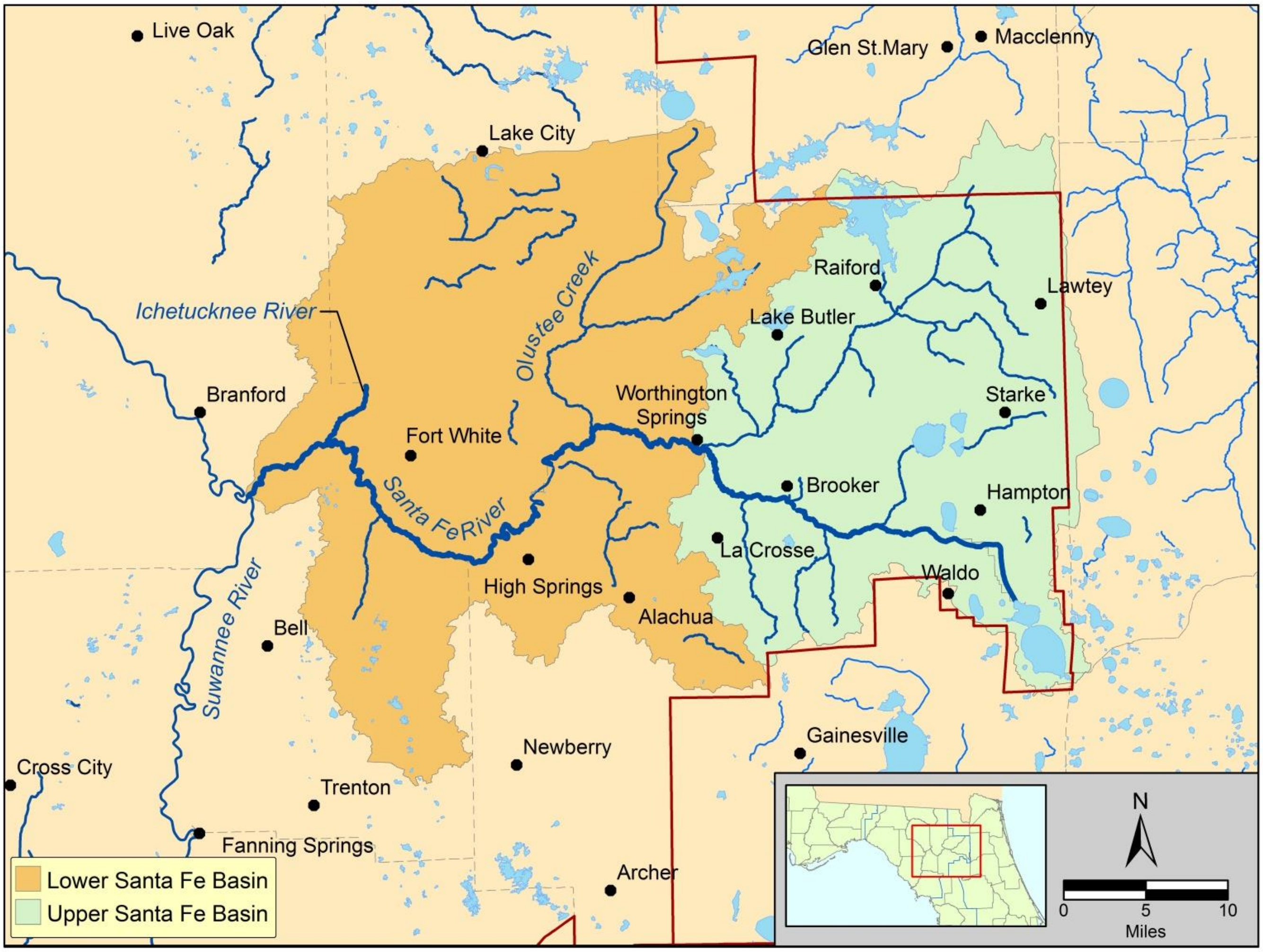


Figure 1-1. Location and Extent of the Lower Santa Fe River Basin MFL Study Area

Hydrogeology

The Santa Fe River Basin straddles two major physiographic provinces which greatly affect the hydrology of the area: the Northern Highlands and the Gulf Coastal Lowlands, separated by the Cody Escarpment (Upchurch, 2007);(White, 1970). These features, along with the underlying Upper Floridan aquifer, dominate the local hydrologic regimes of the Santa Fe River Basin. A generalized description of the hydrogeology of the basin is provided in this section, and a detailed description of the geology of the Santa Fe Basin can be found in the Lower Santa Fe and Ichetucknee Rivers MFL document (SRWMD, 2013).

NORTHERN HIGHLANDS

The Northern Highlands (White, 1970) are present in the eastern and northern portions of the Lower Santa Fe River Basin in parts of Columbia, Union, and Alachua Counties. The Northern Highlands consist of a plateau made up of a thick sequence of relatively low-permeability Miocene Hawthorn Group sediments, which are capped in some areas by undifferentiated Pleistocene-age sandy sediments. Due to the relatively low permeability sediments at or near the surface, local rainfall drainage in the Northern Highlands is dominated by surface water features, with numerous lakes, swamps, and streams present. The Upper Santa Fe River and its tributaries (such as Olustee Creek) convey surface water runoff from the Northern Highlands as evidenced by the drainage patterns illustrated in **Figure 1-2**.

GULF COASTAL LOWLANDS PROVINCE

The Gulf Coastal Lowlands extend inland from the Gulf of Mexico shoreline, a distance of approximately 50 miles, terminating in the western portion of the Lower Santa Fe River Basin. The Gulf Coastal Lowlands are characterized by broad and flat marine plains blanketed by thin Pleistocene sands, which overlie the porous Ocala Limestone of the Upper Floridan aquifer (Rupert, 1988).

As a result of the thin sediment cover over porous limestone, karst features are numerous in the Gulf Coastal Lowlands, and the Lower Santa Fe Basin is punctuated by various depressional features, such as sinkholes. This extensive karst development creates a groundwater-dominated drainage pattern; consequently, the Lower Santa Fe River Basin in the Gulf Coastal Lowlands is largely devoid of stream channels. Furthermore, surface water features in this area of the Lower Santa Fe Basin, including the Santa Fe and Ichetucknee Rivers, generally exhibit a high degree of connectivity to the Upper Floridan aquifer.

CODY ESCARPMENT

The Cody Escarpment (Scarp) is a physiographic feature that represents the largest continuous topographic break in Florida. The Cody Scarp generally separates the Northern Highlands from the Gulf Coastal Lowlands, as shown in **Figure 1-2**. The geomorphologic features of the Cody Scarp and similar physiographic features are unique, and developed due to a combination of headward erosion by streams and dissolution of carbonate rocks by streams and groundwater. The land surface along the Cody Scarp typically contains sinkholes, sinking streams, and other large and well-developed karst features.

The hydrology of the Lower Santa Fe River Basin is markedly influenced by the karst terrain. In the vicinity of the Cody Scarp, the Santa Fe River flows into a swallet (a sinkhole where streams go underground) at O'Leno State Park (north of High Springs) and reappears (resurges) approximately three miles south-southwest at River Rise Preserve State Park. The flows in the Santa Fe River consist of a combination of stormwater runoff and groundwater discharge. The upper portion of the Santa Fe River (above Worthington Springs) is dominated by stormwater runoff. Downstream of this reach the river flows through a transitional area of increasing groundwater influence, with the lower portion of the Santa Fe River and the entirety of the Ichetucknee River dominated by springflow.

UPPER FLORIDAN AQUIFER

The Upper Floridan aquifer is the primary source of water supply for all water use types in the Lower Santa Fe River Basin, and also provides the baseflow in the Lower Santa Fe and Ichetucknee Rivers and priority springs. The primary Upper Floridan aquifer production zone in the Lower Santa Fe Basin is the upper portion of the Ocala Limestone, where dissolution processes have greatly increased the porosity and productivity of the limestone. The Upper Floridan aquifer is generally well confined or semi-confined by Hawthorn Group sediments in the Northern Highlands, and is generally unconfined in the Gulf Coastal Lowlands. In the Lower Santa Fe River Basin, the Upper Floridan aquifer discharges to the Santa Fe and Ichetucknee Rivers and their springs under most conditions (with the exception of flood events). As a result, maintaining Upper Floridan aquifer water levels in the Lower Santa Fe River

Basin is critical to maintaining flow in the springs and baseflow in the Lower Santa Fe and Ichetucknee Rivers.

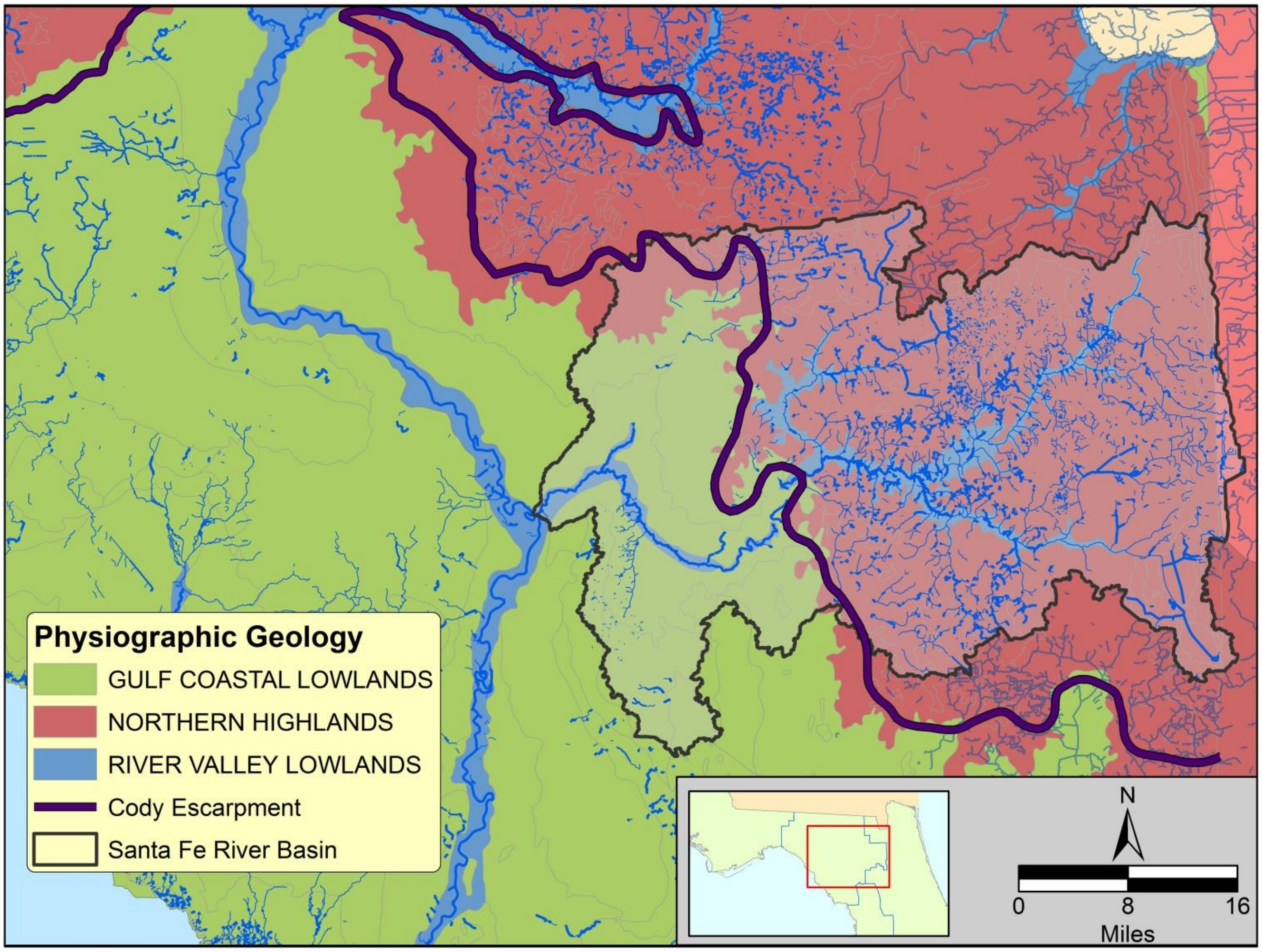


Figure 1-2. Physiography of the Lower Santa Fe River Basin

1.5 REGIONAL WATER USE

In the Santa Fe Basin and throughout the north Florida region, the Upper Floridan aquifer remains the primary source of water for all uses by a wide margin. Presently, within the SRWMD and the nine northernmost counties of the SJRWMD, groundwater withdrawals make up an estimated 581 Million Gallons per Day (MGD) of a total estimated water use of 753 MGD (data compiled by Marella, USGS Florida Water Science Center). Historically, the majority of groundwater use in this region was centered in the more developed areas along the east coast, but in recent years, agricultural water uses have increased significantly in the inland areas, particularly in the Suwannee River Basin. This groundwater-based water use regime has persisted in north Florida for much of the twentieth century to the present, and has contributed to significant regional groundwater declines (Grubbs, 2007). These regional groundwater level declines have been identified in the Upper Floridan aquifer throughout the north Florida region, and have impacted groundwater-based water resources in this area, including freshwater springs and their contributions to baseflow in streams and rivers.

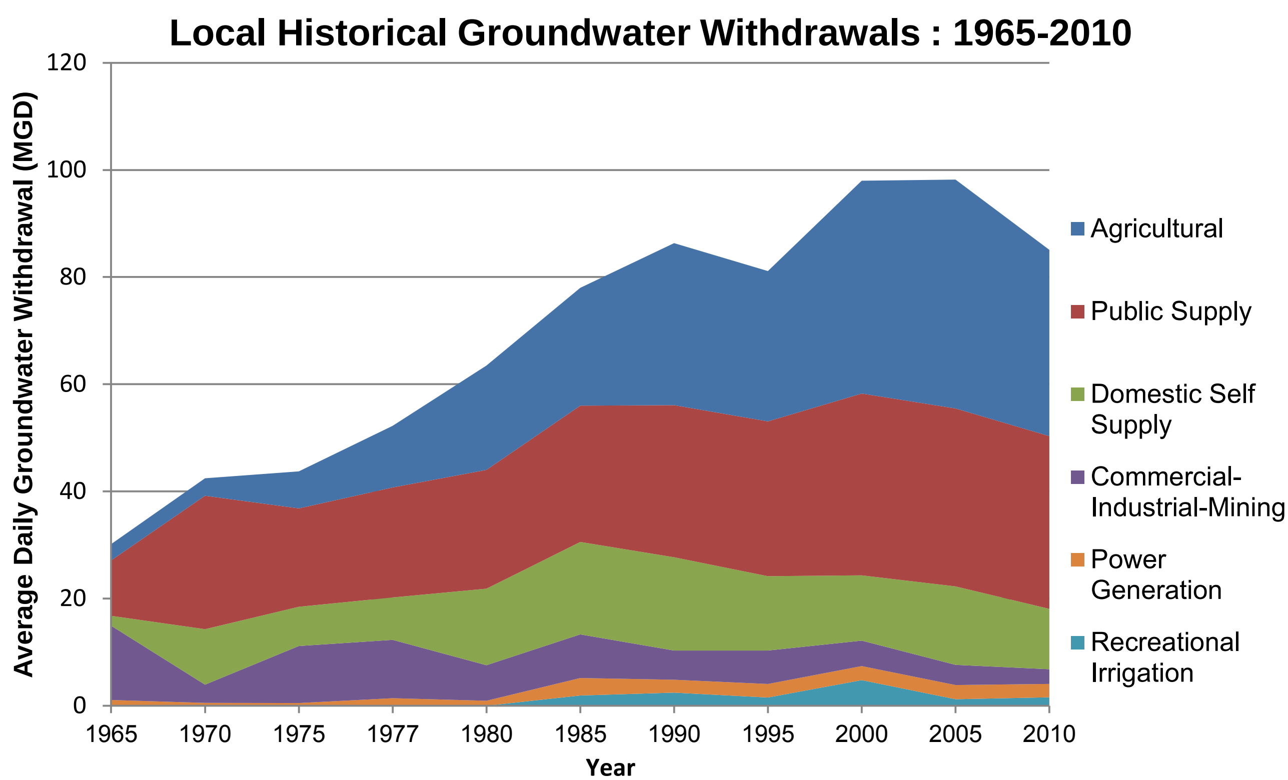
Although climatologic trends have affected the hydrologic regime, analyses conducted by SRWMD during the development of the Lower Santa Fe Basin MFLs indicated that regional groundwater use had contributed to observed stream and springflow impacts within the Santa Fe Basin. Regional impacts to the Lower Santa Fe Basin are discussed in Section 3.0 of this report.

Historical Water Use

This section provides a brief overview of the historical local water use regime in the Santa Fe River Basin. Although regional drivers have contributed to water resource impacts in the Santa Fe Basin, an understanding of local water use patterns is critical to the implementation of a successful Recovery Strategy. To examine historical trends in water use in the Santa Fe River Basin, the District utilized historical estimated water use data compiled by the United States Geological Survey (USGS) Florida Water Science Center for Alachua, Bradford, Columbia, Gilchrist, and Union Counties, which comprise the majority of the Santa Fe River Basin. The historical water use data record extended from 1965 to 2010, with records available for every fifth calendar year. The records utilized in this analysis can be found as an appendix in the MFL document, and are also available from the USGS Florida Water Science Center. It should be noted that at the time of this publication, the 2010 records are still preliminary and subject to future revision by the USGS.

In 1965, total water use in the five county area of the Santa Fe River Basin was approximately 31.4 MGD. Groundwater withdrawals accounted for 96% of this use. The major water use groups were commercial-industrial-mining and public supply, which utilized approximately 13.9 MGD and 10.4 MGD respectively. Self-supplied agricultural irrigation accounted for a relatively low percentage of total use, at approximately 4.3 MGD, or 14% of total use. It is noteworthy that in 1965 over one quarter (1.2 MGD) of agricultural demand was satisfied by surface water withdrawals.

Since 1965, water use has changed significantly in this five county area. Based on 2010 preliminary water use estimates, total water use in this area has increased to 85.9 MGD, with groundwater usage constituting 99% of all withdrawals. To date, several of the counties in this area have relatively little overall water use, namely Union, Bradford, and Gilchrist Counties, which used only an estimated 3.1 MGD, 5.3 MGD, and 9.2 MGD of fresh groundwater in 2010. Among the various user groups, agricultural use within the Santa Fe River Basin has increased significantly since the late 1970s due to advances in irrigation technology. Currently, self-supplied agriculture is the largest user of water in the Santa Fe Basin, accounting for approximately 41% of total freshwater withdrawals in 2010 at an estimated 35.3 MGD. Water withdrawals for public supply have also grown significantly in association with increasing population in this five county area, now totaling approximately 32.2 MGD. Domestic self-supply experienced similar growth in this period, but has remained relatively steady since the 1980s, now totaling approximately 11.3 MGD. It should also be noted that commercial-industrial-mining uses have decreased significantly since 1965, and now account for only 2.7 MGD, or 3% of total withdrawals in this five county area. These reductions have been offset by growth in other areas, with agriculture and public supply increasing greatly in this period.



[1]Data Source: USGS Florida Water Science Center

Figure 1-3 Historical Groundwater Withdrawals for Various Uses in Alachua, Bradford, Columbia, Gilchrist, and Union Counties

In summary, agriculture, public supply, and domestic self-supply currently exert the greatest demand for water in the Santa Fe River Basin region. Together, these three water use groups account for nearly 91% of estimated freshwater withdrawals. Based on current data, the vast majority of these demands are expressed in the form of groundwater withdrawals from the Upper Floridan aquifer, such that all demands are from fresh groundwater sources. Therefore, the strategies developed by the SRWMD to recover and maintain stream and springflows in the Lower Santa Fe and Ichetucknee Rivers, in accordance with the proposed MFLs, will be designed to address and ameliorate the effects of these local withdrawals.

Local Land Use

The dominant land cover of the Santa Fe Basin is forest and rangeland, which makes up approximately 57% of the basin land cover (based on SRWMD generalized Florida Land Use, Land Cover Classification System, FLUCCS, data from 2008). **Figure 1-4** depicts the generalized land use in the Santa Fe River Basin. Much of the forested land in the basin has been modified or managed for silviculture, although this is believed to have a minimal impact on the overall basin water use. Approximately 19% of the land cover of the basin is agricultural, and is generally utilized for rowcrop production such as peanut and corn operations, as well as some cattle and dairy operations and plant nurseries. Together, agriculture and silviculture account for much of the economic activity in the basin. Urban and transportation land uses make up a small but significant portion (approximately 9%) of the basin land cover. The largest concentrations of urban land within the Santa Fe River Basin are located near Lake City and near the eastern boundary of the District (the US Highway 301 corridor including the City of Starke in Bradford County).

Table 1-1. Historical Land Use within the Santa Fe River Basin

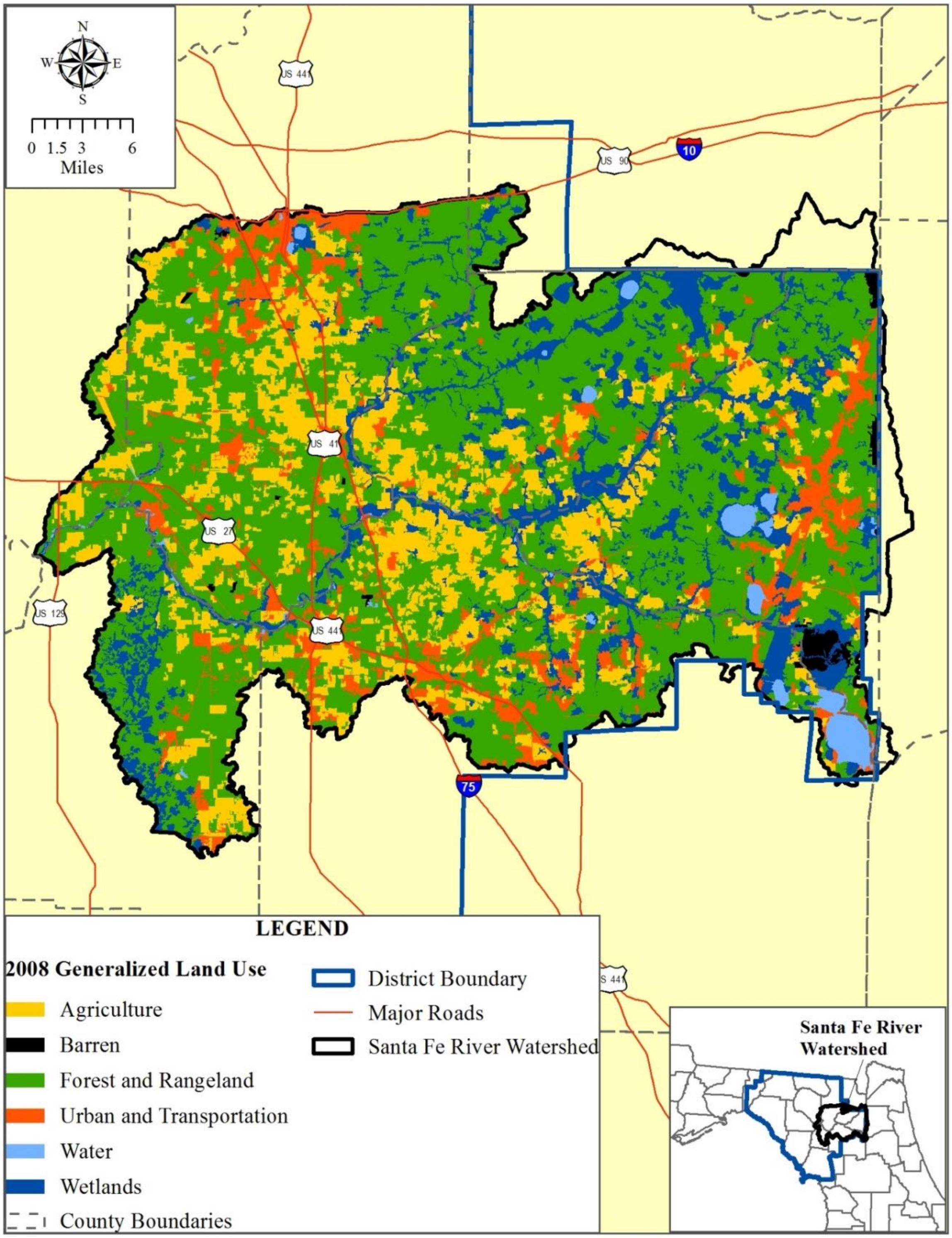
FLUCCS[1] Code	Land Use Description	1970s		1988		2008	
		Area (ac)	Percent	Area (ac)	Percent	Area (ac)	Percent
1000	Urban and Transportation	16,655	1.9	26,218	3.1	80,710	9.4
2000	Agriculture	252,836	29.5	212,803	24.8	159,420	18.6
3000 and 4000	Forest and Rangeland	489,689	57.2	516,860	60.3	488,384	57.0
5000	Water	11,935	1.4	14,731	1.7	14,485	1.7
6000	Wetlands	80,983	9.5	85,040	9.9	107,531	12.6
7000	Barren	4,468	0.5	907	0.1	6,071	0.7
	Total	856,567	100.0	856,558	100.0	856,601	100.0

[1] Florida Land Use and Cover Classification System

The Santa Fe Basin has also experienced shifts in historical land use in recent decades. **Table 1-1,** provides a summary of the historical land use coverages in the Santa Fe Basin. The amount of land in agricultural production decreased significantly in recent decades, shifting from approximately 30% of the basin area in the 1970s, to only 19% of land cover by 2008. This trend lies in sharp contrast to the trend in self-supplied agricultural water use, which has increased greatly since the 1970s. This inverse relationship partially reveals the increased water demand created in the Lower Santa Fe region subsequent to the introduction of more intensive irrigation practices since the late 1970s. It should be noted that a minor portion of the changes in land use acreages in the Florida Land Use and Cover Classification System may be attributed to uncertainty in the development of this data from aerial photography; however, this data provides the best available information about the general historical changes in land use in the Santa Fe Basin over the last several decades.

The Santa Fe Basin has also experienced a significant increase in urban and transportation land use in recent years (**Figure 1-4**). In the 1970s, residential, commercial, industrial, and transportation land uses collectively comprised approximately 2% of the basin area. By 2008, it had risen to approximately 9%. Part of this increase in urban land use was associated with increased development in Lake City and Columbia County, as well as along the Interstate 75 corridor. This increase in urban land corresponds to increased water withdrawals for both the public supply and domestic self-supply water use groups.

In summary, the dominant land cover in the Santa Fe Basin, forest and rangeland, has remained relatively constant over the last several decades. Additionally, the basin has experienced a trend toward the smaller agricultural acreage totals, which are managed at higher irrigation intensity, while urban areas have experienced modest but steady growth. These trends in land use within the Santa Fe Basin provide a basis for formulating local recovery measures, and also illustrate the need to plan for future changes in the types and quantities of the water use in implementing the Recovery Strategy.



[1] Source: SRWMD generalized Florida Land Use, Land Cover Classification System, 2008

Figure 1-4. 2008 Land Use within the Santa Fe River Basin

2.0 SUMMARY OF PROPOSED MFLS

The following sections provide a brief overview of the MFLs proposed for the Lower Santa Fe and Ichetucknee Rivers and their Priority Springs. For a complete description of the development of the proposed MFLs, refer to "Minimum Flows and Levels for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs," published by the District, and dated November 22, 2013.

State policy guidance established in Rule 62-40.473, F.A.C., lists ten environmental and water resource values that must be considered in establishing MFLs. These values, referred to in this report as Water Resource Values or WRVs, are specific aspects or specific uses of the natural system to be considered during MFL development. Two WRVs were relevant to the study area and had sufficient available information to allow for an evaluation of the relationship between the WRVs and system hydrology: (1) Recreation in and on the water, and (2) Fish and wildlife habitats and the passage of fish. The predominant metrics used for these values include:

- Santa Fe River near Fort White:
  - Fish and wildlife habitat and the passage of fish: fish passage, floodplain vegetation inundation, floodplain hydric soils, bankfull flows, in-stream habitat;

- Ichetucknee River at US Highway 27:
  - Fish and wildlife habitat and the passage of fish: fish passage, bankfull flows, floodplain hydric soils, in-stream habitat.
  - Recreation in and on the water: recreational tubing

The District developed a continuous MFL flow regime that incorporated the available information relating to these values. During the establishment of the MFL, District staff utilized the historical streamflow record prior to 1990 as a historical baseline, since significant streamflow reductions due to anthropogenic impacts were not readily discernable in the flow record during that timeframe. This historical baseline flow regime was utilized to develop the MFL flow regime, and also provided a mechanism for evaluating the compliance status of the rivers. Given the characteristics of the rivers and the available flow data, MFLs were developed at two river gages, the Fort White Gage on the Lower Santa Fe River and the US Highway 27 Gage for the Ichetucknee River. Based on flow records, District staff determined that the Lower Santa Fe River is in recovery with an estimated streamflow deficit of 17 cubic feet per second (cfs) as of 2010. Likewise, District staff also determined that the Ichetucknee River is in recovery, with an estimated streamflow deficit of 3 cfs.

2.1 PROPOSED MFL CRITERIA

The following tables provide a numerical summary of the proposed MFL flow regime for the Lower Santa Fe and Ichetucknee Rivers, on a percent exceedance basis (the percentage of time that each flow listed is expect to be exceeded). The baseline (built on the historical flow record prior to 1990) flows from the MFL analysis are provided for comparison.

Table 2-1. MFL Flow Values and Baseline Flows for the Lower Santa Fe River near Fort White

Flow Duration Curve	Discharge Exceedance Amounts (cfs)						
	5%	10%	25%	50%	75%	90%	95%
Baseline	**3,230**	**2,630**	**1,860**	**1,320**	**1,050**	**885**	**810**
MFL	**3,101**	**2,523**	**1,768**	**1,214**	**920**	**749**	**672**

Table 2-2. MFL Flow Values and Baseline Flows for the Ichetucknee River at US Highway 27

Flow Duration Curve	Discharge Exceedance Amounts (cfs)						
	5%	10%	25%	50%	75%	90%	95%
Baseline	**483**	**457**	**395**	**354**	**328**	**304**	**280**
MFL	**473**	**448**	**386**	**343**	**318**	**282**	**246**

In addition to developing MFLs for the Lower Santa Fe and Ichetucknee Rivers, the District also established MFLs for each of the priority springs associated with these rivers. The Priority Springs MFLs were expressed as a cumulative allowable percent reduction in baseline springflow discharge for each listed spring. The allowable reduction was developed based on the allowable reduction in streamflow from the associated river flow at median conditions (i.e., at the 0.5 exceedance probability). This method ensures that the maximum change at any individual priority spring contributing to flow in either river will continue to provide the same proportional flow contribution to the river under the MFL regime that it did under baseline conditions.

Table 2-3. MFLs for Priority Springs on the Lower Santa Fe and Ichetucknee Rivers

Spring	Allowable Reduction from Baseline at Median Springflow
Santa Fe Rise	8%
ALA112971 (Treehouse)	
Hornsby	
Columbia	
Poe	
COL101974	
Rum Island	
July	
Devil’s Ear (Ginnie Group)	
Siphon Creek Rise	
Ichetucknee Head	3%
Blue Hole	
Mission	
Devil’s Eye	
Grassy Hole	
Mill Pond	

2.2 PEER REVIEW

As previously stated, the SRWMD elected to conduct voluntary, independent, scientific peer review of the technical analysis used to develop the MFLs. In accordance with Section 373.042, F.S., SRWMD contracted with the University of Florida's Water Institute to conduct the peer review of the initial draft MFL technical report in July 2013. During the peer review period the District also solicited comments on the draft MFLs from stakeholders. The draft peer review report was submitted to the SRWMD on September 11, 2013, and the final peer review report, entitled "Peer Review of the Proposed Minimum Flows and Levels for the Lower Santa Fe and Ichetucknee Rivers and Associated Priority Springs," was submitted to the SRWMD on October 11, 2013.

According to the Peer Review Report, the peer review panel "supports the general approach that the SRWMD has adopted to develop MFLs for the Lower Santa Fe and Ichetucknee Rivers" and further concluded that "the panel believes that, with relatively minor and easily reconcilable exceptions noted in the report, the SRWMD utilized the best available data and information in their analyses." The peer review report further provided a number of comments, recommendations, and suggestions for SRWMD staff to consider or evaluate in finalizing the proposed MFLs. The SRWMD addressed the comments of the peer review and utilized the findings and recommendations to develop the final proposed MFL to ensure that MFLs are based on the best available information. Additionally, as the stakeholder comments were received, SRWMD staff worked to incorporate those comments into the final MFL report to the extent practical. A complete summary of the District's response to the peer review and other public comments received can be found in "The Minimum Flows and Levels for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs Peer Review and Public Comment Resolution Document," published on December 17, 2013, which is available on the SRWMD's website (www.mysuwanneeriver.com).

2.3 MFL COMPLIANCE STATUS

To evaluate the current regulatory status of the Lower Santa Fe and Ichetucknee Rivers with respect to the MFL flow regimes, the District utilized several physical and empirical hydrologic models; observed streamflow and climate data were used to assess the degree of historic impacts to the water resources. By examining several metrics for impacts to streamflows, the District built a body of scientific evidence to ascertain the compliance status of the priority water bodies. By comparing this weight of evidence of estimated impacts to streamflows in the Lower Santa Fe and Ichetucknee Rivers to the MFL flow regimes, the District assessed whether the Lower Santa Fe and Ichetucknee Rivers are currently meeting their MFLs. A full technical description of these analyses is provided in the MFL report.

Comparison of the weight of evidence of streamflow impacts for the Lower Santa Fe River with the proposed MFL indicated that the Lower Santa Fe River had an estimated flow deficit of 17 cfs in 2010. Thus the MFL being proposed for the Lower Santa Fe River is not currently being met. *Based on the estimated streamflow deficit of 17 cfs (approximately 11 MGD) below the proposed MFL, the SRWMD has determined that the Lower Santa Fe River is not currently meeting the MFL*, *and requires a Recovery Strategy to achieve the restoration of minimum flows.*

Similar comparison of the weight of evidence of streamflow impacts for the Ichetucknee River with the proposed MFL indicated that the Ichetucknee River currently has an estimated streamflow deficit of 3 cfs (approximately 2 MGD). *Based on the estimated streamflow deficit of 3 cfs (approximately 2 MGD)* *below the proposed MFL, the SRWMD has determined that the Ichetucknee River is not meeting the MFL, and requires a Recovery Strategy to achieve the restoration of minimum flows.*

Chapter 373.0421(2), F.S., provides clear direction in the event the existing flow in a water body is below the applicable minimum flow. Consistent with Section 373.0421, F.S., these circumstances necessitate the development of a Recovery Strategy for the Lower Santa Fe and Ichetucknee Rivers and their associated priority springs.

3.0 ASSESSMENT OF REGIONAL HYDROLOGIC INFLUENCE

In order to effectively develop and direct the components of the Recovery Strategy, the origins and causes of the impacts to streamflows and springflows must be examined. Previous work conducted in the 2010 Water Supply Assessment indicated that groundwater withdrawals throughout the north Florida and southeast Georgia region were contributing to trends in regional groundwater levels. To assess the potential effects of regional groundwater withdrawals on streamflow reductions in the Lower Santa Fe Basin, the SRWMD conducted an analysis to examine the effects of groundwater withdrawals outside of the SRWMD boundaries on the flows in the Lower Santa Fe and Ichetucknee Rivers and priority springs. A detailed summary of this analysis is included in the MFL document. The results of the District's analysis indicated that a significant portion of the stream and springflow impacts to the Lower Santa Fe and Ichetucknee Rivers and priority springs are the result of groundwater withdrawals originating outside of the SRWMD's boundaries.

ANALYSIS APPROACH AND METHODOLOGY

The primary tool the District employed to examine the effects of regional groundwater withdrawals on the Lower Santa Fe River and Ichetucknee River streamflows and springflows was the District's North Florida Model (NFM). The NFM is a finite difference, numerical groundwater flow model which the District developed for the north Florida region. The geographic extent of the NFM is shown in **Figure 3-1.** The NFM can be used to examine the effects of various groundwater withdrawals on regional groundwater levels and flows in springs and baseflows in groundwater dominated rivers. The model can also be used to estimate the benefits of proposed recovery projects and programs within the District. The WMDs intend to continue to utilize the best available modeling tools within their respective boundaries to direct the development and implementation of recovery measures until a joint model is available for use throughout the planning area.

To develop an understanding of the impact of existing groundwater withdrawals within the north Florida region on Lower Santa Fe Basin streamflows and springflows, District staff used the NFM to evaluate several theoretical groundwater conditions. Initially, the current flows of the Lower Santa Fe and Ichetucknee Rivers were examined with current estimated groundwater use included in the model (the "pumps on" condition). District staff then evaluated several hypothetical "pumps-off" scenarios, which were created by removing various groundwater withdrawals from the model. Initially, the District established several theoretical predevelopment flow scenarios by removing groundwater pumping from the model across the entire model domain. Staff then created comparable scenarios in which only groundwater withdrawals within SRWMD boundaries were removed from the model. This allowed the District to examine the theoretical impact of groundwater withdrawals outside of SRWMD boundaries on the Lower Santa Fe River and Ichetucknee River streamflows if no local withdrawals were present. By comparing the theoretical streamflows from the various "pumps-on" and "pumps-off" modeling scenarios, the District was able to assess the potential for regional groundwater uses both within and outside of the SRWMD to impact streamflows in the Lower Santa Fe and Ichetucknee Rivers.

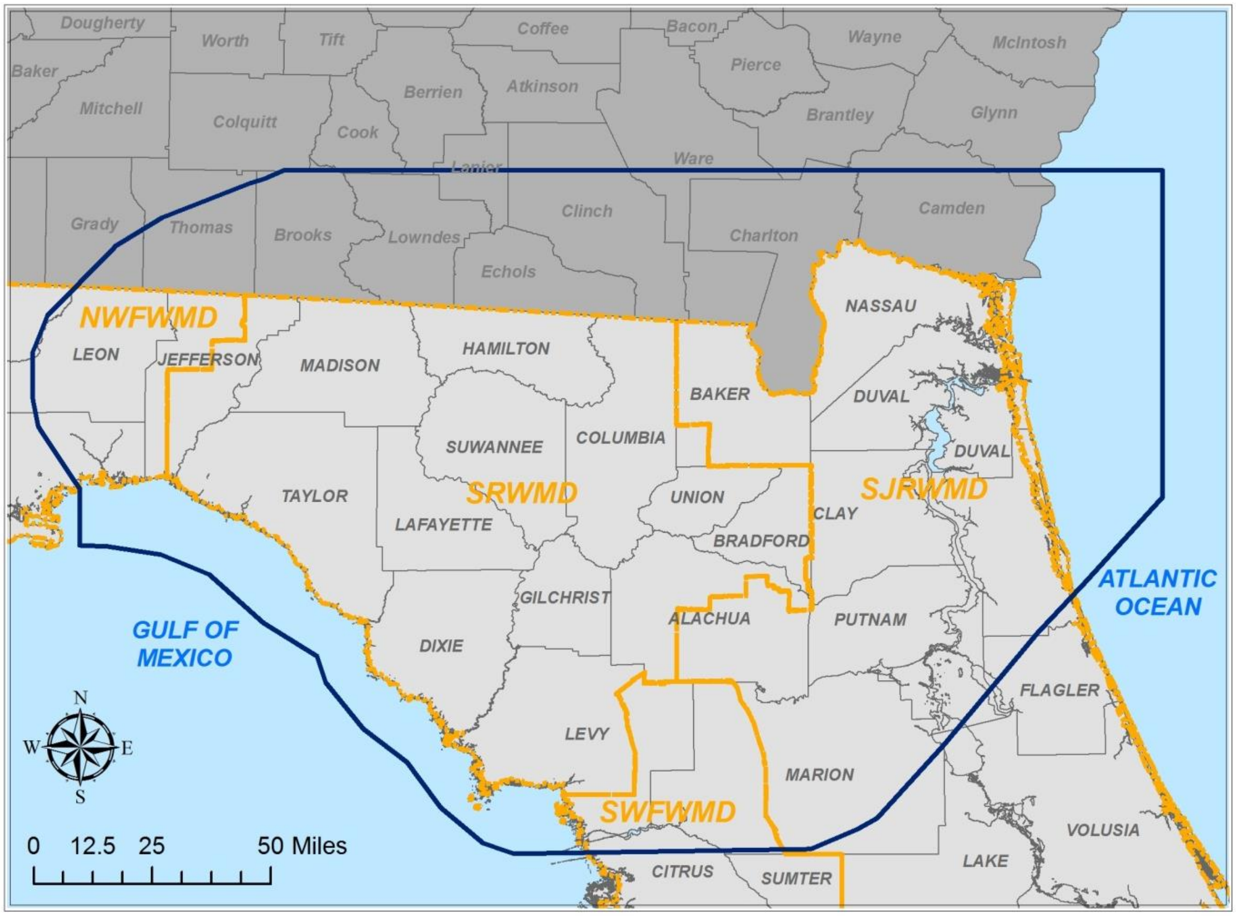


Figure 3-1. Geographic Extent of the North Florida Model.

REGIONAL IMPACTS

Although there are some technical limitations associated with this type of analysis, the use of the District's current groundwater model can provide qualitative insight into general regional hydrologic effects on the Lower Santa Fe River Basin. Current findings and modeling results indicate that impacts to streamflows and springflows in the Lower Santa Fe Basin are the result of groundwater withdrawals both within and outside of SRWMD boundaries. This conclusion mirrors the findings of the 2010 Assessment.

Based on these findings, it is clear that groundwater use in both the SWRMD and SJRWMD contribute to the current status and thus, the cross boundary MFLs and Recovery Strategies are appropriate to achieve long-term recovery and maintenance of minimum flows in the Lower Santa Fe Basin. This emphasizes the importance of continuing to work with other regional water agencies and user groups, particularly the SJRWMD. As previously mentioned, the passage of new legislation in Chapter 2013-229 of the Laws of Florida will further increase the ability of the SRWMD and SJRWMD to coordinate recovery efforts to address these regional groundwater trends and achieve MFL recovery in the Lower Santa Fe Basin and other priority water bodies.

The SRWMD and SJRWMD are currently working on the development of broader, regional groundwater modeling tools, particularly the North Florida Southeast Georgia Model (NFSEG). Once completed, the WMDs will continue to utilize the best available tools to further assess regional water use and hydrologic trends.

4.0 RECOVERY STRATEGY GOALS AND APPROACH

Based on the findings in the proposed MFLs for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs, streamflows and springflows on the Lower Santa Fe and Ichetucknee Rivers have fallen below the proposed MFLs. This circumstance has necessitated the development of a Recovery Strategy, consistent with Section 373.0421, F.S. The purpose of this Recovery Strategy is to develop near-term managerial practices to address these streamflow impacts, and provide a framework to identify long-term water management strategies, water resource development projects, and conservation measures, which can be implemented to recover and maintain the flows in these water bodies at the proposed minimum flow criteria.

GUIDING PRINCIPLES

To maximize the effectiveness of the Recovery Strategy, the SRWMD, in conjunction with the Department and SJRWMD, developed the following principles to guide the design and execution of the Recovery Strategy:

- Use the best available information.
- Strategy components and projects should contribute significantly to resource management and recovery.
- Ensure the Recovery Strategy is implemented as expeditiously as practicable.
- Seek consistency with other prevention or recovery strategies, the NFRWSP, and other state and regional water management programs.
- Recovery strategies should not adversely impact water bodies in adjacent basins and counties of north Florida.
- Protect the investment of existing water use permit holders.
- Provide the flexibility needed to allow economic growth.
- Provide incentives to maximize the benefits of public/private partnerships.

These guiding principles support the creation and implementation of an effective and practical strategy for the recovery and maintenance of minimum flows in the Lower Santa Fe and Ichetucknee Rivers and Priority Springs, as defined by the proposed MFLs.

RECOVERY GOALS

To further guide the development of this Recovery Strategy and ensure clarity of its intent, the SRWMD, in conjunction with the Department and SJRWMD, enumerated the following goals:

1. Achieve the restoration of the Lower Santa Fe and Ichetucknee Rivers and their priority springs to their proposed minimum flows.
2. Develop measures to provide sufficient water supplies for existing and projected reasonable-beneficial uses as practical.

TIME-TABLE FOR STRATEGY IMPLEMENTATION

In coordination with the SJRWMD and the Department, the SRWMD has established a timeframe for implementation of the Recovery Strategy, which extends from rule adoption through 2035. This schedule coincides with the planning timeframe of the North Florida Regional Water Supply Plan, and will be divided into two phases of implementation. A brief summary of the recovery measures to be conducted in the two phases of the Recovery Strategy is provided in **Table 4-1**, and the components of the Recovery Strategy are detailed in Sections 5 and 6 of this document. The focus of the first phase will be the implementation of the preliminary regulatory strategies to protect the MFL water bodies from additional harm, creation of water resource development project concepts, and the implementation of water conservation measures. Phase I will extend from rule adoption until the development of the long-term recovery measures with the completion of the North Florida Regional Water Supply Plan, expected to be finalized in late 2015.

Phase II of the Recovery Strategy will focus on the implementation of the recommendations in the North Florida Regional Water Supply Plan, the adoption of long-term regulatory measures, and the identification and execution of any necessary water resource development and alternative water supply projects. Phase II will be divided into five-year project cycles, beginning in 2015. After each five-year period, a general assessment of water resource conditions and program efficacy will be conducted in cooperation with the SJRWMD. These five-year cycles will include assessment of the success of the recovery measures implemented to date, and will provide a basis for continuing refinement of the Recovery Strategy and for adaptive management to new hydrologic conditions and water use patterns, as detailed in Section 7 of this document.

Table 4-1. Prevention and Recovery Strategy Implementation

	Action	Regulatory Action Required
Phase I (2013-2015)	**FDEP will adopt preliminary Recovery Strategy Regulatory Measures:** • Implement supplemental review criteria for individual water use permit applicants: offset of new impacts to recovering MFL water bodies and limited duration permits for existing impacts • Implement special condition to ensure uses comply with future recovery measures. • Implement special water use permit condition for MIL evaluation every five years for applicable agricultural uses.	FDEP adopt regulatory measures into Rule 62-42 F.A.C.
	Work with user groups to implement water conservation measures and ensure public participation in the planning process.	No regulatory action required for implementation
	Direct SRWMD agricultural cost-share funding to implement enhanced agricultural conservation practices based on MIL evaluations.	No regulatory action required for implementation
	Planning: • Complete NFSEG model. • Examine impacts of regional user groups on MFLs throughout the north Florida region (Keystone-area, Ichetucknee, Lower Santa Fe, or other). • Identify and investigate potential water resource development projects and water supply projects that can contribute to resource recovery • Use regional model analysis, MFLs constraints, project concepts, and related information to establish regional water availability for existing and new quantities, concurrently with the North Florida Regional Water Supply Plan. • Develop long-term regulatory measures to address regional impacts to MFLs and achieve regional water supply goals of the North Florida Regional Water Supply Plan.	No regulatory action required for implementation
Phase II (2015-forward)	**Based on results of regional model analysis, assessment for major users/groups, and magnitude of prevention/recovery needed, identify water supply measures needed to achieve MFLs.**	No regulatory action required
	Use regional model analysis, MFLs constraints, project concepts, and related information to determine regional water availability for existing and new sources. Implement long-term regulatory measures as required to achieve MFLs.	FDEP adopt rules in 62-42 F.A.C.
	Further develop and implement water resource development projects and water supply projects throughout the north Florida region to restore and maintain MFLs and to provide sufficient water supplies for existing and projected reasonable-beneficial uses.	No regulatory action anticipated for implementation

5.0 RECOVERY STRATEGY COMPONENTS

In order to restore and maintain streamflows to the proposed MFLs, the SRWMD, with support from the Department and SJRWMD, identified five strategic components to be evaluated and incorporated into the Recovery Strategy. The components are:

- **Planning Component**: Development of the North Florida Regional Water Supply Plan.
- **Water Conservation Component**: Increase the Efficiency of Existing Water Use.
- **Water Supply Development Component**: Projects to Implement Alternative Water Supplies.
- **Water Resources Development Component**: Projects to Enhance or Protect the Water Resources of the Lower Santa Fe River Basin.
- **Regulatory Component**: Utilizing Existing Rules to Ensure Compliance with the Proposed MFLs.

Based on the recent publication of the proposed MFLs for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs, the SRWMD considers these strategy components to represent a basic foundation for minimum flows recovery in the Lower Santa Fe River Basin. A list of current and conceptual regional projects currently being assessed for each component is provided in Appendix A. A preliminary timeline for implementing these components is provided as Appendix B.

5.1 PLANNING COMPONENT: DEVELOPMENT OF THE NORTH FLORIDA REGIONAL WATER SUPPLY PLAN

As previously discussed, there have been significant impacts to the water resources of the Lower Santa Basin from water uses both within and outside of the SRWMD. The reductions in streams and springflows in the Lower Santa Fe River Basin are the result of both the local impacts within the Santa Fe Basin and regional declining trends in Upper Floridan aquifer groundwater levels that have occurred throughout north Florida. As such, projects, conservation measures, and regulatory strategies to achieve recovery of the Lower Santa Fe and the Ichetucknee Rivers and priority springs must address regional impacts. These measures are best considered in a regional water supply planning context. To create effective programs and measures to achieve recovery, the Planning Component of the Recovery Strategy is being conducted concurrently and as a component of the North Florida Regional Water Supply Plan.

The SRWMD and SJRWMD are working together to draft the North Florida Regional Water Supply Plan (Plan), under the IAA. The planning region, shown in **Figure 5-1**, will address the projected regional water use demand for the 2015–2035 planning horizon, as well as the water resource impacts that could occur based on future projected population growth and estimated increased water demands. Upon completion, the Plan will also identify potential water conservation initiatives, water supply development projects, including alternative water supply projects, and water resource development projects that collectively will provide sufficient water to meet all existing and future reasonable-beneficial needs while sustaining the water resources and natural systems, which includes offsetting predicted water resource impacts. The Plan will provide guidance to effectively manage the water resources of the Lower Santa Fe Basin in a holistic manner, and provide the framework to create long-term strategies to address regional impacts to the Lower Santa Fe River Basin.

In addition to the current North Florida Regional Water Supply Plan initiative, the SRWMD will continue to pursue future agreements and partnerships with federal, state, and local agencies, and resource stakeholders for participation in planning efforts.

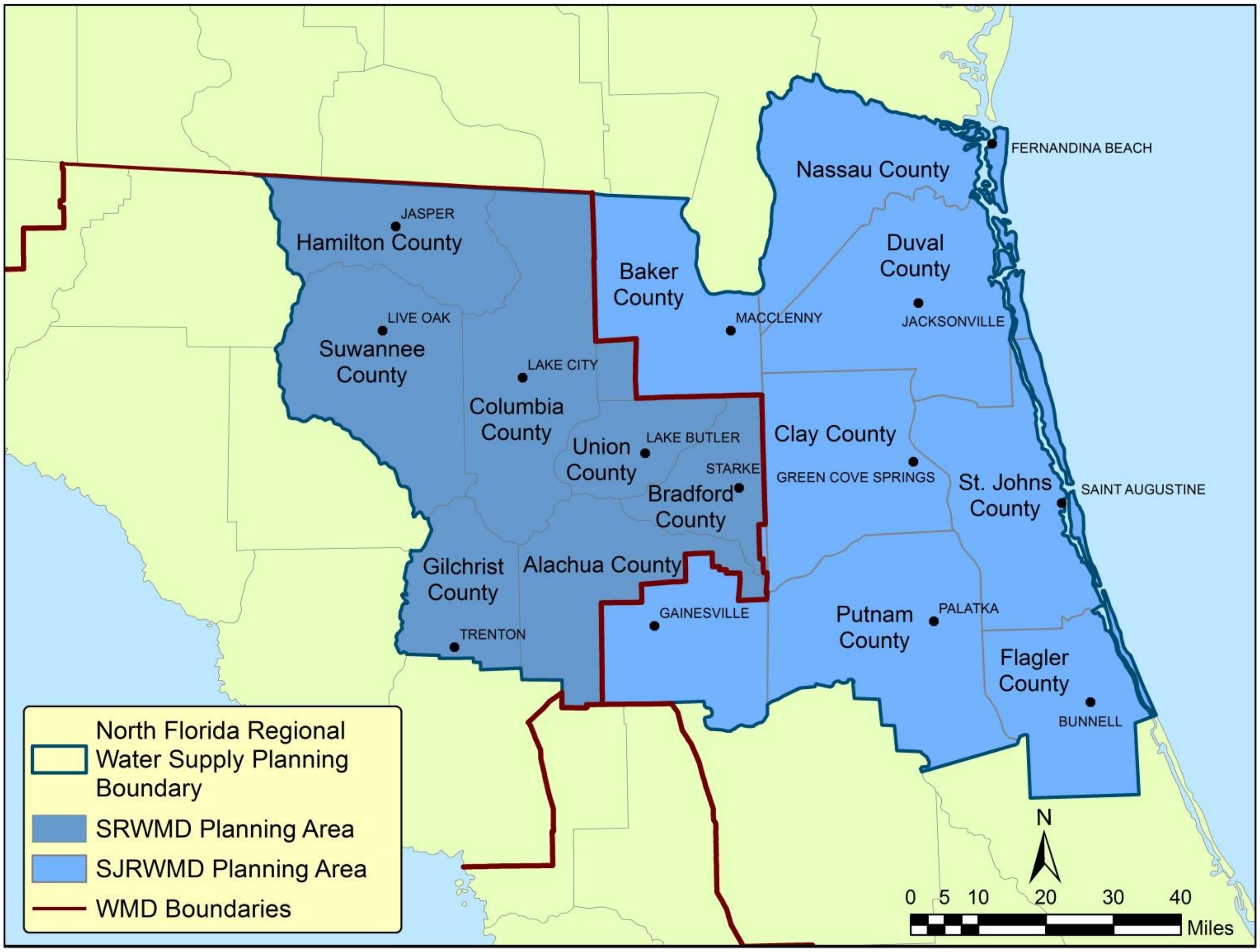


Figure 5-1. North Florida Regional Water Supply Planning Area

5.2 WATER CONSERVATION COMPONENT

Increased emphasis on water conservation programs is one of the primary tools the District will employ to meet the requirements for MFL Recovery in the Lower Santa Fe River Basin. These programs will focus on increasing the efficiency of water use throughout the Lower Santa Fe River Basin, and will be tailored to the various water use categories. Legislative findings provided in Subsection 373.227(1), F.S. state: *"The Legislature recognizes that the proper conservation of water is an important means of achieving the economical and efficient utilization of water necessary, in part, to constitute a reasonable-beneficial use."* As such, it should be noted that water conservation is expected of all users, and that successful conservation practices among specific users as part of the Recovery Strategy, will not preclude the responsibility for other users to maintain sound water conservation practices. The success of the Recovery Strategy will be contingent upon maintaining present conservation practices and continued improvement of conservation practices and programs throughout the north Florida region.

Agricultural Water Conservation

Currently, agricultural groundwater use accounts for an estimated 40% of the total water use in the Santa Fe River Basin. Although the historical impacts to Santa Fe Basin streamflows and springflows are the result of both regional and local water use, local agricultural water conservation practices will be an essential component towards achieving MFL Recovery in the Lower Santa Fe River Basin. There are currently several existing agricultural water conservation programs within the SRWMD, and the District plans to utilize these programs and also explore new strategies to reduce agricultural groundwater consumption within the Lower Santa Fe River Basin.

The primary approach to water conservation amongst agricultural water users is to minimize water use to what the producer needs to meet product requirements for their operation. Several strategies to optimize agricultural water use processes are:

- Continual improvement of Best Management Practices maintained by FDAC and DEP in conjunction with the industry to minimize water use needs for agricultural operations.
- Irrigation technology improvements to improve water use efficiency.
- Supporting implementation of water conservation practices among agricultural water users with Mobile Irrigation Labs and WMD agricultural outreach programs.
- Support continued refinement of science based modeling of water use requirements for agricultural commodities to efficiently apply water only on an as needed basis per the BMP process. These efforts could be coordinated with such entities as the SRP, IFAS, the UF Water Institute, and industry to maintain and continuously improve the model(s). Support efforts to improve real-time water use efficiencies through the use of Weather/Eco stations which could incorporate on site rainfall, ET and soil moisture into individual producers irrigation practices.

This section provides a brief summary of the estimated potential for agricultural water conservation, and how the District has implemented these water conservation strategies and intends to utilize them in support of the Lower Santa Fe and Ichetucknee Rivers and Priority Springs Recovery Strategy.

AGRICULTURAL WATER CONSERVATION POTENTIAL

During the development of this Recovery Strategy, the District conducted a local assessment of water conservation potential within the five counties comprising the majority of the Santa Fe Basin. Current USGS water use data estimated that annual irrigation demand accounts for approximately 30.3 MGD of water use in these counties (note that the values in this section only include the portions of these counties located within the SRWMD). Using potential water savings data compiled by Mobile Irrigation Labs (MILs) and 2010 agricultural acreage data, the District developed an estimate of total agricultural conservation potential in this area based on crop type. This information is summarized in **Table 5-1**.

Table 5-1 Potential Agricultural Water Savings by Crop Type for Alachua, Bradford Columbia, Gilchrist, and Union Counties

Crop Type	2010 Irrigated Acres	Use per Acre (MGD)	Total Irrigation Use (MGD)	Savings per Acre (MGD)	Potential Total Savings (MGD)
Vegetables (Mixed Vegetables, Melons)	6,617	0.00098	6.51	0.00010	0.66
Nursery (Fern and Ornamentals)	1,369	0.00942	12.90	0.00083	1.14
Blueberries and Grapes	1,231	0.00096	1.18	0.00025	0.31
Field Crops (Corn, Soy, etc.)	6,282	0.00105	6.62	0.00038	2.37
Sod, Pasture, Grass	3,649	0.00086	3.12	0.00027	1.00
Total	**19,148**		**30.33**		**5.48**

[1]Analysis based on 2010 USGS Water Use Estimate Data

The results of this analysis indicate that of the approximately 30.3 MGD of water use for agricultural irrigation in these counties, up to 5.5 MGD of water use could be saved by implementing standard measures to increase irrigation efficiency for existing irrigation systems. Typical practices which would be implemented to achieve this potential water savings include: center-pivot retrofits, replacement of worn irrigation nozzles, and other measures that improve the efficiency of existing irrigation systems. In order to achieve these water savings, it is essential that agricultural users within the Santa Fe Basin undergo MIL evaluations, providing a quantitative basis to direct District cost-share funding, and for area farmers to optimize their irrigation practices. Presently, the SRWMD estimates that the two MILs currently operating in this area have sufficient capacity to conduct evaluations for the permitted agricultural operations in this area within a five year window.

It should be noted that the data presented here on potential irrigation efficiency is only based on the potential efficiency improvements of existing irrigation systems, as evaluated previously by the MILs. As such, this analysis does not take into account other potential water conservation practices aside from improving the delivery of water in existing systems. The District recognizes that there is considerable additional potential for water conservation beyond the efficiency data supplied by the MIL evaluations and intends to continue to pursue increases in agricultural irrigation conservation through future programs. Conservation practices which the District has encouraged in the past or is currently evaluating include switching to more efficient irrigation systems (i.e. replacing overhead irrigation with drip irrigation), adjusting agricultural practices to less water intensive methods (i.e. conservation tillage), and utilizing alternative water supplies (such as farm ponds or tailwater recovery).

AGRICULTURAL WATER CONSERVATION COST-SHARE PROGRAMS

One of the primary tools the SRWMD will utilize to achieve increases in water conservation among agricultural users is the use of cost-share programs. The SRWMD has recently implemented several successful cost-share programs for agricultural water conservation practices, in conjunction with FDEP and FDACS. Conservation practices for which the SRWMD has offered cost-share funds include: center pivot irrigation retrofits, installation of subsurface drip irrigation, installation of soil moisture probes and weather stations, and upgrades to irrigation pumps and irrigation control systems. In October 2012, the SRWMD initiated a cost-share program with a value of $1.5 million. During the first four phases of this cost-share program, over $1.2 million were distributed, resulting in the implementation of conservation projects that are projected to save an estimated 5.2 MGD in agricultural water use district-wide. This program was administered throughout the District. Based on the results of current cost-share programs, the typical cost of achieving and maintaining these water conservation practices over a twenty-year cycle would be approximately $0.20 per 1,000 gallons of water savings, representing an efficient cost recovery program when compared to infrastructure improvements or other large projects. In order to achieve increases in agricultural water conservation in the Santa Fe Basin as expeditiously as possible, the SRWMD intends to prioritize its current agricultural efficiency cost-share programs to the most sensitive areas of the Santa Fe Basin.

SRWMD AGRICULTURAL ASSISTANCE TEAM

The SRWMD Agricultural Assistance Team (“Ag Team”) is an agricultural outreach program that was created to assist agricultural operations with water use and environmental resource permits, Best Management Practices (BMPs), and cost-share programs. The Ag Team implements the SRWMD’s cost-share programs for agricultural water conservation projects and acts as a liaison for agricultural cost-share programs operated by other state agencies.

The District envisions Ag Team participation as a critical component of MFL recovery in the Lower Santa Fe River Basin. As the MFL Recovery Strategy is implemented, the Ag Team will assist agricultural operators in compliance with recovery measures and their water use permit conditions. Furthermore, the Ag Team will work with agricultural users within the basin to achieve higher participation rates in water conservation practices. When dispensing cost-share funding, the Ag Team will prioritize projects that offer the greatest contributions to priority water bodies in the MFL Recovery areas.

SUWANNEE RIVER PARTNERSHIP

Another partner the District will rely on to assist in the ongoing implementation of the MFL Recovery Strategy is the Suwannee River Partnership (Partnership). The Partnership is a coalition of state, federal, and regional agencies, local governments, and private industry representatives formed in 1999 to address nitrate levels in the surface waters and groundwater of the Middle Suwannee River Basin. The District, FDACS, and the Department are members of the Partnership. One of the hallmarks of the Partnership is its history of voluntary or incentive-based programs for water quality protection in the local agricultural industry. The Partnership works to increase agricultural participation in these voluntary and incentive-based nutrient reduction BMP programs, as an alternative to regulatory enforcement.

Based on the Partnership’s past success in increasing BMP enrollment and the use of environmental management plans, the District will continue to work with the Partnership to increase participation in agricultural water conservation measures in the Lower Santa Fe River Basin.

COORDINATION WITH OTHER AGENCY PROGRAMS AND GRANTS

One method which the District has employed in the past to reduce agricultural water use is coordinating involvement between agricultural producers and other state and regional agencies. For example, in February 2012, the Department established a Basin Management Action Plan (BMAP) to reduce nutrient loadings to the Santa Fe River, under the Total Maximum Daily Loads (TMDL) program. The Department subsequently made cost-share funding available for BMP implementation within the Santa Fe River Basin. The District shares regulatory authority for the BMAP, and is administering the BMP cost-share program. As the BMPs implemented address both water quality and water conservation, the District was able achieve an estimated 1.2 MGD potential reduction in agricultural water use, in addition to a significant reduction in fertilizer use.

In addition to the BMAP program, the District coordinated with agricultural users to participate in cost-share programs offered by FDACS and the Environmental Quality Incentives Program (EQIP), administered by the US Department of Agriculture's Natural Resource Conservation Service (NRCS). By continuing to coordinate with other agencies and water quality programs, the District can provide access to cost-share funds for the implementation of conservation practices to reduce agricultural water use in the Lower Santa Fe River Basin.

WORK WITH IFAS AND USER GROUPS

Many of the water conservation practices currently employed by agricultural users were developed years ago and may not fully account for the advances in agricultural technology and research that have taken place in the last few decades. As such, the University of Florida's Institute of Food and Agricultural Sciences (IFAS) continues to do research on new agricultural conservation practices. The District may partner with IFAS and other agencies to ensure that new and innovative water conservation practices are implemented as they are developed. The District will also explore opportunities for cost-sharing between IFAS and producers in the Lower Santa Fe River Basin as part of research or pilot study efforts to improve water conservation.

Non-Agricultural Water Conservation

In order to achieve restoration and maintenance of minimum flows in the Lower Santa Fe and Ichetucknee Rivers and priority springs, the District will also implement water conservation measures for non-agricultural water user groups. This section provides a brief overview of the potential conservation measures that can be implemented with publicly supplied domestic users, self-supplied users, utilities, and commercial, industrial, and institutional users. The District anticipates working with local municipalities and utilities to implement these conservation programs and encourages adoption by the residents and water users of the affected areas.

NON-AGRICULTURAL WATER CONSERVATION POTENTIAL

To provide a general estimation of the recovery potential for non-agricultural water conservation, the District relied on the results of the 2010 Assessment. The Assessment included District-wide projected water demands for the 2030 timeframe, as well as estimations of potential conservation for each user group. It should be noted that the water use estimates in this section represent total District-wide use, and do not include permitted uses in the SJRWMD portion of Alachua County. The data are summarized in **Table 5-2.**

Based on the 2010 estimates, under a no-action scenario, demand for water for public supply, domestic self-supply, and recreational irrigation uses within the SRWMD would increase by an estimated 9.4 MGD. However, estimates of water conservation potential for these uses indicate that up to 8.8 MGD of this projected demand could be offset by potential water conservation. Thus, if the estimated conservation potential for public supply, domestic self-supply, and recreational irrigation uses is realized in the 2030 timeframe, increases in new withdrawal for these uses would be limited to minor increases (approximately 0.6 MGD cumulatively). This analysis indicates that achieving the maximum potential water conservation among these user groups is likely an important strategy to reduce the need to increase groundwater withdrawals within the SRWMD, thus minimizing additional impacts to the water resources of the Lower Santa Fe River Basin.

Additionally, the results of the 2010 Assessment indicate that among commercial, industrial, and institutional users, there is a potential for a net reduction in water use of nearly 4 MGD, if the estimated water conservation potential is achieved. It should also be noted that the commercial, industrial, and institutional conservation potential was estimated as 5% of total projected use for individual users, and the potential for conservation or water reuse could be significantly higher among commercial, industrial, and institutional users than indicated by this analysis. Based on these results and current initiatives with existing commercial, industrial, and institutional operations, the District believes that achieving improved water conservation and reuse among this user group could provide significant reductions in groundwater use to aid the recovery of the water resources of the Lower Santa Fe Basin. As such, the District intends to continue to work with commercial, industrial, and institutional users to achieve improvements in water conservation to benefit the water resources of the Lower Santa Fe Basin.

Table 5-2. Non-Agricultural Water Conservation Potential within the SRWMD

	2010 Estimated Water Use	2030 Projected Water Use	Projected Increase	2030 Conservation Potential	Net Water Use Change after Conservation
Public Supply	23.30	27.37	4.07	3.70	0.37
Commercial/Industrial/ Institutional	84.72	85.70	0.98	4.94	-3.96
Domestic Self Supply	18.87	23.76	4.89	4.75	0.14
Recreational Irrigation	1.81	2.20	0.39	0.31	0.08
Total	128.70	139.03	10.33	13.70	-3.37

[1]All values provided in MGD

The SRWMD and SJRWMD are currently developing improved estimates of water conservation potential as a part of the North Florida Regional Water Supply Plan. As these estimates are developed, they will be incorporated into the Recovery Strategy to improve the direction and implementation of conservation measures.

EDUCATIONAL PROGRAMS AND PUBLIC AWARENESS

One of the primarily challenges in implementing water conservation programs is encouraging resident participation. As such, the District will implement educational programs aimed at increasing the public's general knowledge about water conservation and its ecological and economic benefits. In particular, the District will reach out to local municipalities and schools to provide a forum for conservation education presentations. Additionally, the District will seek to form working relationships with local interest groups and charities, such as the Ichetucknee Partnership, to aid in the dissemination of water conservation educational materials. The educational programming will not only provide information about water conservation, but also provide specific information about the ecological health and economic importance of the Lower Santa Fe and Ichetucknee Rivers and priority springs, as well as their MFL recovery status. This will aid in linking the water conservation measures being implemented to specific community natural resources, with the goal of increasing public participation in water conservation programs.

To further increase public participation in domestic and commercial water conservation, the District will issue water conservation notices during periods of drought in the Santa Fe River Basin. These conservation notices will primarily serve as a form of public outreach, seeking to inform water users about water conservation measures the District is recommending, or temporary rules restricting irrigation for lawns and ornamental landscape and other outdoor water uses. The water conservation notices will include practical water conservation recommendations for domestic and commercial users.

HIGH EFFICIENCY FIXTURES AND APPLIANCES

High efficiency fixtures and appliances can potentially save hundreds of gallons of water per month per application. The District will examine the potential to work with local utilities and local plumbing and home improvement retailers to implement rebate programs for high efficiency fixtures and appliances. Where practicable, rebate programs can result in significant reductions in domestic water use at a minimal cost to the District, while increasing business for local retailers. The District will also examine the feasibility of high-efficiency fixture (such as showerheads) giveaways which achieve material reductions in water use, and can also spur public interest and participation in other domestic water conservation practices.

SRWMD LAWN AND LANDSCAPE IRRIGATION RULE

In many areas of Florida, home landscape irrigation is estimated to make up roughly 50% of domestic water use. Although the proportion of water use for home irrigation in the District is generally considered to be lower due to the rural nature of the region, landscape irrigation still contributes significantly to groundwater withdrawals.

To address landscape irrigation, on January 6, 2010, the District implemented a lawn and landscape irrigation rule which limits irrigation to two days per week during Daylight Savings Time and one day per week during Standard Time. The rule also requires that watering not be conducted between 10 AM and 4 PM, when evaporation is greatest. During periods in which a Water Shortage Order was declared by the District, additional irrigation restrictions were implemented, such as limiting irrigation to one day per week during Daylight Savings Time and assigning specified lawn watering days based on home address, as was the case in the summer of 2012. As demonstrated by the Southwest Florida Water Management District, adjusting watering restrictions from two days to one day per week can achieve public supply water use reductions of 9% to 20% (Whitcomb, 2005). To aid in MFL Recovery, the District will continue to implement the lawn and landscape irrigation rule. The District will work with local governments and utilities to develop a long-term enforcement plan to ensure stakeholders are informed of and comply with the landscape irrigation rule.

FLORIDA FRIENDLY LANDSCAPE AND LOW IMPACT DEVELOPMENT

In addition to water conservation via watering restrictions, lawn and landscape irrigation demand can also be reduced by the use of Florida Friendly Landscaping. Florida Friendly Landscaping is defined in the Florida Statutes as “landscapes that conserve water, protect the environment, are adaptable to local conditions, and are drought tolerant…” To date, many guidance documents and techniques for maintaining Florida Friendly Landscaping have been developed by IFAS. In accordance with legislative directive, the District will continue to encourage local municipalities and county governments to enact ordinances that promote Florida Friendly Landscape practices.

Although residential development in Florida has slowed since the economic downturn in 2008, it is expected to continue in the region for the foreseeable future. In order to minimize the impact that future development may have on groundwater resources in the Lower Santa Fe River Basin, the District will work with local municipalities and county governments to promote Low Impact Development. Low Impact Development is a set of design principles for new construction which seek to conserve water and natural resources, minimize impervious area, and manage stormwater in a manner that maintains natural hydrologic patterns. The principals of Low Impact Development sometimes require amendments to local building ordinances, but if implemented, can assist in maintaining water resources and reducing water demand from future growth within the Lower Santa Fe Basin.

PUBLIC SUPPLY INFRASTRUCTURE IMPROVEMENT

One method of reducing water withdrawals for public supply is addressing water losses within public distribution systems. Previous studies have indicated some North American utilities are impacted by water losses of 20-50% (Brothers, 2001). Identifying sources of water loss within public distribution systems can not only significantly reduce withdrawals by utilities, but also significantly reduce utilities operating costs, while causing little to no impact to public supply users. The District is currently working with the cities of Newberry, Alachua, and High Springs to address leakage and losses through the SRWMD's RIVER cost-share program. Some of the projects being implemented to assess and reduce water losses in these public supply systems include metering efforts to identify locations of water losses, and the replacement of aging valves and leaky distribution infrastructure. The District will continue to work with local utilities within the Lower Santa Fe River Basin to determine if significant water losses are occurring in public water supply systems, and work to identify sources of funding or cost-sharing mechanisms to remedy these losses.

WATER CONSERVING RATE STRUCTURES

Another tool which can be implemented by area utilities to reduce water consumption is a water conservation rate structure. Water conservation rate structures typically utilize a block pricing approach, with water rates increasing with increasing water use. This incentivizes water conservation by encouraging users to restrain water consumption to maintain a lower billing rate. Studies in Florida have shown that increasing the water rate from $1.20 to $2.00 per thousand gallons can lead to a decrease in water demand of up to 17% among public supply users (although some of this reduction can be attributed to use of an alternative water supply rather than conservation). Block rate structures can be set up in such a way as to reward low demand water users for conservation, while using higher rates among less conservative users, to maintain the utility's current average billing rate and revenue stream (Whitcomb, 2005).

Currently, Gainesville Regional Utilities (GRU), and the Cities of Archer, Newberry, Alachua, High Springs, and Lake City have implemented water conservation rate structures. The District will build upon this effort by working with other local utilities within the Lower Santa Fe River Basin to implement water conservation rate structures where practicable.

COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL WATER CONSERVATION PLANS

Based on 2010 water use estimates from the USGS Florida Water Science Center, self-supplied commercial, industrial, and mining uses make up just over three percent of estimated water use in the five county area comprising the Lower Santa Fe River Basin, although several significant industrial uses are present in the north Florida region. In addition to self-supplied withdrawals, commercial, industrial, and institutional users may also contribute significantly to public supply demand through connection to a local utility. To reduce water demand from commercial, industrial, and institutional users, the District has required water conservation plans for all new commercial, industrial, and institutional water use permittees or permit renewals (including mining) since 2010. In addition to this requirement, the District may consider requiring certain existing users to implement water conservation plans. As with other user groups, the District will seek to identify sources of funding or cost-sharing to assist with water conservation programs for commercial, industrial, and institutional users.

In many cases, water use can represent a significant cost to commercial, industrial, and institutional users. As such implementing water conservation measures not only reduces water consumption, but also reduces operating cost. One commercial water conservation program currently administered by the District in Lake City is the Water Conservation Hotel and Motel Program (CHAMP). By enrolling in CHAMP, area hotels agree to implement various water conservation measures in their operations, such as reusing towels and linens for multiple-day stays, and replacing old fixtures with water efficient fixtures when possible. These measures not only reduce water consumption, but also result in cost savings for the hotels, via reduced water, detergent, and energy costs. The District will continue to expand CHAMP to other areas of the District and work with local industries and businesses to identify new and practical water saving measures that can be implemented in business operations.

5.3 WATER SUPPLY DEVELOPMENT COMPONENT (ALTERNATIVE WATER SUPPLIES)

As previously discussed, the primary source for freshwater supplies within the north Florida region is the Upper Floridan aquifer. Due to the high degree of connectivity between the Lower Santa Fe and Ichetucknee Rivers and the Upper Floridan aquifer, regional declines in groundwater levels have led to streamflow declines in these rivers and their associated springs. Finding methods to replace groundwater withdrawals with alternative water supplies can aid in recovery of water levels in the Upper Floridan aquifer and flows in the Lower Santa Fe and Ichetucknee Rivers and their associated springs. To meet this goal, the SRWMD and SJRWMD will assess, promote, and implement (as practicable) various water supply development projects to reduce reliance on groundwater withdrawals.

Reclaimed Water

The District believes that there is potential for additional development of reclaimed wastewater or reuse water within the Lower Santa Fe River Basin and throughout the north Florida region. The rural nature and small size of many wastewater utilities in this region create distinct challenges to the development of wastewater reclamation systems. Namely, the cost of enhanced treatment and conveyance of reclaimed water from rural wastewater treatment plants to potential users (electrical utilities, farms, etc.) can prove cost prohibitive for small local utilities. The District will work with small utilities and potential reclaimed water users to identify practical reuse projects which can be implemented practicably in the Lower Santa Fe River Basin.

Presently, the District is working with the City of High Springs, in northwestern Alachua County, to develop a reuse plan for the City's secondary treated wastewater effluent. The effluent is currently discharged to a sprayfield; the proposed plan will utilize this water source to offset groundwater withdrawals. Groundwater recharge will also occur within the project. The proposed project components consist of constructing a storage facility and installing transmission lines. Although this project was already under consideration prior to the creation of the Recovery Strategy, it would provide benefits to the Lower Santa Fe River by offsetting groundwater withdrawals, and provides an excellent example of the types of alternative water supply projects the District will seek to identify and implement as the Recovery Strategy is developed.

Alternative Groundwater Sources

The intermediate aquifer system is currently utilized as a local source of groundwater, albeit at relatively low yields. Due to the area geology, the highest potential for use of the intermediate aquifer is in the Upper Santa Fe River Basin; however, offsetting demand for Upper Floridan aquifer withdrawals in the upper reaches of the river can have beneficial impacts on spring and streamflows within the Lower Santa Fe River Basin. The District can provide incentives and exercise its regulatory process to encourage new water use permit applicants and existing permit holders to utilize the intermediate aquifer system for low-yield applications where practical, reducing potential demand on the Upper Floridan aquifer.

Limited investigation has been conducted regarding use of the Lower Floridan aquifer as a potential alternative water supply in the SRWMD; furthermore, hydrogeological studies to date have not identified the presence of the Lower Floridan aquifer in the Lower Santa Fe River Basin. As such, the District believes that the current potential for utilizing the Lower Floridan aquifer as an alternative water supply is limited. The District will continue to assess its presence and potential for water supply as opportunities and available funding permit.

Surface Water Sources

Another option which the District will examine is utilizing surface water to replace existing fresh groundwater uses. Due to proposed and future MFLs, it is unlikely that surface water can provide a year-round water supply; however, there is some potential for the diversion, storage, treatment, and distribution of excess surface water during moderate to high flow periods.

Agricultural users are one group that may have some ability to utilize moderate to high streamflows for seasonal irrigation requirements. Where agricultural uses are located near appropriate surface water bodies, agricultural users would be encouraged to draw irrigation water from local rivers and streams during moderate to high flows, and utilize traditional groundwater sources during the remainder of the year, where feasible. Additionally, many area farms maintain private ponds on their property which may provide another potential surface water source. The use of surface water is generally more viable in the Upper Santa Fe River Basin, where the clayey soils of the Hawthorn Group are more conducive to building off-stream storage reservoirs and ponds than in the Lower Santa Fe River Basin, where the Hawthorn Group is absent and recharge rates to the Upper Floridan aquifer are high. Regardless, the replacement of groundwater withdrawals with seasonally available surface water in the Upper Santa Fe River Basin can have beneficial effects on the potentiometric surface of the Upper Floridan aquifer and stream and springflows in the Lower Santa Fe River Basin.

A final list of water supply development projects will be included in the Regional Water Supply Plan proposed to be completed in 2015.

5.4 WATER RESOURCE DEVELOPMENT COMPONENT

Water resource development projects will be another critical component of the MFL Recovery Strategy for the Lower Santa Fe River Basin. The District has identified several potential water resource development programs which can contribute to the re-establishment and maintenance of MFLs. The goal of these programs is to enhance groundwater levels to restore flow to rivers and contributing springs and to augment streamflows within the Lower Santa Fe River Basin to meet MFLs. The District is also working with local businesses and stakeholders to identify potential future water resource development projects which can be implemented as public-private partnerships.

Aquifer Recharge

The District is currently pursuing several strategies for aquifer recharge to the Upper Floridan aquifer. Some of these potential projects are expected to offer benefits to the Lower Santa Fe River Basin by raising the potentiometric surface of the Upper Floridan aquifer. The aquifer recharge strategies currently being studied include:

- Capture and recharge of wet season streamflows
- Capture and recharge of excess stormwater runoff
- Treatment and recharge of reclaimed water

These recharge strategies can be implemented via either direct recharge (wells to the Upper Floridan aquifer), or indirect recharge methods (rapid infiltration basins, floodplain, ponds). Depending on the recharge method, source, and receiving aquifer, differing levels of treatment may be required prior to recharge, which can greatly impact the cost and feasibility of individual projects. In addition to these initiatives, the District will also examine other potential aquifer recharge sources and strategies as opportunities arise.

Off-Stream Storage

As previously stated, excess stormwater and seasonally available streamflows represent a potential source of water within the District. In certain areas of the Lower Santa Fe River Basin, there may be potential for off-stream storage of excess streamflows during flood stages or large rain events. The potential for off-stream storage in the Lower Santa Fe Basin is limited by the relatively pervious soils throughout much of this area; however, storage of excess surface waters can provide a source for augmenting dry season streamflows in the Upper Santa Fe Basin. Increases in flows of contributing streams in the Upper Santa Fe Basin can potentially contribute significant improvements to the Lower Santa Fe Basin streamflows. Off-stream storage of excess surface waters can also aid in the alleviation of localized flooding problems in some areas of the basin, providing a basis for potential cooperation and cost-sharing with other agencies and local governments. As such, the District will examine the feasibility of creating off-stream storage projects for excess surface waters within the Santa Fe River Basin.

Dispersed Water Storage

In some areas of the Santa Fe Basin and north Florida region, the historical loss or modification of natural wetland systems has significantly reduced local surface water storage and consequently reduced the potential for aquifer recharge. Re-establishment of wetland and floodplain storage within a river basin can increase aquifer recharge and the stored water can be used to augment dry season streamflows. The District will assess the potential for programs to create dispersed water storage in the Santa Fe Basin to recover groundwater levels and minimum flows. One area which has already been identified for wetlands storage or restoration projects is Middle Suwannee River and Springs Restoration and Aquifer Recharge project, located in Mallory Swamp, Lafayette and Dixie Counties. The District continues to evaluate District properties for such projects.

DISPERSED STORAGE ON PRIVATE LANDS

Another management strategy the SRWMD will consider is public-private partnerships for dispersed water storage. With the large quantity of agricultural and silvicultural land present in the Lower Santa Fe River Basin, there may be opportunities for dispersed water storage cooperative projects with local landholders. Geologic conditions for potential locations would have to be assessed in order to evaluate the recharge potential of local soils and to determine project viability.

5.5 REGULATORY COMPONENT

Achieving the restoration and maintenance of minimum flows for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs will require careful management of local and regional water consumption patterns. As such, a regulatory component of the Recovery Strategy will be necessary to ensure that local water use is consistent with the recovery and maintenance of MFLs in the Lower Santa Fe and Ichetucknee Rivers and Priority Springs. As previously discussed, recent legislation allows the five WMDs to implement MFLs and Recovery and Prevention Strategies that the Department adopts to ensure that impacts to water resources across WMD boundaries are addressed. The SRWMD has requested that the Department adopt the proposed MFLs for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs, as well as the regulatory portion of the Recovery Strategy. The regulatory component of the Recovery Strategy will be developed and adopted concurrently with the proposed MFL. This section provides a brief summary of the current, proposed, and future regulatory tools which the WMDs will employ to aid in the recovery of the Lower Santa Fe River Basin MFLs, and Section 6.0 of this document provides the additional rule language which the Department will adopt by reference to implement the proposed regulatory recovery measures.

In order to ensure that regulatory strategies are implemented in an expedient manner, while also allowing the Districts the ability to develop regulatory tools in an ongoing and adaptive manner, the regulatory portion of the Recovery Strategy will be developed and adopted in a phased manner. Initially, the Districts will enforce existing rules in light of the adopted MFLs, particularly with regard to water use. The SRWMD and SJRWMD have also created several near-term regulatory strategies which will be adopted by the Department concurrently with the proposed MFL, and will focus on implementing measures which can immediately be taken to protect the resources from additional harm, and provide a basis for establishing long-term recovery programs. Long-term regulatory strategies will be developed in conjunction with SJRWMD in the context of the North Florida Joint Regional Water Supply Plan to address regional impacts and trends that have impacted the Lower Santa Fe Basin.

Current Rules

Presently, the SRWMD and SJRWMD possess a comprehensive system of rules which regulate the consumptive use of water. This section provides a brief overview of existing rules and regulatory authority that are applicable to the implementation of the Recovery Strategy.

PERMIT CRITERIA

Presently, there are a number of criteria that must be met for the issuance of a water use permit within each district. These water use permit criteria are listed in the applicable rules codified in Florida Administrative Code, and expanded upon in the applicable Applicant’s Handbook. Several of the existing general permit requirements will be especially effective in ensuring that water use permits within the Planning Region are consistent with criteria for issuance:

- Reasonable-beneficial water uses must utilize the *lowest quality water sources* environmentally, technologically and economically feasible. Lower quality water sources include reclaimed water, recycled irrigation return flow, storm water, saline water and other alternative water supplies.

- Reasonable-beneficial uses *may not cause harm to the water resources of the area*. According to the definition of an MFL, withdrawals that can be shown to result in decreased flows in rivers or springs in MFL Recovery cause significant harm to that water body. More detailed criteria for harm to wetlands and surface waters are found in the Water Use Permitting Guide.

- Reasonable-beneficial uses must be *in accordance with any minimum flow or level and implementation strategy*.

These requirements, in addition to the other criteria set forth in each Districts water use permitting rules, will provide a foundation for the Districts to assess and issue water use permits in a manner that is compatible with recovery and maintenance of MFLs in the Lower Santa Fe Basin.

SPECIAL PERMIT CONDITIONS

Each of the WMDs has the ability to condition water use permits as necessary to ensure that the permitted consumptive use continues to meet the conditions for issuance and are consistent with the Recovery Strategy. Special conditions will vary among use classes, source classes, and geographic locations, and may be project-specific.

Special conditions which may be utilized for new water use permits or permit renewals in the Planning Region include requirements for water conservation measures or measures to ensure participation in the Recovery Strategy, such as monitoring and reporting requirements. The District intends to incorporate these measures into permittees' water conservation plans on an individual basis, based on the intended water use. The District may also utilize special permit conditions to incorporate the completion of specific projects agreed upon by the permittee into their water use permit, and condition allocations based on the completion of those projects. Special permit conditions provide the District a method to ensure that projects to offset water resource impacts, conservation measures, use of alternative water supplies, and other practices proposed by the user to protect the recovering resource are implemented expeditiously and maintained for the duration of the water use permit.

REVOCATION OF UNUSED WATER USE PERMITS

In order to better quantify and allocate existing water supplies, District staff currently has the ability to request that the Governing Board revoke existing unused water use permits. As stated in subsection 40B-2.341, F.A.C., "The Governing Board may revoke a permit permanently and in whole for non-use of the water for a period of two years or more…" The District also has the ability to revoke unused water use permits at the request of the permittee. Although the revocation of existing permits does not directly reduce water consumption, periodically removing unused permits from the water use allocations allows the District to re-allocate existing unused water supplies, potentially preventing the need for additional water resource development projects that would be identified in the regional water supply planning process. Maintaining an up-to-date and accurate account of allocated water uses greatly aids in planning for future demand.

WATER SHORTAGE ORDERS

Existing rules and Florida statutes (373.175) allow the Districts' Governing Boards to declare a water shortage for the affected source class, if the District determines there is a possibility that "insufficient ground or surface water is available to meet the needs of the users or when conditions are such as to require temporary reduction in total use within the area to protect water resources from serious harm." Extended periods of lower than average precipitation in the District can greatly exacerbate low groundwater levels, as there will typically be an increase in irrigation pumpage to offset the rainfall deficit. Water Shortage Orders, such as the declaration issued by the SRWMD in May of 2012, provide a mechanism to reduce impacts to water resources during periods of water deficit. As nessessitated by local climatic patterns and hydrologic conditions, the District may utilize Water Shortage Orders to implement water conservation and management practices to prevent or reduce impacts to the Lower Santa Fe and Ichetucknee Rivers and priority springs during periods of drought. The Districts, as a part of the joint regional water supply planning effort, may develop hydrologic thresholds for declaration of water shortage orders.

Phase I Regulatory Strategies

In addition to rules currently in place, the Department will adopt additional regulatory measures designed to provide protection to the water resources of the Lower Santa Fe River Basin in the near term, while long-term recovery strategies are developed to address the resource recovery in a regional manner. The rule language to implement these regulatory strategies is contained in Section 6.0 of this document, entitled "Supplemental Regulatory Measures", which will be incorporated by reference by the Department.

Collectively, these Phase I rules provide an important interim mechanism for the prevention of additional harm to the recovering MFL water bodies, while also providing protections to existing legal uses. These rules also define how the existing requirements that proposed water uses not cause harm to water resources will be addressed in the water use permitting review process with regard to the proposed MFLs. The language contained in these rules was crafted to provide the WMDs the opportunity for adaptive management of allocated water uses, and the implementation of long-term recovery measures subsequent to the completion of the North Florida Regional Water Supply Plan. The WMDs and the Department expect that these rules will likely be revised after the North Florida Regional Water Supply Plan and associated recovery strategies are developed.

Phase II Regulatory Strategies

The development of long-term strategies to address the impacts of regional groundwater trends and water use patterns is critical to achieving the recovery of minimum flows in the Lower Santa Fe Basin. As such, the Department, SRWMD, and SJRWMD, will develop long-term recovery measures concurrently with the development of the North Florida Regional Water Supply Plan. This will assist the Districts and the Department in refining the Recovery Strategies and future regulatory measures to address regional groundwater impacts to the Lower Santa Fe and Ichetucknee Rivers.

6.0 SUPPLEMENTAL REGULATORY MEASURES

1. Section 6.0 entitled “Supplemental Regulatory Measures” shall be adopted by the Department of Environmental Protection by rule pursuant to Section 373.042(4), F.S., as a component of the overall recovery strategy for the Lower Santa Fe and Ichetucknee Rivers and Associated Priority Springs MFLs. These rules shall be applicable within the boundaries of the SRWMD and that portion of the North Florida Regional Water Supply Planning Area (see Figure 6-1,) within the SJRWMD.

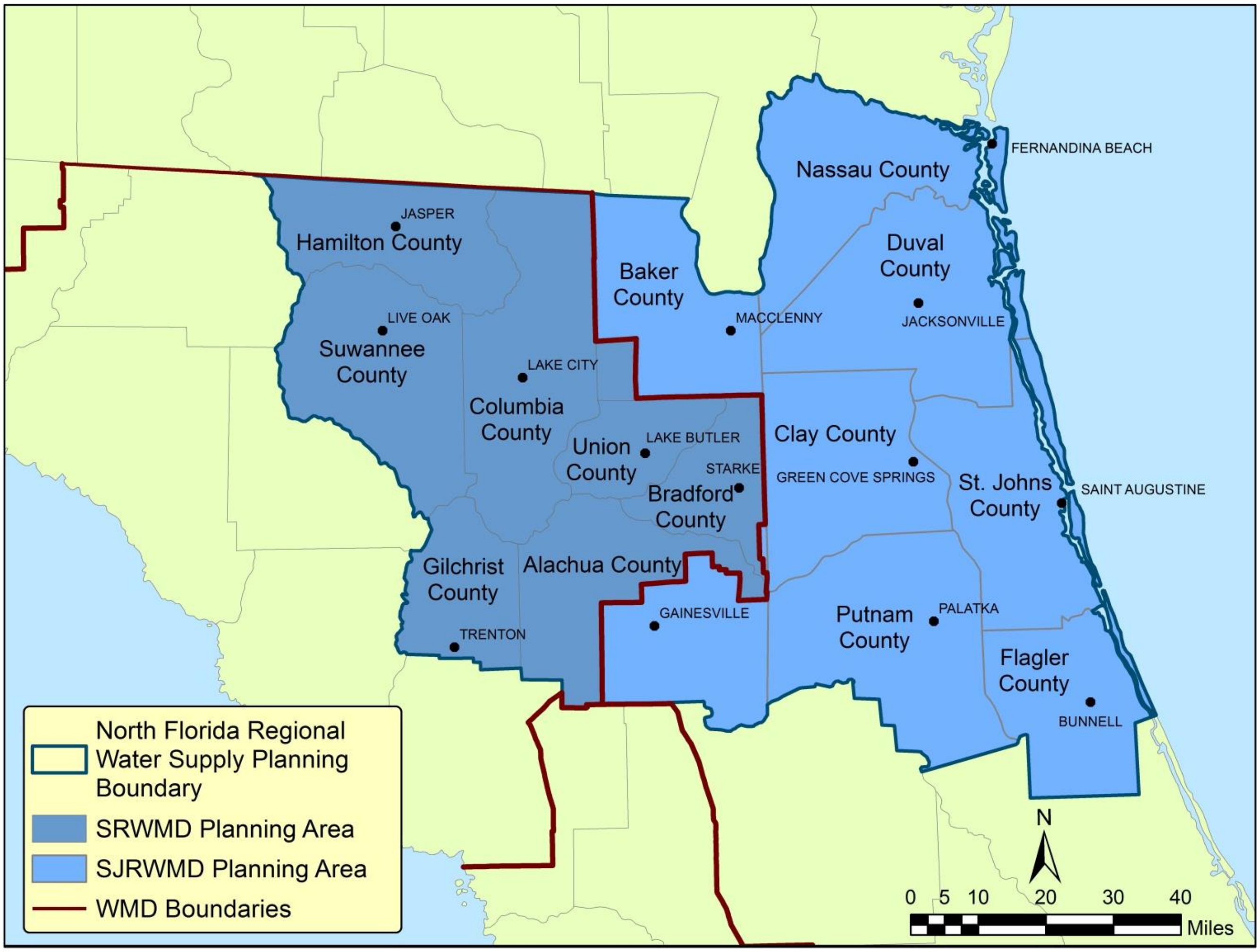


Figure 6-1. North Florida Regional Water Supply Planning Area

2. These rules provide additional criteria for review of consumptive use permit applications prior to the completion of the North Florida Southeast Georgia Regional Groundwater Flow Model and development of long-term recovery measures in the North Florida Regional Water Supply Plan (NFRWSP). Prior to the completion of the North Florida Southeast Georgia Regional Groundwater Flow Model, each District shall apply the best available modeling tools to evaluate permit applications and their potential impact to the MFLs in the Lower Santa Fe River Basin. Upon completion of the North Florida Southeast Georgia Regional Groundwater Flow Model, the

MFLs and these additional regulatory criteria shall be re-evaluated pursuant to Rule 62-42.300(1)(e), F.A.C.

3. In view of the statutory recognition in section 373.709(2)(a)2., F.S., that "…alternative water supply options for agricultural self-suppliers are limited," the Department recognizes that the districts may participate in developing offsets for proposed uses for the purposes of protecting the MFL water bodies consistent with the goals of the Recovery Strategy.

4. "MFL water bodies," when used in this section, shall mean the MFLs established for the Lower Santa Fe and Ichetucknee Rivers and Associated Priority Springs adopted in subparagraph 62-42.300(1)(a)–(c), F.A.C. "MFL water body" shall mean any one of the MFL water bodies described in this definition.

5. Additional Review Criteria for all Individual Permit Applicants:

   a) Evaluation of Potential Impacts: All applications, including applications for renewals, modifications, and new uses, shall be evaluated for their potential impact on the MFL water bodies utilizing best available information. Potential impacts to the MFL water bodies shall be assessed based on potential changes to flow at the Lower Santa Fe River Ft. White Gage and the Ichetucknee River US Highway 27 Gage.

   b) New Permits:
      i. Applications that do not demonstrate a potential impact to the MFL water bodies shall be issued provided the applicant meets the conditions for issuance.
      ii. Applications that demonstrate a potential impact to the MFL water bodies shall provide reasonable assurance of elimination or offset of the potential impact. Such applications shall be considered consistent with the Recovery Strategy, provided the applicant meets all other existing conditions for issuance.

   c) Renewals and Modifications with Increased Allocations:
      i. Applications that do not demonstrate a potential impact to the MFL water bodies based on the total requested allocation shall be issued provided the applicant meets the conditions for issuance.
      ii. Renewal and modification applications that demonstrate a potential impact to the MFL water bodies based on the total requested allocation shall provide reasonable assurance of elimination or offset of that portion of the requested allocation that exceeds the existing allocation and that results in potential impacts to the MFL water bodies. Such applications shall be considered consistent with the Recovery Strategy and shall be issued a permit for a duration of no more than five years provided the applicant meets all other existing conditions for issuance. If the potential impacts of the total requested allocation to the MFL water bodies will be eliminated or offset, the five year permit duration limitation under this subparagraph shall not apply. Permits issued for a duration longer than five years must include the necessary actions to provide for elimination or offset of impacts of the total requested allocation to the MFL water bodies, and a schedule for implementation.

   d) Renewals with No Increase in Allocations:
      i. Applications that do not demonstrate a potential impact to the MFL water bodies based on the total requested allocation shall be issued provided the applicant meets the conditions for issuance.

ii. Renewal applicants that demonstrate a potential impact to the MFL water bodies based on the requested allocation shall be considered consistent with the Recovery Strategy and shall be issued a permit for a duration of no more than five years provided the applicant meets all other existing conditions for issuance. If potential impacts to the MFL water bodies will be eliminated or offset, the five year permit duration limitation under this subparagraph shall not apply. Permits issued for a duration longer than five years must include the necessary actions to provide for elimination or offset of impacts to the MFL water bodies, and a schedule for implementation.

e) Existing permitted uses: Existing permitted uses shall be considered consistent with the Recovery Strategy provided the permittee does not exceed its permitted quantity. Such permits shall not be subject to modification during the term of the permit due to potential impacts to the MFL water bodies unless otherwise provided for in rule revisions pursuant to Rule 62-42.300(1)(e), F.A.C. Nothing in this section shall be construed to alter the District's authority to enforce or modify a permit under circumstances not addressed in this provision.

f) Nothing contained in this Section shall be construed to require a permittee in Florida to be responsible for recovery from impacts to an MFL water body from water users in Georgia, or in any case to be responsible for more than its proportionate share of impacts to an MFL water body that fails to meet the established minimum flow or level.

6. Additional Individual Permit Conditions:

a) Permits within the boundaries of the SRWMD and that portion of the North Florida Regional Water Supply Planning Area within the SJRWMD that are issued for a duration of greater than five years shall be issued with the following permit condition:

> Following the effective date of the re-evaluated Minimum Flows and Levels adopted pursuant to Rule 62-42.300(1)(e), F.A.C., this permit is subject to modification during the term of the permit, upon reasonable notice by the District to the permittee, to achieve compliance with any approved MFL recovery or prevention strategy for the Lower Santa Fe River, Ichetucknee River, and Associated Priority Springs. Nothing herein shall be construed to alter the District's authority to modify a permit under circumstances not addressed in this condition.

b) Permits for agricultural use located within Columbia, Suwannee, Union, and Gilchrist Counties, and the portions of Baker, Bradford, and Alachua Counties within the boundaries of the SRWMD, shall include the following condition:

> The permittee agrees to participate in a Mobile Irrigation Lab (MIL) program and allow access to the Project Site for the purpose of conducting a MIL evaluation at least once every five years.

7.0 MEASURING SUCCESS AND ADAPTIVE MANAGEMENT

Due to the regional nature of the declining groundwater trends in the Upper Floridan aquifer, and their impact on the flows in the Lower Santa Fe and Ichetucknee Rivers and priority springs, implementation of this Recovery Strategy will take place within the context of the existing IAA between the SRWMD, SJRWMD, and the Department. The Districts will coordinate implementation of this Recovery Strategy. By addressing local water resource impacts, in addition to regional groundwater trends, the Districts intend to achieve recovery and maintenance of minimum flows in the Lower Santa Fe and Ichetucknee Rivers and priority springs in an expeditious and effective manner.

7.1 ASSESSMENT OF RECOVERY PROGRESS

One of the most important parts of the Recovery Strategy is measurement of the results. Both the SRWMD and SJRWMD operate monitoring programs in conjunction with the USGS to monitor and analyze hydrologic data, including aquifer levels, streamflows, spring discharges, and lake levels. The WMDs will utilize existing monitoring networks to evaluate trends in the Lower Santa Fe and Ichetucknee Rivers and springs, and in groundwater levels in the region to measure the success of Recovery Strategy programs and projects. To assess the progress of the Recovery Strategy, the SRWMD will develop and use a set of metrics to measure hydrologic trends and the impacts of the Recovery Strategy components in the Lower Santa Fe River Basin.

TRACKING RESOURCE RECOVERY

Analysis of published flow data as a measurement of recovery progress provides a consistent method that can be repeated without the use of models as new flow data are published. However, as the MFLs were developed as flow duration curves based on streamflow data from the baseline period of 1933 to 1990, it can be problematic to compare a single year's streamflow data directly to the MFL flow duration curves which include 57 years of data. To better account for annual climatic variation, the SRWMD has developed a hydrologic screening method to evaluate trends in streamflows in the Lower Santa Fe and Ichetucknee Rivers using annual flow duration curves. This method is presented in **Appendix C**, which develops a MFL screening threshold that can be used on an annual basis to assess if flow trends are moving toward recovery. Utilizing the methodology presented in Appendix C and available hydrologic assessment tools, and the SRWMD will annually evaluate the recovery progress of the Lower Santa Fe and Ichetucknee Rivers and Priority Springs with regard to their MFLs.

MEASUREMENT OF EFFICACY OF INDIVIDUAL RECOVERY PROGRAMS AND PROJECTS

As water resource and water supply development projects are implemented as part of the Recovery Strategy, local hydrologic monitoring stations will be utilized, along with current modeling tools, to examine the hydrologic benefits of projects, particularly with regard to groundwater levels and streamflows. The WMDs will establish metrics to evaluate the efficacy of individual recovery programs and projects prior to implementation. Due to the hydrogeologic characteristics of the Lower Santa Fe River Basin, and year to year weather patterns, the effects of individual recovery programs and projects may not be immediately discernible in hydrologic readings at the streamflow gaging stations on the Lower Santa Fe and Ichetucknee Rivers. Furthermore, the fact that many recovery projects will be focused on improvements in regional or local groundwater levels means that there may be a lag time after implementation before improvements in streamflows can be assessed. As such, project performance metrics will be tailored to individual projects prior to implementation to assess their efficacy over time. This will allow the Districts to periodically gauge the success of individual implemented projects as well as the direction of the overall Recovery Strategy; thereby providing a basis for targeting future funds and programs.

PERIODIC RECOVERY STRATEGY ASSESSMENT

During the implementation of the Recovery Strategy, the Districts will conduct periodic general assessments of the Recovery Strategy and of the water resources within the Planning Region and the Lower Santa Fe River Basin. This periodic assessment will typically be conducted on a five-year timetable, and likely be included as a component of the District's Water Supply Assessments. These periodic assessments will assess the efficacy of the Recovery Strategy components implemented to date, and also examine regional trends in the potentiometric surface of the Upper Floridan aquifer, springflow and streamflow trends, and regional water use trends. The goal of these periodic assessments will be to provide direction and guidance to future recovery projects and programs, by incorporating new hydrologic assessment tools and examining trends in regional hydrologic conditions. For example, by the end of the first five-year Water Supply Assessment cycle (circa 2020), the metering programs for agricultural water users in SRWMD should provide sufficient data to re-examine agricultural use patterns, and may provide additional direction to new agricultural conservation programs. As such, periodic assessment of the Recovery Strategy will also provide an opportunity for the WMDs to examine the Recovery Strategy components with regard to future water use patterns within the Planning Region. Periodic assessment of Recovery Strategy components and resource recovery will enable the Districts to evaluate the efficacy of implemented regulatory approaches and recovery measures, and also provide a basis for adapting future recovery measures, water management decisions, and regulatory approaches to current hydrologic conditions and water use patterns.

7.2 ADDITIONAL INFORMATION GATHERING/FUTURE RESEARCH

In addition to assessing the hydrologic status of the Lower Santa Fe and Ichetucknee River and priority springs, the SRWMD will continue to collect scientific and ecological data relating to these water bodies. The SRWMD recognizes that in some cases during MFL development, insufficient data was available to assess the relationship between streamflows and springflows and some biological characteristics of the river system. As such, the SRWMD will continue to identify potential data needs, and work with other agencies and organizations to develop additional scientific and biological data relating to these systems, to strengthen any future revisions to these MFLs. The SRWMD will continue to assess the latest scientific research to ensure that the adopted MFLs are protective of the Lower Santa Fe and Ichetucknee Rivers and their priority springs.

7.3 PUBLIC AND STAKEHOLDER PARTICIPATION

Throughout the development and implementation of MFL recovery measures, the Department and the WMDs will seek input and participation from the interested stakeholders. As the planning component of this strategy is centered on the North Florida Regional Water Supply Plan, the NFRWSP will provide an excellent forum for stakeholder engagement. The WMDs also intend to engage the public and provide opportunity for comment and participation in the creation of long-term recovery strategies.

7.4 ADAPTIVE MANAGEMENT

This Recovery Strategy is intended to provide general overview of the current initiatives the WMDs intend to implement and establish a path forward to develop long-term measures required to achieve the recovery and maintenance of minimum flows in the Lower Santa Fe and Ichetucknee Rivers and priority springs. Presently, numerous potential approaches that can contribute to resource recovery have been identified, and the Districts understand that flexibility will be an ongoing element of the Recovery Strategy process. New feasibility and pilot studies, updates to groundwater models, changes in funding programs, and the effectiveness of existing projects will guide implementation of the Recovery Strategy over time. Furthermore, the implementation of the North Florida Regional Water Supply Plan with the SJRWMD will provide more detailed strategies that will aid in the full recovery of the MFL water bodies and address the regional water supply issues which have impacted the Lower Santa Fe Basin.

The annual hydrologic evaluations and periodic Recovery Strategy assessments described in Section 7.1 will provide opportunities for the Districts to adapt to changing water resource and water use conditions. These evaluations will provide the opportunity to re-focus the components of the Recovery Strategy, prioritize projects and programs with successful outcomes and established funding sources, and minimize or end less successful efforts. The Districts will also update modeling tools, when feasible, to more accurately predict the anticipated effects and flow recovery for the various executed projects. Moreover, the continued coordination between the SRWMD, SJRWMD and the Department will facilitate the implementation of broader, regional water resource projects in the Planning Region. This recurring process of evaluation, coordination, and planning will allow the Districts to adapt to changes in water use patterns and needs throughout the Recovery Process, thereby meeting the goal of recovering and preserving minimum flows in the Lower Santa Fe and Ichetucknee Rivers and priority springs.

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Appendix A:
Lower Santa Fe and Ichetucknee River Prevention and Recovery Strategy
Summary of Recovery Targets, Existing Projects and Programs, and Concepts with Potential Lower Santa Fe Basin Benefits
March 2014

TABLE A1: Estimated Streamflow Recovery Required for LSFR Basin MFLs				
Project Name	**Location**	**Est. Project Volume (MGD)**	**Est. Impact to Santa Fe River Flow (MGD, at Fort White Gage)**	**Est. Impact to Ichetucknee River Flow (MGD, at Hwy 27 Gage)**
Estimated Streamflow Recovery Required to Meet MFLs based on current water use patterns (2010)		NA	11.0	2.0
Projected Public Supply Water Use Increase SJRWMD Region 1 2030	SJRWMD	NA	6.5	0.6
Projected Non-Public Supply Water Use Increase SJRWMD Region 1 2030	SJRWMD	NA	1.3	0.1
City of Alachua Public Supply Demand Increase	Alachua County, FL	0.40	0.3	0.0
Archer Public Supply Demand Increase	Alachua County, FL	0.03	0.02	0.0
High Springs Public Supply Demand Increase	Alachua County, FL	0.11	0.08	0.0
Lake Butler Public Supply Demand Increase	Union County, FL	0.00	0.00	0.0
Lake City Public Supply Demand Increase	Columbia County, FL	0.72	0.14	0.06
Live Oak Public Supply Demand Increase	Suwannee County, FL	0.20	0.01	0.02
Newberry Public Supply Demand Increase	Alachua County, FL	0.19	0.14	0.0
Starke Public Supply Demand Increase	Bradford County, FL	0.09	0.01	0.0
SRWMD AG Increase	SRWMD	~ 0.0	~ 0.0	~ 0.0
SRWMD DSS Increase	SRWMD	~ 5.0	~ 1.0	~ 0.5
SRWMD CII Increase	SRWMD	~ 0.97	~ 0.02	~ 0.0
SRWMD REC Increase	SRWMD	~ 0.40	~ 0.07	~ 0.0

TOTAL Recovery Targets (Est. Current Recovery + Future Demand)	**NA**	**20.6**	**3.3**

Notes:

1. SRWMD Water Use Projections here represent the low range projections from the 2010 SRWMD Water Supply Assessment
2. SJRWMD Water Use Projections here represent the 5-in-10 year water use projections from the SJRWMD's 2013 Draft Water Supply Plan

Appendix A:
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TABLE A2: Conceptual Lower Santa Fe Basin Recovery Projects/Programs**

Project Name	Location	Project Type	Est. Project Volume (MGD)	Est. Benefit to Santa Fe River Flow (MGD, at Fort White Gage)	Est. Benefit to Ichetucknee River Flow (MGD, at Hwy 27 Gage)	Est. Cost	Est. Cost-Benefit ($/1000gal water savings)
Agricultural Water Conservation Potential: Efficiency Improvements ("Farms" - Row crops, irrigated pasture, fruit crops, etc.)	Alachua, Bradford, Columbia, Gilchrist, Union, and Suwannee counties	Water Conservation	2.2 - 4.3	1.2 - 2.3	1.1 - 2.1	$3,910,000	$0.20
Agricultural Water Conservation Potential: Efficiency Improvements (Plant Nurseries)	Alachua, Bradford, Columbia, Gilchrist, Union, and Suwannee counties	Water Conservation	0.6 - 1.1	0.3 - 0.7	0.2 - 0.4	$9,610,000	$1.92
Agricultural Water Conservation Potential: Phase II Irrigation Improvements ("Farms" - Row crops, irrigated pasture, fruit crops, etc.)	Alachua, Bradford, Columbia, Gilchrist, Union, and Suwannee counties	Water Conservation	0.9 - 1.7	0.5 - 0.9	0.4 - 0.9	$15,110,000	$1.92
Agricultural Water Conservation Potential: Phase II Irrigation Improvements (Plant Nurseries)	Alachua, Bradford, Columbia, Gilchrist, Union, and Suwannee counties	Water Conservation	0.6 - 1.3	0.4 - 0.8	0.2 - 0.5	$11,270,000	$1.92
Bradford Timberlands Flood Control and Water Resource Development Project	Bradford County, Florida	Excess Streamflow Capture, Aquifer Recharge, Flood Control, potential Dispersed Water Storage Wetlands	0.5 - 0.9	0.1 - 0.9	0.0 - 0.01	$1,690,000	$0.33
Bradford County Rayonier South Flood Control and Water Resource Development Project	Bradford County, Florida	Stormwater Storage, Aquifer Recharge, Streamflow Augmentation, Dispersed Water Storage Wetlands	1.0 - 2.0	0.1 - 2.0	0.0 - 0.02	$3,500,000	$0.33
Bradford County Dispersed Water Storage and Aquifer Recharge Projects	Bradford County, Florida	Stormwater Storage, Aquifer Recharge, Dispersed Water Storage Wetlands	1.5	0.4	~ 0.0	$750,000	$0.10
Lake Harris Aquifer Recharge Project	Lake City, Columbia County, Florida	Aquifer Recharge, Flood Mitigation	0.3 - 0.6	0.03 - 0.06	0.1	$250,000	$0.08
Conceptual Dispersed Water Storage Public-Private Partnerships	Alachua, Gilchrist, Columbia, Suwannee, Bradford, Union Counties	Surface Water sources, Reclaimed Water	~ 4	~ 1.1	0.4	$1,430,000	$0.07
Optimization of Regional Water Balance through Modified Silviculture Practices (Pilot Scale)	Alachua, Gilchrist, Columbia, Suwannee, Bradford, Union Counties	Land Management Practices	~ 6	~ 1.8	0.3	$2,440,000	$0.07
City of Alachua Reclaimed Water Aquifer Recharge Project	City of Alachua, Alachua County, Florida	Reclaimed Water, Aquifer Recharge	0.5	- 0.02	0.001	$800,000	$0.31
Alachua County Conceptual Reclaimed Water Recharge Projects	Alachua County	Reclaimed Water, Aquifer Recharge	7.7	1.6	0.1	$3,800,000	$0.09
Future Water Resource Development Concepts	SRWMD	Water Resource Development	~ 4.0	~ 1.2	~ 0.2	$36,390,000	$2.00
Subtotal			**35.1**	**13.7**	**4.97**	**$90,940,000**	**$0.49**

** Users seeking to develop offsets for proposed uses may elect to participate in the above listed recovery conceptual projects and programs.

Appendix A:
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TABLE A3: Future Potential Water Conservation: 2030***

Project Name	Location	Project Type	Est. Project Volume (MGD)	Est. Benefit to Santa Fe River Flow (MGD, at Fort White Gage)	Est. Benefit to Ichetucknee River Flow (MGD, at Hwy 27 Gage)	Est. Cost	Est. Cost-Benefit ($/1000gal water savings)
City of Alachua Public Supply Conservation	Alachua County, FL	Water Conservation	0.11 - 0.33	0.2	0.0	$1,870,000	$1.87
Archer Public Supply Conservation	Alachua County, FL	Water Conservation	0.03 - 0.03	0.02	0.0	$20,000	$0.27
High Springs Public Supply Conservation	Alachua County, FL	Water Conservation	0.04 - 0.11	0.08	0.0	$590,000	$1.96
Lake Butler Public Supply Conservation	Union County, FL	Water Conservation	0.03 - 0.04	0.01	0.0	$40,000	$1.77
Lake City Public Supply Conservation	Columbia County, FL	Water Conservation	0.32 - 0.66	0.13	0.05	$3,930,000	$2.67
Live Oak Public Supply Conservation	Suwannee County, FL	Water Conservation	0.10 - 0.20	0.01	0.02	$50,000	$0.10
Newberry Public Supply Conservation	Alachua County, FL	Water Conservation	0.05 - 0.15	0.11	0.0	$610,000	$1.39
Starke Public Supply Conservation	Bradford County, FL	Water Conservation	0.08 - 0.09	0.02	0.0	$0	$0.08
SRWMD CII Conservation Potential	SRWMD	Water Conservation	TBD	TBD	TBD	TBD	TBD
Agricultural BMPs - SJRWMD	SJRWMD portion of Alachua County	Water Conservation	0.3	0.14	0.0	$1,500,000	$0.96
Water-wise Florida Landscape - Inground: Alachua County	Alachua County, FL	Water Conservation	1.9	1.3	0.1	$10,030,000	$1.44
Targeted Residential Water Conservation BMPs: LDR Modifications - Alachua County	Alachua County, FL	Water Conservation	1.8	1.1	0.1	$32,000	$0.00
SJRWMD Region 1 Public Supply Conservation Potential	SJRWMD	Water Conservation	~ 20.0	1.4	0.0	$36,690,000	$1.28
SJRWMD Region 1 DSS and Small Public Supply Conservation Potential	SJRWMD	Water Conservation	3.0	0.21	0.0	TBD	TBD
SJRWMD Region 1 AG Conservation Potential	SJRWMD	Water Conservation	8.2	0.4	0.1	$71,610,000	$1.92
SJRWMD Region 1 CII Conservation Potential	SJRWMD	Water Conservation	1.6	0.11	0.0	TBD	TBD
Subtotal			**38.4**	**5.3**	**0.3**	**$120,980,000**	**NA**

*** These and other water supply/restoration projects under development or consideration are a part of the water supply planning process or other MFL constraints, and may reduce groundwater withdrawals or provide ancillary benefits to the Upper Floridan Aquifer in the North Florida region and the Lower Santa Fe Basin. These and other concepts under development are not a component of the Recovery Strategy for the Lower Santa Fe Basin, but are provided here to demonstrate their potential ancillary benefits to the Lower Santa Fe MFL recovery efforts.

Appendix A:
Lower Santa Fe and Ichetucknee River Prevention and Recovery Strategy
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TABLE A4: Current Projects and Concepts with Benefits to Lower Santa Fe Basin: SRWMD***

Project Name	Location	Project Type	Est. Project Volume (MGD)	Est. Benefit to Santa Fe River Flow (MGD, at Fort White Gage)	Est. Benefit to Ichetucknee River Flow (MGD, at Hwy 27 Gage)	Est. Cost	Est. Cost-Benefit ($/1000gal water savings)
City of Waldo Water Meter Replacement	Alachua County, FL	Infrastructure Improvements	0.01	0.002	0.0	$150,000	$2.18
City of Alachua Water Conservation RIVER cost-share Project	Alachua County, FL	Water Conservation	0.05	0.038	0.0	$60,000	$0.22
City of High Springs Water Conservation RIVER cost-share project	Alachua County, FL	Water Conservation	0.02	0.012	0.0	$60,000	$0.68
Live Oak Golf Course Reuse Connection RIVER cost-share project	Suwannee County, FL	Reclaimed Water	0.1	0.004	0.008	$20,000	$0.04
City of Archer Wastewater Collection, Treatment & Reuse RIVER cost share project	Alachua County, FL	Reclaimed Water	0.14	0.09	0.004	$14,400,000	$19.66
Lake City Sprayfield Treatment Wetlands Project	Lake City, Columbia County, Florida	Reclaimed Water, Aquifer Recharge	3.0	~ 0.04	~ 0.06	$4,600,000	$0.30
Middle Suwannee Springs Restoration Project: Mallory Swamp Improvements - Phase II	Lafayette County, Florida	Aquifer Recharge, Dispersed Water Storage	~ 5.0	~ 0.25	~ 0.5	$1,900,000	$0.07
Lake City Municipal Airport Modification	Columbia County, FL	Stormwater Improvements, Increased soil percolation	~ 1.9	~ 0.4	~ 0.4	No Additional Cost - Existing Project	NA
Starke By-pass	Bradford County, Florida	Stormwater Improvements, Indirect Aquifer Recharge	TBD	TBD	TBD	No Additional Cost - Existing Project	NA
Subtotal			**10.2**	**0.8**	**1.0**	**$21,190,000**	**$0.40**

*** These and other water supply/restoration projects under development or consideration are a part of the water supply planning process or other MFL constraints, and may reduce groundwater withdrawals or provide ancillary benefits to the Upper Floridan Aquifer in the North Florida region and the Lower Santa Fe Basin. These and other concepts under development are not a component of the Recovery Strategy for the Lower Santa Fe Basin, but are provided here to demonstrate their potential ancillary benefits to the Lower Santa Fe MFL recovery efforts.

Appendix A:
Lower Santa Fe and Ichetucknee River Prevention and Recovery Strategy
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TABLE A5: Current Projects Concepts with Benefits to Lower Santa Fe Basin: SJRWMD***

Project Name	Location	Project Type	Est. Project Volume (MGD)	Est. Benefit to Santa Fe River Flow (MGD, at Fort White Gage)	Est. Benefit to Ichetucknee River Flow (MGD, at Hwy 27 Gage)	Est. Cost	Est. Cost-Benefit ($/1000gal water savings)
Clay County Utilities: Postmaster Wellfield - Lower Floridan Aquifer Water Supply Wells* **	Clay County, Florida	Alternative Groundwater Supply	0.7	0.01	0.0	$1,000,000	$0.63
Grandin Sand Mine - LFAS* **	Putnam County, Florida	Alternative Groundwater Supply	3	0.1	0.0	$1,500,000	$0.11
Mid-Clay Reservoir project* **	Clay County, Florida	Reclaimed Water	NA	NA	0.0	$5,500,000	NA
Keystone Area Rapid Infiltration Basin System* **	Clay County, Florida	Aquifer Recharge, Reclaimed Water, Alternative Water Supplies	3 - 5	0.5	0.1	$113,000,000	$4.32
GRU Smart Meter Program	Alachua County	Water Conservation	0.1	0.07	0.0	$100,000	$0.19
GRU – Innovation District	Alachua County	Reclaimed Water	0.1	0.07	0.0	$400,000	$0.76
GRU – Finely Woods	Alachua County	Reclaimed Water	0.1	0.03	0.0	$250,000	$0.96
GRU – Celebration Pointe	Alachua County	Reclaimed Water	0.1	0.07	0.0	$700,000	$1.34
Subtotal			**8.6**	**0.8**	**0.1**	**$123,650,000**	**$2.74**

TOTAL Benefits (Tables A2-A5)	**92.3**	**20.6**	**6.4**

*** These and other water supply/restoration projects under development or consideration are a part of the water supply planning process or other MFL constraints, and may reduce groundwater withdrawals or provide ancillary benefits to the Upper Floridan Aquifer in the North Florida region and the Lower Santa Fe Basin. These and other concepts under development are not a component of the Recovery Strategy for the Lower Santa Fe Basin, but are provided here to demonstrate their potential ancillary benefits to the Lower Santa Fe MFL recovery efforts.

Notes:
1. Costs presented represent estimated project costs at time of publication.
2. Costs presented were obtained from current project proposals or estimated based on unit rates of similar district projects.

Appendix B

Timeline for Recovery Strategy Implementation

	Phase I			***Phase II***
Planning	2010 Water Supply Assessment	Formation of NFRWSP	**Create North Florida Regional Water Supply Plan.** Concurrently develop long-term recovery strategies to address regional impacts.	Continue Developing Long Term Recovery Strategies and Projects based on Current Hydrologic Conditions and Water Supply Needs
Projects			Project Identification and Feasibility Analysis	Implement Alternative Water Supply and Water Resource Development Projects
Conservation			Implement Preliminary Conservation Measures and Programs	Continue Implementing Programs to Achieve Long Term Conservation Goals
Regulatory			Implement Preliminary Regulatory Measures	Implement Long Term Regulatory Measures
Funding/Cost Share Programs			Implment Cost-Share Programs in Lower Santa Fe Basin. Seek Funding Sources and Cost-Share Partnerships	Seek Funding Sources and Cost-Share Partnerships. Utilize Cost Share Programs to Achieve Conservation Goals
Water Resource Monitoring	Use Monitoring Data from Lower Santa Fe Basin Water Resources to Direct Recovery Measures			Maintain and Expand Monitoring Program as Needed in Lower Santa Fe Basin to Direct Recovery Measures
	2010	2011		2015

	Phase II, continued			
Planning	**5 Year Water Supply Assessment & Strategy Evaluation**	Continue Developing Long Term Recovery Strategies and Projects based on Current Hydrologic Conditions and Water Supply Needs	**5 Year Water Supply Assessment & Strategy Evaluation**	Continue Developing Long Term Recovery Strategies and Projects based on Current Hydrologic Conditions and Water Supply Needs
Projects	Implement Alternative Water Supply and Water Resource Development Projects		Implement Alternative Water Supply and Water Resource Development Projects	
Conservation	Continue Implementing Programs to Achieve Long Term Conservation Goals		Continue Implementing Programs to Achieve Long Term Conservation Goals	
Regulatory	Implement Long Term Regulatory Measures		Implement Long Term Regulatory Measures	
Funding/Cost Share Programs	Seek Funding Sources and Cost-Share Partnerships. Utilize Cost Share Programs to Achieve Conservation Goals		Seek Funding Sources and Cost-Share Partnerships. Utilize Cost Share Programs to Achieve Conservation Goals	
Water Resource Monitoring	Maintain and Expand Monitoring Program as Needed in Lower Santa Fe Basin to Direct Recovery Measures		Maintain and Expand Monitoring Program as Needed in Lower Santa Fe Basin to Direct Recovery Measures	
	2020		2025	

	Phase II, continued			
Planning	**5 Year Water Supply Assessment & Strategy Evaluation**	Continue Developing Long Term Recovery Strategies and Projects based on Current Hydrologic Conditions and Water Supply Needs	**5 Year Water Supply Assessment & Strategy Evaluation**	Continue Developing Long Term Strategies and Projects to Maintain Water Resources based on Current Hydrologic Conditions and Water Supply Needs
Projects	Development Projects		Supply Needs and MFL Requirements	
Conservation	Conservation Goals		Conservation Goals	
Regulatory	Implement Long Term Regulatory Measures		Implement Long Term Regulatory Measures	
Funding/Cost Share Programs	Seek Funding Sources and Cost-Share Partnerships. Utilize Cost Share Programs to Achieve Conservation Goals		Maintain Funding and Partnerships for ongoing Conservation Efforts	
Water Resource Monitoring	Maintain and Expand Monitoring Program as Needed in Lower Santa Fe Basin to Direct Recovery Measures		Maintain and Expand Monitoring Program as Needed in Lower Santa Fe Basin to Direct Recovery Measures	
	2030		2035	

APPENDIX C
Annualized Flow Duration Curves: Methods for Assessing MFL Recovery

Introduction

In order to assess if flow trends are moving towards recovery, there is a need for a tool that allows comparison of different flow regimes during different periods of record, yet retains measures of the intra-annual variability in the systems. Flow Duration Curves, as described below, are one such tool. The SRWMD will utilize Flow Duration Curves (FDCs), based on the method described in this appendix, for tracking recovery of the Lower Santa Fe and Ichetucknee rivers and as a statistical tool in assessing if flow trends are moving toward recovery of MFLs. This appendix describes the background and development of this assessment tool for these two rivers.

Traditional Flow Duration Curves

Traditional FDCs are a convenient tool for visualization, simplification, and comparison of streamflow data. Searcy (1959) notes that the curves are cumulative frequency curves "combining in one curve the flow characteristics of a stream throughout the range of discharge." FDCs have had "wide-spread application" and a "long history" in a variety of hydrologic studies including in-stream flow assessments (Vogel & Fennessey, 1995).

The vertical axis of a FDC is the streamflow rate in cubic feet per second (cfs) and the horizontal axis is the proportion of time flow is equaled or exceeded, sometimes termed the exceedance. The calculation of exceedance commonly used (and used here) is the Weibull plotting position (Jacobs & Ripo, 2002) expressed as a decimal. As can be observed in Figures 1 and 2, FDCs are constructed by sorting all of the daily data, from highest to lowest and assigning the exceedance. The highest flow in the record corresponds to the lowest exceedance probability flow; the lowest flow in the record corresponds to the highest exceedance probability flow.

FDCs show the proportion of time specified discharges were equaled or exceeded for a continuous record in a given period. For example, **Figure 1** provides the hydrograph and FDC of the daily mean flow of the Santa Fe River near Fort White during the period 1932 to 2012. From that FDC, it can be shown that the daily mean flow at that point on the river was at least 885 cfs, 90 percent of the time during the period of record. (**Figure 2** similarly provides the hydrograph and FDC for the Ichetucknee River at the Highway 27 gage). However, flow duration curves are influenced by the period of record used in their creation, exhibiting sensitivity to the period of record in the "tails," but they are useful for comparison purposes between different scenarios over the same time period.

Flows and/or exceedances of interest can be plotted on the FDC. For example, the magnitude of a spring is of common interest to the public and is used in MFL priority list development. An exceedance probability of 0.5 (the median) is used to determine spring magnitude (Florida Geological Survey, 2005).

Given the characteristics of the rivers and the available flow data, MFLs have been developed at two USGS gages and plotted as FDCs (see MFL Technical Report). These gages are the Santa Fe River near Fort White (Fort White) and the Ichetucknee River at Highway 27 near Hildreth (HWY27).

Period of Record Flow Duration Curve vs. Annual Flow Duration Curve

Note: The following section is adapted from Jacobs and Ripo (2002).

Traditionally, FDCs have been constructed by simply ranking all streamflows q_i over the period-of-record (Searcy 1959) from largest to smallest, q_1, q_2, ..., q_S where S is the total number of streamflows and $q_i > q_{i+1}$. Each streamflow quantity has a corresponding exceedance $p_i = i/(S+1)$ using the Weibull plotting position. If an FDC is constructed using period-of-record streamflows (termed here a PFDC), then one interprets the exceedance as the reliability of streamflow exceeding some level over the period of record.

Alternatively, one can construct an annual-based FDC (AFDC) that represents the exceedance probability or reliability of streamflow exceeding some minimum level in a design year (see Vogel and Fennessey, 1994). The AFDC provides a different graphical tool to illustrate the quantity and frequency of streamflow available in a river basin. The AFDC, as compared to the traditional period-of-record (POR) flow duration curve, has a robust statistical interpretation of streamflow that allows for the determination of high and low flow AFDCs and their annual yield with a specified recurrence interval T (T-year return period). The AFDC is constructed by developing a FDC for each of the N-years of data by rank ordering each year's 365 discharge values. The AFDC is constructed from the N-year series of annual FDCs using a specified probability (e.g., the mean or the median) for each of the 365 sets of values.

Figures 1 and 2 show the PFDCs and the median AFDCs for Fort White and HWY27, respectively. **Figures 3 and 4** show the 2-year (median) and 10-year flood and drought AFDC curves for Fort White and HWY27, respectively. The 10-year flood curve corresponds to the p = 0.10 probability. The 10-year drought curve corresponds to the p = 0.90 probability.

Use of Annual Flow Duration Curves to Assess Flow Trends

The SRWMD selected a 20-year moving AFDC statistic for use in MFL trend assessment. Using a 20-year moving AFDC statistic provides a methodology for District staff to compare annual streamflow data to the MFL, and evaluate the trends in streamflow recovery on an annual basis, while minimizing year to year climate variations. Based on assessment of multiple "windows" in time, including 5- and 10-year estimates, SRWMD staff determined that a 20-year period is long enough to provide a stable estimate without significant potential for "false positives" the shorter periods produced, due to short term climate fluctuations.

The assessment tool is constructed by first obtaining the 20-year moving median AFDCs of the Baseline period (Water Years 1933-1990) from the MFL time series. Figures 5 and 6 show these AFDCs for the Fort White and HWY27 respectively (gray lines). Then, the T-year AFDCs (from the complete baseline individual year data, not the 20-year medians) were found that completely bound the set of 20-year median AFDCs (the median AFDC for the Baseline period is also shown for completeness). These T-year AFDCs which are the lower bound for Baseline MFL data represent the lower limit beyond which the AFDC for any subsequent 20-year period in the flow record should not fall if the river is meeting the MFL (assuming similar climatological conditions). These lower bound AFDCs for the MFL data, represent a hydrologic threshold, hereafter referred to as the lower MFL screening threshold, for annual comparison of streamflow data to the MFL.

SRWMD staff utilized this method to develop the lower MFL screening threshold for the Lower Santa Fe and Ichetucknee Rivers, as shown in **Figures 5 and 6**. In this case, the return period for the lower MFL screening threshold AFDC was the 2.7-year AFDC for the Lower Santa Fe River, and the 3.8-year AFDC for the Ichetucknee River. These lower MFL screening thresholds are illustrated by the red line in Figures 5 and 6, which demonstrate how the lower MFL screening threshold AFDC for each river provides a lower bound for the 20 year AFDCs for the MFL Baseline data. As previously stated, in subsequent years after the baseline period, it would be expected that the 20-year AFDC of observed streamflows for each year after the Baseline period would be above the lower MFL screening threshold if the river is meeting the MFL, assuming similar long term climate conditions. Similarly if several years of new 20-year AFDCs fall below the lower MFL screening threshold, and exhibit a declining trend, then there is potential that the river is not meeting the MFL, and further assessment of streamflows and climate conditions would be required to determine the river's status.

To illustrate how the SRWMD will use the lower MFL screening threshold, Figures 7 and 8 show the lower MFL screening threshold for the Lower Santa Fe and Ichetucknee Rivers, respectively, along with one 20-year AFDC from the post-Baseline period (in this case 1991 to 2010). Each of these 20-year AFCDs is below the lower MFL screening threshold, indicating that there is potential that the rivers are not meeting their MFLs. This matches the conclusion of the assessment of the status of these rivers in the establishment of the MFLs. When evaluating these rivers with regard to their MFLs, the District will examine multiple, sequential 20-year AFDCs, to gage the overall trends in streamflows with regard to the MFLs. When the 20-year condition increases to the MFL metric AFDC, the system is trending toward recovery. Similarly, when recovery is achieved in the future, it is expected that each 20-year AFDC will be above this screening threshold.

In addition to examining the overall ADFC, the District will also examine various exceedances along the ADFCs to assess trends in low flows, median flows, and high flows over time. As an example, **Figures 7 and 8** illustrate the 0.5 (median) and 0.9 (a low flow) exceedance conditions over several consecutive 20-year AFDCs. The horizontal lines are 0.5 and 0.9 exceedance flows taken from the lower MFL screening threshold, and the plotted points illustrate the overall trend in the 0.5 and 0.9 excedance flows for several 20-year AFDCs ending in recent years. These points exhibit a slight declining trend for both rivers, as would be expected considering that the rivers are not meeting their MFLs. As recovery projects are implemented and hydrologic conditions in the Lower Santa Fe basin improve, it would be expected that these points would gradually begin to trend upward toward the flow metric taken from the lower MFL screening threshold.

Utilizing AFDCs to create the lower MFL screening thresholds provides an important tool for the SRWMD to assess the status of the Lower Santa Fe and Ichetucknee River on a recurring annual basis. The method is based on actual data as opposed to modeling, and provides a simple metric to compare the trends in streamflows to the MFL. It should be noted that one limitation of this method is that it assumes that future climate conditions will be similar to the baseline period of 1933-1990. As discussed in the MFL Technical Document, this baseline data represents the best available information, and the duration of hydrologic data records is a limitation of nearly all hydrologic analysis. The SRWMD intends to utilize this AFDC tool as a hydrologic screening threshold and a method to evaluate trends in future streamflows with regard to the MFL. The SRWMD will also continue to utilize the best available tools, streamflow data, and climate records to evaluate the status of the Lower Santa Fe and Ichetucknee Rivers and associated priority springs with regard to their MFLs.

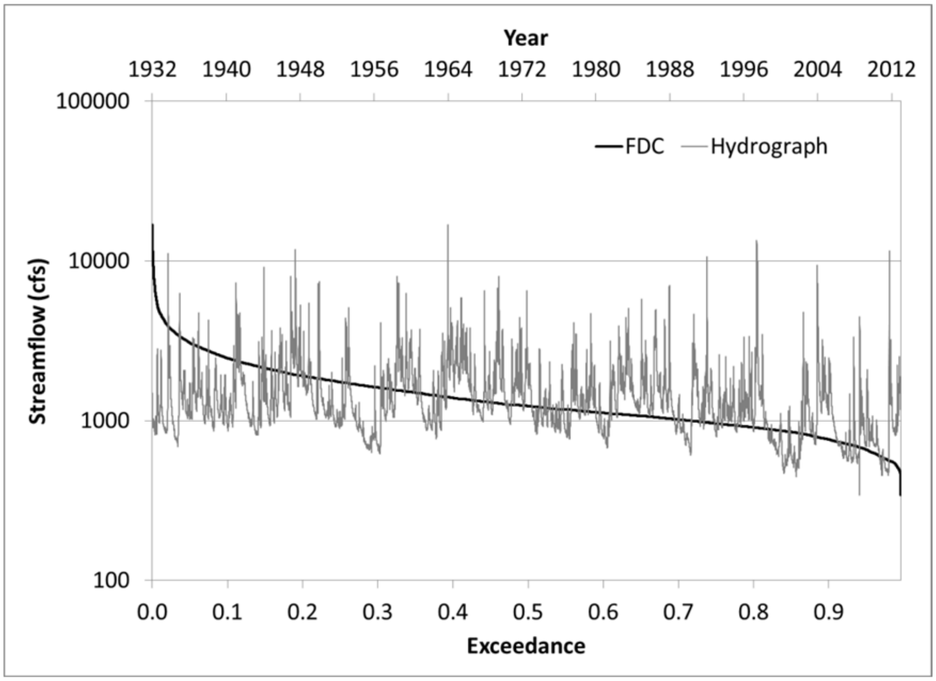

Figure 1. Comparison of the period-of-record hydrograph of the Lower Santa Fe River near Fort White with its period-of-record flow duration curve.

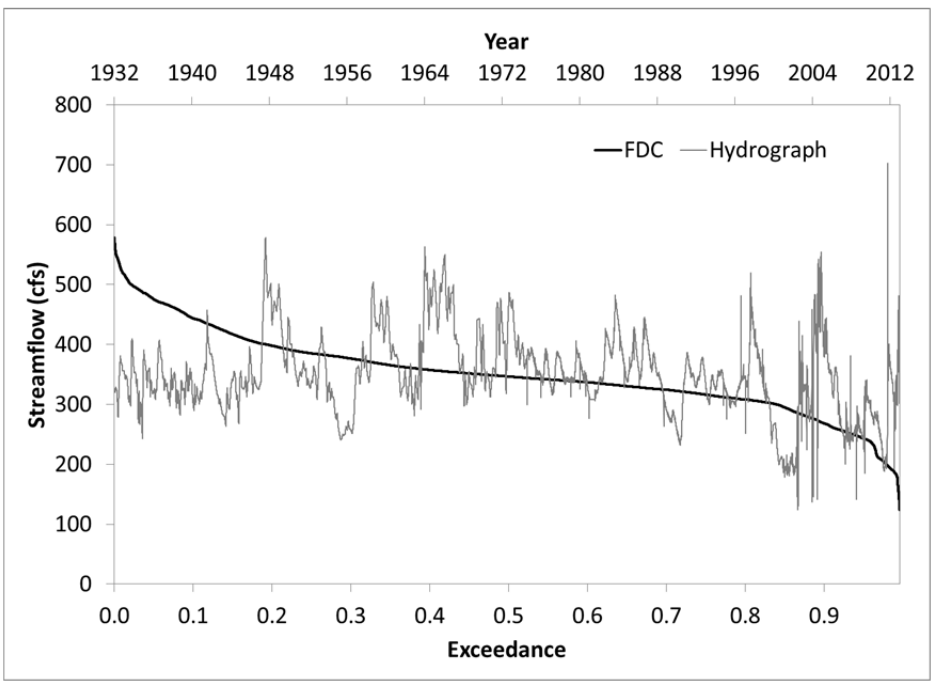

Figure 2. Comparison of the period-of-record hydrograph of the Ichetucknee River at Highway 27 Hildreth with its period-of-record flow duration curve.

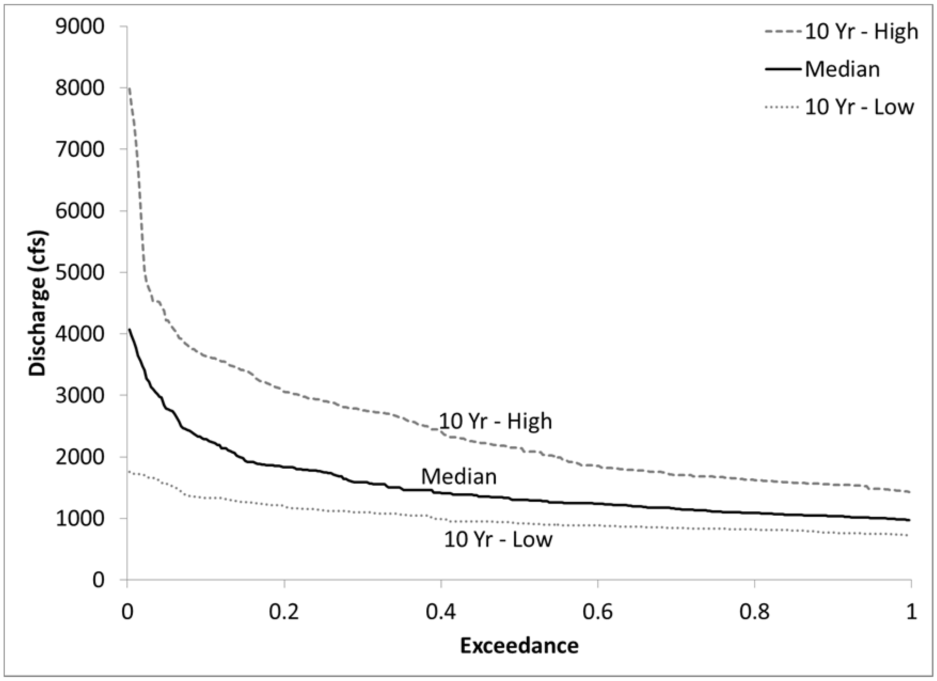

Figure 3. Annual Flow Duration Curves for the Lower Santa Fe River near Fort White.

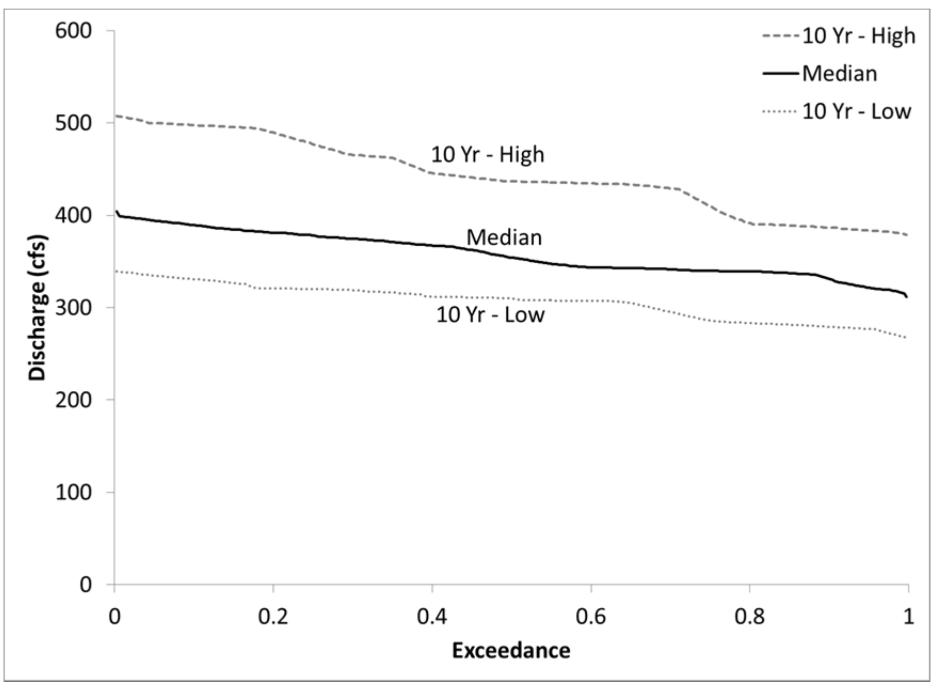

Figure 4. Annual Flow Duration Curves for the Ichetucknee River at Highway 27.

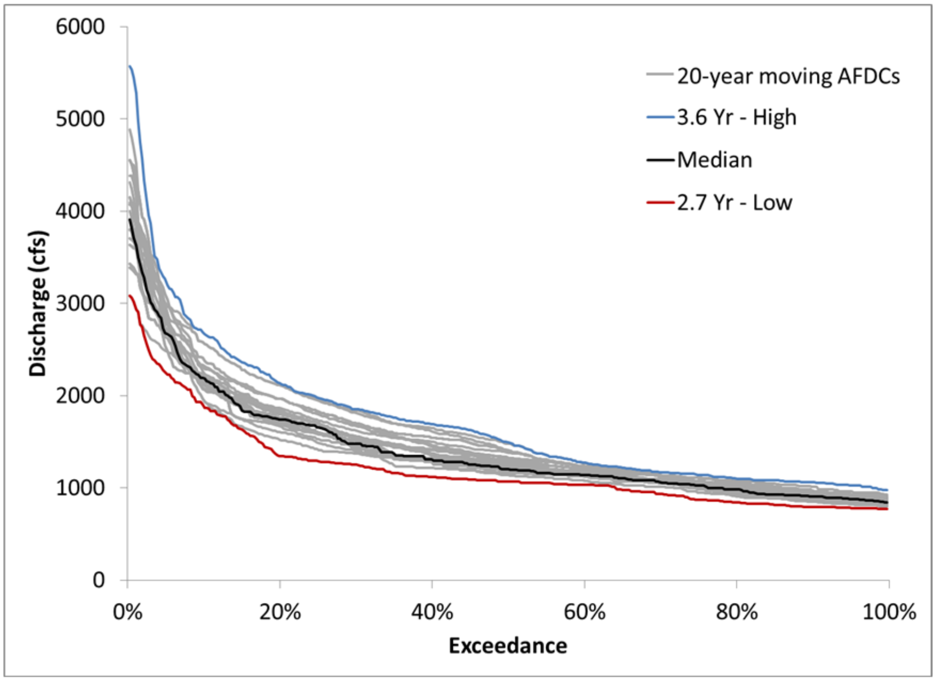

Figure 5. Median and Bounding T-year Annual Flow Duration Curves superimposed on the Individual 20-Year moving Annual Flow Duration Curves for the Lower Santa Fe River near Fort White.

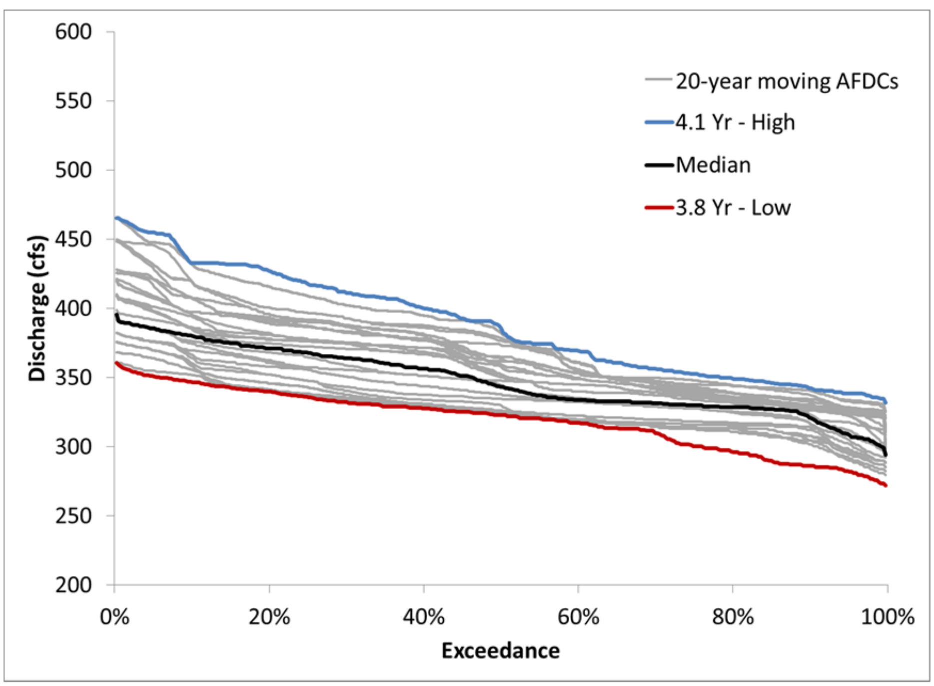

Figure 6. Median and Bounding T-year Annual Flow Duration Curves superimposed on the Individual Annual Flow Duration Curves for the Ichetucknee River at Highway 27.

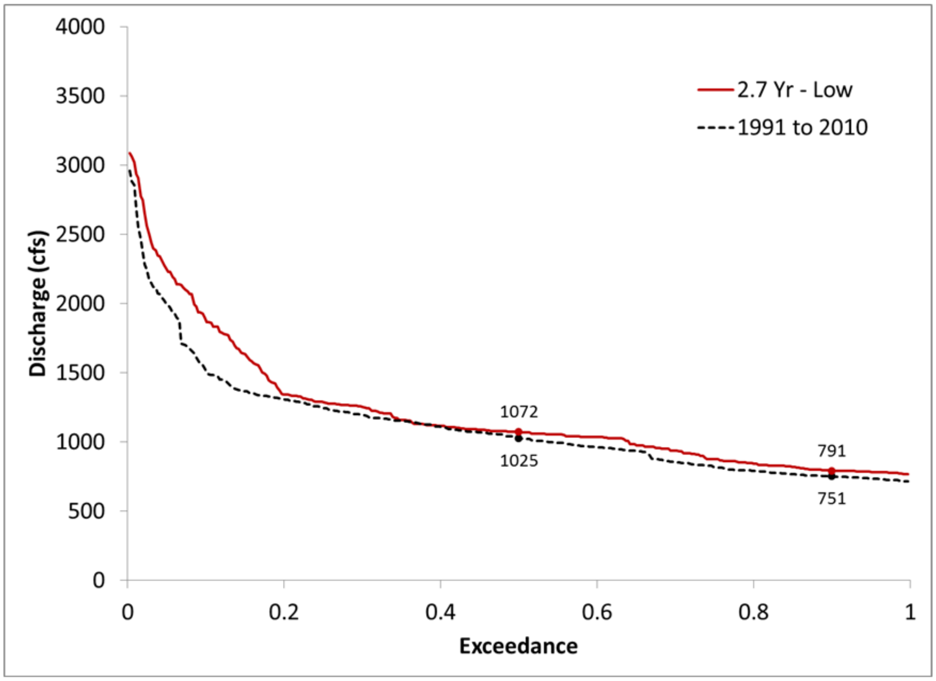

Figure 7. Lower MFL Screening Threshold and 20-Year moving Annual Flow Duration Curve for the Lower Santa Fe River near Fort White.

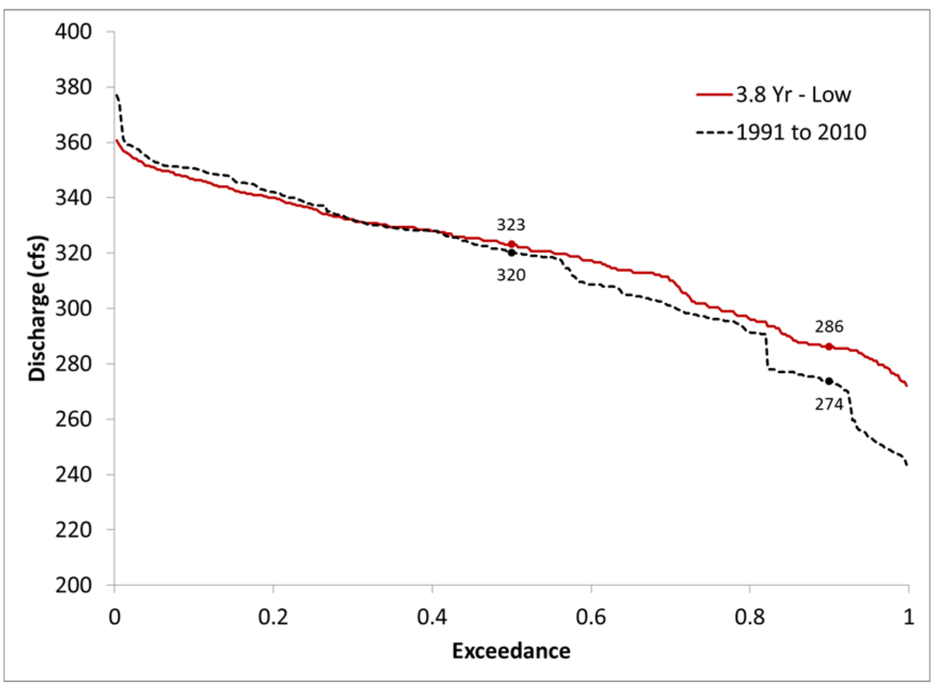

Figure 8. Lower MFL Screening Threshold and 20-Year moving Annual Flow Duration Curve for the Ichetucknee River at Highway 27.

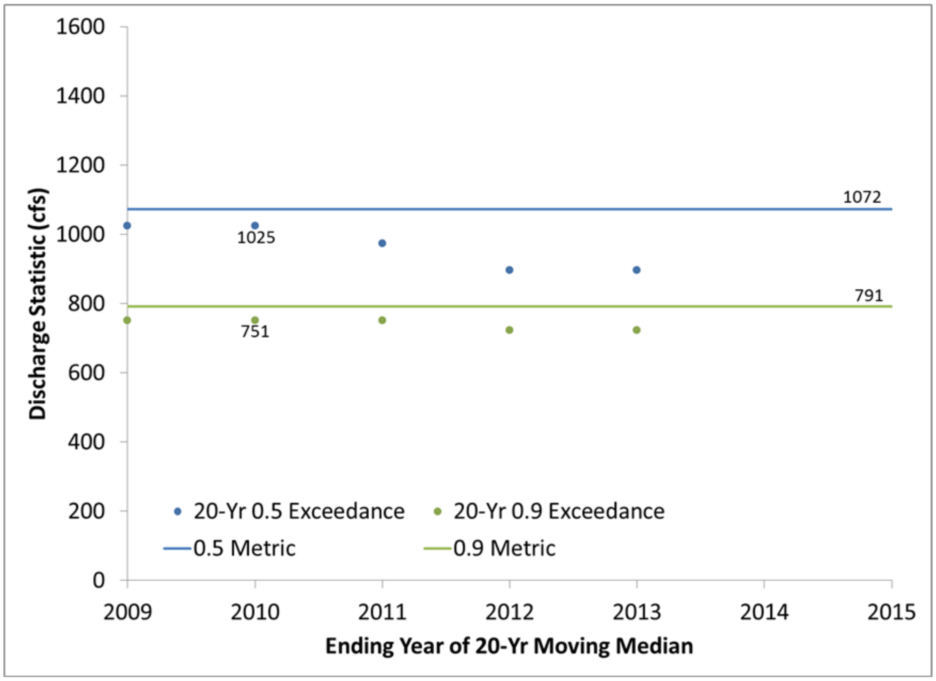

Figure 9. Assessment Tool for the Lower Santa Fe River near Fort White.

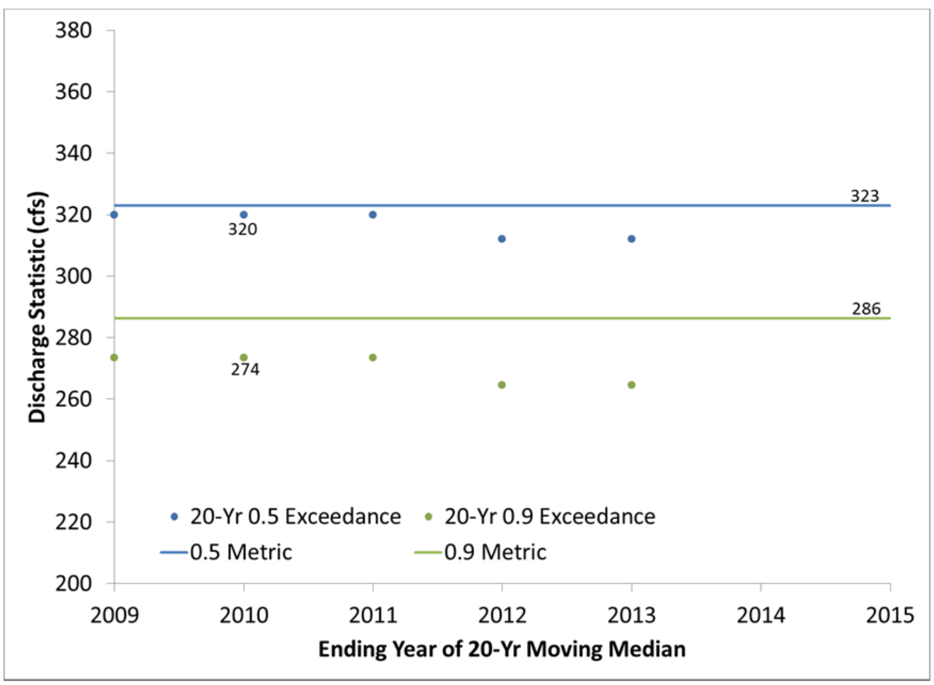

Figure 10. Assessment Tool for the Ichetucknee River at Highway 27.

Appendix H

Priority Waterbodies without Minimum Flows and Minimum Levels – Assessment

Technical Memorandum
North Florida Regional Water Supply Plan
Priority Waterbodies without Minimum Flows and Minimum Levels – Assessment
September 1, 2016

Within the North Florida Regional Water Supply Plan (NFRWSP) area, there are two river reaches, six springs, and 13 lakes on the Districts' priority lists for future minimum flows and minimum levels (MFLs) development. Of these priority waterbodies, only the river reaches and springs were evaluated in this analysis due to the current lack of a meaningful screening threshold available for the lakes. Upon MFL adoption, the 13 lakes will be assessed in a subsequent water supply plan. This assessment provides a sense of the potential for water resource impacts in portions of the planning area where MFLs have not been adopted.

Methodology

Reference conditions for the priority waterbodies were calculated using the North Florida-Southeast Georgia regional groundwater flow model (NFSEG) pumps off scenario. Predicted spring flows under this reference condition were compared to the NFSEG-simulated withdrawal conditions at the 2035 planning horizon within the NFRWSP area only and within the entire NFSEG domain. Waterbodies showing more than a 10 percent reduction in flow from reference conditions were identified, however, these results were not utilized in the NFRWSP sufficiency analysis.

A 10 percent reduction in flow does not necessarily correspond to an ecological threshold beyond which significant harm would occur. Conversely, waterbodies experiencing less than a 10 percent reduction in flow may still experience significant harm. The ten percent threshold does, however, highlight areas where resource constraints may occur upon upcoming MFLs adoption. Accounting for the unique hydrologic and ecological conditions for individual priority springs and linking changes in flow to a quantitative significant harm threshold occurs during MFL development. Subsequent versions of the NFRWSP will incorporate any newly adopted or reevaluated MFLs in the water resource assessment and sufficiency analysis in order to utilize the best information available at the time of plan development.

Results

The Alapaha, and the Upper Suwannee Rivers and Stevenson Springs, did not show predicted flow reductions greater than 10 percent at 2035 conditions within the NFRWSP area or at 2035 conditions within the entire NFSEG domain. Alapaha Rise did not show predicted flow reduction greater than 10 percent at 2035 conditions within the NFRWSP area, however, flow reductions exceeded 10 percent under 2035 conditions within the entire NFSEG domain. Holton Creek Rise, Unnamed spring (SUW1017972), Suwannee Spring, and White Spring predicted flow reductions exceeded 10 percent under both 2035 pumping scenarios. Per the SRWMD priority list, MFLs will be set on the Upper Suwannee River and associated priority springs in 2017.

Table H1: NFRWSP Priority Waterbodies without MFLs Assessment Results

Type	Name	County/Basin	WMD	MFL Priority List Year	Reduction in Flow at 2035 > 10% (NFRWSP Area)[1]	Reduction in Flow at 2035 > 10% (NFSEG Model Domain)[2]
River	Alapaha	Alapaha	SR	2017	No	No
River	Upper Suwannee	Upper Suwannee	SR	2016	No	No
Spring	Alapaha Rise	Upper Suwannee	SR	2016	No	Yes
Spring	Holton Creek Rise	Upper Suwannee	SR	2016	Yes	Yes
Spring	Lime	Upper Suwannee	SR	2016	No	No
Spring	Lime Run Sink	Upper Suwannee	SR	2016	No	No
Spring	SUW923973 (Stevenson)	Upper Suwannee	SR	2016	No	No
Spring	SUW1017972 (Unnamed)	Upper Suwannee	SR	2016	Yes	Yes
Spring	Suwannee	Upper Suwannee	SR	2016	Yes	Yes
Spring	White	Upper Suwannee	SR	2016	Yes	Yes

[1] Groundwater modeling scenario simulated 2035 projected withdrawals within the NFRWSP area, with areas outside the NFRWSP area set at 2009 conditions

[2] Groundwater modeling scenario simulated 2035 projected withdrawals within the entire NFSEG domain

Appendix I

Potential Adverse Change to Wetland Function – Methodology and Results

Technical Memorandum
North Florida Regional Water Supply Plan
Potential Adverse Change to Wetland Function – Methodology and Results
January 3, 2017

Introduction

As part of North Florida Regional Water Supply Plan (NFRWSP) development, the St. Johns River Water Management District (SJRWMD) and Suwannee River Water Management District (SRWMD)(Districts) assessed the extent to which water resources and related natural systems may be impacted by projected increases in water use through 2035. Adverse Change to wetland function is one component of the water resource assessment, along with saltwater intrusion/upwelling, minimum flows and levels (MFLs), priority waterbodies without MFLs, and water reservations. In addition to serving as an educational tool, this information helps guide the delineation of water resource caution areas and the formulation of project options.

This technical memorandum details the methods used to assess wetlands in the NFRWSP area associated with projected water demand at the planning horizon (2035) and the assessment results. Although significantly altered wetlands have occurred in the past due mainly to farmland conversion and urbanization, wetlands can be altered by factors other than groundwater withdrawals (e.g., modification of surface water hydrology), therefore, this analysis focused exclusively on assessing the adverse change to existing wetlands due to projected increases in water demand. The outcome of this assessment was used with other factors in determining whether traditional water supply (i.e., fresh groundwater) sources are sufficient to meet future water demands.

Stakeholder Advisory Committee Recommendation

District staff briefed the North Florida Regional Water Supply Partnership Stakeholder Advisory Committee (SAC) on the wetlands assessment methodology in March 2014 and December 2015. The Districts received a favorable recommendation on the methodology from the SAC on January 25, 2016.

Background

In previous SJRWMD Water Supply Assessments, the probability of adverse change in wetland functions was determined using variations of the Kinser-Minno method (Kinser and Minno, 1996; Kinser et. al., 2003). Changes to the analysis timeframe and minor soil/vegetation classification revisions have occurred over time with changes in the planning horizon, geographic scope of individual planning projects, and improvements to the input data and groundwater models. In 2008, a modified Kinser-Minno method (Dunn et. al., 2008) was developed for assessing the adverse change to wetland function in areas where the upper Floridan aquifer (UFA) is unconfined. The modified method includes two additional steps that effectively remove those areas where the vegetative community and the Surficial Aquifer System (SAS) are not hydraulically connected to the UFA and therefore would not be influenced by changes in UFA levels. With some minor modifications discussed below, the Kinser-Minno method and the modified Kinser-Minno method were used for the NFRWSP wetland assessment in the confined and unconfined portions of the planning area, respectively. For purposes of the NFRWSP, the terms sensitive vegetation and wetland are considered interchangeable as the majority of the vegetation community types that are highly sensitive to SAS drawdowns are wetlands (see Table I2).

Both methods use a geographic information system (GIS) model to conduct a matrix analysis of soil permeability, sensitivities of plant communities to dewatering, and projected declines in the SAS to estimate the potential adverse change to individual plant communities that may occur if future water demands were met with traditional sources. The modified method adds depth from land surface to the potentiometric surface of the unconfined UFA to the final matrix. The results of the GIS analyses highlight wetlands with low, moderate and high potential for adverse change due to potential declines in the SAS from 2009 (the reference year) to 2035.

Data and Information Sources

GIS data used in the wetland analysis included:

1. 2012 Soil Survey Geographic Database for Florida (SSURGO)
2. 2009 Land Cover/Land Use GIS Data Layer, SJRWMD
3. 2010 Land Cover/Land Use GIS Data Layer, SRWMD
4. Unconfined Floridan Aquifer System Boundary, United States Geologic Survey (Miller, 1986)
5. 2008 Digital Elevation Model for the State of Florida, Florida Department of Environmental Protection (FDEP)
6. May 2014 UFA Potentiometric Surface GIS Data Layer, SJRWMD

Soil permeability classifications were derived from the county soil survey for each county (Title 430-VI, United States Department of Agriculture, Soil Conservation Service). Vegetation type classifications were derived from the Land Cover/Land Use GIS database and classified based on technical expertise from District wetland scientists (P. Kinser, SJRWMD; M. Minno, SRWMD).

Soil Permeability Classification

Soil permeability describes the capacity of a soil to allow fluids to pass through it. For purposes of the wetlands assessment, permeability is a key component because it dictates how quickly an area of sensitive vegetation becomes dewatered when the water table declines in elevation.

The Natural Resources Conservation Service (NRCS) provides estimates of the inches of water per hour that can move downward through a saturated soil based upon laboratory measurements. For the NFRWSP, NRCS permeability classes in Florida (U.S. Department of Agriculture, NRCS, National Cooperative Soil Survey) were grouped in high, moderate, or low categories of drawdown sensitivity, as shown in Table I1.

Table I1: Soil Permeability Classification (SCS)

SCS Permeability Class	SCS Permeability Rate (inches/hour)	NFRWSP Class
Very Slow	Less than 0.06	Low sensitivity to drawdown (1)
Slow	0.06 – 0.2	
Moderately Slow	0.2 – 0.6	
Moderate	0.6 – 2.0	Moderate sensitivity to drawdown (2)
Moderately Rapid	2.0 – 6.0	
Rapid	6.0 – 20	High sensitivity to drawdown (3)
Very Rapid	Greater than 20	

Vegetation Type Classification

The extent to which vegetation types are sensitive to SAS drawdown varies dramatically. Hydric vegetation communities such as swamps are highly sensitive to water table elevation, whereas more xeric communities such as sand pine are much less affected by adverse changes in the water table.

Input data for vegetative communities included the land use/land cover GIS layers from SJRWMD (2009) and SRWMD (2010/2011; FDEP Bureau of Watershed Restoration). Both data sources rely on digitized aerial photography, with classifications derived from the Florida Land Use and Cover Classification System.

For purposes of the NFRWSP, polygons in the land cover/land use layers were classified as "high, moderate or low" sensitivity to drawdown, relative to their dominant vegetation type, per Table I2.

Table I2: Classification of Sensitive Vegetation Types

Land Use Code	**NFRWSP Class** 1 = Low Sensitivity 2 = Moderate Sensitivity 3 = High Sensitivity
4100: Upland Coniferous Forests	1
4110: Pine Flatwoods	2
4120: Longleaf Pine - Xeric Oak	1
4130: Sand Pine	1
4140: Pine - Mesic Oak	1
4190: Hunting Plantation Woodlands	1
4200: Upland Hardwood Forests	2
4210: Xeric Oak	1
4270: Live Oak	1
4271: Oak - Cabbage Palm Forests	1
4280: Cabbage Palm	2
4340: Upland Mixed - Coniferous / Hardwood	2
4400: Tree Plantations	1
4410: Coniferous Plantations	2
4420: Hardwood Plantations	1
4430: Forest Regeneration Areas	2
6100: Wetland Hardwoods Forests	3
6110: Bay Swamps	3
6111: Bayhead	3
6120: Mangrove Swamps	1
6130: Gum Swamps	3
6140: Titi Swamps	3
6150: Stream and Lake Swamps (bottomland)	3
6170: Mixed Wetland Hardwoods	3
6172: Mixed Shrubs	3
6180: Cabbage Palms	3
6181: Cabbage Palm Hammock	3
6182: Cabbage Palm Savannah	3
6200: Wetland Coniferous Forests	3
6210: Cypress	3
6215: Cypress- Domes/Heads	3

Table I2: Classification of Sensitive Vegetation Types

Land Use Code	**NFRWSP Class** 1 = Low Sensitivity 2 = Moderate Sensitivity 3 = High Sensitivity
6216: Cypress - Mixed Hardwoods	3
6220: Pond Pine	3
6240: Cypress - Pine - Cabbage Palm	3
6250: Hydric Pine Flatwoods	3
6260: Pine Savannah	3
6300: Wetland Forested Mixed	3
6400: Vegetated Non-Forested Wetlands	3
6410: Freshwater Marshes	3
6411: Freshwater Marshes - Sawgrass	3
6420: Saltwater Marshes	1
6430: Wet Prairies	3
6440: Emergent Aquatic Vegetation	3
6460: Mixed Scrub-shrub Wetland	3
6500: Non-Vegetated Wetlands	3
6510: Tidal Flats	1
6520: Shoreline	1
6530: Intermittent Ponds	3
6600: Salt Flats	1

Potential for Future Impacts

A key component of the wetlands assessment is the magnitude to which the projected increase in future groundwater withdrawals through the planning horizon will affect the water table elevation of the SAS throughout the planning region and, thus, potentially alter wetlands. For these steps in the analysis, each polygon was assigned a potential for impact ranking through combination of the soil permeability and vegetation type classes (Table I3). This potential for altered classification assigns high and medium rank to only those vegetation communities that have a high sensitivity to water table drawdown, the wetland communities. The North Florida-Southeast Georgia regional groundwater model (NFSEG) was used to calculate the change in SAS elevation (i.e., SAS drawdown) between the reference year (2009) and 2035 for each model grid cell. Surficial Aquifer System drawdown for each vegetation polygon was derived from the most applicable model grid cell. The change potential classification and projected drawdown in the SAS were combined into a polygon-specific potential for wetland change classification (Table I4). Surficial aquifer drawdown breakpoints were derived from published literature and unpublished data, as discussed in the Water 2020 Constraints Handbook (CH2M Hill, 1998). This assessment provided an estimate of magnitude (acres), degree (moderate vs. high), and spatial distribution of the potential of future adverse change to wetland functions throughout the portion of the NFRWSP area where the UFA is confined.

Table I3: Potential for Wetland Change Classification (Integrated Soil Permeability and Vegetation Type Sensitivity)

	Vegetation Sensitivity Classification		
Soil Permeability Classification	*High*	*Moderate*	*Low*
High	High	Low	Low
Moderate	Moderate	Low	Low
Low	Low	Low	Low

Table I4: Potential Future Wetland Change Classification (Confined)

	Potential Future Wetland Change Classification		
Projected SAS Drawdown	*High*	*Moderate*	*Low*
> 1.2 ft.	High	High	Low
0.35 – 1.2 ft.	High	Moderate	Low
< 0.35 ft.	Low	Low	Low

Modified Kinser-Minno Method – Additional Steps

There are two additional steps in the modified methodology for assessing adverse changes to wetlands in areas where the Floridan aquifer is unconfined. A spatial representation of the unconfined areas of the Floridan aquifer was used to extract a new dataset showing only those polygons identified as having a high and moderate potential for change (Table I4) within the unconfined portions of the NFRWSP area. Depth from land surface to the 2014 Floridan aquifer potentiometric surface was calculated and categorized into three 15-ft intervals (Table I5). The initial potential adverse change designation of wetland polygons (Table I4) was then reclassified based on the depth to the Floridan aquifer.

Table I5: Potential Future Wetland Change Classification (Unconfined)

	Potential Future Wetland Change Classification (Confined)		
Depth from Land Surface to Unconfined Aquifer	*High*	*Moderate*	*Low*
0 – 15 ft.	High	Moderate	Low
15 – 30 ft.	Moderate	Low	Low
>30 ft.	Low	Low	Low

Results

When assessing potential adverse change to existing wetlands due to 2035 conditions solely within the NFRWSP area (all other areas in NFSEG domain held at 2009 conditions), it is estimated that 20,175 acres of wetlands have a high or moderate potential of being altered (Table I6, Figure I1). The estimated acreage increases to 24,083 acres when assessing alteration potential using 2035 demand conditions within the entire NFSEG domain (Figure I2).

Table I6: Wetland Acreage Identified as Having a Moderate or High Potential for Adverse Change

County	WMD	Potential Wetland Adverse Change at 2035 Conditions (NFRWSP Area) (acres)	Potential Wetland Adverse Change at 2035 conditions (NFSEG Domain) (acres)
Alachua	SJR	1,392	1,615
Alachua	SR	209	220
Baker	SJR	0	0
Baker	SR	0	0
Bradford	SJR	8	8
Bradford	SR	116	116
Clay	SJR	3,879	4,063
Columbia	SR	54	54
Duval	SJR	955	1,124
Flagler	SJR	3,532	4,197
Gilchrist	SR	798	1,103
Hamilton	SR	998	2,586

Table I6: Wetland Acreage Identified as Having a Moderate or High Potential for Adverse Change

County	WMD	Potential Wetland Adverse Change at 2035 Conditions (NFRWSP Area) (acres)	Potential Wetland Adverse Change at 2035 conditions (NFSEG Domain) (acres)
Nassau	SJR	389	471
Putnam	SJR	5,392	5,766
St. Johns	SJR	63	63
Suwannee	SR	13	18
Union	SR	2,377	2,699
Total		**20,175**	**24,103**

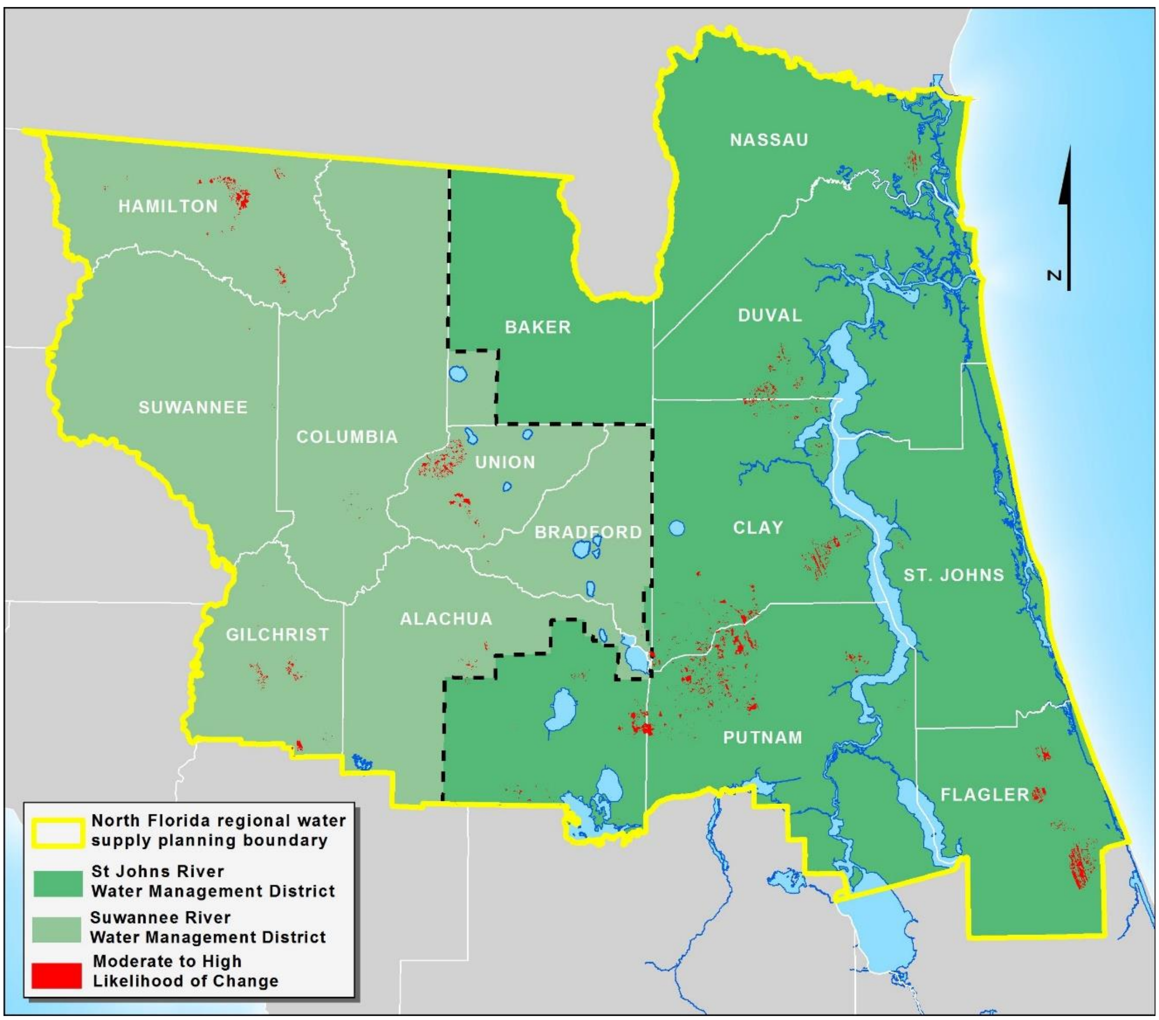

Figure I1: Wetlands at Risk of Adverse Change Due to 2035 Projected Withdrawals within the NFRWSP Area

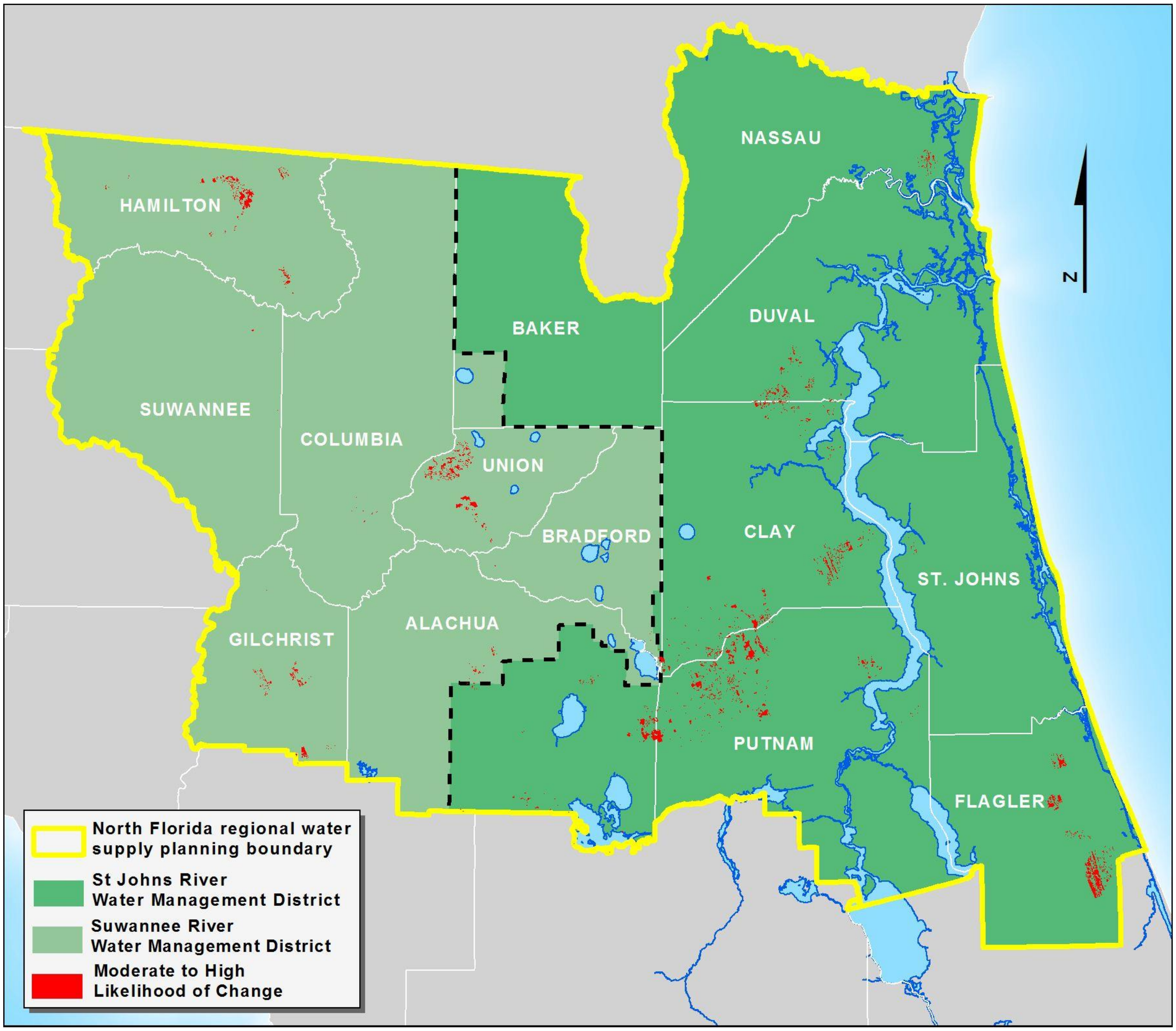

Figure I2: Wetlands at Risk of Adverse Change Due to 2035 Projected Withdrawals within the NFSEG domain

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Appendix J

Water Resource Development Project Options

North Florida Regional Water Supply Plan
Water Resource Development Project Options

County	Project Name	Implementing Agency or Entity	Project Description	Project Type	Water Source	Project Capacity (mgd)	Total Capital ($M)	Estimated Annual O&M	Timeframe for Completion
Alachua	Oakmont Groundwater Recharge Wetlands	GRU	Construction of groundwater recharge wetlands at Oakmont subdivision.	Reuse - Recharge	Reclaimed Water	1.00	0.60	$29,000	2017 [2]
Alachua	Kanapaha Middle School GW Recharge Wetlands	GRU	Construction of groundwater recharge wetlands at Kanapaha Middle School.	Reuse - Recharge	Reclaimed Water	0.50	0.15	$18,000	2017 [2]
Bradford	West Ridge WRD Area	SRWMD	Restore natural flows, with or without aquifer recharge wells.	Recharge	Surface Water	1.00	2.79	$29,000	2035 [3]
Bradford	Brooks Sink Phase 2	SRWMD	Redirects flow to natural sink.	Recharge	Surface Water	0.60	0.20	$20,000	2035 [3]
Clay	Black Creek	SJRWMD, local cooperator	Withdrawal near Penney Farms with 200 MGAL reservoir at corner of SR16 and SR 21; used for land application to spreader field south of Lake Magnolia for recharge or could be utilized by utility.	Recharge	Surface Water	10.00	85.50	$507,000	2035 [3]
Columbia	Ichetucknee Springshed W.Q. Improvement Project	City of Lake City, SRWMD	A sprayfield will be converted into wetlands that will provide additional treatment to reduce nitrogen and recharge to the aquifer.	Recharge	Surface Water	1.20	5.01	$33,000	2016 [2]
Columbia	Ichetucknee Trace - Clay Hole Creek / Alligator Lake Aquifer Recharge and Stormwater Mitigation	Columbia County, SRWMD, FDEP	Construct recharge wells to capture stormwater runoff from Price and Alligator Creek basins.	Recharge	Surface Water	4.00	2.56	$95,000	2020 [3]
Columbia	Lake Harris	SRWMD	Construction of an additional recharge well to reduce flooding and to provide aquifer recharge.	Recharge	Floridan	0.30	0.20	$13,000	2016 [1]
Columbia	Falling Creek	SRWMD	This project involves a maximum daily capacity from the Upper Suwannee River to Falling Creek Falls, recharging the aquifer.	Recharge	Surface Water	10.00	48.42	$227,000	2035 [3]
Columbia	Cannon Creek	SRWMD	Stormwater improvements and recharge wells.	Recharge	Surface Water	2.24	2.50	$56,000	2020 [2]
Dixie	Lower Suwannee Drainage Basin Aquifer Recharge Project	Dixie County, FDEP, SRWMD	Eliminating ditched stormwater runoff and re-establishing flow patterns from the drainage basin to rehydrate lakes and wetlands for natural recharge.	Recharge	Surface Water	3.26	2.41	$78,000	2020 [3]
Dixie	Cow Pond Drainage Basin Aquifer Recharge Project	Dixie County, FDEP, SRWMD	Eliminating ditched stormwater runoff and re-establishing flow patterns from the drainage basin to recharge wells and rehydrate lakes and wetlands for natural recharge.	Recharge	Surface Water	1.69	1.60	$44,000	2020 [3]
Duval	District 2 WWTF RIB - Transmission and Pumping	JEA	Rapid Infiltration Basin for District 2 WWTF (estimated 6.0 MGD capacity, land costs TBD).	Reuse - Recharge	Reclaimed Water	6.00	8.90	$375,000	2024 [3]
Hamilton	Eagle Lake	PCS, FDEP, SRWMD	Reduction of Groundwater withdrawal with increased use of surface water for process use.	Wellfield Reduction	Floridan	10.00	3.60	$71,000	2016 [1]
Lafayette	Middle Suwannee River and Springs Restoration and Aquifer Recharge Project	SRWMD	Hydrologic restoration to rehydrate wetlands and ponds to recharge the aquifer.	Recharge	Surface Water	10.00	1.90	$227,000	2018 [2]
Madison	Madison Blue Spring Aquifer Recharge	SRWMD	Four existing drainage wells will be rehabilitated or replaced to improve recharge rates.	Recharge	Surface Water	3.40	0.70	$82,000	2025 [3]
					Total:	**65.19**	**$ 167.04**		

[1] Project Completed
[2] Project Under Construction
[3] Project Construction has Not Started

Appendix K

Water Supply Development Project Options

North Florida Regional Water Supply Plan
Water Supply Development Project Options

County	Water Management District	Project Name	Implementing Entity	Project Description	Project Type	Water Source	Estimated Water Supply Benefit (mgd)	Total Capital ($M)	Estimated Annual O&M	Timeframe for Completion*
Alachua	SJRWMD	Brytan Subdivision Reclaimed Water System Expansion	GRU	Expansion of reclaimed water distribution system pipelines in Brytan subdivision to offset use of potable water for irrigation.	Reuse - Pipeline	Reclaimed Water	0.16	$2.23	$2,000	2026
Alachua	SJRWMD	Innovation District Reclaimed Water System Expansion	GRU	Expansion of reclaimed water distribution system pipelines to offset use of potable water for industrial cooling and irrigation in the Innovation District.	Reuse - Pipeline	Reclaimed Water	0.11	$1.50	$1,100	2035
Alachua	SRWMD	Oakmont Reclaimed Water Main Extension	GRU	This project will include construction of reclaimed water (RCW) mains for the internal distribution network for construction of the Oakmont Subdivision, Phase 2.	Reuse - Pipeline	Reclaimed Water	0.05	$0.44	$1,000	2035
Alachua	SRWMD	Oakmont Subdivision Reclaimed Water System Expansion	GRU	Expansion of reclaimed water distribution system pipelines in Oakmont subdivision to offset use of potable water for irrigation. Includes additional transmission and storage/pumping facilities to facilitate addition of groundwater recharge wetlands and/or further expansion of potable offset irrigation.	Reuse - Pipeline	Reclaimed Water	0.40	$8.40	$5,600	2026
Alachua	SRWMD and SJRWMD	Reclaimed Water System Expansion into New Neighborhoods	GRU	Expansion of reclaimed water distribution system pipelines to offset use of potable water for irrigation.	Reuse - Pipeline	Reclaimed Water	0.40	$5.00	$3,000	2035
Clay	SJRWMD	First Coast Outer Beltway Stormwater Ponds	CCUA	Horizontal well and treatment sites at 29 Stormwater ponds along SR 23 phase 3 corridor (First Coast Outer Beltway).	Reuse - Pipeline	Stormwater	2.50	$27.00	$69,000	2030
Clay	SJRWMD	Green Cove Regional Reclaimed WTP	CCUA	New reclaim water treatment facility with 0.4 MGD AADF capacity.	Reuse - Supply	Reclaimed Water	0.40	$1.30	$24,000	2018
Clay	SJRWMD	Mid-Clay Land Application and Recovery Site	CCUA	Construction of a rapid infiltration basin and horizontal well recovery system.	Reuse - Storage	Reclaimed Water	2.08	$2.76	$199,000	2015
Clay	SJRWMD	Reclaim Future System Expansion	CCUA	Extension of CCUA reclaimed water transmission and distribution to supply future developments.	Reuse - Pipeline	Reclaimed Water	7.50	$7.50	$4,000	2030
Clay	SJRWMD	Reclaimed Water Transmission/Distribution Main Extensions	CCUA	Extend CCUA reclaimed water infrastructure to developments under construction.	Reuse - Pipeline	Reclaimed Water	0.38	$1.30	$1,000	2016
Clay	SJRWMD	Stormwater Harvest Pilot Project	CCUA	Horizontal well and treatment site to withdraw and treat groundwater near stormwater ponds for reuse supply.	Reuse - Pipeline	Stormwater	0.40	$1.20	$4,500	2017
Clay	SJRWMD	Reclaimed Water Ground Storage Tanks	CCUA	Old Jennings and Ridaught Reclaimed Water Treatment Plants 0.75 MG Ground Storage Tanks (x2).	Reuse - Storage	Reclaimed Water	0.03	$1.25	$1,000	2018
Clay	SJRWMD	LSJRB Reuse and Treatment	Town of Orange Park	Primarily a WWTP Upgrade for WQ improvement with secondary implementation of reuse in cooperation with CCUA through an interconnect.	Reuse - Supply	Reclaimed Water	0.25	$0.27	$7,800	2013
Columbia	SRWMD	City of Lake City Reclaimed Water System Upgrade (Phase 1)	SRWMD	Installation of 2.7 miles of reclaimed water main to increase the amount of reclaimed water users.	Reuse - Pipeline	Reclaimed Water	0.54	$0.55	$1,000	2018
Duval	SJRWMD	Atlantic Beach Selva Marina Reclaimed Water System Expansion	City of Atlantic Beach	Install pipeline to supply reclaimed water to golf course and residential homes.	Reuse - Supply	Reclaimed Water	0.50	$1.11	$1,000	2015
Duval	SJRWMD	NAS Reclaimed Water Project	City of Jacksonville	Expand the reuse to the NAS-JAX golf course, weapons storage area and ballfields.	Reuse - Pipeline	Reclaimed Water	0.36	$1.87	$1,000	2012
Duval	SJRWMD	Jacksonville Beach Water & Sewer Mains Extension	City of Jacksonville Beach	The project objective is to eliminate private wells for potable use and septic tanks adjacent to the Intracoastal Waterway by extending the water main (about 1000 feet new & 1000 feet upsized replacement) and by extending the sanitary sewer main (about 2000 feet new) to 7 residential properties on the private road extension connected to the end of Hopson Road. A fire hydrant will be added near the end of the water main extension to improve fire safety. Currently, six of these properties are developed and have private water wells and septic tanks, which are not charged. With charging for utility water & sewer services, it is ultimately anticipated that water usage may be conserved. With abandonment of septic tanks, the nutrient load into the adjacent area near the Intracoastal Waterway is reduced and reclaimed water supply is increased. Project capacity and water supply benefit are based on an estimated 500 gpd per connection.	Reuse - Supply	Reclaimed Water	0.00	$0.43	$1,000	2018
Duval	SJRWMD	Reuse Treatment and Initiative Program	City of Neptune Beach	Upgrade WWTP to reuse standards and implement reuse program.	Reuse - Supply	Reclaimed Water	0.03	$0.95	$12,000	2014

County	Water Management District	Project Name	Implementing Entity	Project Description	Project Type	Water Source	Estimated Water Supply Benefit (mgd)	Total Capital ($M)	Estimated Annual O&M	Timeframe for Completion*
Duval	SJRWMD	9B Reclaimed Water System Expansion	JEA	This project is in coordination with a roadway project at a new interchange. Significant cost savings will result from this new reclaimed water main being installed during construction of new roadway. The estimated length of 30" reclaimed water main to be installed is 1,868 feet. This pipeline will provide reclaimed water to commercial and residential customers resulting in an offset of potable water used for irrigation, reducing the amount of water withdrawn from the Floridan Aquifer. Two WWTFs (Mandarin and Arlington East) will provide reclaimed water to the proposed pipeline, both WWTFs discharge effluent to the St. Johns River. Any reclaimed water used will reduce the amount effluent discharged to the St. Johns River.	Reuse - Pipeline	Reclaimed Water	13.00	$0.45	$1,000	2015
Duval	SJRWMD	Arlington East 2 MGD Reclaimed Water Filter	JEA	2.0 MGD water reclamation facility filter expansion to support increased reclaimed water demands	Reuse - Supply	Reclaimed Water	2.00	$0.99	$11,000	2015
Duval	SJRWMD	Arlington East Reclaim Storage Conversion	JEA	Conversion of a 2.0 MG sludge holding tank to effluent storage to be used for reclaimed water production	Reuse - Storage	Reclaimed Water	2.00	$0.64	$1,000	2012
Duval	SJRWMD	Arlington East Water Reclamation Facility - Onsite Reuse Pump Upgrade	JEA	On-site piping upgrades and pump replacement, increasing reclaimed water delivery capacity from 750 to 1200 gpm (1.1 To 1.7 MGD).	Reuse - Pipeline and Pumping	Reclaimed Water	0.60	$0.64	$1,000	2016
Duval	SJRWMD	Arlington East WRF - Reclaimed Water Filtration Expansion - Increase Capacity from 8.0 to 10.0 MGD	JEA	2.0 MGD water reclamation facility filter expansion to support increased reclaimed water demands.	Reuse - Supply	Reclaimed Water	2.00	$2.80	$11,000	2023
Duval	SJRWMD	Arlington East WWTP 2.0 MGD Reuse Capacity Addition	JEA	2.0 MGD water reclamation facility filter expansion to support increased reclaimed water demands	Reuse - Supply	Reclaimed Water	2.00	$0.60	$11,000	2012
Duval	SJRWMD	CCUA Reclaimed Water Transmission Main - Southwest WWTF to CCUA	JEA	Installation of 44,000 feet of 24" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	10.15	$15.00	$8,000	2023
Duval	SJRWMD	Glen Kernan Pkwy - Kernan Blvd to Royal Troon Lane - Reclaimed Water System Expansion	JEA	Installation of 2,100 feet of 8" reclaimed water main to serve the Glen Kernan Golf & Country Club golf course.	Reuse - Pipeline	Reclaimed Water	0.43	$0.26	$1,000	2023
Duval	SJRWMD	Greenland Reclaimed Water Repump Facility - Storage Tank and Booster Pump Station	JEA	4.0 MG storage tank and high service pumps.	Reuse - Storage and Pumping	Reclaimed Water	4.00	$5.00	$3,500	2024
Duval	SJRWMD	Mandarin Water Reclamation Facility - High Level UV Upgrade	JEA	UV disinfection system capacity upgrade from 5.7 to 8.75 MGD to increase supply available for public access reuse.	Reuse - Supply	Reclaimed Water	3.05	$4.15	$16,500	2017
Duval	SJRWMD	Monument Rd - Cancun Dr to Hidden Hills Ln - Reclaimed Water System Expansion	JEA	Installation 1,600 feet of 12" and 2,300 feet of 8" reclaimed water main to serve the Hidden Hills Country Club golf course.	Reuse - Pipeline	Reclaimed Water	0.36	$0.64	$1,000	2018
Duval	SJRWMD	RG Skinner - North Rd - Reclaimed Water System Expansion	JEA	Installation of 11,000 feet of 30" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.47	$3.00	$2,000	2020
Duval	SJRWMD	Ridenour WTP - Reclaimed Water Storage and Repump	JEA	3.0 MG storage tank and high service pumps.	Reuse - Storage and Pumping	Reclaimed Water	3.00	$3.70	$3,500	2024
Duval	SJRWMD	Station Creek Rd - Beach Blvd to Hunt Club Rd N - Reclaimed Water System Expansion	JEA	Installation of 2,200 feet of 8" reclaimed water main to serve the Jax Golf & Country Club golf course.	Reuse - Pipeline	Reclaimed Water	0.35	$0.28	$1,000	2023
Duval	SJRWMD	Upgrade Pumps at Mandarin-R	JEA	Install pumps capable of supplying 5.7 MGD	Reuse - Storage and Pumping	Reclaimed Water	1.90	$0.37	$20,000	2013
Duval	SJRWMD	Water Treatment Pilot/Demonstration Phase 1 and 2	JEA	Purified water pilot and demonstration projects.	Technology evaluation	Reclaimed Water	1.00	$20.00	$1,000	2022
Duval	SJRWMD	Bartram Park WTP - RW - Storage Expansion	JEA	Installation of a new 2.5 Mgal storage tank.	Reuse - Storage	Reclaimed Water	0.05	$2.15	$1,000	2017
Duval	SJRWMD	Baymeadows Rd - Point Meadows Rd to Old Still PUD - Reclaimed Water System Expansion	JEA	Installation of 9,500 feet of 8" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.01	$1.00	$1,000	2020
Duval	SJRWMD	Davis - Gate Pkwy to RG Skinner - Reclaimed Water System Expansion	JEA	Installation of 13,700 feet of 30" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.12	$5.00	$1,000	2024
Duval	SJRWMD	District 2 WWTF Reclaimed Water Storage Tank and Booster Pump Station	JEA	1.0 MG storage tank.	Reuse - Storage	Reclaimed Water	0.02	$2.90	$1,000	2019
Duval	SJRWMD	District II - Broward River Crossing Replacement	JEA	Installation of 2,800 feet of 24" of reclaimed water transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.08	$4.84	$1,000	2016
Duval	SJRWMD	Gate Pkwy - Glen Kernan to T-Line - Trans - New - Reclaimed Water System Expansion	JEA	Installation of 18,000 feet of 30" and 2,000 feet of 20" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.18	$8.50	$1,000	2020
Duval	SJRWMD	Gate Pkwy - Shiloh Mill Blvd to Town Ctr Pkwy - Reclaimed Water System Expansion	JEA	Installation of 2,300 feet of 8" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.01	$0.33	$1,000	2018

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Duval	SJRWMD	JP - FDOT - SR 9A (I-295) - Managed Lanes - JTB - 9B Extension - Reclaimed Water System Expansion	JEA	Installation of 1,300 feet of 20" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.06	$0.31	$1,000	2017
Duval	SJRWMD	Mandarin Water Reclamation Facility - Equalization Storage Tank and Transfer Pump Station	JEA	1.7 MG storage tank and a high service pumping upgrade from 5.7 to 8.75 MGD to increase supply available for public access reuse.	Reuse - Storage and Pumping	Reclaimed Water	0.03	$2.56	$6,310	2017
Duval	SJRWMD	Monument Rd - Arlington East WRF to St Johns Bluff Rd - Reclaimed Water System Expansion	JEA	Installation of 7,900 feet of 20" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.06	$3.30	$1,000	2023
Duval	SJRWMD	RG Skinner Area - 9B to Parcels 10A - 11 - Reclaimed Water System Expansion	JEA	Installation of 2,900 feet of 30" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.12	$1.11	$1,000	2017
Duval	SJRWMD	RG Skinner Area - 9B to T-Line - Reclaimed Water System Expansion	JEA	Installation of 3,600 feet of 30" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.12	$1.23	$1,000	2017
Duval	SJRWMD	T-Line - Greenland Substation to GEC - Reclaimed Water System Expansion	JEA	Installation of 8,000 feet of 30" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.12	$3.10	$1,000	2024
Duval	SJRWMD	Tredinick Pkwy - Millcoe Rd to Mill Creek Rd - Reclaimed Water System Expansion	JEA	Installation of 5,800 feet of 12", 1,000 feet of 10", and 4,300 feet of 4" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.04	$1.57	$1,000	2019
Duval/St. Johns	SJRWMD	US 1 - Greenland WRF to CR 210 - Reclaimed Water System Expansion	JEA	Installation of 30,000 feet of 20" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.06	$7.80	$1,000	2022
Duval	SJRWMD	Queens Harbor Reclaimed Water Main Expansion	JEA and Queens Harbor Golf and Country Club	This project will provide reclaimed water to Queens Harbor. A planned 6” reclaimed water main will be installed from an existing reclaimed water main located adjacent to Wonderwood Road. The estimated length of pipe to be installed is 6,265 feet in addition to flow metering and flow control devices.	Reuse - Pipeline	Reclaimed Water	0.30	$0.46	$1,000	2014
Duval	SJRWMD	Intermediate Well Conversion	San Jose Country Club	Installation of an intermediate zone well to a depth of 450 feet to produce approximately 25,200 gallons per day, thus reducing pumping from the Floridan aquifer.	AWS	Intermediate aquifer	0.27	$0.03	$4,800	2016
Flagler	SJRWMD	State Street Irrigation System Expansion	City of Bunnell	Extend reclaimed water mains to their public park and two median enhancement projects along the US1 and SR100 crossroads. The goal is to be able to utilize the city's reclaim water for maximum irrigation and reduce the amount of well water being used while reducing the nutrient loading rate and wet weather discharge from the city's Wastewater Treatment Facility into Old Haw Creek.	Reuse - Pipeline	Reclaimed Water	0.10	$0.05	$1,500	2016
Flagler	SJRWMD	Palm Coast Grand Landing Reclaimed Water Transmission Main	City of Palm Coast	Construct 6,750 linear feet of 16” PVC transmission line and 350 linear feet of 18” HDPE transmission line with associated fittings, valves and site work.	Reuse - Pipeline	Reclaimed Water	0.56	$0.70	$1,000	2017
Flagler	SJRWMD	Palm Coast Matanzas Woods Reclaimed Pipeline	City of Palm Coast	Construct a reclaimed water transmission main extension along Matanzas Woods Pkwy. between Old Kings Rd. and US 1. The capacity of this project is >2 mgd and will supply irrigation demands with reclaimed water in lieu of potable or local groundwater.	Reuse - Pipeline	Reclaimed Water	2.00	$2.53	$1,000	2016
Flagler	SJRWMD	Palm Coast RCW Irrigation Along US-1 & Palm Coast Park	City of Palm Coast	Install a reclaimed water transmission main over Matanzas Woods Parkway from the east side of I-95 to the west side of I-95 to US#1 to make use of WWTP#1 Reclaimed water for irrigation and aquifer recharge.	Reuse - Pipeline	Reclaimed Water	1.00	$1.50	$1,000	2017
Flagler	SJRWMD	Palm Coast Royal Palms Parkway Reclaimed Water Line	City of Palm Coast	Construct a 6,000' of reclaimed water transmission main extension along Royal Palms Parkway between Town Center Boulevard and Belle Terre Parkway to supply residents with reclaimed water for irrigation in lieu of a stormwater pond.	Reuse - Pipeline	Reclaimed Water	0.05	$0.30	$2,000	2015
Flagler	SJRWMD	Palm Coast Utilization of Concentrate as Raw Water Supply	City of Palm Coast	Install cartridge filters and ozone treatment system to allow concentrate to be used as an alternative water supply source when blended with treated water.	AWS	Concentrate	0.75	$1.24	$7,800	2015
Nassau	SJRWMD	Nassau Area - Radio Av - Reclaimed Water Storage Tank and Booster Pump Station	JEA	1.0 MG storage tank and 1,000 gpm high service pumps.	Reuse - Storage and Pumping	Reclaimed Water	1.44	$3.29	$5,000	2019
Nassau	SJRWMD	Nassau Regional WWTF Reclaimed Water Storage Tank, UV Disinfection and Pumps	JEA	1.0 MG storage tank, 1,500 gpm high service pumps, and high level UV disinfection.	Reuse - Storage, Pumping and Supply	Reclaimed Water	2.16	$6.12	$20,000	2019
Nassau	SJRWMD	William Burgess Rd - SR200 to Harts Rd - Trans - New - Reclaimed Water System Expansion	JEA	Installation of 13,000 feet of 16" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.46	$2.50	$5,500	2017

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Nassau	SJRWMD	Nassau RW Main - Radio Av to Harts Rd - Trans - Reclaimed Water System Expansion	JEA	Installation of 11,000 feet of 16" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.04	$2.30	$1,000	2019
Nassau	SJRWMD	T-Line - Amelia Concourse to Amelia National - Reclaimed Water System Expansion	JEA	Installation of 5,700 feet of 10" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.02	$0.80	$1,000	2021
Putnam	SJRWMD	Vulcan Upper to Lower Floridan Aquifer Well Conversion	Vulcan and SJRWMD	Constructing a new lower Floridan aquifer well to replace an existing upper Floridan well.	Change of source	Lower Floridan Aquifer	2.61	$0.76	$64,000	2017
St. Johns	SJRWMD	Bartram Park Reclaimed Water Storage Tank Expansion	JEA	This project adds 2.5 mgd more of storage to support peak demands. Bartram repumps reclaimed water supplied by 2 major wastewater facilities (Arlington East & Mandarin) to support St. Johns County demands, which is currently 7,000 customers. This second tank will provide an additional 5 hours of peak supply at the current pumping rate of 11 mgd.	Reuse - Storage	Reclaimed Water	0.53	$2.10	$21,000	2017
St. Johns	SJRWMD	Bartram Trail HS - Longleaf Pine Pkwy - Reclaimed Water System Expansion	JEA	Installation of 2,600 feet of 6" reclaimed water main to serve the Bartram High School.	Reuse - Pipeline	Reclaimed Water	0.13	$0.24	$1,000	2023
St. Johns	SJRWMD	Nocatee Booster Station	JEA	Allows for increased reclaimed water delivery capacity from 3800 to 4650 gpm (5.5 to 6.7 MGD).	Reuse - Pumping	Reclaimed Water	1.20	$1.35	$3,000	2016
St. Johns	SJRWMD	Nocatee Coastal Oaks Phase 4	JEA	Supply new residents with reclaimed water for irrigation in lieu of potable water by constructing a reclaimed water transmission main extension in the Nocatee Coastal Oaks Phase 4 – R area. The quantity of water expected from this project is 2 mgd and consists of 4,500' of 12" diameter pipe.	Reuse - Supply	Reclaimed Water	2.00	$1.06	$1,000	2016
St. Johns	SJRWMD	Nocatee South Reclaimed Water Storage Tank and Booster Pump Station	JEA	2.0 Mgal storage tank and high service pumps.	Reuse - Storage and Pumping	Reclaimed Water	2.00	$3.50	$2,000	2021
St. Johns	SJRWMD	RiverTown WTP - Reclaimed Water - New Storage and Pumping System	JEA	2.0 Mgal storage tank and high service pumps.	Reuse - Storage and Pumping	Reclaimed Water	2.00	$3.95	$2,000	2021
St. Johns	SJRWMD	Twin Creeks Reclaimed Water Storage Tank and Booster Pump Station	JEA	2.0 Mgal storage tank and high service pumps.	Reuse - Storage and Pumping	Reclaimed Water	2.00	$3.50	$2,000	2021
St. Johns	SJRWMD	CR210 - Longleaf Pine Pkwy to Ashford Mills Rd - Reclaimed Water System Expansion	JEA	Installation of 11,600 feet of 30" and 2,300 feet of 16" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.16	5.00	$1,000	2023
St. Johns	SJRWMD	CR210 - Old Dixie Hwy to Twin Creeks - Trans - Reclaimed Water System Expansion	JEA	Installation of 9,500 feet of 20" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.06	2.30	$1,000	2019
St. Johns	SJRWMD	CR210 - South Hampton to Ashford Mills - Trans - Reclaimed Water System Expansion	JEA	Installation of 7,400 feet of 12" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.02	0.65	$1,000	2018
St. Johns	SJRWMD	CR210 - St Johns Pkwy to Leo Maguire Pkwy - Reclaimed Water System Expansion	JEA	Installation of 9,000 feet of 8" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.01	1.12	$1,000	2024
St. Johns	SJRWMD	CR210 - Twin Creeks to Russell Sampson Rd - Reclaimed Water System Expansion	JEA	Installation of 12,000 feet of 20" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.06	3.00	$1,000	2021
St. Johns	SJRWMD	Greenbriar Rd - Longleaf Pine Pkwy to Spring Haven Dr - Reclaimed Water System Expansion	JEA	Installation of 13,500 feet of 20" reclaimed water main to serve as a transmission pipeline	Reuse - Pipeline	Reclaimed Water	0.06	3.50	$1,000	2021
St. Johns	SJRWMD	Nocatee - Coastal Oaks Phase 4 - Reclaimed Water System Expansion	JEA	Installation of 3,400 feet of 12" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.02	0.17	$1,000	2016
St. Johns	SJRWMD	Nocatee Area - Artisan Lakes - N10 - Reclaimed Water System Expansion	JEA	Installation of 4,200 feet of 12" reclaimed water main to serve as a gridded transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.02	0.23	$1,000	2016
St. Johns	SJRWMD	Nocatee Area - Crosswater Pkwy - Coastal Oaks to South Village - Reclaimed Water System Expansion	JEA	Installation of 8,400 feet of 16" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.04	0.39	$1,000	2017
St. Johns	SJRWMD	Nocatee Area - Riverwood POD 17 - Reclaimed Water System Expansion	JEA	Installation of 4,500 feet of 12" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.02	0.17	$1,000	2016
St. Johns	SJRWMD	Nocatee Area - Twenty Mile Village - Reclaimed Water System Expansion	JEA	Installation of 8,400 feet of 12" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.02	0.30	$1,000	2016
St. Johns	SJRWMD	Nocatee Area - Twenty Mile Village Ph 4A - 4B - Reclaimed Water System Expansion	JEA	Installation of 1,400 feet of 12" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.02	0.32	$1,000	2016
St. Johns	SJRWMD	Nocatee North Storage and Repump Facility - New 3.5 MG Reclaimed Water Storage Tank	JEA	Installation of a new 3.5 Mgal storage tank.	Reuse - Storage	Reclaimed Water	0.07	2.50	$1,000	2017
St. Johns	SJRWMD	Nocatee Storage and Repump Facility Tank Expansion	JEA	Increase storage tank capacity from 1.009 to 1.178 Mgal.	Reuse - Storage	Reclaimed Water	0.003	0.29	$1,000	2016
St. Johns	SJRWMD	Rivertown - Parcel 13 - Southern POD - Reclaimed Water System Expansion	JEA	Installation of 1,800 feet of 10" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.02	0.06	$1,000	2017
St. Johns	SJRWMD	Russell Sampson Rd - St. Johns Pkwy to CR210 - Reclaimed Water System Expansion	JEA	Installation of 12,000 feet of 20" reclaimed water main to serve as a transmission pipeline	Reuse - Pipeline	Reclaimed Water	0.06	2.50	$1,000	2021

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St. Johns	SJRWMD	St Johns Pkwy - Racetrack Rd to Espada Ln - Reclaimed Water System Expansion	JEA	Installation of 5,000 feet of 8" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.01	0.55	$1,000	2018
St. Johns	SJRWMD	Veterans Pkwy - Longleaf Pine Pkwy to CR210 - Reclaimed Water System Expansion	JEA	Installation of 20,000 feet of 30" and 3,700 feet of 20" reclaimed water main to serve as a transmission pipeline.	Reuse - Pipeline	Reclaimed Water	0.06	8.80	$1,000	2024
St. Johns	SJRWMD	Bannon Lakes 2 MG Reclaimed Water Storage and Booster Pump Station	SJCUD	2.0 MG storage tank, 2,500 gpm booster pump station, control valve, electrical building, civil site work and yard piping, and associated electrical and instrumentation. The project will supply reclaimed water to new residential customers along International Golf Parkway just east of I-95. The additional storage will allow the County to collect reclaimed water during times of low irrigation demand to be utilized to serve peak irrigation demands. This offsets augmentation supply and conserves groundwater use for over 1,300 homes and commercial properties. As a result of increasing the reclaimed water system storage, the County will be able to reduce the discharge from the Northwest Wastewater Treatment Plant to Mill Creek, a tributary of Six Mile Creek and the lower St. Johns River.	Reuse - Storage and Pumping	Reclaimed Water	0.05	$2.00	$18,000	2017
St. Johns	SJRWMD	City of St. Augustine Beach Reclaimed Water System Expansion	SJCUD	10" reuse main east from the Anastasia Island WWTP along 16th Street to A1A to serve the St. Augustine Beach City Hall and park, continuing southeast to serve a new 73 home subdivision, Ocean Ridge. The new reuse main would also allow future service to customers along the route. The additional conveyance will allow the County to offset potable water demand, conserving groundwater. As a result of expanding the reclaimed water system, the County will be able to reduce the discharge from the Anastasia Island WWTP to the Matanzas River.	Reuse - Pipeline	Reclaimed Water	0.05	$0.50	$1,000	2017
St. Johns	SJRWMD	CR 2209 Corridor Reclaimed Water System Expansion	SJCUD	20" reuse main along the future County Road 2209. The project will supply reclaimed water to new residential customers along this corridor, including Steeplechase and Smith Ranch. The additional conveyance will allow the County to offset potable water demand, conserving groundwater use for at least 1,900 homes. As a result of expanding the reclaimed water system, the County will be able to reduce the discharge from the Northwest Wastewater Treatment Plant to Mill Creek, a tributary of Six Mile Creek and the lower St. Johns River.	Reuse - Pipeline	Reclaimed Water	0.57	$2.00	$1,000	2017
St. Johns	SJRWMD	Develop supplemental reclaimed water source from stormwater harvesting (Potential I-95 Corridor)	SJCUD	Potential partnership with FDOT to supplement reclaimed water system in the Northwest service area with harvested stormwater from I-95 corridor expansion.	Reuse - Supply	Stormwater	2.00	$14.50	$212,000	2025
St. Johns	SJRWMD	Fox Creek Stormwater Harvesting Station	SJCUD	St. Johns County owns a stormwater pond (over 200 MG of storage) on Fox Creek relatively near the SR-16 Wastewater Treatment Facility. As part of the SJCUD Integrated Water Resource Plan, developing a supplemental reclaimed water source from the Fox Creek facility was one of the recommended options. Feasibility study is underway to determine usable volume, treatment and routing options.	Reuse - Supply	Stormwater	0.23	$6.58	$32,000	2018
St. Johns	SJRWMD	NW WWTF Reclaimed Water System Expansions/Improvements	SJCUD	Construction of a 2 MG tank and reuse booster station on the new NW WWTF site, and 5,500 lf of offsite 20" reclaimed water transmission main to provide high pressure service to reuse customers located in the SJCUD NW service area. The construction project received SRF Loan funding from FDEP.	Reuse - Pipeline, Storage, Pumping	Reclaimed Water	3.00	$2.55	$110,000	2016
St. Johns	SJRWMD	South WRF and Reuse System Expansion	SJCUD	Construction of a 1 MGD AADF Water Reclamation Facility and associated reclaimed water infrastructure to serve new development in the southern SJCUD service area.	Reuse - Storage and Pumping, and Pipeline	Reclaimed Water	1.00	$26.80	$486,000	2025

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St. Johns	SJRWMD	SR 16 Corridor Reclaimed Water System Expansions/Improvements	SJCUD	Improvements consisted of several projects to increase capacity of reclaimed water sent from the SR 16 WWTP and provide high pressure service along SR16 to the World Golf Village area to interconnect with the NW WWTF reuse system. Projects included an inline booster station at the Turnbull Booster Site, a 1 MG GST at the SR 16 WWTP site, a 1.5 MG tank at the Turnbull Booster Site. The inline booster project received SRF Loan funding, and the SR 16 GST received a 1/3 funding grant from the SJRWMD.	Reuse - Pipeline, Storage, Pumping	Reclaimed Water	1.00	$3.13	$39,000	2016
St. Johns	SJRWMD	Twin Creeks 1.5 MG Reclaimed Water Storage and Booster Pump Station	SJCUD	1.5 MG reuse storage tank, 4,200 gpm booster pump station, control valve, electrical building, civil site work and yard piping, and associated electrical and instrumentation. The project will supply reclaimed water to new residential and commercial customers within the Twin Creeks Development located along CR 210W just west of US Highway 1. The additional storage will allow the County to collect reclaimed water during times of low irrigation demand to be utilized to serve peak irrigation demands. This offsets augmentation supply and conserves groundwater use for over 2,000 homes and commercial properties. This project will allow the County to serve the Twin Creeks DRI with reclaimed water for irrigation via a bulk service agreement with JEA, and will reduce nutrient loading to the St Johns River by beneficially reusing wastewater effluent from JEA's Reclaimed Water System.	Reuse - Storage and Pumping	Reclaimed Water	0.60	$1.75	$25,000	2018
St. Johns	SJRWMD	WGV Area Stormwater Harvesting	SJCUD	Harvested stormwater will be collected from a large stormwater system located at the head of the Mill Creek basin in northwest St. Johns County. Once collected, the stormwater will be filtered and disinfected to public access reuse standards, and distributed through the County's reuse transmission system. The County will construct an intake structure in the stormwater basin, install control valves, piping, filtration and disinfection systems, and a new pump station to inject the water into the reclaimed water distribution system. County is currently evaluating feasibility.	Reuse - Supply	Stormwater	0.23	$1.40	$12,000	2018
St. Johns	SJRWMD	CR 214 Water Blending Station	SJCUD	Improvements to the CR 214 WTP site to allow for water quality conditioning of water transferred from the NW Grid to be blended and distributed into the Mainland Water System. Project helps to meet growing demands and helps sustain water quality in the Tillman Ridge Wellfield.	Well field optimization	Floridan	0.06	2.67	$25,000	2017
St. Johns	SJRWMD	SR 16 Water Main Interconnect	SJCUD	20" Water Main Extension along SR 16 to connect the NW WTP grid to the CR 214 WTP grid. Project transfers service of the SR 16 corridor to the NW WTP and serves as first phase to allow up to 2 MGD of water to be transferred from the NW grid to the CR 214/Mainland Grid to help meet growing supply demands and help maintain water quality in the Tillman Ridge Wellfield.	Well field optimization	Floridan	0.06	1.97	$1,000	2014
St. Johns	SJRWMD	AI WWTP Reuse Storage Tank and Booster Pump Station	SJCUD/ SJRWMD	Construction of a 1 MG tank and reuse booster station to provide high pressure service to reuse customers near the AI WWTP facility. Ultimate goal is to provide reuse service to new developments with in a 2 mile radius of the facility. SJRWMD awarded a grant to fund 1/3 of the construction cost.	Reuse - Storage and Pumping	Reclaimed Water	2.00	$1.51	$12,000	2016
St. Johns	SJRWMD	International Golf Parkway - Reclaimed Water System Expansion	SJCUD/ SJRWMD	Installation of a 20" and 16" Reuse WM (approx 13,500 lf total) along International Golf Parkway (IGP) to serve as the transmission main from the Northwest WRF for future development in the World Golf Village area (SJCUD Northwest Service Area). The transmission main will ultimately serve future development east of I-95 along IGP, the bulk of which will be residential reuse for irrigation. SJRWMD awarded a grant to fund 1/3 of the construction cost.	Reuse - Pipeline	Reclaimed Water	0.42	$2.40	$2,000	2016
						Total:	**97.16**	**$309.12**		

*Project Status- Projects with past dates have been completed. Projects with 2016-2017 dates are under construction. All other projects have not started

Appendix L

Potential Water Supply Development, Water Resource Development and Conservation Project Options

North Florida Regional Water Supply Plan
Potential Water Supply Development, Water Resource Development and Water Conservation Project Options

County	Water Management District	Project Name	Implementing Entity	Project Description	Project Type	Water Source	Estimated Water Supply Benefit (mgd)	Total Capital ($M)	Timeframe for Completion
Alachua	SJRWMD or SRWMD	Groundwater Recharge Wetlands	GRU	Construction of groundwater recharge wetlands (location not yet defined).	Reuse - Recharge	Reclaimed Water	1.5	2.00 to 6.00	2035
Alachua	SRWMD	S.R. 26 Water Supply Project	Newberry	Construct a new potable water well with a water main and an elevated storage tank.	Supply	Floridan	TBD	4.90	2035
Bradford	SRWMD	Rayonier South WRD Area	SRWMD	Restore natural flows, with or without aquifer recharge wells.	Recharge	Surface Water	TBD	TBD	2035
Clay	SJRWMD	CCUA AWS Initiative	CCUA	Various AWS projects currently being considered for selection and development; currently in study for feasibility, economy, etc.	Supply/Storage	Storm/Surface Water	TBD	0.00 to 103.00	2030
Clay	SJRWMD	CCUA Data Analytics	CCUA	Outreach/conservation project for our entire potable water system. This project will have and initial cost of approximately $263,000 and a reoccurring annual cost of approximately $240,000. Project capacity based on current CCUA demand.	Conservation	N/A	TBD	TBD	2020
Clay	SJRWMD	Reclaimed Water SCADA System	CCUA	Automated SCADA System for handling/ diverting existing Reclaim Water Demand (2015 was 4.51 MGD avg.).	Reuse	Reclaimed Water	TBD	0.68	2016
Clay	SJRWMD	ACES Project 1 – Clean Alligator Creek Part A	SOLO	Increase flow of Alligator Creek to Lake Brooklyn by surveying, cleaning out debris, and correcting sedimentation caused by low flow conditions, all of which will help to restore inflow to Lake Brooklyn.	Recharge	Stormwater	TBD	0.10	2016
Clay	SJRWMD	ACES Project 10 – Lake Santa Fe water to Lake Geneva	SOLO	Redirect 5 MGD of surface water by pumping and conveyance structures from Lake Santa Fe to Lake Geneva for recharge.	Recharge	Surface water	TBD	0.30	2019
Clay	SJRWMD	ACES Project 11– Lake Brooklyn Water to Lake Geneva	SOLO	Redirect 3 MGD of surface water by gravity outflow conveyance from Lake Brooklyn to Lake Geneva for recharge.	Recharge	Surface water	TBD	0.10	2018
Clay	SJRWMD	ACES Project 12 – Lower Florida Aquifer Water Recharge Lakes	SOLO	Have CCUA pump at the same volume flow conditions, and release water not consumed by its users to Lake Geneva for recharge credit, offsetting the cumulative impact of CCUA drawdown on the Keystone Lakes.	Recharge	Floridan	TBD	0.40	2017
Clay	SJRWMD	ACES Project 3 – Increase Chemours D002 Water Releases – Pumping to OMA and Etoniah Chain of Lakes	SOLO	Changing flow apportionment and timing initially, and eventually increasing flow capacity of piping and pumping system by replacement with greater capacity systems.	Recharge	Stormwater	TBD	0.25	2018
Clay	SJRWMD	ACES Project 4 – Plan Chemours Reclamation to Direct Water toward the Etoniah Chain of Lakes	SOLO	Direct water that originates in the mine site by engineering reclamation to deliver and convey water from north to south (rather than east to west), and be pumped up to the Old Minded Area for filtration and storage before release to Alligator Creek South and the Etoniah Chain of Lakes.	Recharge	Stormwater	TBD	3.00	2020
Clay	SJRWMD	ACES Project 5 – Channelize Alligator Creek near Lake Brooklyn	SOLO	Survey, channelize by sediment removal and stabilized creek bed, reducing sediment impediments to flow and navigation.	Recharge	Stormwater	TBD	0.50	2017
Clay	SJRWMD	ACES Project 6 – Piping First Coast Outer Beltway Stormwater Runoff to the OMA and Etoniah Chain of Lakes	SOLO	First Coast Outer Beltway (FCOB) to pump station north of Middleburg Florida and Trail Ridge, to storage pond near OMA Camp Blanding; ultimately the Etoniah Chain of Lakes and Etoniah Creek.	Recharge	Stormwater	TBD	10.00	2023
Clay	SJRWMD	ACES Project 7 – Piping treated water from Starke, FL	SOLO	Construct a pipeline from the City of Starke Water Treatment Plant to the Northeast corner of the OMA. Employ natural sand filtration and purification processes of the unreclaimed mine site with its purified sand to deliver high-quality, low nutrient water to the Etoniah Chain of Lakes.	Recharge	Reclaimed	TBD	0.10	2017
Clay	SJRWMD	ACES Project 8 – JEA Treated and Reuse Water to Trail Ridge Corridor and OMA (Camp Blanding) and Etoniah Lakes	SOLO	JEA Redirect 20 MGD of effluent from SJR to Trail Ridge Corridor and OMA for purification and recharge.	Recharge	Reclaimed	TBD	10.00	2025
Clay	SJRWMD	ACES Project 9 – Black Creek Water to Trail Ridge Corridor and OMA (Camp Blanding) and Etoniah Lakes.	SOLO	CCUA Redirect 5 MGD of surface water from Black Creek near SJR to Trail Ridge Corridor and OMA for purification and recharge.	Recharge	Surface water	TBD	3.00	2023
Flagler	SJRWMD	Replacement Well 12R	Flagler Beach	Drill Well 12-R to replace Well 12 that collapsed during construction in 2009.	Supply	Floridan	0	0.26	2016
Flagler	SJRWMD	Indirect Potable Reuse through Aquifer Recharge	Palm Coast	Recharging the Palm Coast Northern Wellfield aquifer system including rehydration of wetlands utilizing membrane filtration will provide highly treated wastewater for reclamation.	Reuse - Supply	Reclaimed Water	TBD	TBD	TBD
Flagler	SJRWMD	Rainwater (Stormwater) Harvesting (Capture, Storage and Retention) resulting in Aquifer Recharge and increased storage time possibly improving water quality through nutrient reduction	Palm Coast	The City of Palm Coast has a large (54 miles X 80 Ft X 4 Ft = 682,463,232 gallons stored) fresh stormwater canal system spread throughout the western portion of the City. While designed as a floodwater management system, it collects stormwater from swales and ditches throughout Palm Coast and acts as a surface water reservoir.	Recharge	Stormwater	TBD	TBD	TBD
Flagler	SJRWMD	Reuse of Reclaimed Wastewater	Palm Coast	This project would provide a means to reduce or eliminate discharge of excess reuse water to the Intracoastal Waterway. Utilizing excess reuse water for improving natural systems by rehydration of wetlands and recharge of the Northern Wellfield aquifer systems will mitigate any negative impacts from Public Water Supply withdrawals and providing a new source of supply in that region.	Recharge	Reclaimed	TBD	TBD	TBD
Flagler	SJRWMD	Upper Floridan Aquifer Brackish Water Supply	Palm Coast	Develop a brackish alternative groundwater source for treatment at the Palm Coast Low Pressure Reverse Osmosis Plant.	Supply	Floridan	TBD	TBD	TBD
Gilchrist	SRWMD	Water System Improvements	Trenton	Replacement of failing galvanized water mains within the City's distribution system and construction of a back-up production well.	Supply	Floridan	0	4.80	2018
St. Johns	SJRWMD	St. Augustine Water Supply/LPRO Phase 2	COSA	Increase LPRO production from 2 mgd to 4 mgd.	Supply	Floridan	0	8.08	2016

Appendix M

Water Conservation Project Options

North Florida Regional Water Supply Plan
Water Conservation Project Options

County	Water Management District	Project Name	Implementing Entity	Project Description	Project Type	Water Source	Estimated Water Supply Benefit (mgd)	Total Capital ($M)	Estimated O&M Costs through 2035	Timeframe for Completion
Alachua	SRWMD and SJRWMD	Alachua County Florida Water Star Rebate Program	Alachua County Environmental Protection	This project is to offer rebates to entities that participate in the Florida Water Star program.	Conservation	N/A	0.0190	0.21	$15,000	2017
Alachua	SJRWMD and SRWMD	Alachua County Landscape Irrigation Retrofit Rebate Program	Alachua County Environmental Protection	This project offers Alachua County residents an opportunity to replace 200-400 ft^2 of irrigated turf with Florida Friendly Landscape.	Conservation	N/A	0.044	0.60	$10,000	2017
Alachua	SRWMD	Repair/replace leaking infrastructure	City of Alachua	The City of Alachua water conservation project will reduce leakage in a water resource caution area, conserving 0.05 MGD of unaccounted water.	Conservation	N/A	0.05	0.06	OT	2015
Alachua	SRWMD	Repair/replace leaking infrastructure	City of Archer (Holy Hills)	The City of Archer water conservation project involves replacing leaking pipes service connections estimated to reduce water loss by 0.001 MGD	Conservation	N/A	0.001	0.032	OT	2020
Alachua	SJRWMD	Water Main Replacement	City of Hawthorn	Replace old galvanized and cast iron pipes to reduce frequency of breaks and associated water loss.	Conservation	N/A	0.04	0.53	OT	2017
Alachua	SRWMD	Repair/replace leaking infrastructure	City of High Springs	The City of High Springs water conservation project is to replace old leaking water mains in various parts of the City which will conserve 0.10 MGD of potable water.	Conservation	N/A	0.01	0.82	OT	2015
Alachua	SRWMD	Repair/replace leaking infrastructure	City of High Springs	The City of High Springs water conservation project will reduce leakage in a water resource caution area, conserving 0.02 MGD of unaccounted water.	Conservation	N/A	0.02	0.06	OT	2015
Alachua	SRWMD	Repair/replace leaking infrastructure	City of Newberry	The City of Newberry water conservation project will reduce leakage in a water resource caution area, conserving 0.04 MGD of unaccounted water.	Conservation	N/A	0.04	0.06	OT	2015
Alachua	SRWMD	Upgrade infrastructure to reduce losses	City of Waldo	The City of Waldo water conservation project will replace 543 meters. The new meters will be able to keep an accurate account of water usage and potential leakage, reducing 0.01 MGD in lost water.	Conservation	N/A	0.01	0.15	$8,000	2015
Alachua	SJRWMD and SRWMD	GRU Water Conservation Projects	GRU	Implement cost effective projects that may include but are not limited to public education, advanced metering, indoor plumbing retrofit replacement of high flow toilets, shower heads, and sink aerators with efficient units, commercial water efficiency programs, and outdoor irrigation efficiency programs. Estimated water savings of 0.3 to 0.5 mgd.	Conservation	N/A	0.4	2.00	$7,000	2035
Alachua	SJRWMD and SRWMD	Indoor Plumbing Retrofit	GRU	Replace existing "high flow" toilets with ultra-low flow toilets. Also replace shower heads and sink aerators with high efficiency units.	Conservation	N/A	0.032	0.30	$7,000	2017
Alachua	SJRWMD and SRWMD	Large Meter Replacement	GRU	Replace existing large meters with more accurate new meters. Greater accuracy of meter measurement will promote conservation.	Conservation	N/A	0.085	0.40	$100	2017
Alachua	SJRWMD and SRWMD	Phase 1: Advanced Metering Infrastructure (AMI) and Service Lateral Replacement	GRU	Replace existing meters with smart meters that can help detect leaks on the customers' side of the meter, while also replacing service laterals that are made of polybutylene which are prone to leaking. Estimated water savings of 0.2 to 0.5 mgd.	Conservation	N/A	0.055	1.45	$15,000	2017
Alachua	SJRWMD and SRWMD	Phase 2-10: Advanced Metering Infrastructure (AMI) and Service Lateral Replacement	GRU	Replace existing meters with smart meters that can help detect leaks on the customers' side of the meter, while also replacing service laterals that are made of polybutylene which are prone to leaking. Estimated water savings of 0.2 to 0.5 mgd.	Conservation	N/A	0.4	13.05	$15,000	2028
Alachua	SJRWMD and SRWMD	Santa Fe College Plumbing Retrofit	Santa Fe College	Replace existing "high flow" toilets with ultra-low flow toilets. Also replace shower heads and sink aerators with high efficiency units.	Conservation	N/A	0.050	0.03	$20,000	2017
Alachua	SRWMD	Automated Meter Reading		This project will install exitisting standard water meters with automated meter readers (AMR).	Conservation	N/A	0.007	0.27	$60,000	2035
Bradford	SRWMD	Lawtey Water Main Replacement	SRWMD	Replacement of the cities water distribution system.	Conservation	N/A	0.012	3.01	OT	2035
Bradford	SRWMD	Upper Santa Fe Basin Cypress Creek Wastewater Reuse System	SRWMD	Installation of an advanced wastewater treatment and reuse system in an existing livestock/aquaculture operation to eliminate a surface water discharge to the Upper Santa Fe Basin and provide nutrient treatment for recirculated water.	Conservation	N/A	0.1	0.42	TBD	2035
Bradford	SRWMD	Upper Santa Fe Basin Freeze Protection Conservation Program	SRWMD	This project will provide cost share funding to implement up to 5 acres of freeze protection high tunnels to significantly reduce freeze protection water demands in fresh blueberry operations. This will significantly reduce groundwater use for freeze protection and runoff potential.	Conservation	N/A	0.1	1.52	TBD	2035
Bradford	SRWMD	Repair/replace leaking infrastructure	Town of Hampton	The Town of Hampton water conservation project is to repair the 64,000 gallon ground storage tank which supplies clean water to its 179 residents. This project is expected to conserve 0.01 MGD through reduced flushing.	Conservation	N/A	0.01	0.03	OT	2015
Bradford	SRWMD	Automated Meter Reading	City of Hampton	This project will install exitisting standard water meters with automated meter readers (AMR).	Conservation	N/A	0.008	0.095	$60,000	2035
Bradford	SRWMD	Outdoor Plumbing Retrofit	Santa Fe College Andrews Center Main Campus	This project will provide a new irrigation system with a smart irrigation controller and drought tolerant landscape materials.	Conservation	N/A	0.001	0.005	OT	2035
Bradford	SRWMD	Automated Meter Reading	City of Starke	This project will install exitisting standard water meters with automated meter readers (AMR).	Conservation	N/A	0.08	0.5	$15,333	2035
Clay	SJRWMD	CCUA AMI	CCUA	Leak Detection program to reduce water loss; Avg 2015 savings was approximately 74,460 gpd.	Conservation	N/A	0.074	0.04	OT	2015
Clay	SJRWMD	Meter Reader Replacement	Penny Farms	Replacing existing meters with smart meters.	Conservation	N/A	0.015	0.01	$10,000	2016
Columbia	SRWMD	Lake City Indoor Plumbing Retrofit	City of Lake City	Replace existing "high flow" toilets with ultra-low flow toilets and faucets with high efficiency units in the cities parks and government buildings.	Conservation	N/A	0.019	0.10	$1,000	2017
Columbia	SRWMD	Upgrade infrastructure to reduce losses	Columbia County	The Columbia County water conservation project is to construct a water main extension which will reduce the flushing required at the Ellisville water treatment plant by 0.03 MGD.	Conservation	N/A	0.03	0.45	OT	2015
Columbia	SRWMD	Florida Gateway College Cooling Tower Retrofit	Florida Gateway College	This project will replace the college's aging cooling towers with retrofitted cooling towers that will use surface water from a local pond instead of potable water from the	Conservation	N/A	0.090	1.08	$3,000	2017
Columbia	SRWMD	Columbia County Jail Indoor Retrofit	SRWMD	Replace existing "high flow" toilets with ultra-low flow toilets. Also replace shower heads and sink aerators with high efficiency units.	Conservation	N/A	0.019	0.56	$317,870	2016

North Florida Regional Water Supply Plan
Water Conservation Project Options

County	Water Management District	Project Name	Implementing Entity	Project Description	Project Type	Water Source	Estimated Water Supply Benefit (mgd)	Total Capital ($M)	Estimated O&M Costs through 2035	Timeframe for Completion
Columbia	SRWMD	Columbia County Water Initiative	SRWMD	Replace existing "high flow" toilets with ultra-low flow toilets. Also replace shower heads and sink aerators with high efficiency units.	Conservation	N/A	0.058	0.25	OT	2017
Columbia	SRWMD	Decentralization of Boilers	Florida Gateway College	This project will replace the existing steam system with a campus-wide decentrallized system utilizing high efficency boilers producing no steam and condensation eliminating water use.	Conservation	N/A	0.0006	0.94	$50,000	2035
Duval	SJRWMD	AMI Implementation	City of Atlantic Beach	Implementation of a pilot project for AMI meter and software installation. 650 meters	Conservation	N/A	0.02	0.21	$9,750	2017
Duval	SJRWMD	Jacksonville Beach Advanced Metering Infrastructure	City of Jacksonville Beach	The project objective is to reduce water leaks by: 1) replacing old manually read, moving parts water meters with industry state of the art automatically read, static (no moving parts) water meters to detect leaks on the customer side of the meter and 2) installing leak detection infrastructure on water mains to improve detection of leaks in the water distribution system. Project area is within the city limits of Jacksonville Beach, Florida. It is anticipated that automatically read, more accurate metering of consumed water will promote quicker leak repairs and conservation. Project capacity based on the Jax Beach Water/Sewer Utility withdrawing 911.9 million gallons of total raw water from the Floridan Aquifer in CY2015. Water supply benefit is based on goal of reducing unaccounted water from the CY2015 estimated amount of 15.5% to the estimated target amount of 7.5%.	Conservation	N/A	0.20	4.50	$15/meter	2018
Hamilton	SRWMD	Repair/replace leaking infrastructure	City of Jasper	The City of Jasper water conservation project is to replace 26 leaking fire hydrants in a water resource caution area. This project is expected to conserve approximately 0.04 MGD.	Conservation	N/A	0.04	0.11	OT	2015
Hamilton	SRWMD	Upgrade infrastructure to reduce losses	Hamilton County	The Hamilton County water conservation project is to install variable frequency drive controllers at the water treatment plant which will reduce the flushing required by 0.04 MGD.	Conservation	N/A	0.04	0.05	OT	2015
Levy	SRWMD	Repair/replace leaking infrastructure	Levy County (University Oaks Water System)	Levy County water conservation project involves replacing leaking pipes and service connections estimated to reduce water loss by 0.003 MGD	Conservation	N/A	0.003	0.16	OT	2020
Madison	SRWMD	Repair/replace leaking infrastructure	City of Madison (Barrsfield)	The City of Madison (Barrsfield) water conservation project is to replace a 12-inch check valve which will reduce Madison's water loss by 0.03 MGD.	Conservation	N/A	0.03	0.01	OT	2015
Madison	SRWMD	Repair/replace leaking infrastructure	City of Madison (Solenoid)	The City of Madison (Solenoid) water conservation project is to install two solenoid valves which will reduce Madison's water loss by 0.01 MGD.	Conservation	N/A	0.01	0.00	OT	2015
St. Johns	SJRWMD	Conservation Rate Implementation	City of St. Augustine	The City of St. Augustine is conducting a comprehensive conservation program to include a rate study, education program, block rate implementation, AMR pilot installation and results analysis.	Conservation	N/A	0.58	0.26	$15/meter	2016
St. Johns	SJRWMD	AMR - Ponta Vedra System	SJCUD	Replaced all water meters in SJCUD Ponte Vedra System (approximately 10,000) and added a Fixed Base reading system. Pre-existing meters were old and inaccurate. Project to more accurately meter accounts and will allow for AMR monitoring for leak detection etc.	Conservation	N/A	0.386	4.30	$150,000	2015
St. Johns	SJRWMD	NW Automated Metering Infrastructure System Expansion	SJCUD	Installation of 2 new tower gateway base stations to effectively maintain signal for AMR meters in the fastest growing SJCUD service area.	Conservation	N/A	0.144	0.22	$2,000	2017
St. Johns	SJRWMD	Promote Cost-Effective Conservation Programs	SJCUD	Reducing demands from existing water uses through investments in conservation is possible. Previous studies have determined that the most cost-effective and practical conservation best management practices can include retrofits to indoor and outdoor fixtures, improved customer education, irrigation efficiency programs, and utilizing soil moisture sensing devices to reduce irrigation demands.	Conservation	N/A	1.14	3.80	OT	2020
St. Johns	SJRWMD	Web Based Customer Portal	SJCUD	Develop web-based, interactive application for customers to access usage information and water conservation information.	Conservation	N/A	0.368	0.10	$6,250	2017
St. Johns	SJRWMD	Outdoor BMP Retrofit	SJCUD/ SJRWMD	Cost share pilot project to retrofit 30 existing homes with predetermined BMPs for outdoor irrigation systems.	Conservation	N/A	0.002	0.09	$3,000	2015
St. Johns	SJRWMD	Soil Moisture Sensor Pilot Project	SJCUD/ SJRWMD	Three year cost share pilot project that retrofitted 88 existing homes with smart irrigation controllers. Project monitored and compared the water use 2 years prior to the installation and 2 years after the installation to evaluate system performance. Average result was 38% reduction in water use. SJCUD now requiring new non-reuse developments to utilize similar technology.	Conservation	N/A	0.038	0.28	OT	2015
St. Johns	SJRWMD	Florida Friendly Landscaping	SJCUD	This project is to prepare a landscape plan for the St Johns County Administration Building with Florida Friendly Landscape	Conservation	N/A	0.001	0.047	OT	2035
Various	SJRWMD	Agriculture Water Conservation	SJRWMD/Cooperators	Assess and implement water conservation BMPs as part of the agricultural cost-share program (does not include TCAA projects administered by FDACS). The cost and savings are the total for the following counties: Nassau, Putnam and St. Johns.	Conservation	N/A	0.233	1.39	$1,553,672	2015
Various	SJRWMD	Agriculture Water Conservation	SJRWMD/Cooperators	Assess and implement water conservation BMPs as part of the agricultural cost-share program (does not include TCAA projects administered by FDACS). The cost and savings are the total for the following counties: Alachua, Duval, Flagler and St. Johns.	Conservation	N/A	0.333	2.30	$1,151,080	2016
Various	SRWMD	Agriculture Water Conservation	SRWMD/Cooperators	Assess and implement water conservation BMPs as part of agricultural cost-share program. The cost and savings are the total for the following counties: Alachua, Columbia, Gilchrist, Hamilton, and Suwannee.	Conservation	N/A	2.008	1.33	$115,000	2013
Various	SRWMD	Agriculture Water Conservation	SRWMD/Cooperators	Assess and implement water conservation BMPs as part of agricultural cost-share program. The cost and savings are the total for the following counties: Alachua, Gilchrist, Hamilton, and Suwannee.	Conservation	N/A	0.462	0.24	$21,000	2014

North Florida Regional Water Supply Plan
Water Conservation Project Options

County	Water Management District	Project Name	Implementing Entity	Project Description	Project Type	Water Source	Estimated Water Supply Benefit (mgd)	Total Capital ($M)	Estimated O&M Costs through 2035	Timeframe for Completion
Various	SRWMD	Agriculture Water Conservation	SRWMD/Cooperators	Assess and implement water conservation BMPs as part of agricultural cost-share program. The cost and savings are the total for the following counties: Gilchrist and Suwannee.	Conservation	N/A	1.13	0.28	$23,000	2015
Various	SRWMD	Agriculture Water Conservation	SRWMD/Cooperators	Assess and implement water conservation BMPs as part of agricultural cost-share program. The cost and savings are the total for the following counties: Gilchrist and Suwannee.	Conservation	N/A	0.79	0.91	$8,000	2016
						Totals:	9.83	$ 49.59		

O and M Notes
OT=One Time Cost
· 6 assumes 182 applicants changing rain sensor.
d $100 in replacement for either showers or faucet aerators or rain sensors
Row 14 assumes 50% of fixtures replaced