

Special Publication SJ2004-SP28

2004 Interim Update to

Special Publication SJ2000-SP1

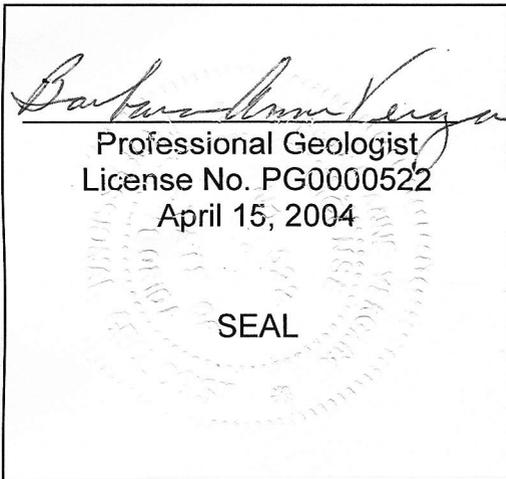
District Water Supply Plan



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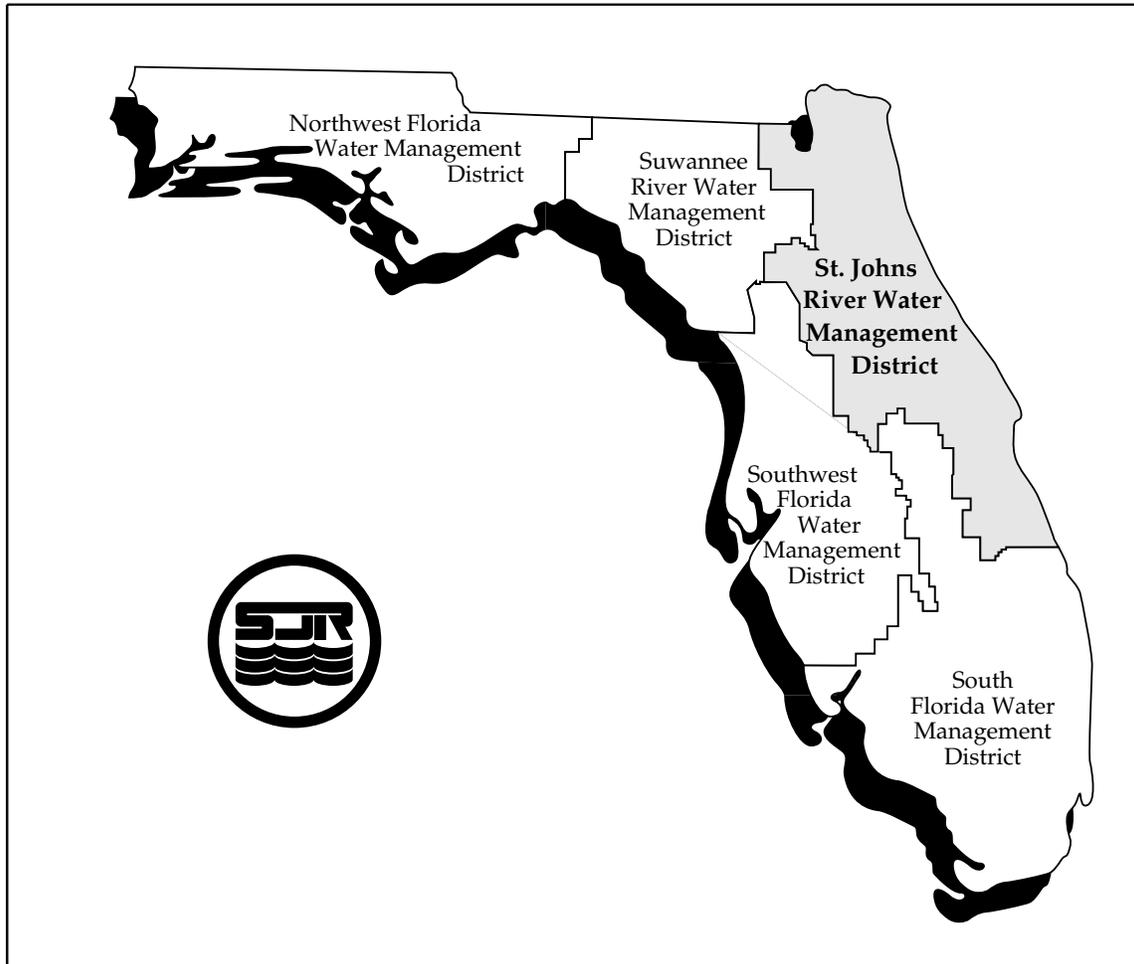
Edited by

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St. Johns River Water Management District
Palatka, Florida

2004



The St. Johns River Water Management District (SJRWMD) was created by the Florida Legislature in 1972 to be one of five water management districts in Florida. It includes all or part of 18 counties in northeast Florida. The mission of SJRWMD is to ensure the sustainable use and protection of water resources for the benefit of the people of the District and the state of Florida. SJRWMD accomplishes its mission through regulation; applied research; assistance to federal, state, and local governments; operation and maintenance of water control works; and land acquisition and management.

This document is published to disseminate information collected by SJRWMD in pursuit of its mission. Copies of this document can be obtained from:

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CONTENTS

INTRODUCTION	1
WATER SUPPLY DEVELOPMENT PROJECTS IDENTIFIED IN DWSP	5
Changes to Water Supply Development Projects Identified in DWSP	5
Water Supply Development Projects Identified Through ECFWSPI.....	6
Descriptions of Projects Added to List of Water Supply Development Projects.....	10
St. Johns River Projects.....	10
Taylor Creek Reservoir Expansion Project.....	10
Lower Ocklawaha River in Putnam County Project.....	11
Indian River Lagoon Seawater Projects.....	11
Intracoastal Waterway at New Smyrna Beach Project	11
Lake Apopka Reuse Augmentation Project	12
References	17
Appendix A— Recommendations on the St. Johns River Water Management District’s Involvement in Water Resource Development and Water Supply Development	19
Appendix B — East-Central Florida Water Supply Planning Initiative Cost- Estimating Criteria.....	31

FIGURES AND TABLES

FIGURES

- 1. Approximate locations of potential alternative water supply projects identified as part of the East-Central Florida Water Supply Planning Initiative process8

TABLES

- 1. Summary of potential public water supply projects, quantities and estimated costs in east-central Florida.....13

INTRODUCTION

The St. Johns River Water Management District (SJRWMD) approved its first regional water supply plan, *District Water Supply Plan* (DWSP) in 2000 (Vergara 2000). DWSP is designed to meet the requirements of the water supply planning provisions of Section 373.0361, *Florida Statutes (FS)*. DWSP is based on a 20-year planning horizon extending through 2020 and includes the following components:

- A water supply development component
- A water resource development component
- A minimum flows and levels component

Since DWSP approval, SJRWMD has begun implementation of the projects identified in the water supply development component and the water resource development component of DWSP. Implementation of the water resource development project Facilitation of Regional Decision-Making Project included the East-Central Florida Water Supply Planning Initiative (ECFWSPI). ECFWSPI has resulted in the identification of potential water supply development projects that are not identified in DWSP (Vergara 2004).

The primary purpose of this interim update of DWSP is to include the potential water supply development projects identified to date as a result of ECFWSPI in the water supply development component of DWSP. Based on the provisions of Subsection 373.0831(4), *FS*, water supply development projects that are consistent with the relevant regional water supply plans and that meet one or more of the following criteria shall receive priority consideration for state or water management district funding assistance:

- The project supports establishment of a dependable, sustainable supply of water which is not otherwise financially feasible (Subparagraph 373.0831(4)(a)1, *FS*).
- The project provides substantial environmental benefits by preventing or limiting adverse water resource impacts, but requires funding assistance to be economically competitive with other options (Subparagraph 373.0831(4)(a)2, *FS*).
- The project significantly implements reuse, storage, recharge, or conservation of water in a manner that contributes to the sustainability of regional water sources (Subparagraph 373.0831(4)(a)3, *FS*).

The SJRWMD Governing Board has developed a position paper concerning SJRWMD's involvement in water resource and water supply development (Appendix A). As expressed in this position paper, SJRWMD recognizes that

water supply development can generally be financed through user fees. In addition, this position paper recognizes that, “regardless of the conclusion that funding the development of alternative sources through user fees is generally affordable, there are significant obstacles to overcome in funding water supply development through user fees, including

- Political difficulty in implementing even modest rate increases
- Uncertainties about when new, more expensive water supply sources will be needed
- No history of interlocal cooperation on water supply
- Poor history of interlocal cooperation on other issues, leading to lack of trust
- Potential inequities among rate payers within different water supply utilities”

In the east-central Florida area, alternative water supply projects may need to be operational before 2010 (Vergara 2004). As described in the Governing Board’s position paper, “despite the apparent affordability of these supplies and the projected shortfall in available fresh groundwater in the near future, there has been a lack of significant movement by water supply utilities toward the development of alternative water supplies that will be needed. If water users do not move forward expeditiously and in a coordinated fashion, the potential exists for water supply shortfalls in the near future and higher rate impacts to users of water from public supply systems. Ultimately, significant delays and lack of cooperation could make water supply development much more expensive and potentially unaffordable to some users.”

Notwithstanding this, water is predicted to be affordable if alternative water supply requirements are planned for properly and timely; however, even with proper planning, increases in local utility rates in the order of 50% or more, or rate spikes, may be required to finance required alternative water supply facilities (Burton & Associates 2004). This raises the question of financial feasibility in the form of the willingness of local officials to enact very large rate increases to fund the required alternative water supply facilities.

Although annual rate indexing and alternative revenue sources such as taxing districts may provide partial local solutions to this issue of financial feasibility, supplemental funding can also help mitigate the rate spikes necessary to finance alternative water supply facilities.

However, supplemental funding may play an even more important role in serving as the catalyst for local utilities to begin the alternative water supply development process in earnest. The inclusion of supplemental funding, even in modest amounts, may also make it easier for local rate payers to accept the required rate increases.

For these reasons, the SJRWMD Governing Board recognizes the importance of supplemental funding as an incentive for the expeditious implementation of water supply projects identified in DWSP in order to minimize costs and ensure that water supply development remains affordable to water users and is financially feasible to implement.

WATER SUPPLY DEVELOPMENT PROJECTS IDENTIFIED IN DWSP

DWSP describes the following six water supply development projects:

- St. Johns River Water Supply Facility Component of the Eastern I-4 Corridor Water Project
- Eastern Orange and Seminole Counties Regional Reuse Component of the Eastern I-4 Corridor Water Project
- City of Apopka Reuse Component of the Eastern I-4 Corridor Water Project
- North-Central St. Johns County Wellfield Project
- Strategic Water Conservation Assistance Project
- Strategic Reclaimed Water Assistance Project

Since approval of DWSP, three of these projects have been affected by changes in character that warrant changes in their identification as water supply development projects. Following is a description of these changes.

CHANGES TO WATER SUPPLY DEVELOPMENT PROJECTS IDENTIFIED IN DWSP

- St. Johns River Water Supply Facility Component of the Eastern I-4 Corridor Water Project — This project was included in DWSP in anticipation that one or more surface water supply facilities would be developed on the St. Johns River from DeLand in Volusia County upstream to Lake Washington in Brevard County. Specific potential projects involving withdrawal of water from the St. Johns River have now been identified through ECFWSPI and are included on the list of water supply development projects in this interim update of DWSP. Therefore, the St. Johns River Water Supply Facility Component of the Eastern I-4 Corridor Water Project no longer needs to be identified and has been removed from the list.
- Eastern Orange and Seminole Counties Regional Reuse Component of the Eastern I-4 Corridor Water Project — The name Eastern I-4 Corridor Water Project is no longer used by SJRWMD as a project name. This project has been retitled Eastern Orange and Seminole Counties Regional Reuse Project and remains on the list in this interim update of DWSP under this new title.
- City of Apopka Reuse Component of the Eastern I-4 Corridor Water Project — This project is complete and has, therefore, been removed from the list in this interim update of DWSP.

WATER SUPPLY DEVELOPMENT PROJECTS IDENTIFIED THROUGH ECFWSPI

DWSP concluded that, in the near future, water supply needs in east-central Florida will not be able to be met by available fresh groundwater alone without likely incurring unacceptable environmental impacts to lakes, wetlands, or springs, as well as unacceptable saltwater intrusion. Therefore, it is expected that meeting future water supply needs in east-central Florida will require a combination of fresh groundwater, other alternative sources, and integrated water resource management techniques.

ECFWSPI resulted from two regionwide water summits held in early 2002 where local government officials, water supply utilities, and the St. Johns River, South Florida, and Southwest Florida water management districts began working together to develop solutions to their collective future water supply issues.

Representatives from all 10 counties in the east-central Florida area were invited to participate in Phase I of ECFWSPI, which focused on a dialogue process to identify key water supply issues, provide information and education on the issues, and identify regional and subregional strategies to address the issues. The Florida Conflict Resolution Consortium managed the Phase I process. The Phase I process resulted in the East-Central Florida Water Agenda (Agenda) (FCRC 2002), which lists six key water supply issue areas, 17 recommendations, and 32 strategies developed by the ECFWSPI Phase I participants. The six issue areas identified in the Agenda are

- Enhance intergovernmental coordination
- Develop new water supply
- Link land use planning and water supply planning
- Increase use of reclaimed water
- Enhance aquifer recharge using reclaimed water
- Increase water conservation

Phase II of ECFWSPI is designed to build upon the results of Phase I with the development of action plans and identification of specific projects to implement the Agenda recommendations and strategies. SJRWMD is managing the Phase II effort in coordination with the South Florida and Southwest Florida water management districts.

ECFWSPI activities in 2003 were focused in six counties of the 10-county east-central Florida region — Volusia, Brevard, Orange, Seminole, Lake, and

Osceola. Though Marion County was not included in the focus area, Marion County representatives were invited to participate in ECFWSPI meetings.

ECFWSPI Phase II activities during 2003 included efforts in each of the six issue areas identified in Phase I. However, the primary focus was on developing new water supply. One of the goals of ECFWSPI is to expand and enhance the findings of DWSP, including further investigations of potential alternative water supply sources and identification of additional water supply development projects that could be implemented to develop these sources to help meet future water supply needs.

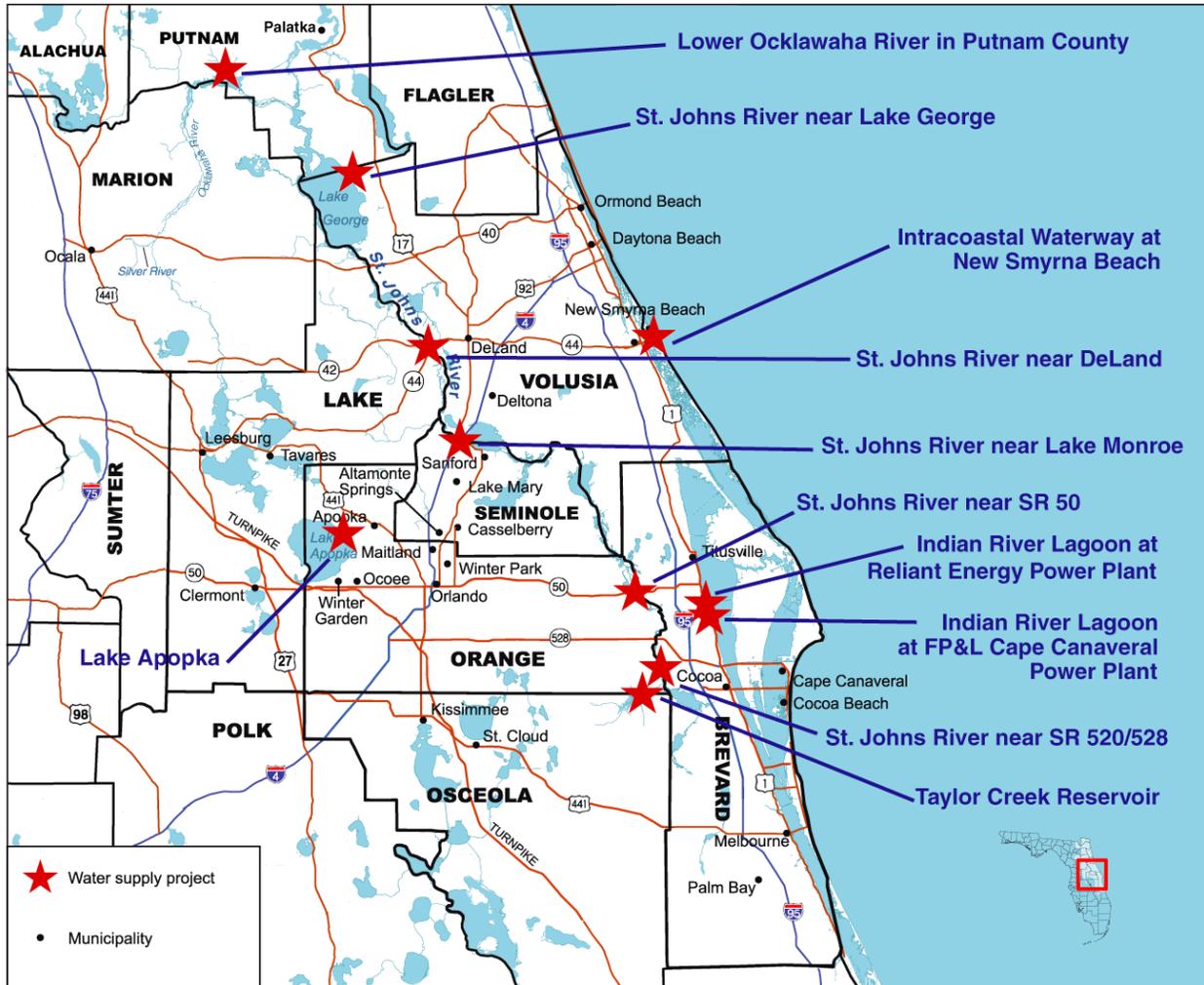
The 2003 ECFWSPI Phase II process included many workshops with east-central Florida water supply utilities and local government elected officials for the exchange of information and ideas. One of the major goals of these workshops was to identify potential water supply development projects of interest to the local communities that could be incorporated into a 2004 interim update to DWSP. The following projects were identified for incorporation into a 2004 interim update to DWSP (Figure 1):

- St. Johns River Near SR 520/528 Project
- St. Johns River Near SR 50 Project
- St. Johns River Near Lake Monroe Project
- St. Johns River Near DeLand Project
- St. Johns River Near Lake George Project
- Taylor Creek Reservoir Expansion Project
- Lower Ocklawaha River in Putnam County Project
- Indian River Lagoon at FP&L Cape Canaveral Power Plant Project
- Indian River Lagoon at Reliant Energy Power Plant Project
- Intracoastal Waterway at New Smyrna Beach Project
- Lake Apopka Reuse Augmentation Project

Additional details of the ECFWSPI Phase II 2003 process and of these projects are included in the document titled *East-Central Florida Water Supply Planning Initiative Phase II — Annual Report of Activities and Accomplishments, 2003* (Vergara 2004).

An additional project, including a brackish wellfield with associated treatment and transport facilities in eastern Orange County, was suggested for inclusion during the ECFWSPI process by Orlando Utilities Commission. The evaluation of the feasibility of this potential project is not complete at this time and therefore, the project is not included in this interim update of DWSP.

Figure 1. Approximate locations of potential alternative water supply projects identified as part of the East-Central Florida Water Supply Planning Initiative process



Subsequent to identification of these projects through ECFWSPI, discussions were held between potential partners in the Taylor Creek Reservoir Expansion Project and with the Brevard Water Supply Board. Based on these discussions, a decision was made to continue the planning of the St. Johns River Near SR 520/528 Project and the Taylor Creek Reservoir Expansion Project in concert with one another, making them one project — the Taylor Creek Reservoir Expansion Project.

Based on the changes to the projects identified in DWSP, as described in the section of this document titled Changes to Water Supply Development Projects Identified in DWSP (page 5), and based on the addition of water supply projects identified through ECFWSPI, DWSP is herewith updated to include the following changes to the list of proposed water supply development projects and the following project descriptions:

Projects with change in name

- Eastern Orange and Seminole Counties Regional Reuse Component of the Eastern I-4 Corridor Water Project changed to Eastern Orange and Seminole Counties Regional Reuse Project (no change in project description)

Projects deleted from list

- St. Johns River Water Supply Facility Component of the Eastern I-4 Corridor Water Project
- City of Apopka Reuse Component of the Eastern I-4 Corridor Water Project

Projects added to list

- St. Johns River Near SR 50 Project
- St. Johns River Near Lake Monroe Project
- St. Johns River Near DeLand Project
- St. Johns River Near Lake George Project
- Taylor Creek Reservoir Expansion Project
- Lower Ocklawaha River in Putnam County Project
- Indian River Lagoon at FP&L Cape Canaveral Power Plant Project
- Indian River Lagoon at Reliant Energy Power Plant Project
- Intracoastal Waterway at New Smyrna Beach Project
- Lake Apopka Reuse Augmentation Project

DESCRIPTIONS OF PROJECTS ADDED TO LIST OF WATER SUPPLY DEVELOPMENT PROJECTS

The water supply development projects described in this section were identified through ECFWSPI. Various project development scenarios were examined through ECFWSPI to provide examples of various water supply quantities and costs associated with each project (Table 1, at end of this section). The identified projects, if developed, will be designed and constructed based on the specific requirements of the projects' developer(s) and a more thorough engineering evaluation than was performed through ECFWSPI. Therefore, quantities, service areas, and costs may vary from those developed through ECFWSPI.

St. Johns River projects

- St. Johns River Near SR 50 Project
- St. Johns River Near Lake Monroe Project
- St. Johns River Near DeLand Project
- St. Johns River Near Lake George Project

As currently envisioned, the potential St. Johns River projects would include raw water intakes and off-line storage reservoirs, conventional surface water treatment, membrane treatment, and ozone treatment. Treated water aquifer storage and recovery (ASR) could also be provided for system reliability and peaking capacity. Consistent with the requirements of Subparagraph 373.0831(4)(a)1, *FS*, these projects support establishment of a dependable, sustainable supply of water which is not otherwise financially feasible as per the related discussion on pages 1–3 of this document.

Taylor Creek Reservoir Expansion Project

As currently envisioned, this project would involve expansion of the existing Taylor Creek Reservoir water supply system, which is owned and operated by the City of Cocoa. It would require diversion facilities to transport raw water from the St. Johns River to the Taylor Creek Reservoir as well as additional treatment facilities. Raw river water would be diverted for both water supply and augmentation of Taylor Creek to avoid any adverse impacts to the Taylor Creek floodplain. Diversion facilities would include a raw water pumping station and a pipeline.

Only conventional surface water treatment and ozone treatment would be required because only freshwater would be diverted from the St. Johns River.

Treated water ASR would also be provided for seasonal storage and peaking capacity. Consistent with the requirements of Subparagraph 373.0831(4)(a)1, *FS*, this project supports establishment of a dependable, sustainable supply of water which is not otherwise financially feasible as per the related discussion on pages 1–3 of this document.

Lower Ocklawaha River in Putman County Project

The potential Lower Ocklawaha River in Putnam County Project would require raw water diversion facilities, conventional surface water treatment, and ozone treatment. Because of the reliable baseflow, storage would not be required. Consistent with the requirements of Subparagraph 373.0831(4)(a)1, *FS*, this project supports establishment of a dependable, sustainable supply of water which is not otherwise financially feasible as per the related discussion on pages 1–3 of this document.

Indian River Lagoon seawater projects

- Indian River Lagoon at FP&L Cape Canaveral Power Plant Project
- Indian River Lagoon at Reliant Energy Power Plant Project

These two potential seawater demineralization projects are collocated with power generation facilities. These projects will require complete high pressure reverse osmosis seawater treatment plants. These potential project sites have existing once-through seawater cooling systems that may provide both inflow to the treatment plant and concentrate disposal. Consistent with the requirements of Subparagraph 373.0831(4)(a)1, *FS*, these projects support establishment of a dependable, sustainable supply of water which is not otherwise financially feasible as per the related discussion on pages 1–3 of this document.

Intracoastal Waterway at New Smyrna Beach Project

This potential seawater demineralization project is located at the Swoope generating facility in New Smyrna Beach. The Swoope facility does not have an existing seawater cooling system, and a dedicated raw water withdrawal and concentrate disposal outfall would need to be constructed in addition to the treatment plant. This project could also include a treated water ASR system for seasonal storage and peaking capacity. Consistent with the requirements of Subparagraph 373.0831(4)(a)1, *FS*, this project supports establishment of a dependable, sustainable supply of water which is not otherwise financially feasible as per the related discussion on pages 1–3 of this document.

Lake Apopka Reuse Augmentation Project

The purpose of this potential project would be to supplement the city of Apopka reclaimed water reuse system with water withdrawn from Lake Apopka and treated to reuse standards. Water would only be withdrawn from the lake during peak irrigation periods to supplement available reclaimed water. The development of supplemental water will assist in achieving full beneficial irrigation use of available reclaimed water. Consistent with the requirements of Subparagraph 373.0831(4)(a)3, *FS*, this potential project would significantly implement reuse, storage, recharge, or conservation of water in a manner that contributes to the sustainability of regional water sources.

Table 1—continued

Water Supply Source	Project Location	Potential Service Area	System Capacity (mgd)		Water Supply System Component	Capital Cost (\$M)	O&M Cost (\$M/yr)	Unit Production Cost (\$/1,000 gallons)	
			Average Day Flow	Maximum Day Flow					
St. Johns River	Near Lake Monroe	Portions of Volusia, Seminole, Orange, and Lake counties — serving nearest demand centers first	10	15	Treatment	\$72	\$3.5	\$2.55	
					Transmission	\$9	\$0.3	\$0.25	
					Total	\$81	\$3.8	\$2.80	
			50	75	Treatment	\$306	\$17.2	\$2.30	
					Transmission	\$66	\$1.6	\$0.33	
					Total	\$372	\$18.8	\$2.63	
	100	150	Treatment	\$571	\$34.0	\$2.20			
			Transmission	\$143	\$3.2	\$0.35			
			Total	\$714	\$37.2	\$2.55			
	Near DeLand	Volusia County only	Volusia County only	20	30	Treatment	\$134	\$6.93	\$2.44
						Transmission	\$76	\$0.63	\$0.78
						Total	\$210	\$7.56	\$3.22
10				15	Treatment	\$72	\$3.5	\$2.55	
					Transmission	\$33	\$0.30	\$0.70	
					Total	\$105	\$3.8	\$3.25	
50	75	Treatment	\$306	\$17.2	\$2.30				
		Transmission	\$141	\$1.6	\$0.61				
		Total	\$447	\$18.8	\$2.91				
Near Lake George	Palm Coast and Volusia County	Palm Coast and Volusia County	100	150	Treatment	\$571	\$34.0	\$2.20	
					Transmission	\$300	\$3.2	\$0.64	
					Total	\$871	\$37.2	\$2.84	
			33	49.5	Treatment	\$210	\$11.37	\$2.36	
					Transmission	\$176	\$1.03	\$1.05	
					Total	\$386	\$12.40	\$3.41	

Table 1—continued

Water Supply Source	Project Location	Potential Service Area	System Capacity (mgd)		Water Supply System Component	Capital Cost (\$M)	O&M Cost (\$M/yr)	Unit Production Cost (\$/1,000 gallons)
			Average Day Flow	Maximum Day Flow				
Taylor Creek Reservoir	Near Cocoa	Cocoa planned expansion	10	15	Treatment	\$14	\$1.90	\$0.82
					Transmission	\$41	\$0.30	\$0.84
					Total	\$55	\$2.20	\$1.66
Lower Ocklawaha River	Putnam County	Cocoa/Titusville/eastern Orange County	25	37.5	Treatment	\$73	\$5.20	\$1.14
					Transmission	\$61	\$0.80	\$0.54
					Total	\$134	\$6.00	\$1.68
Indian River Lagoon	Putnam County	East Palatka/Volusia County	21.5	32.25	Treatment	\$76	\$4.77	\$1.35
					Transmission	\$179	\$0.68	\$1.59
					Total	\$255	\$5.45	\$2.94
Indian River Lagoon	FP&L Cape Canaveral Power Plant	Northern Brevard County/eastern Orange County	10	15	Treatment	\$77	\$4.70	\$3.00
					Transmission	\$13	\$0.30	\$0.33
					Total	\$90	\$5.00	\$3.33
Indian River Lagoon	FP&L Cape Canaveral Power Plant	Northern Brevard County/eastern Orange County	20	30	Treatment	\$144	\$8.70	\$2.81
					Transmission	\$36	\$0.70	\$0.42
					Total	\$180	\$9.40	\$3.23
Indian River Lagoon	FP&L Cape Canaveral Power Plant	Northern Brevard County/eastern Orange County	30	45	Treatment	\$208	\$12.60	\$2.71
					Transmission	\$66	\$1.00	\$0.49
					Total	\$274	\$13.60	\$3.20

Table 1—continued

Water Supply Source	Project Location	Potential Service Area	System Capacity (mgd)		Water Supply System Component	Capital Cost (\$M)	O&M Cost (\$M/yr)	Unit Production Cost (\$/1,000 gallons)
			Average Day Flow	Maximum Day Flow				
Indian River Lagoon	Reliant Power Plant	Northern Brevard County/eastern Orange County	10	15	Treatment	\$74	\$4.20	\$2.82
					Transmission	\$16	\$0.30	\$0.38
					Total	\$90	\$4.50	\$3.20
			20	30	Treatment	\$139	\$7.70	\$2.63
					Transmission	\$38	\$0.70	\$0.44
					Total	\$177	\$8.40	\$3.07
			30	45	Treatment	\$202	\$11.10	\$2.54
					Transmission	\$66	\$1.00	\$0.49
					Total	\$268	\$12.10	\$3.28
			5	7.5	Treatment	\$66	\$2.90	\$4.32
					Transmission	\$17	\$0.20	\$0.74
					Total	\$83	\$3.10	\$5.06
Intracoastal Waterway	Near New Smyrna Beach	Coastal Volusia County	10	15	Treatment	\$97	\$4.90	\$3.46
					Transmission	\$24	\$0.30	\$0.53
					Total	\$121	\$5.20	\$3.99
			15	22.5	Treatment	\$131	\$7.10	\$3.17
					Transmission	\$28	\$0.50	\$0.44
					Total	\$159	\$7.60	\$3.61

All costs are estimated at the conceptual planning level of accuracy, based on assumption and cost-estimating criteria presented in Appendix B. Actual individual project costs, based on detailed planning and design or other cost-estimating criteria, will vary. These order-of-magnitude cost estimates have been prepared for relative comparisons among the potential projects.

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**APPENDIX A — RECOMMENDATIONS ON THE ST. JOHNS
RIVER WATER MANAGEMENT DISTRICT'S
INVOLVEMENT IN WATER RESOURCE DEVELOPMENT
AND WATER SUPPLY DEVELOPMENT**

**Recommendations on the St. Johns River Water
Management District's Involvement in Water Resource
Development and Water Supply Development**

Governing Board

Position Paper

December 10, 2002

Recommendations on the St. Johns River Water Management District's Involvement in Water Resource Development and Water Supply Development

Subject to the annual budget appropriation process, the St. Johns River Water Management District (SJRWMD) plans to support water resource development and water supply development with the following strategic actions, in order of priority (see Figure 1 for graphic presentation of concept):

1. Continue to fund the SJRWMD 5-year water resource development work program (WRDWP) to make water available to water users for water supply development.
2. Continue to fund the other SJRWMD activities that serve to directly support water supply development, including the following core actions:
 - **Regional water supply planning**, which includes the 5-year update of the SJRWMD Water Supply Assessment and the District Water Supply Plan (DWSP), along with ongoing assistance to local governments, utilities, and other water users in planning for specific water supply development projects
 - **Alternative water supply cost-sharing program**, which is an annual program mandated by *Florida Statutes (FS)*, with funds to be made available on a competitive basis exclusively for capital projects or phases of such projects that can be completed within 24 months of the SJRWMD funding commitment
 - **Strategic water conservation and reclaimed water reuse assistance**, including planning assistance for regional reclaimed water reuse projects and limited cost-sharing for water conservation initiatives not otherwise economically feasible.
3. Allocate additional funds if needed to increase funding for water resource development work program. An economic analysis by SJRWMD indicates that a SJRWMD goal (subject to annual review during SJRWMD budget development) to commit a portion of the increase in ad valorem assessed value due to new construction and growth is one potential source for additional funding.

While the 5-year projection for ad valorem funding for the WRDWP is fairly constant, funding will likely need to increase in the future based on the following considerations:

- Many of the projects currently in the work plan are demonstration/feasibility projects. It is highly probable that within the 5-year horizon, one or more of these projects will prove to be particularly effective and therefore proposed to be implemented on a larger scale to make more water available for development. One potential example would be aquifer storage recovery (ASR) systems constructed in conjunction with regional surface water supply projects built by water users.
- By FY 2007, the predominant portion of funding for the WRDWP should be committed to capital projects to make more water available for development. This shift from

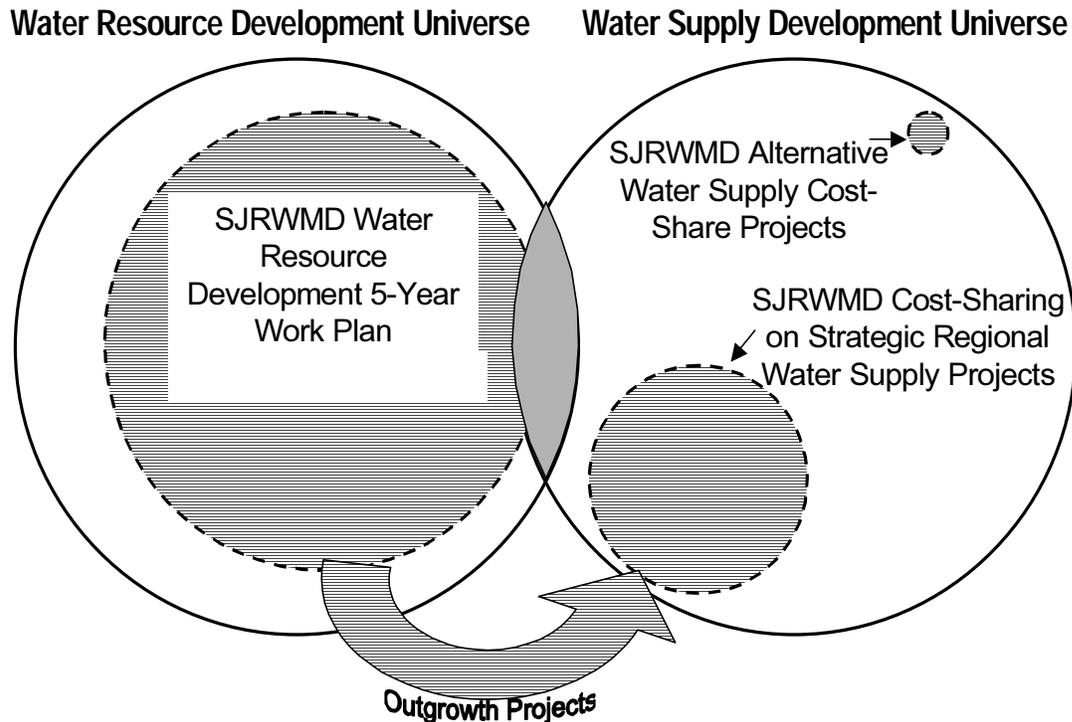
demonstration/feasibility projects to more capital-intensive projects with regional benefits may justify the need for additional funding.

- The funding plan is heavily dependent on Florida Forever (FF) funds. If the amount of FF funds is reduced, additional ad valorem funding may be needed.
4. After the WRDWP is adequately funded, the Governing Board may then consider the need for funding assistance of certain strategic regional water supply development projects. These generally would be larger scale, regional projects that provide significant quantities of water to more than one water supply utility for potable and other uses from alternative water supply sources, including surface water, brackish ground water, seawater, or reclaimed water.

Any SJRWMD cost-sharing would be made with a fundamental recognition that water supply development can generally be financed through user fees. SJRWMD's goal in providing any supplemental funding will be as an incentive when needed for water utilities and other users to overcome obstacles and delays, and move forward expeditiously and cooperatively to implement regionally significant water supply projects identified in the DWSP that will minimize additional costs and ensure that water supply development remains affordable to water users. As a result, any funding assistance would generally be expected to be 15% or less of the total project cost. As an alternative to direct funding assistance, SJRWMD may be able to provide significant incentives to certain projects by cost-sharing on certain project components, such as ASR for a regional project, that may be included in the SJRWMD water resource development work program. Another incentive option that will be considered is the use of SJRWMD lands when needed for regional water supply projects.

Any incentive cost-share funding assistance for regional projects should be made available at the discretion of the Governing Board, considering the following criteria:

- a. The project meets one or more of the statutory criteria in section 373.0831, *FS*, for priority funding consideration.
- b. The project is identified in the DWSP as a water supply option and a priority for supplemental funding assistance.
- c. The project provides new water supplies for the region in quantities that are significant and an appropriate timetable, in addressing water supply shortfalls identified in the DWSP.
- d. The project requires the cooperation of or partnership with multiple local governments or water supply utilities to implement.
- e. Utilities that benefit from the assistance have implemented a program of annual rate indexing at least on the order of magnitude of inflation — approximately 2.5% annually.
- f. SJRWMD funding assistance is directed exclusively at capital projects or phases of such projects that can be completed within 24 months of the SJRWMD funding commitment.
- g. The project is an outgrowth of the SJRWMD water resource development work program.



Water Resource Development — increasing the amount of water resources available for water supply development (i.e., “expanding the water pie”)

Examples

- ASR long-term/seasonal storage
- Aquifer recharge enhancement
- Seawater demineralization feasibility study
- Surface water pilot treatment projects
- Wetland augmentation/restoration
- Monitoring/management to optimize fresh groundwater withdrawals
- Operation/modification of SJRWMD works, such as reservoirs to augment supplies
- Regional reclaimed water reuse program

Water Supply Development — constructing and operating the treatment, storage, transmission, and distribution facilities required to provide water supply to customers

Examples

- Wellfields and surface water intake structures
- Storage facilities
- Treatment plants
- Pump stations
- Transmission and distribution lines

Figure 1 – SJRWMD’s role in making more water available

Supporting Information for Recommendations

Section 1. Roles and Responsibilities

1. Section 373.0831(1)(a), *FS*, provides that, “The proper role of the water management districts in water supply is primarily planning and water resource development, but this does not preclude them from providing assistance with water supply development.” In addition, this same section provides that “water resource development and water supply development must receive priority attention, where needed, to increase the availability of sufficient water for all existing and future reasonable-beneficial uses and natural systems” (373.0831(1)(c), *FS*). This section further provides that the Legislature’s intent is that “water management districts take the lead in identifying and implementing water resource development projects, and be responsible for securing necessary funding for regionally significant water resource development projects” (373.0831(2)(b), *FS*). Section 373.0831(3), *FS*, provides that “The water management districts shall fund and implement water resource development projects as defined in s. 373.019, *FS*. Each governing board shall include in its annual budget the amount needed for the fiscal year to implement water resource development projects, as prioritized in its regional water supply plans.”
2. Section 373.0831(1)(b), *FS*, states, “The proper role of local government, regional water supply authorities, and government-owned and privately owned water utilities in water supply is primarily water supply development, but this does not preclude them from providing assistance with water resource development.” Section 373.0831(1)(c), *FS*, states, “Local governments, regional water supply authorities, and government-owned and privately owned water utilities take the lead in securing funds for and implementing water supply development projects. Generally, direct beneficiaries of water supply development projects should pay the costs of the projects from which they benefit, and water supply development projects should continue to be paid for through local funding sources.”
3. Section 373.0831, *FS*, also provides guidance for the prioritization of water supply development projects that are considered for state or water management district funding assistance, as follows:
 - (4)(a) Water supply development projects which are consistent with the relevant regional water supply plans and which meet one or more of the following criteria shall receive priority consideration for state or water management district funding assistance:
 - i. The project supports establishment of a dependable, sustainable supply of water which is not otherwise financially feasible;
 - ii. The project provides substantial environmental benefits by preventing or limiting adverse water resource impacts, but requires funding assistance to be economically competitive with other options; or
 - iii. The project significantly implements reuse, storage, recharge, or conservation of water in a manner that contributes to the sustainability of regional sources.

4(b) Water supply development projects which meet the criteria in paragraph (a) and also bring about replacement of existing sources in order to help implement a minimum flow or level shall be given first consideration for state or water management district funding assistance.

Section 2. Definitions of Water Resource Development and Water Supply Development

1. Water resource development is defined in Section 373.019(21), *FS*, as the formulation and implementation of regional water resource management strategies, including:
 - a. The collection and evaluation of surface water and groundwater data
 - b. Structural and nonstructural programs to protect and manage water resources
 - c. The development of regional water resource implementation programs
 - d. The construction, operation, and maintenance of major public works facilities to provide for flood control, surface and underground water storage, and groundwater recharge augmentation
 - e. Related technical assistance to local governments and to government-owned and privately owned water utilities
2. Some examples of water resource development projects from the WRDWP:
 - a. Artificial recharge investigations and projects to increase groundwater supplies available for water supply development
 - b. Feasibility investigations, such as facility siting studies for potential seawater demineralization (desalination) facilities
 - c. Technical studies necessary before engineering and design for facilities, such as the pilot treatment facility on the St. Johns River
 - d. ASR well construction, testing, and operation for long-term or seasonal storage of water associated with regional reclaimed water systems or surface water development
3. Other examples of water resource development projects undertaken by SJRWMD (completed prior to the WRDWP):
 - a. Surface storage areas as part of the Upper St. Johns River Basin Project
 - b. Lake Washington weir structure, allowing storage in Lake Washington for water supply while maintaining minimum flow releases downstream to the river
4. Water supply development is defined in Section 373.019(21), *FS*, 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.
5. Typical examples of water supply development include the following:

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- a. Withdrawal facilities, such as wellfields
 - b. Treatment facilities for fresh groundwater, brackish groundwater, surface water, and seawater
 - c. Storage facilities needed for local system operation/reliability
 - d. Transmission from water source to demand center
 - e. Distribution to customers
6. Some water supply components may potentially be either water resource development or water supply development, depending on case-specific facts.

Section 3. Water Resource Development Work Program

1. Because of the relatively higher responsibility given to Florida's water management districts for water resource development projects as compared to water supply development projects, SJRWMD's funding priority is focused on performance of water resource development projects contained in the WRDWP.
2. The WRDWP is a 5-year work plan developed by SJRWMD to implement the water resource development projects identified in the DWSP. Projects now in the program were selected through the regional water supply planning process completed in April 2000. Many of the current projects will be completed within this 5-year period. The WRDWP is updated annually to maintain a 5-year planning horizon. The consideration of any new projects in the WRDWP will be made by the Governing Board as part of the update to the DWSP, scheduled to be completed by 2005.
3. There are currently 14 programs/projects in the WRDWP, as follows:
 - a. Abandoned Artesian Well Plugging Program
 - b. Adaptive Management Project
 - c. Aquifer Protection Program
 - d. ASR Construction and Testing Program
 - e. Central Florida Aquifer Recharge Enhancement Program
 - f. Cooperative Well Retrofit Project
 - g. Demineralization Concentrate Management Project
 - h. Facilitation of Regional Decision-Making Process
 - i. Feasibility of Seawater Demineralization Projects
 - j. Hydrologic data collection and analysis
 - k. Investigation of areas where domestic wells are sensitive to water level fluctuation
 - l. Regional Aquifer Management Project
 - m. Surface water in-stream monitoring and treatability studies (St. Johns River)
 - n. Wetland Augmentation Demonstration Program
4. A history of expenditures for the WRDWP, along with projections through 2006, is as follows (in million dollars):

Funds	1999/2000	2001	2002	2003	2004	2005	2006	Total
SJRWMD	\$6.577	\$7.470	\$6.127	\$5.461	\$5.187	\$4.819	\$4.721	\$40.362
Florida Forever	\$0.000	\$2.375	\$5.175	\$4.398	\$11.107	\$12.893	\$14.487	\$50.435
Cooperative	\$0.185	\$2.399	\$4.401	\$5.116	\$6.886	\$5.363	\$5.193	\$29.543
Total	\$6.762	\$12.244	\$15.703	\$14.975	\$23.180	\$23.075	\$24.401	\$120.340

5. The WRDWP will benefit public supply utilities and other water users that develop new water supplies from alternative sources. For example:
- Increased quantities of ground and surface water that can be tapped for water supply development will be made available (see the WRPDP for details on quantities to be made available by specific projects)
 - Through data collection and monitoring, water resource investigations, and pilot testing projects, critical information is provided which water suppliers and others can use to fully evaluate options, complete engineering and design, and support permitting for facilities needed for water supply development. Notable examples of programs/projects that provide these benefits include the ASR Construction and Testing Program, the Wetland Augmentation Demonstration Program, and the St. Johns River Water Supply Project.

Section 4. Water Supply Development Assistance

1. Water supply development is primarily the responsibility of water supply utilities, water users, and local governments. SJRWMD’s primary role is to assist water users in their efforts to implement water supply development.
2. In general, if utilities or groups of utilities, through interlocal agreements or other arrangements, fund the development of alternative water supplies without supplemental funding from outside sources, the impact upon their retail rates appears to be affordable. To be successful, utilities must:
 - a. Recognize the need to develop new sources and plan well in advance (the design, permitting and construction of new source facilities will likely take 5 to 10 years)
 - b. Use rate indexing in advance of capital expenditures
 - c. Enter into interlocal agreements or other institutional arrangements to jointly develop alternative supplies
 - d. Develop blended rates for existing groundwater sources and new alternatives
3. This conclusion is further validated by several examples of water supply development using alternative water supply sources being financed through user fees. Examples in SJRWMD include the city of Melbourne’s water supply from Lake Washington and brackish groundwater wellfield, and the city of Cocoa’s development of water supplies from Taylor Creek Reservoir.

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4. Regardless of the conclusion that funding the development of alternative sources through user fees is generally affordable, there are significant obstacles to overcome in funding water supply development through user fees, including:
 - a. Political difficulty in implementing even modest rate increases
 - b. Uncertainties about when new, more-expensive water supply sources will be needed
 - c. No history of interlocal cooperation on water supply
 - d. Poor history of interlocal cooperation on other issues, leading to lack of trust
 - e. Potential inequities among rate payers within different water supply utilities
 5. SJRWMD is assisting users in water supply development by:
 - a. Conducting regional water supply planning
 - b. Making tools available for planning specific water supply development projects
 - c. Implementing the SJRWMD WRDWP
 - d. Allowing for the potential use of SJRWMD lands for water supply development
 - e. Providing limited cost-sharing assistance, on a competitive basis, through the following programs: Water Conservation Strategic Assistance; and, the Alternative Water Supply Cost-sharing program
 - f. Implementing a District-wide water conservation awareness media campaign
 - g. Securing limited funding from federal sources to supplement utility revenues
 6. Despite the apparent affordability of alternative water supplies and the projected shortfall in available fresh groundwater in the near future, there has been a lack of significant movement by water supply utilities toward the development of regional alternative water supplies that will be needed.
 7. Since water supply development appears to be, in general, affordable to water users, there does not appear to be a justification or need for supplemental funding on a routine basis. However, the impact of customer complaints concerning even affordable rate increases should not be underestimated. Such complaints can significantly increase the reluctance of rate-setting bodies to increase rates to levels necessary to implement alternative water supply projects.
 8. If water users do not move forward expeditiously and in a coordinated fashion, the potential exists for water supply shortfalls in the near future and higher rate impacts to users of water from public supply systems. Ultimately, significant delays and lack of cooperation could make water supply development much more expensive and potentially unaffordable to some water users. In addition, shortfalls in supply would limit the future economic development of affected regions.
 9. SJRWMD's goal in providing any supplemental funding should be to provide an incentive for water utilities and other users to move forward expeditiously and cooperatively to implement regionally significant water supply projects identified in the DWSP that will minimize costs and ensure that water supply development remains affordable to water users.

10. The availability of even modest supplemental funds is likely to provide incentives to some utilities for overcoming barriers to developing new alternative water supply sources. Some water utility representatives have indicated that even relatively limited cost-sharing funds from SJRWMD have significant benefits, including increasing the credibility of the project to local decision makers and the ability to secure supplemental funding from state and federal sources.
11. SJRWMD's current estimate of the capital investment needed for alternative water supply development in SJRWMD is on the order of \$1.5 billion; the estimate for east-central Florida is on the order of \$1 billion. For east-central Florida, this cost estimate is based on construction of several regional surface water facilities, a seawater demineralization facility, and regional reclaimed water systems. Annual capital recovery costs would be about \$100 million (financed over 20 years at 7%.)
12. Based on an analysis performed by the SJRWMD's economic consultant, it would be feasible to dedicate a portion of the incremental ad valorem tax revenue increase derived from real growth in the tax base (from new development) to supplement funding of alternative water supply initiatives.
13. If the Governing Board decides to provide cost-sharing funding assistance as an incentive to implement certain regional alternative water supply projects, the initial focus of SJRWMD's supplemental funding efforts should be in the east-central Florida area where the anticipated cost of new water supply sources by 2020 is 100% greater than in all other areas of SJRWMD combined. A reasonable division of available funds between the east-central Florida area and other portions of SJRWMD should be decided upon by the Governing Board based on the relative magnitudes of necessary new water supply facilities in those areas and the need to address taxpayers' concerns about the distribution of reasonable amounts of ad valorem revenue to areas where the revenue was collected.
14. By continuing its practice of actively seeking federal funding allocations to public supply utilities to support the construction of regionally significant alternative water supply development projects, SJRWMD could potentially leverage SJRWMD revenues and provide even greater incentives to accelerate the process and help ensure success.
15. Funds allocated to be incentive cost-share could be placed in a dedicated sinking fund to accrue until priority regional projects that satisfy the conditions for supplemental funding assistance are ready to move forward. This would serve to further motivate water suppliers to move forward aggressively in developing priority projects.

APPENDIX B — EAST-CENTRAL FLORIDA WATER SUPPLY PLANNING INITIATIVE COST-ESTIMATING CRITERIA

This appendix documents the cost-estimating definitions and criteria used in the preparation of conceptual planning-level cost estimates for the potential new water supply projects identified in the East-Central Florida Water Supply Planning Initiative (Initiative). The purpose of these criteria is to provide a consistent basis for the comparison of relative costs among the individual potential projects.

DEFINITIONS

The following definitions were used in the Initiative potential projects.

Construction Cost

The construction cost is the total amount expected to be paid to a qualified contractor to build the required facilities at peak design capacity.

Non-construction Capital Cost

Non-construction capital cost is an allowance for construction contingency, engineering design, permitting, and administration associated with the constructed facilities.

Land Cost

The market value of the land required to implement the water supply option.

Land Acquisition Cost

The estimated cost of acquiring the required land, exclusive of the land cost.

Total Capital Cost

Total capital cost is the sum of construction cost, non-construction capital cost, land cost, and land acquisition cost.

Operation and Maintenance (O&M) Cost

The estimated annual cost of operating and maintaining the water supply project when operated at average day capacity.

Equivalent Annual Cost

Total annual life cycle cost of the water supply project based on facility service life and time value of money. Equivalent annual cost, expressed in dollars per year, accounts for total capital cost and O&M costs with facility operating at average day design capacity.

Unit Production Cost

Equivalent annual cost divided by annual water production. The unit production cost is expressed in terms of dollars per 1,000 gallons produced.

CRITERIA

The following cost estimating and economic criteria were used in the Initiative potential projects.

Peak Flow Ratio

Capital cost of water supply facilities is based on maximum installed capacity designed to accommodate peak or maximum daily flow (MDF) requirements. O&M costs and annual water production are based on the average daily flow (ADF) produced. The peak flow ratio (MDF/ADF), for an individual water supply system, depends on the demand characteristics of the service area. For public supply systems, the peak ratio is generally at least 1.25 for large systems and can be greater than 2.0 for small systems.

Because the peak flow ratio varies by individual service area and many different individual and combined service areas may be encountered in east-central Florida, a typical value of 1.5 was chosen for all cost calculations.

Cost Index

Engineering News Record (ENR) publishes a construction cost index (CCI) that can be used to adjust the cost basis of a given construction project for past and future times. The cost estimates prepared for the potential Initiative projects are expressed in April 2003 dollars, with a corresponding ENR CCI value of 6635.

Non-construction Capital Cost

For the Initiative potential projects, non-construction capital cost is equal to 45% of the planning level estimated construction cost. This includes a 20% allowance for construction contingency and a 25% allowance for engineering design, permitting, and administration.

Land Cost

Unit land cost (\$/acre) for each land parcel is based upon land use classification and size as supplied by the St. Johns River Water Management District (SJRWMD) land acquisition staff for the 2000 *District Water Supply Plan* (DWSP). General land use classifications include urban, suburban, and rural. Size is based on acreage, where small refers to parcels 50 acres or less in size and large refers to parcels greater than 50 acres in size. Exhibit 1 provides the unit land cost matrix for parcels used in the Initiative potential projects.

Exhibit 1

Unit Land Cost for Parcels

Cost Estimating and Economic Evaluation Criteria

Land Use Classification	Parcel Size	
	Small (< or = 50 acres) (\$/acre)	Large (> 50 acres) (\$/acre)
Urban	\$100,000	N/A
Suburban	20,000	\$10,000
Rural	5,000	3,000

Unit land costs (\$/ft²) for pipeline corridors vary based on the land use classification and whether or not the parcel is adjacent to a public right of way (ROW) or in an undeveloped (new) area, and whether an easement or full ROW is required. Exhibit 2 provides the unit cost matrix for pipeline corridors used in the Initiative potential projects.

Exhibit 2

Unit Land Cost for Pipeline Corridors

Cost-Estimating and Economic Evaluation Criteria

Land Use Classification	Adjacent to Public ROW		New Area	
	Easement (\$/ft ²)	ROW (\$/ft ²)	Easement (\$/ft ²)	ROW (\$/ft ²)
Urban	\$4.00	\$6.00	\$3.00	\$5.00
Suburban	1.50	3.00	1.00	2.00
Rural	0.75	1.00	0.50	0.75

Land Acquisition Cost

Land acquisition cost estimates used in SJRWMD water supply planning applications vary as a function of condemnation requirements, as follows:

- 12% of land value for known non-condemnation parcels
- 25% of land value for know condemnation parcels
- 18% of land value where condemnation status is unknown

In all cases, for the Initiative potential projects, condemnation status was unknown and therefore a value of 18% was applied.

Interest Rate

SJRWMD recently conducted an analysis of the potential financial impacts of alternative water supply development. This analysis, conducted by Burton & Associates, produced a final report titled *Financial Impact of Alternative Water Supply*. The financial impacts analysis project employed an interest rate of 6% per year in all water rates calculations. In order to maintain compatibility among the Initiative activities, an interest rate of 6% was used in all potential Initiative projects’ equivalent annual and unit production cost calculations.

Economic Service Life of Facilities

The economic service life of facilities used in the Initiative potential projects is the same as the criteria adopted for DWSP. Exhibit 3 provides the economic service life, in years based on component type. These values were used in all annual cost and unit production cost calculations.

In all cases, land is considered a permanent resource and therefore has an infinite service life.

Exhibit 3

Economic Service Life

Cost-Estimating and Economic Evaluation Criteria

Component Type	Service Life (years)
Water conveyance structures (pipelines, collection and distribution systems)	40
Other structures (buildings, tankage, site improvements, etc.)	35
Wells	30
Process and auxiliary equipment (treatment equipment, pumps, motors, mechanical equipment, etc.)	20
Reverse osmosis membranes	5

The non-construction capital costs associated with a given project, or major project component, were also distributed in proportion to expected service life of the project. For example, if a given project, or major project component, has an economic service life of 20 years, then the non-construction capital cost for that project, or major project component, also has an economic service life of 20 years.