



Photo by Jack Rogers

## **Water Resource Development Work Program and Alternative Water Supply Annual Report**

# 4. WATER RESOURCE DEVELOPMENT WORK PROGRAM AND ALTERNATIVE WATER SUPPLY ANNUAL REPORT

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## SUMMARY

### A. WATER RESOURCE DEVELOPMENT WORK PROGRAM

SJRWMD developed the Water Resource Development Work Program (WRDWP) pursuant to the requirements of Subparagraph 373.536(6)(a)4, F.S., in association with its water supply planning effort. SJRWMD considers a water resource development project to be one that contributes to the formulation and implementation of regional water resource management strategies, based on the definition of water resource development included in Subsection 373.019(19), F.S. The WRDWP has a five-year planning horizon with an annual update.

For FY 2010-2011, SJRWMD has identified 16 water resource development (WRD) projects. Several WRD projects correspond to more than one water resource management strategy.

1. Abandoned artesian well plugging - ongoing
2. Aquifer protection - completed
3. Aquifer storage and recovery construction and testing - ongoing
4. Central Florida aquifer recharge enhancement - completed
5. Cooperative well retrofit - ongoing
6. Demineralization concentrate management - ongoing
7. Facilitation of regional decision-making - ongoing
8. Feasibility of seawater demineralization - ongoing
9. Hydrologic data collection and analysis - ongoing
10. Investigation of the augmentation of public supply systems with local surface water / stormwater sources - ongoing
11. Lake Apopka basin water resource development project - ongoing
12. Lower Lake Louise water control structure project - completed
13. Treatability of algal toxins using oxidation and adsorption - completed
14. Upper St. Johns River basin project - ongoing
15. Water resource development components of water supply development projects - ongoing
16. Wetland augmentation demonstration – completed

The projected total cost of all current and completed projects in the 2011 Five-Year WRDWP is \$272.26 million. The allocation of funding is 43.0 percent for the District, 17.0 percent for cooperators, and 40.0 percent for the State's Florida Forever. About 32.0 percent of the projected expenditures will be in the category of Construction, Testing, Monitoring, and Demonstration.

As required by Section 373.536(6)9a)4, F.S., the District submitted the annual WRDWP to FDEP on October 26, 2010, for review and FDEP approved the report on December 8, 2010.

## **B. ALTERNATIVE WATER SUPPLY ANNUAL REPORT**

In response to the requirements of Subsection 373.1961(2), F.S., the District initiated in 1996 the Alternative Water Supply Construction Cost Sharing Program to fund the construction of alternative water supply facilities. The District is required by Section 373.1961(3)(n), F.S. to submit an annual report for the disbursement of all budgeted amounts for the construction of alternative water supply facilities.

The District's Governing Board has approved 59 AWS projects for funding, with a total projected cost share of \$113.8 million, of which \$96.3 million was authorized and awarded. These projects represent \$1.218 billion in total construction costs. The amount of cost-shares is a combination of WP&STF and District ad valorem funds and will result in approximately 196 mgd total yield when the approved projects are complete. As of December 31, 2010, the District has paid out a total of \$53.8 million to local governments and water utilities on 38 AWS projects. The total amount of water production capacity created by these projects was 64.3 MGD.

## **A. WATER RESOURCE DEVELOPMENT WORK PROGRAM**

### **INTRODUCTION**

The St. Johns River Water Management District (SJRWMD) completed the 2003 Water Supply Assessment (WSA) and the 2005 District Water Supply Plan (DWSP) in compliance with the water supply planning provisions of Section 373.0361, Florida Statutes (F.S.). Projections made for DWSP indicate that alternative water supply sources will have to be developed in significant portions of SJRWMD's priority water resource caution areas to meet future needs while sustaining water quality, wetland and aquatic systems, and existing legal uses. Fresh groundwater alone probably cannot meet all future water supply needs. DWSP identifies water resource development projects based on the provisions of Subsection 373.0361(2)(b), F.S., to meet the identified needs.

SJRWMD developed the Water Resource Development Work Program (WRDWP) pursuant to the requirements of Subparagraph 373.536(6)(a)4, F.S., in association with its water supply planning effort. SJRWMD considers a water resource development project to be one that contributes to the formulation and implementation of the following regional water resource management strategies, based on the definition of water resource development included in Subsection 373.019(19), F.S.:

- The collection and evaluation of surface water and groundwater data
- Structural and nonstructural projects to protect and manage water resources
- The development of regional water resource implementation projects
- The construction, operation, and maintenance of public works facilities to provide for flood control, surface and underground water storage, and groundwater recharge augmentation
- Related technical assistance to local governments and to government-owned and privately owned water utilities

The following water resource development projects have been identified by SJRWMD in DWSP. These projects, including phases and elements of the projects, are cross-referenced to the statutory definitions (Table 4-1). Several water resource development projects correspond to more than one water resource management strategy. SJRWMD's water resource development projects and their current status are:

1. Abandoned artesian well plugging - ongoing
2. Aquifer protection - completed
3. Aquifer storage and recovery construction and testing - ongoing
4. Central Florida aquifer recharge enhancement - completed
5. Cooperative well retrofit - ongoing
6. Demineralization concentrate management - ongoing
7. Facilitation of regional decision-making - ongoing
8. Feasibility of seawater demineralization - ongoing
9. Hydrologic data collection and analysis - ongoing

10. Investigation of the augmentation of public supply systems with local surface water / stormwater sources - ongoing
11. Lake Apopka basin water resource development project - ongoing
12. Lower Lake Louise water control structure project - completed
13. Treatability of algal toxins using oxidation and adsorption - completed
14. Upper St. Johns River basin project - ongoing
15. Water resource development components of water supply development projects - ongoing
16. Wetland augmentation demonstration - completed

In addition, Table 4-2 presents a summary of estimates of water made available (both potential and actual) for the listed projects. The reader should note that the values given are not additive. In some cases there is overlap among projects.

The WRDWP is updated annually to augment DWSP and provide implementation guidance for water resource development projects identified in DWSP. The WRDWP contains a description of each current project, organized alphabetically and including a programming estimate of the project cost by year, an estimate of the quantity of water the project will make available when feasible, a timeline for commencement and completion, cross references to the SJRWMD budget, and specific project tasks where such tasks have been developed. Not all cooperative funds identified in this document appear in the corresponding Fiscal Year Work Plan and Budget. However, SJRWMD has worked diligently to ensure that the ad valorem, state, and federal funds shown herein for do match the SJRWMD Fiscal Year 2010-2011 Work Plan and Budget as adopted by the SJRWMD Governing Board on September 28, 2010.

A portion of the project work has been and will continue to be accomplished by SJRWMD staff; however, contractors will complete much of the work. Contractors annually perform approximately 80.0 percent to 90.0 percent of the project work for this program.

A more detailed explanation of the water resource development component and additional information for each project may be found in DWSP. Table 4-8 in Appendix A contains a summary of the funding for all program elements. Appendix B contains two figures that graphically depict total program funding and spending. Figure 4-1 shows the proportion of funds coming from different sources and Figure 4-2 shows the proportion of funds spent on different types of projects.

Table 4-1 Water resource development projects and the strategies they support. (This table is based on the definition of water resource development included in Subsection 373.019(19), FS.)

Name Project	Definition				
	A) Collection and evaluation of surface water and groundwater data	B) Structural and nonstructural projects to protect and manage water resources	C) Development of regional water resource implementation projects	D) 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
Abandoned Artesian Well Plugging		●			
Adaptive Management*			●		
Aquifer Protection			●		●
Aquifer Storage and Recovery Construction and Testing				●	●
Central Florida Aquifer Recharge Enhancement (Phase 1 may be complete by publication time)				●	●
Cooperative Well Retrofit		●			●
Demineralization Concentrate Management					●
Facilitation of Regional Decision-Making			●		
Feasibility of Seawater Demineralization					●
Hydrologic Data Collection and Analysis	●				
Investigation of Areas Where Domestic Self-Supply Wells Are Sensitive to Water Level Fluctuation*					●
Investigation of the Augmentation of Public Supply Systems With Local Surface Water / Stormwater Sources	●	●			●
Lake Apopka Basin Water Resource Development Project	●		●		●
Lower Lake Louise Water Control Structure Project		●			
Regional Aquifer Management*		●	●	●	
Surface Water Instream Monitoring and Treatability Studies*	●				●
Treatability of Algal Toxins Using Oxidation and Adsorption	●		●		●
Upper St. Johns River Basin Project		●	●	●	
Water Resource Development Components of Water Supply Development Projects		●	●	●	
Wetland Augmentation Demonstration	●	●			●

Note: \* Indicates completed projects, described in Appendix C.

Table 4-2. Water made available by water resource development projects.

Project Name	Water Made Available <sup>13</sup>	
	Potential	Current
Abandoned Artesian Well Plugging	Indeterminate	Indeterminate
Adaptive Management Project <sup>1</sup>	Indeterminate	Indeterminate
Aquifer Protection	Indeterminate	0
Aquifer Storage and Recovery Construction and Testing	Indeterminate	0
Central Florida Aquifer Recharge Enhancement Phase 1 <sup>1</sup>	50 mgd <sup>2</sup>	0
Central Florida Aquifer Recharge Enhancement Phase 2 <sup>1</sup>	0 <sup>3</sup>	0
Central Florida Aquifer Recharge Enhancement Phase 3	2.28 mgd <sup>4</sup>	2.28 mgd <sup>4</sup>
Cooperative Well Retrofit <sup>5</sup>	12,500 gpd	0
Demineralization Concentrate Management	57-268 mgd <sup>6</sup>	0
Facilitation of Regional Decision-Making	200 mgd <sup>7, 8</sup>	0
Feasibility of Seawater Demineralization	15-75 mgd <sup>7, 9</sup>	0
Hydrologic Data Collection and Analysis	Indeterminate	Indeterminate
Investigation of Areas Where Domestic Self-Supply Wells Are Sensitive to Water Level Fluctuation <sup>1</sup>	Indeterminate	Indeterminate
Investigation of the Augmentation of Public Supply Systems With Local Surface Water / Stormwater Sources	2- 4 mgd	0
Lake Apopka Basin Water Resource Development Project	5-10 mgd	0
Lower Lake Louise Water Control Structure Project	0.18 mgd <sup>10</sup>	0.18 mgd <sup>10</sup>
Regional Aquifer Management <sup>1</sup>	10 mgd	4 mgd
Surface Water Instream Monitoring and Treatability Studies <sup>1</sup>	22 - 173 mgd <sup>7, 11</sup>	0
Treatability of Algal Toxins Using Oxidation and Adsorption	22 - 173 mgd <sup>7, 11</sup>	0
Upper St. Johns River Basin Project	25 mgd <sup>12</sup>	Indeterminate
Water Resource Development Components of Water Supply Development Projects	5 mgd	3 mgd
Wetland Augmentation Demonstration	Indeterminate	Indeterminate

## Notes:

1. Indicates completed projects, described in Appendix C.
2. This estimate is as shown in DWSP 2005. Subsequent to that plan this study was completed and findings indicate that increasing water supply availability through this means may not be feasible to implement.
3. No additional water will be made available directly from CFARE Phase 2. Projects identified in CFARE Phase 2 will be constructed in CFARE Phase 3 or other projects.
4. Quantity is for groundwater recharge not necessarily water recoverable for use.
5. Although wells have been repaired to correct this problem, cooperative funds available through this project have not been used.
6. Based on projects currently identified in the DWSP 2005, first update, Table 15, and includes brackish groundwater, surface water and seawater projects, all for potable use.
7. These projects will not directly make more water available. Quantities are for projects that are expected to be undertaken as outcomes of these projects. Projects which will directly make the specified quantities of water available will be included in future updates of the WRDWP.

8. This value range is a composite of average projected deficits, which must be met by other projects, and includes projected deficits for the East Central Florida area, Volusia County, Flagler County, St. Johns County, the East Putnam Water System and Marion County
9. Based on projects currently identified in the DWSP 2005, first update, Table 15, and includes identified seawater projects for potable use.
10. This number represents the current CUP allocation for permits under review for Lower Lake Louise withdrawals.
11. Based on projects currently identified in the DWSP 2005, first update, Table 15, and includes surface water projects for potable use.
12. This value was taken from DWSP 2005, but more recent estimates indicate that the yield may be lower.
13. The values in this table are not additive. There is overlap among projects.

## ABANDONED ARTESIAN WELL PLUGGING

### BACKGROUND

The goal of this program is to assure the continued availability of groundwater resources by detecting, evaluating, and controlling abandoned artesian wells. Uncontrolled or improperly constructed artesian wells (abandoned artesian wells) reduce groundwater levels and contribute to the contamination of both ground and surface waters.

### UPDATE

SJRWMD has plugged or repaired approximately 100 abandoned artesian wells per year since the program was established in 1983. Abandoned artesian wells in priority water resource caution areas are given the highest priority for plugging. However, the program is also tasked with locating abandoned artesian wells not in the inventory. Additional abandoned wells are detected each year and added to the inventory.

Specific estimates of the amount of water made available as a result of this project are not made by SJRWMD. However, this project supports the water supply development program.

### FUNDING AND ADDITIONAL INFORMATION

The program will require continued funding through the planning horizon in order to plug or repair newly inventoried wells. SJRWMD anticipates that funding needs for continuation of this program through FY 2015 will be about \$6.19 million, including those funds previously expended in FY 2000 through 2010. Individual well owners and several counties historically have contributed to support this program. A description of this cooperative funding effort is included in the Abandoned Artesian Well Plugging Program 2004, Technical Fact Sheet SJ2004-FS4.

Cooperative funds source:	Various
Implementing agency:	SJRWMD
Potential water made available:	Indeterminate
Current water made available:	Indeterminate

SJRWMD DWSP page:	125
WBS reference:	2.2.3
FY 2010-2011 budget page:	156

**FUNDING AND EXPENDITURES FOR ABANDONED ARTESIAN WELL PLUGGING**

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							
	Prior Years	2011 <sup>1</sup>	2012	2013	2014	2015	Future	Total Cost
<b>Sources</b>								
SJ-Ad Valorem	\$2.881	\$0.111	\$0.111	\$0.111	\$0.111	\$0.111	\$0.111	\$3.547
SJ-FF Const.	\$1.445	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$1.445
SJ-FF Land Acq.								
SFWMD								
Cooperators	\$1.122	\$0.015	\$0.015	\$0.015	\$0.015	\$0.015	\$0.015	\$1.212
<b>Total</b>	<b>\$5.448</b>	<b>\$0.126</b>	<b>\$0.126</b>	<b>\$0.126</b>	<b>\$0.126</b>	<b>\$0.126</b>	<b>\$0.126</b>	<b>\$6.204</b>
<b>Disbursements</b>								
Internal	\$2.356	\$0.111	\$0.111	\$0.111	\$0.111	\$0.111	\$0.111	\$3.022
Contract	\$3.092	\$0.015	\$0.015	\$0.015	\$0.015	\$0.015	\$0.015	\$3.182

Note 1: This is an ongoing program with continued funding at a similar level indefinitely beyond 2015.

## AQUIFER PROTECTION

Aquifer systems in SJRWMD provide important sources of water supply and are susceptible to contamination and potential reductions in recharge from overlying activities on the land surface. Therefore, these aquifers should be protected to ensure their continued availability as water supply sources. This project consists of the following three elements.

- Wellhead Protection
- Recharge Area Protection—Plan Development
- Recharge Area Protection—Plan Implementation

### I. Wellhead Protection

#### BACKGROUND

Florida’s wellhead protection program is one element of aquifer protection (sometimes referred to as source protection). This program was developed in Florida in response to the requirements of Section 1428 of the U.S. Safe Drinking Water Act. Local governments must limit or restrict land uses that have a high potential for contaminant release in wellhead protection zones. The specific techniques used to identify wellhead protection zones vary by location because wellhead protection is implemented at the local level. Some techniques are technically rigorous, but many local governments utilize a nominal 200-foot radius around the wellhead without regard to hydrologic conditions. The popular use of a 200-foot zone provides limited protection of the surficial aquifer in areas with highly permeable sandy soils or the Floridan aquifer in areas where confining beds are thin or absent. SJRWMD assists local governments in the determination of the area around a well that should be protected and how to protect it through regulations.

#### UPDATE

Specific estimates of the amount of water to be made available as a result of this program are not made by SJRWMD. However, this program may be necessary to ensure the availability of all existing and future groundwater supplies in SJRWMD.

#### FUNDING AND ADDITIONAL INFORMATION

SJRWMD expended approximately \$0.20 million to complete this element of work. Future funds are not budgeted because this service is provided on request from a local government. The funds needed to resolve this issue are modest and are transferred to this project as needed and it is anticipated that efforts to implement this program will be accomplished under other programs.

Cooperative funds source:	None
Implementing agency:	SJRWMD
Potential water made available:	Indeterminate
Current water made available:	0 mgd

SJRWMD DWSP page:	126
WBS reference:	2.2.1
FY 2010-2011 budget page:	N/A

**FUNDING AND EXPENDITURES FOR WELLHEAD PROTECTION**

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							Total Cost
	Prior Years	2011	2012	2013	2014	2015	Future	
<b>Sources</b>								
SJ-Ad Valorem	\$0.201							\$0.201
SJ-FF Const.								
SJ-FF Land Acq.								
SFWMD								
Cooperators								
<b>Total</b>	<b>\$0.201</b>							<b>\$0.201</b>
<b>Disbursements</b>								
Internal	\$0.201							\$0.201
Contract								

*Future projects will be accomplished in other programs.*

**II. Recharge Area Protection – Plan Development**

**BACKGROUND**

SJRWMD has developed a draft Aquifer Protection Plan that identifies strategies for achieving aquifer protection goals. The draft plan was developed cooperatively with FDEP and local governments to identify and implement strategies to protect surficial aquifers, the Floridan aquifer in areas where confining beds are thin or absent and associated recharge areas. The following strategies are included in the draft plan:

- Investigate specific strategies to retain and use storm water and reclaimed water to reduce existing or potential loss of recharge and to potentially make more water available for potable or irrigation supply.
- Identify strategic land acquisitions to implement recharge strategies and include as a priority for land acquisition.
- Continue the wellhead protection technical assistance program to provide timely delineations and implementation assistance to local governments.
- Continue a coordinated outreach program to inform local governments of the aquifer protection technical assistance available from SJRWMD.
- Delineate surficial aquifer recharge areas and significant recharge areas as a basis for protective regulations by local governments.
- Consider incorporating recharge standards and criteria for important recharge areas into SJRWMD’s surface water and stormwater rules.

**UPDATE**

It is anticipated that recommendations from the Aquifer Protection Plan have been or will be incorporated into regulatory or other programs and that no further action will occur under this program.

**FUNDING AND ADDITIONAL INFORMATION**

SJRWMD expended \$284,850 under contract to complete this element of work. Specific estimates of the amount of water to be made available as a result of this project have not been made by SJRWMD. However, recommendations from this project are necessary to ensure the availability of all existing and future groundwater supplies in SJRWMD.

Cooperative funds source: None	SJRWMD DWSP page: 127
Implementing agency: SJRWMD	WBS reference: 2.2.1
Potential water made available: Indeterminate	FY 2010-2011 budget page: N/A
Current water made available: Indeterminate	

**FUNDING AND EXPENDITURES FOR RECHARGE AREA PROTECTION—PLAN DEVELOPMENT**

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							Total Cost
	Prior Years	2011	2012	2013	2014	2015	Future	
<b>Sources</b>								
SJ-Ad Valorem	\$0.285							\$0.285
SJ-FF Const.								
SJ-FF Land Acq.								
SFWMD								
Cooperators								
<b>Total</b>	<b>\$0.285</b>							<b>\$0.285</b>
<b>Disbursements</b>								
Internal								
Contract	\$0.285							\$0.285

Funding Complete

**III. Recharge Area Protection – Plan Implementation**

**BACKGROUND**

As noted above, implementation of the aquifer protection plan is expected to occur as part of other regulatory or programmatic strategies as no further individual efforts are expected. SJRWMD has identified several specific implementation strategies that can be incorporated into these other programs. These strategies include the following categories:

- Regulatory changes—If data collection and analyses so indicate, strengthen FAC 40C-42, FAC 40C-4; encourage and assist in development and adoption of local government regulations over and above those of SJRWMD.
- Natural area preservation — Encourage and support local governments development of Land Use Controls and Comprehensive Plan revisions that provide aquifer protection; cooperate with local government land acquisition activities.
- Artificial recharge projects — Identify, implement, and maintain artificial recharge projects that maintain or enhance groundwater recharge quantity or quality; support projects identified in the Central Florida Aquifer Recharge Enhancement project report; support projects identified in the artificial recharge projects identified in the Regional Aquifer Management Project.
- Groundwater quality protection — Convene interagency work groups to consider groundwater protection improvements; identify groundwater monitoring requirements related to reclaimed water use; identify best management practices and develop strategies for their implementation.
- Data collection and analysis — develop a data collection and analysis system to quantify land development impacts and effectiveness of current regulations; improve Floridan aquifer mapping; integrate interactive model information into regulatory reviews.
- Intergovernmental coordination — Coordinate with other governmental agencies to accomplish activities described above.
- Public involvement and awareness measures — Develop and implement public involvement and awareness measures designed to build support for regulatory and other aquifer protection efforts and to encourage valuable voluntary protection efforts. Continue a coordinated outreach program to inform local governments of the aquifer protection technical assistance available from SJRWMD.
- Technical assistance program — Continue the wellhead protection technical assistance program to provide timely delineations and implementation assistance to local governments.

Potential funding sources for land acquisition to increase recharge include SJRWMD, FF, federal funds for alternative water supply development, local governments, and privately owned utilities. The funding level required for land acquisition cannot be determined at this time.

### **UPDATE**

No individual plan implementation work is anticipated. Incorporated implementation work may include all or a portion of implementation strategies included in the plan. Coordination with FDEP, Florida Department of Community Affairs, and local governments is anticipated, depending on the strategies selected for implementation. Recent studies performed for other agencies include recommendations similar to the recommendations contained in the draft Aquifer Protection Plan. Further SJRWMD actions may be needed to better integrate and coordinate SJRWMD's Aquifer Protection Plan with these other studies.

### **FUNDING AND ADDITIONAL INFORMATION**

SJRWMD estimates the cost to other programs to be about \$18.0 million, including land acquisition. Specific estimates of the amount of water to be made available as a result of this project have not been made by SJRWMD.

Cooperative funds source:	Various
Implementing agency:	SJRWMD
Potential water made available:	Indeterminate
Current water made available:	Indeterminate

SJRWMD DWSP page:	127
WBS reference:	2.2.1
FY 2009-2010 budget page:	N/A

**FUNDING AND EXPENDITURES FOR RECHARGE AREA PROTECTION—PLAN IMPLEMENTATION**

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							
	Prior Years	2011	2012	2013	2014	2015	Future	Total Cost
<b>Sources</b>								
SJ-Ad Valorem								
SJ-FF Const.								
SJ-FF Land Acq.								
SFWMD								
Cooperators								
<b>Total</b>								
<b>Disbursements</b>								
Internal								
Contract								

*Future projects will be accomplished in other programs.*

## **AQUIFER STORAGE AND RECOVERY CONSTRUCTION AND TESTING**

### **BACKGROUND**

Aquifer storage and recovery (ASR) construction and testing is necessary to assure that ASR can be used successfully at specific sites. SJRWMD is pursuing ASR construction and testing projects with water treated to primary and secondary drinking water standards cooperatively with local governments to test the feasibility of this technique as a means of managing the availability of water. The results of this project are critical to the development of ASR systems associated with future water supply development projects. ASR testing by SJRWMD is performed only with water treated to primary and secondary drinking water standards. Ownership of completed ASR projects will be transferred to cooperators for their operational phase after construction. A cooperator then may operate the ASR facility with water treated to primary and secondary drinking water standards or with reclaimed water treated to reclaimed water standards. Both of these types of ASR uses can be permitted under current regulations. No special legislation or rule variances will be necessary to implement these projects. Effective ASR systems could make it economically feasible to use surface water sources that may yield significant additional quantities of water supply.

SJRWMD has awarded work order-based contracts for this construction and testing to three engineering firms. Each phase or component of each potential ASR project will be accomplished as a single work order. Each work order will yield data that will facilitate a feasibility go/no-go decision by SJRWMD staff. This approach, summarized in the Aquifer Storage and Recovery Construction and Testing Program Plan, dated April 2003, will limit financial commitment for each ASR project and maximize the use of available funds.

### **UPDATE**

In the early part of the program, desktop assessments were conducted, and agreements were executed with cooperators for seven projects. After exploratory wells were drilled, four projects were selected to proceed through all phases of the program, including final design, permitting, construction, startup, training, and cycle testing.

At the end of FY 2009-2010, construction of the four projects was completed, including installation of pretreatment systems on three of them. The potential for mineral leaching during cycle testing is being addressed by pretreatment consisting of de-chlorination and or de-oxygenation systems on three of the four projects. The project without pretreatment has features which will lessen the impact of mineral leaching if it occurs, so pretreatment will not be added. Cycle testing is underway on all four projects, in accordance with Florida Department of Environmental Protection requirements. In FY 2010-2011, technical assistance during cycle testing will be conducted, to complete the transfer of ownership to the local government cooperator, and continue facilitating the transition from construction and startup, to operational testing.

Projects will be accomplished with SJRWMD ad valorem and FF funds and cooperator funding in the form of significant in-kind services. Each potential cooperator has an immediate need for ASR in a location where SJRWMD is constructing and testing ASR wells.

**Florida Forever Discussion:** SJRWMD uses FF funds to cooperatively fund the construction and testing of these ASR wells. This use of FF funds is consistent with the following subparagraphs of *Florida Statutes*:

259.03(6)—It increases the amount of water available to meet the needs of natural systems and the citizens of the state by enhancing or restoring aquifer recharge, facilitating the capture and storage of excess flows in surface waters, and promoting reuse.

259.105(3)—The budget for this project falls within the prescribed percentage distribution limits of this subparagraph.

259.105(4)(d)—This project is one component of a regional water supply plan that will help ensure that sufficient quantities of water are available to meet the current and future needs of natural systems and the citizens of the state, as measured by:

The quantity of water made available through the water resource development component of a district water supply plan for which a water management district is responsible.

259.105(6)—No significant harm is predicted as a result of the project; the project will comply with all applicable permitting requirements; and the project is consistent with SJRWMD’s regional water supply plan.

### FUNDING AND ADDITIONAL INFORMATION

SJRWMD estimates that total project costs will be \$30.67 million, beginning in FY 2002 and continuing through FY 2011. Funds sources for this construction and testing effort include public supply utilities, FF, and ad valorem. The ASR construction and testing project has the potential of making additional water available during high demand periods. This is a critical component to assure the success of some surface water supply development projects due to the seasonal variability of quality and quantity in surface water bodies in SJRWMD. The availability of FF funding for construction of ASR wells affords SJRWMD the opportunity to accomplish construction and testing on the scale needed, rather than as limited by ad valorem funds.

Cooperative funds source:	Various
Implementing agency:	SJRWMD
Potential water made available:	Indeterminate
Current water made available:	0 mgd

SJRWMD DWSP page:	130
WBS reference:	2.2.1
FY 2010-2011 budget pages:	N/A

**FUNDING AND EXPENDITURES FOR ASR CONSTRUCTION AND TESTING**

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							
	Prior Years	2011	2012	2013	2014	2015	Future	Total Cost
<b>Sources</b>								
SJ-Ad Valorem	\$1.302	\$0.000						\$1.302
SJ-FF Const.	\$24.251	\$0.530						\$24.781
SJ-FF Land Acq.	\$3.000	\$0.000						\$3.000
SFWMD								
Cooperators	\$5.100	\$0.000						\$5.100
<b>Total</b>	<b>\$33.653</b>	<b>\$0.530</b>						<b>\$34.183</b>
<b>Disbursements</b>								
Internal	\$1.503	\$0.000						\$1.503
Contract	\$32.149	\$0.530						\$32.679

Funding Complete

## CENTRAL FLORIDA AQUIFER RECHARGE ENHANCEMENT

The purpose of the Central Florida Aquifer Recharge Enhancement (CFARE) Project is to increase the sustainable fresh groundwater supply by maximizing local recharge to the Floridan aquifer. Providing additional aquifer recharge in central Florida could significantly increase available fresh groundwater supplies and thereby reduce or delay the need for development of alternative water supplies. Aquifer recharge can be increased by enhancing natural recharge or by providing artificial recharge, including infiltration basins or recharge wells. Recharge enhancement can be integrated with stormwater management systems to provide needed drainage and flood control as well as increased water supply.

CFARE has three phases, as listed below and described on the following pages.

- Phase I—Artificial Recharge Demonstration Projects
- Phase II—Recharge Enhancement Evaluation and Design
- Phase III—Recharge Project Implementation

### Phase I – Artificial Recharge Demonstration Projects

#### BACKGROUND

SJRWMD performed a preliminary assessment of the aquifer recharge characteristics of existing recharge wells in central Florida. Aquifer recharge provided by existing wells has been estimated to be between 39 mgd and 52 mgd. The opportunity exists to significantly increase the current recharge rate to further supplement groundwater supplies. However, concern about the potential for bacterial and other contamination of the aquifer resulting from using lake water or stormwater runoff as the source of recharge currently limits this practice.

The purpose of this phase of CFARE is to demonstrate the use of recharge wells for net water resource benefit, which may include increasing recharge volume without increasing aquifer contamination or decreasing aquifer contamination while preserving existing recharge rates. The demonstration project focuses on the following elements:

- Determine the fate of bacteria and other contaminants in the Floridan aquifer
- Determine the effectiveness of passive stormwater treatment for reducing bacteria and other contaminants
- Determine the effectiveness and cost feasibility of physically reducing bacteria in lake water recharge

SJRWMD will evaluate passive treatment options for existing street drainage wells, if determined necessary. Systems such as disk filtration and disinfection using ultraviolet light will be considered for lake drainage wells.

## UPDATE

This project was completed in FY 2006 with the final report published in September 2006. Key results from the study are as follows:

- The two recharge well systems studied have been active for greater than 40 and 60 years. Results represent effects of long-term operations and suggest that no significant long term impact has occurred to the aquifer.
- A reduction of bacteria concentrations was observed in the groundwater (compared to the recharge water) of 2- to 6- orders-of-magnitude
- Synthetic organics were either undetected or detected at concentrations less than MCLs
- Arsenic mobilization observed, something that was not anticipated.

SJRWMD believes that there are significant opportunities for continued investigation and there are recommendations for these investigations contained in the final report. They will not be carried out under this project, which is now complete.

At this project's inception, consideration was being given to increasing the number of recharge wells (with appropriate safeguards put in place) in order to increase beneficial recharge in the greater Orlando area. Given the study's findings relative to arsenic mobilization, increasing water supply availability through this means may not be feasible to implement.

**Florida Forever Discussion:** SJRWMD used FF funds to construct monitoring wells in support of this project. This use of FF funds is consistent with the following subparagraphs of the *Florida Statutes*:

259.03(6)—It increases the amount of water available to meet the needs of natural systems and the citizens of the state by enhancing and restoring aquifer recharge and facilitating the capture and storage of excess flows in surface waters.

259.105(3)—The budget for this project falls within the prescribed percentage distribution limits of this subparagraph.

259.105(4)(d)—This project is one component of a regional water supply plan that will help ensure that sufficient quantities of water are available to meet the current and future needs of natural systems and the citizens of the state, as measured by:

The quantity of water made available through the water resource development component of a district water supply plan for which a water management district is responsible.

259.105(6)—No significant harm is predicted as a result of the project; the project will comply with all applicable permitting requirements; and the project is consistent with the District's regional water supply plan.

## FUNDING AND ADDITIONAL INFORMATION

This project was a cooperative effort with the South Florida Water Management District (SFWMD) and the cities of Altamonte Springs and Orlando. The total cost of the project, including the investigation, was \$1.69 million.

Cooperative funds source:	Various
Implementing agency:	SJRWMD
Potential water made available:	50 mgd <sup>1</sup>
Current water made available:	0 mgd

SJRWMD DWSP page:	131
WBS reference:	2.2.1
FY 2010-2011 budget page:	N/A

Note 1: This estimate is derived from DWSP 2005. Subsequent to that plan this study was completed and findings indicate that increasing water supply availability through this means may not be feasible to implement.

## FUNDING AND EXPENDITURES FOR ARTIFICIAL RECHARGE DEMONSTRATION PROJECTS

Fund Sources and Disbursements	Prior Years	Funds Needed/Expended -- \$ Million						Total Cost
		2011	2012	2013	2014	2015	Future	
<b>Sources</b>								
SJ-Ad Valorem	\$1.426							\$1.426
SJ-FF Const.	\$0.133							\$0.133
SJ-FF Land Acq.								
SFWMD	\$0.110							\$0.110
Cooperators	\$0.020							\$0.020
<b>Total</b>	<b>\$1.689</b>							<b>\$1.689</b>
<b>Disbursements</b>								
Internal	\$0.010							\$0.010
Contract	\$1.679							\$1.679

### Phase II – Recharge Enhancement Evaluation and Design

#### BACKGROUND

SJRWMD performed evaluations of the feasibility of other artificial recharge enhancement approaches, including the placement of stormwater and reclaimed water in rapid infiltration basins and naturally occurring closed depressions in upland recharge areas, concurrently with the performance of Phase I work. Recharge water treatment requirements, costs, and hydrologic design requirements will be better defined upon completion of the Phase I demonstration projects and these evaluations. This information, along with local stormwater management and flood control needs, can be used to design an integrated central Florida aquifer recharge system. This system should meet water supply, stormwater management, and aquifer protection needs, and will contribute to integrated regional water resource management.

## UPDATE

The cost to complete the Central Florida Aquifer Recharge Enhancement Phase II Project and the Tri-Party Reclaimed Water System Expansion and Optimization Study was \$1.00 million. No further studies or evaluations will be performed in Phase II. Project implementation outlined below will occur in Phase III.

### FUNDING AND ADDITIONAL INFORMATION

The proposed Orange County recharge plan, consisting of 18 projects, would increase groundwater recharge by approximately 17.6 mgd at an estimated cost of \$74.5 million. The proposed Tri-Party recharge plan, consisting of 21 projects, would increase reuse/recharge by approximately 7.3 mgd through public access reuse irrigation, and increases reclaimed water storage capacity by approximately 752 million gallons per year in proposed recharge basins, at an estimated cost of \$21.8 million. Projects derived from the Orange County and the Tri-Party recharge plans currently programmed for construction are estimated to cost \$73.74 million. The estimated quantity of water made available by these two efforts, in terms of net increase in groundwater withdrawals, has not been determined. These efforts were concentrated in Orange and Seminole counties and were performed cooperatively and cost-shared by those counties and two cities in Seminole County.

The cost to complete all the above work was \$1.00 million. No further studies or evaluations will be performed in Phase II. Project implementation will occur in Phase III.

Cooperative funds source:	Various
Implementing agency:	SJRWMD
Potential water made available:	0 mgd <sup>1</sup>
Current water made available:	0 mgd <sup>1</sup>

SJRWMD DWSP page:	134
WBS reference:	2.2.1
FY 2010-2011 budget page:	N/A

Note 1: No additional water will be made available directly from CFARE Phase 2. Projects identified in CFARE Phase 2 will be constructed in CFARE Phase 3.

### FUNDING AND EXPENDITURES FOR RECHARGE ENHANCEMENT EVALUATION AND DESIGN

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							
	Prior Years	2011	2012	2013	2014	2015	Future	Total Cost
<b>Sources</b>								
SJ-Ad Valorem	\$0.407							\$0.407
SJ-FF Const.								
SJ-FF Land Acq.								
SFWMD	\$0.040							\$0.040
Cooperators	\$0.557							\$0.557
<b>Total</b>	<b>\$1.004</b>							<b>\$1.004</b>
<b>Disbursements</b>								
Internal								
Contract	\$1.004							\$1.004

Funding Complete

**Phase III – Recharge Enhancement Project Implementation**

**BACKGROUND**

The full scope of the Central Florida Aquifer Recharge Enhancement Project Phase III could be determined only after completion of Phase II and, therefore, was not provided in earlier versions of this document. The proposed CFARE Phase 2 recharge plan, consisting of 18 projects, would increase groundwater recharge by approximately 17.6 mgd at an estimated cost of \$74.5 million. The proposed Tri-Party recharge plan, consisting of 21 projects, would increase reuse/recharge by approximately 7.3 mgd through public access reuse irrigation, and increases reclaimed water storage capacity by approximately 752 million gallons per year in proposed recharge basins, at an estimated cost of \$21.8 million. Projects derived from the Orange County and the Tri-Party recharge plans currently programmed for construction are estimated to cost \$73.74 million. The estimated quantity of water made available by these two efforts, in terms of net increase in groundwater withdrawals, has not been determined. These efforts will be concentrated in Orange and Seminole counties and will be performed cooperatively and cost-shared by those governments in Orange County and Seminole County.

**UPDATE**

Phase III was completed in January 2010 when the City of Sanford completed all activities related to the completion of the Mill Creek Reclaimed Water Storage Pond and submitted the final invoice of \$0.013 million for payment. No other CFARE projects are proposed. Future projects of this type will most likely occur as a larger water supply project under the Water Protection and Sustainability Program.

**Florida Forever Discussion:** SJRWMD proposes the use of FF funds cooperatively to purchase larger tracts of land and perform the construction necessary to complete regionally significant recharge enhancement projects as identified through Phase II of this project. This use of FF funds is consistent with the following subparagraphs of the *Florida Statutes*:

259.03(6)—It increases the amount of water available to meet the needs of natural systems and the citizens of the state by enhancing or restoring aquifer recharge, facilitating the capture and storage of excess flows in surface waters, and promoting reuse.

259.105(3)—The budget for this project falls within the prescribed percentage distribution limits of this subparagraph.

259.105(4)(d)—This project is one component of a regional water supply plan that will help ensure that sufficient quantities of water are available to meet the current and future needs of natural systems and the citizens of the state, as measured by:

The quantity of water made available through the water resource development component of a district water supply plan for which a water management district is responsible; and possibly

The number of acres acquired of groundwater recharge areas critical to springs, sinks, aquifers, other natural systems, or water supply.

259.105(6)—No significant harm is predicted as a result of the project; the project will comply with all applicable permitting requirements; and the project is consistent with the District’s regional water supply plan.

### FUNDING AND ADDITIONAL INFORMATION

Implementation began in FY 2005. Specifically identified projects account for the total projected cost of \$14.71 million over the planning period for construction of feasible projects identified in Phases I and II.

Cooperative funds source: Various	SJRWMD DWSP page: 134
Implementing agency: SJRWMD	WBS reference: 2.2.1
Potential water made available: 2.28 mgd <sup>1</sup>	FY 2010-2011 budget page: N/A
Current water made available: 2.28 mgd <sup>1</sup>	

Note 1: Quantity is for groundwater recharge, not necessarily water recoverable for use.

### FUNDING AND EXPENDITURES FOR RECHARGE ENHANCEMENT PROJECT IMPLEMENTATION

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							Total Cost
	Prior Years	2011	2012	2013	2014	2015	Future	
<b>Sources</b>								
SJ-Ad Valorem	\$0.196							\$0.196
SJ-FF Const.	\$2.338							\$2.338
SJ-FF Land Acq.	\$1.986							\$1.986
SFWMD								
Cooperators	\$10.195							\$10.195
<b>Total</b>	<b>\$14.715</b>							<b>\$14.715</b>
<b>Disbursements</b>								
Internal	\$0.071							\$0.071
Contract	\$14.644							\$14.644

Funding Complete

## COOPERATIVE WELL RETROFIT PROJECT

Interference of higher volume pumpage with the use of domestic self-supply wells has been common during the peak agricultural irrigation season in southwestern St. Johns County and northeastern Putnam County. The Water Supply Planning Area IV work group for the DWSP 2000 developed a proposed solution to deal with existing and potential future well interference problems in this area. The proposed solution, if successfully implemented, should eliminate interference with existing legal domestic users and avoid the construction of new domestic well systems that are inadequate for producing water during the peak irrigation period. The two-pronged solution developed is described as follows:

### I. Eliminating Impact of Seasonal Drawdowns on Existing Legal Domestic Users

#### BACKGROUND

SJRWMD has historically received complaints concerning the loss-of-flow from domestic self-supply wells during the peak agricultural irrigation season in the southwestern St. Johns County and northeastern Putnam county areas. Each loss-of-flow complaint is investigated by SJRWMD to verify that it is directly attributable to water level declines related to pumpage and not to a well system construction, operation, or maintenance problem. If the loss of flow is clearly due to water level declines, the well system will be repaired and SJRWMD and involved water users will share the cost.

#### UPDATE

There is no new information for this element.

#### FUNDING AND ADDITIONAL INFORMATION

The funding needed to resolve this water supply issue is modest. A repair of this type typically involves adding a pump between the well and the aerator and/or increasing the length of drop pipe in the well. This type of modification is estimated to cost between \$400 and \$500 per well. It was estimated that there are fewer than 50 wells in the work group area were subject to loss of flow during seasonal drawdown events at the inception of this project. Estimated maximum capital cost to resolve the existing problem is \$25,000. Funds are not shown in the budget because of the small amount needed and the intermittent need. Funds will be transferred to this project as necessary. This project is expected to impact the continued availability of about 12,500 gallons per day of existing domestic self-supply in northeast Florida.

Cooperative funds source:	Various
Implementing agency:	SJRWMD
Potential water made available:	12,500 gpd
Current water made available:	0 mgd <sup>1</sup>

SJRWMD DWSP page:	136
WBS reference:	2.2.1
FY 2010-2011 budget page:	N/A

Note 1: Although wells have been repaired to correct this problem, cooperative funds available through this project have not been used.

**FUNDING AND EXPENDITURES FOR ELIMINATING IMPACT OF SEASONAL DRAWDOWNS  
ON EXISTING LEGAL DOMESTIC USERS**

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							
	Prior Years	2011	2012	2013	2014	2015	Future	Total Cost
<b>Sources</b>								
SJ-Ad Valorem								
SJ-FF Const.								
SJ-FF Land Acq.								
SFWMD								
Cooperators								
<b>Total</b>								
<b>Disbursements</b>								
Internal								
Contract								

Estimated maximum capital cost to resolve the existing problem is \$25,000. Funds are not shown in the budget because of the small amount needed and the intermittent need.

**II. Avoiding the Construction of Inadequate New Domestic Well Systems**

**BACKGROUND**

SJRWMD has worked with St. Johns County and Putnam County to get county ordinances and well construction procedures in place to ensure that new domestic well installations are capable of producing water during the seasonal drawdown events.

St Johns County has one of the few local government programs that regulate the construction of self-supply wells to avoid reduction or loss of service to these wells. The program specifies pump standards for a large portion of the unincorporated area of the county. The program requires that the pumping system be able to operate with up to as much as 45 ft of additional drawdown depending on the relative location of the Upper Floridan aquifer potentiometric surface (static water level) at the time of well installation. It specifies the use of submersible pumps under certain circumstances.

Putnam County had a well construction ordinance but it did not apply to all areas of the county subject to significant seasonal water level declines. SJRWMD worked with county staff to revise the ordinance to include all affected areas. The county commission approved the revised ordinance.

**UPDATE**

This effort was completed in St. Johns County and Putnam County at a cost of approximately \$10,000. The development of like ordinances or efforts are expected to occur in other programs.

**FUNDING AND ADDITIONAL INFORMATION**

Cooperative funds source:	Various
Implementing agency:	SJRWMD
Potential water made available:	Indeterminate
Current water made available:	Indeterminate

SJRWMD DWSP page:	136
WBS reference:	1.3.1
FY 2010-2011 budget page:	N/A

**FUNDING AND EXPENDITURES FOR AVOIDING THE CONSTRUCTION OF INADEQUATE NEW DOMESTIC WELL SYSTEMS**

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							
	Prior Years	2011	2012	2013	2014	2015	Future	Total Cost
<b>Sources</b>								
SJ-Ad Valorem	\$0.005							\$0.005
SJ-FF Const.								
SJ-FF Land Acq.								
SFWMD								
Cooperators	\$0.005							\$0.005
<b>Total</b>	<b>\$0.010</b>							<b>\$0.010</b>
<b>Disbursements</b>								
Internal	\$0.010							\$0.010
Contract								

Funding Complete

Note: Dedicated funds are not budgeted or programmed for this effort. Staff time is expended as needed.

## **DEMINERALIZATION CONCENTRATE MANAGEMENT PROJECT**

### **BACKGROUND**

SJRWMD has identified brackish groundwater and surface water as potential significant sources of supply to meet projected 2025 demands. The use of this brackish water will require management of the waste concentrate that is a byproduct of the demineralization process. Available management options include placement in deep injection wells, discharge to surface waters, land spreading, discharge to wastewater treatment facilities, and more. Implementation of these management options is subject to FDEP regulations. These regulations are based on federal guidelines administered by EPA. The history of the permitting of demineralization concentrate discharges in SJRWMD indicates the need to develop acceptable management strategies for demineralization concentrate discharge that can be dependably utilized by public supply utilities and other water users. SJRWMD is working cooperatively with FDEP, EPA, public supply utilities, and other affected parties to develop these management strategies and identify any required technical studies, data collection, or analysis needed to formulate management strategies and monitor the effectiveness of management strategies.

The Demineralization Concentrate Management Plan was completed in September 2003. Additional investigations identified in the plan started during FY 2004. A study concerning the appropriateness of reclassifying demineralization concentrate as non-corrosive and of the corrosiveness of concentrate on materials used in the construction of injection wells was performed in FY 2004 and FY 2005.

Subsequently a cooperative project with the National Oceanic and Atmospheric Administration (NOAA) began in FY 2004 to support rules related to demineralization concentrate management. NOAA with assistance from CH2M Hill conducted a preliminary investigation and literature search on the viability of coastal and open ocean concentrate disposal options that include consideration of mixing and dilution models and relating the results to current permitting rules. Their combined work products recommended multiple avenues to pursue in order to assist future cooperators, one of which was a long-term (approximately 5 years) data gathering effort to support potential rule changes or application of current rules.

CH2M Hill completed the final year of their contract to provide project management and technical support services for the Districts Demineralization Concentrate Management Project. CH2M Hill completed planning-level conceptual engineering designs, conducted modeling of a range of St. Johns River outfall discharge scenarios that bracket potential concentrate outfall locations and river conditions likely to be encountered. They also provided technical support services for the District and conducted some minor investigations into the use of Class V (shallow) injection wells for demineralization concentrate and blending of demineralization concentrate with reclaimed water.

### **UPDATE**

Current efforts were completed. Currently there are no plans to conduct additional studies. Should specific projects be identified that would require assistance, funding would be considered either under this project or as part of a specific project identified.

### FUNDING AND ADDITIONAL INFORMATION

The Demineralization Concentrate Management Plan was completed in FY 2003 at a cost of \$0.303 million. The SJRWMD funded approximately \$1.99 million from FY 2005 to FY 2009 for projects.

Cooperative funds source:	Various
Implementing agency:	SJRWMD
Potential water made available:	57-268 mgd <sup>1</sup>
Current water made available:	0 mgd

SJRWMD DWSP page:	137
WBS reference:	2.2.1
FY 2010-2011 budget page:	N/A

Note 1: Based on projects currently identified in the DWSP 2005, first update, Table 15, and includes brackish groundwater, surface water and seawater projects, all for potable use.

### FUNDING AND EXPENDITURES FOR DEMINERALIZATION CONCENTRATE MANAGEMENT

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							
	Prior Years	2011	2012	2013	2014	2015	Future	Total Cost
<b>Sources</b>								
SJ-Ad Valorem	\$1.727	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$1.727
SJ-FF Const.								
SJ-FF Land Acq.								
SFWMD								
Cooperators	\$0.265	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.265
<b>Total</b>	<b>\$1.992</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$1.992</b>
<b>Disbursements</b>								
Internal								
Contract	\$1.992	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$1.992

## FACILITATION OF REGIONAL DECISION-MAKING PROCESS

### BACKGROUND

SJRWMD has supported active regional decision-making in the east-central Florida and northeast Florida areas and plans to continue this effort and extend it into other areas of SJRWMD as necessary. This regional decision-making process seeks to encourage mutually beneficial cooperation of all participants and is not intended to create any particular form of intergovernmental or institutional structure.

SJRWMD strives to maximize decision-oriented discussions between major water users, particularly public supply utilities. SJRWMD proactively implements this regional decision-making process where necessary through the following tasks:

- Provide facilitators for the process at SJRWMD's expense.
- Provide SJRWMD staff, consultant expertise, and funding as appropriate.
- Amend and update the DWSP as necessary to incorporate sustainable water source options selected by water supply utilities that are consistent with DWSP.

SJRWMD facilitated three water supply planning subgroups in east-central Florida in 2001:

- Seminole County subgroup
- North Lake County/south Marion County subgroup
- South Lake County, Orange County, Osceola County, and Polk County subgroup

SJRWMD focused much of its attention in 2004 and 2005 on securing local government interlocal agreements to support development of county-level water supply plans. Meetings with local governments and water suppliers in each county began in 2005 and continued into 2008 with the ultimate goal being to organize and jointly produce county-level water supply plans. Putnam County and Orange County both indicated an interest in 2006 to have the District sponsor the preparation of a County Water Supply Plan following the steps of the other county plans. Activities occurred in each of the following counties:

#### County-level activities

- SJRWMD staff routinely attends Brevard Water Supply Board and Water Authority of Volusia meetings and coordinates regionally significant activities with both organizations.
- Water Supply Plans have been completed for Flagler County on September 5, 2007, Lake County on December 12, 2007, Seminole County on May 24, 2007 (the contract between the District and Casselberry was closed out in July 2007), and Marion County on May 8, 2007 (the contract between the District and Marion County was closed out in the fall of 2007).

Putnam County. On May 9, 2006 District consultants and the Putnam County Administrator met to discuss water supply planning in Putnam County. Putnam County indicated it would like for the District to sponsor a county-wide water supply planning effort in Putnam County similar to those taking place in other counties. The plan was developed with input from representatives from local

public water supply utilities and local governments (deemed “Cooperators”). The plan was finalized in late 2008.

#### Project-level activities

- CROT Integrated Water Supply Alternatives Study. The city of Cocoa, Reedy Creek Improvement District, Orange County and the Toho Water Authority (CROT) worked cooperatively during 2004 and 2005 to identify possible joint alternative water supply projects, which if implemented, could delay the need for more costly projects. The focus of CROT’s attention is focused on reclaimed water and storm water projects. The group advised SJRWMD that it would like to perform an integrated water supply alternatives study with coordination and support of the South Florida Water Management District (SFWMD) and SJRWMD. Both districts reviewed the proposed scope of services, estimated costs, and timeline. The study began in FY 2005 and was completed in FY 2007.
- Taylor Creek Reservoir. The Taylor Creek Reservoir (TCR), located in Orange and Osceola counties near the St. Johns River and State Road 520, was designed to provide flood control and water supply in the upper St. Johns River drainage basin. The city of Cocoa began using the reservoir for water supply in 1999, and is currently withdrawing approximately 5 million gallons per day (mgd) from the reservoir to supplement its groundwater sources.

Three separate projects involving TCR are described here in further detail.

- ◆ The TCR Improvement Project, undertaken by SJRWMD is designed to change the current operating schedule, with improvements that will allow an increase of 3 ft in the year round operating pool level. Raising the pool level creates a potential water supply yield from the reservoir of about 30 mgd using the existing watershed. The design is currently underway.
- ◆ The Enhanced TCR Project capitalizes on the increased potential yield afforded by the TCR Improvement Project. The City of Cocoa is spearheading the effort and several utility partners are currently in discussion to develop and use that additional yield from the watershed—the City of Titusville, Orange County Utilities, Orlando Utilities Commission, Tohopekaliga (Toho) Water Authority and East Central Florida Services Inc. (ECFS). The plan is to treat the water to potable standards and transport it to partners’ existing systems. Expected capacity will likely be in the 12-24 mgd range of additional supply and treatment capacity. While timing is still undecided, customer demands, economic conditions, permit and agreement conditions and planned changes to the Central Florida Coordinating Area Rule all will affect the schedule.
- ◆ The SJR/TCR Water Supply Project was begun in 2003 by these same six partners, together with the SJRWMD and financial assistance from the South Florida Water Management District, to develop the St. Johns River for potable water production using the TCR for storage. Because of the TCR Improvement Project and in addition to the Enhanced Taylor Creek Reservoir Project, the opportunity exists to capitalize further on the available storage space in the TCR by holding water at a higher level and diverting water from the St. Johns River into the reservoir. This project together with other measures could increase the amount of available water supply to around 54 mgd.

The project included the preliminary design, and federally mandated environmental assessments sufficient to proceed with final facility construction design, transmission systems and permitting. A preliminary design report and environmental information document were

completed. At this point in time, the various participants are weighing their options to determine when and if this project meets their future water supply goals.

#### North Central Florida Coordination Area (NCFCA)

- An initiative was begun in 2007 by SWFWMD and SJRWMD to establish a common approach for water supply planning, regulation and modeling for the North Central Florida Coordination Area. In 2007, the two districts focused on developing a common approach for collecting and analyzing groundwater data and withdrawal impacts. In addition, the districts have been working to establish a single methodology for determining MFLs for Silver Springs and Rainbow Springs. These efforts have included numerous face-to-face meetings with district staffs, field visits and teleconferences to coordinate activities. Due to effective ongoing coordination efforts between the districts, it was decided in 2008 that there was no longer a need to formally designate a NCFCA initiative. The districts agreed to continue to coordinate on an as-needed basis planning, regulation and modeling efforts in this geographic region.

### UPDATE

#### Northeast Florida/Southeast Georgia Water Resources Coordination

SJRWMD has coordinated with the State of Georgia, the U.S. Geologic Survey (USGS), and the Suwannee River Water Management District (SRWMD) for more than ten years concerning water resource issues in the northeast Florida/southeast Georgia area. Groundwater withdrawals from the Floridan aquifer in Georgia can affect water levels in Florida and withdrawals in Florida can affect water levels in Georgia. SJRWMD, SRWMD and the State of Georgia have a common interest in management of the water resources of the area for that reason. SJRWMD desires to work cooperatively with the State of Georgia to avoid conflicts that have the potential to arise as water supplies from the Floridan aquifer are developed in the future and has provided a facilitator for discussions between SJRWMD, the State of Georgia, the Florida Department of Environmental Protection, and other interested parties. These discussions were designed to enhance working relationships and avoid conflicts. An initial coordination meeting was held in August 2004 with additional facilitation and coordination taking place in 2005. SJRWMD staff and staff from the Georgia Department of Natural Resources (DNR) met in 2009 and 2010..

#### Central Florida Coordination Area (CFCA)

In the spring of 2006, the Executive Directors of SJRWMD, SFWMD and SWFWMD directed their staffs to develop better mechanisms for formal water supply coordination and communication in the area of central Florida where the boundaries of the three districts come together and where permitting actions in one district can impact water resources and water users throughout the area. In response to this directive a “Recommended Action Plan for the Central Florida Coordination Area” was developed and adopted by the three district governing boards. The Action Plan has three individual components addressing (1) regulation, (2) planning, and (3) computer modeling and tools. Teams consisting of staff and consultants from the three districts were established for each of the three Action Plan components.

- Regulation. The regulation team met with stakeholders on February 20, 2007 and received input on draft documents and suggested revisions. The team had additional stakeholder

meetings in 2007 and revised the draft rule language based on stakeholder input. The three districts adopted the CFCA rules in 2008.

- **Planning.** The planning team met with stakeholders on February 20, April 27 and June 22, 2007. During these meetings staff and consultants from the three districts reviewed and received input on water demand projections, AWS project descriptions and selection processes, and funding alternatives. The final planning group report was completed in January 2008.
- **Computer Modeling and Tools.** The computer modeling and tools team has had numerous team meetings in 2007 developing an action plan. In 2008, the team continued coordination efforts with the regulatory group with the goal of unified approach to evaluating water resource impacts resulting from current and projected ground water withdrawals in the central Florida region. Team meetings and coordination are expected through 2013.

### **FUNDING AND ADDITIONAL INFORMATION**

SJRWMD began this effort in FY 2000 and originally anticipated completion within two years. Continuing need for facilitation resulted in additional funding now totaling \$1.53 million through FY 2010. The completion of the 2010 DWSP may require additional work beyond FY 2010 but funding is uncertain and thus is projected only through FY 2010..

Cooperative funds source:	None
Implementing agency:	SJRWMD
Potential water made available:	200 mgd <sup>1</sup>
Current water made available:	0 mgd

SJRWMD DWSP page:	139
WBS reference:	2.2.1
FY 2009-2010budget page:	N/A

Note 1: This project will not directly make more water available. The specified quantity is for projects that are expected to be undertaken as outcomes of this project. Projects which will directly make additional quantities of water available will be included in future updates of the WRDWP. This value range is a composite of average projected deficits, which must be met by other projects, and includes projected deficits for the East Central Florida area, Volusia County, Flagler County, St. Johns County, the East Putnam Water System and Marion County.

### **FUNDING AND EXPENDITURES FOR FACILITATION OF REGIONAL DECISION-MAKING PROCESS**

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							
	Prior Years	2011	2012	2013	2014	2015	Future	Total Cost
<b>Sources</b>								
SJ-Ad Valorem	\$1.471	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$1.471
SJ-FF Const.								
SJ-FF Land Acq.								
SFWMD								
Cooperators								
<b>Total</b>	<b>\$1.471</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$1.471</b>
<b>.</b>								
Internal								
Contract	\$1.471	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$1.471

## FEASIBILITY OF SEAWATER DEMINERALIZATION

### BACKGROUND

Seawater demineralization is considered as a general option available to all water supply utilities. However, because of the lower cost and ready availability of other options, seawater demineralization is considered a longer-term initiative among the utility-specific options identified in the current DWSP. Two specific demineralization (desalination) projects were included in the DWSP approved in 2005.

Based on current projections, it is reasonable to assume that seawater will be developed as a water supply source within SJRWMD in the future. Special case situations, such as co-siting a seawater demineralization plant with an existing or new electric power plant or limited other options, may make this source competitive with the development of other water supply sources. Early identification of potential desalination projects continues to be a regionally significant effort because of the extended timeframes needed to investigate, plan, test, design, permit, and construct desalination facilities.

This project includes the investigation of the technical, environmental, and economic feasibility of seawater demineralization projects. This feasibility investigation consists, at a minimum, of the following tasks:

- Perform investigations to determine available technologies.
- Investigate potential sites, including sites on the Atlantic Ocean and along the Atlantic Intracoastal Waterway system, with special emphasis on opportunities to co-site with an electric power plant.
- Investigate opportunities for demineralization concentrate management and potential impacts of various options related to seawater demineralization projects under consideration.
- Perform site and cost feasibility assessments.

The first element of this project, consisting of a site selection study, was completed in 2004. The first element of work identified five potential sites for future consideration. Two of these sites, both of which are existing once-through cooling power plants, are located on the Indian River Lagoon (IRL) in Brevard County. SJRWMD completed work to further evaluate the feasibility of these two sites in FY 2006. The work completed in FY 2006, known as the “IRL Salinity Study”, included coordination with local governments in Brevard County on development of the scope, objectives, approach, and findings for the feasibility study of these two sites.

### UPDATE

In FY 2008, to address future water demands in the greater Flagler County area — a region known as the Coquina Coast — the SJRWMD partnered with several county and local governments to further investigate and prepare preliminary design documents for a desalination facility in Flagler County. The funding for this effort is identified under the general program costs section of this document and is described here only due to its relevance to seawater demineralization.

### FUNDING AND ADDITIONAL INFORMATION

SJRWMD estimates that similar projects may arise in the future and will estimate the required funding at that time. To date \$0.85 million has been expended. Additional work beyond FY 2012 may be necessary but has not been identified at this time.

Cooperative funds source: Various	SJRWMD DWSP page: 144
Implementing agency: SJRWMD	WBS reference: 2.2.1
Potential water made available <sup>1</sup> : 15-75 mgd <sup>1</sup>	FY 2010-2110 budget page: 131
Current water made available: 0 mgd	

Note 1: These projects will not directly make more water available. Quantities are for projects that are expected to be undertaken as outcomes of these projects. Projects which will directly make the specified quantities of water available will be included in future updates of the WRDWP. The values are based on projects currently identified in the DWSP 2005, first update, Table 15, and include identified seawater projects for potable use.

### FUNDING AND EXPENDITURES FOR FEASIBILITY OF SEAWATER DEMINERALIZATION

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							
	Prior Years	2011	2012	2013	2014	2015	Future	Total Cost
<b>Sources</b>								
SJ-Ad Valorem	\$0.849	\$0.000	\$0.035	\$0.035				\$0.919
SJ-FF Const.								
SJ-FF Land Acq.								
SFWMMD								
Cooperators								
<b>Total</b>	<b>\$0.849</b>	<b>\$0.000</b>	<b>\$0.035</b>	<b>\$0.035</b>				<b>\$0.919</b>
<b>Disbursements</b>								
Internal	\$0.080							\$0.080
Contract	\$0.769	\$0.000	\$0.035	\$0.035				\$0.839

Funding Complete

## HYDROLOGIC DATA COLLECTION AND ANALYSIS

### BACKGROUND

SJRWMD has identified the need for hydrologic data collection and analysis in association with required five-year revisions of WSA and DWSP and for WRDWP implementation. The following data collection and analysis efforts are ongoing and will continue, with alteration as necessary to better support WSA, DWSP and WRDWP development processes.

- SJRWMD’s hydrologic data collection network
- Water use data management
- Hydrology of native plant communities
- Groundwater modeling
  - ◆ Integrated groundwater and surface-water modeling
  - ◆ Integrated decision modeling
- Surface water modeling

### UPDATE

Specific estimates of the amount of water to be made available as a result of this project will not be made by SJRWMD. However, this project will support all existing and proposed future water resource development projects. SJRWMD estimates that this project will continue into the foreseeable future. To date \$40.16 million has been expended.

### FUNDING AND ADDITIONAL INFORMATION

Cooperative funds source:	Various
Implementing agency:	SJRWMD
Potential water made available:	Indeterminate
Current water made available:	Indeterminate

SJRWMD DWSP page:	146
WBS reference:	1.1.1; 1.2
FY 2010-2011 budget pages:	105-110

**FUNDING AND EXPENDITURES FOR HYDROLOGIC DATA COLLECTION AND ANALYSIS**

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							
	Prior Years <sup>1</sup>	2011	2012	2013	2014	2015	Future <sup>2</sup>	Total Cost
<b>Sources</b>								
SJ-Ad Valorem	\$40.295	\$5.078	\$7.000	\$7.000	\$7.000	\$7.000	\$7.000	\$80.373
SJ-FF Const.								
SJ-FF Land Acq.								
SFWMD								
Cooperators	\$0.173	\$0.141	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.314
<b>Total</b>	<b>\$40.468</b>	<b>\$5.219</b>	<b>\$7.000</b>	<b>\$7.000</b>	<b>\$7.000</b>	<b>\$7.000</b>	<b>\$7.000</b>	<b>\$80.687</b>
<b>Disbursements</b>								
Internal	\$17.226	\$2.925	\$3.500	\$3.500	\$3.500	\$3.500	\$3.500	\$37.651
Contract	\$23.242	\$2.294	\$3.500	\$3.500	\$3.500	\$3.500	\$3.500	\$43.036

Notes:

1. In previous years, only portions of the Hydrologic Data Collection and Analysis program were considered WRDWP-related. Beginning in FY 2007, the entire Hydrologic Data Collection Program plus the Groundwater Programs-Water Resources Assessment – consultant services, the MFL Hydrologic Modeling Services and the Water Use Data Management Program will be reported as supporting WRDWP, resulting in a significant increase in the annual amounts.
2. This is forecast as an ongoing program with continued funding at a similar level in future years.

## **INVESTIGATION OF THE AUGMENTATION OF PUBLIC SUPPLY SYSTEM WITH LOCAL SURFACE WATER /STORMWATER SOURCES**

### **BACKGROUND**

Much effort is being focused on developing alternative water supplies from surface water bodies that have the potential to produce relatively large quantities of water. The St. Johns River is such a source. These surface water sources are often remote from the service areas where the water will be used; thus, considerable transport costs may be incurred.

Smaller quantities of surface water supplies may be available within a public supply service area. The sources of these supplies may include storm water, dewatering/drainage canals, naturally occurring or manmade water bodies, etc. Although these sources of supply may be relatively small, with adequate storage and treatment they could provide important supplemental water supplies to public supply systems.

Through this water resource development project, SJRWMD and cooperating public supply utilities will investigate the feasibility of developing local surface water sources. This investigation will address technical, environmental, and economic feasibility considerations. At the time of preparation of DWSP 2005, SJRWMD had identified only one project for inclusion in this investigation, the Bracco Reservoir Project. SJRWMD anticipates the identification of additional, similar projects for investigation in future years.

#### Bracco Reservoir Project

Bracco Reservoir is located in the public supply service area of the City of Cocoa. The reservoir consists of a series of storm water detention ponds, used as a source of water to augment the City of Cocoa's reclaimed water system. The City of Cocoa proposes to study, and then to construct and operate (if feasible), a small (2–4 mgd) treatment facility. This facility would incorporate multiple barriers and modern treatment technologies to produce potable water from localized sources of runoff. Treatment options may include bank filtration, primary disinfection using ozone or UV radiation, membrane or conventional filtration and secondary disinfection.

This project would address the extent to which localized treatment could add another alternative source of supply to supplement the primary sources of public supply when excess runoff is available. The information generated by the project should be applicable districtwide.

The first phase of this project includes a bench-top study to characterize water quality and expected contaminants from Cocoa's Bracco Reservoir system and a review of applicable regulatory requirements. The cost of this phase is estimated at \$40,000 and should require six months to perform.

The second phase would include additional water quality sampling, and a treatability study and economic feasibility analysis. The cost of this phase is estimated at \$400,000 and should require one year to perform.

The third and final phase would include the design, permitting, construction and operation of a demonstration treatment facility. The cost of this phase is estimated at \$5,000,000 and should require

two and one half years to design, permit and construct, with another three to five years to operate and monitor.

### UPDATE

The first phase was completed in FY 2006 by the City of Cocoa and the concept appears feasible. Cocoa originally planned to proceed with the full treatability study in FY 2009. Cocoa continues to consider this as a viable option. However, the second phase work will commence later than originally planned. SJRWMD has no funding dedicated for this effort; thus previously planned funding for construction will be pursued by the City of Cocoa under other programs.

### FUNDING AND ADDITIONAL INFORMATION

Cooperative funds source: Various	SJRWMD DWSP page: 152
Implementing agency: SJRWMD	WBS reference: 2.2.1
Potential water made available: 2-4 mgd	FY 2009-2010 budget page: N/A
Current water made available: 0 mgd	

### FUNDING AND EXPENDITURES FOR INVESTIGATION OF THE AUGMENTATION OF PUBLIC SUPPLY SYSTEMS WITH LOCAL SURFACE WATER / STORMWATER SOURCES

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							
	Prior Years	2011	2012	2013	2014	2015	Future	Total Cost
<b>Sources</b>								
SJ-Ad Valorem	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
SJ-FF Const.								
SJ-FF Land Acq.								
SFWMD								
Cooperators	\$0.040	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.040
<b>Total</b>	<b>\$0.040</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.040</b>
<b>Disbursements</b>								
Internal								
Contract	\$0.040	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.040

## LAKE APOPKA BASIN WATER RESOURCE DEVELOPMENT PROJECT

### BACKGROUND

This is a new water resource development project included in DWSP 2005. SJRWMD has been working on the restoration of Lake Apopka since 1985. More recently, SJRWMD has identified the need for additional water supplies in the vicinity of the lake. The City of Apopka has identified Lake Apopka as a potential source to provide additional water to its reclaimed water service area. Apopka has identified an immediate need for approximately 2 mgd average annual daily flow (AADF) to augment the city's reclaimed water system. Apopka estimated that it will need an additional supply of approximately 8 mgd AADF for its reclaimed water system by the year 2010 and an additional 16 mgd by 2020. In May 2006, a District cost-share funded study was completed by the City of Apopka. It identified the most cost-effective pretreatment method for using Lake Apopka water for augmenting their reclaimed water. The cities of Clermont and Minneola have also expressed an interest in developing a reclaimed water augmentation supply from Lake Apopka. The cities of Apopka and Minneola have submitted separate consumptive use permit applications for the use of Lake Apopka water.

District staff has begun evaluating the potential for developing water supplies from Lake Apopka while still achieving lake restoration goals. The Lake Apopka Basin Water Resource Development Project will evaluate the potential water supply yield from the lake. It is anticipated that project work components will include:

- Hydrologic modeling
- Evaluation of alternative lake regulation schedules
- Evaluation of storage augmentation options
- Evaluation of potential impacts of management options
- Identification of potential water users including the timing and locations of withdrawals

Should a suitable project be identified as a result of the evaluation phase, a project implementation phase will likely be recommended.

### UPDATE

Planning for the North Shore Restoration and determination of water supply potential for Lake Apopka is incomplete. As future projects are identified, their funding will be contingent on availability of funds in current or future budgets.

### FUNDING AND ADDITIONAL INFORMATION

Cooperative funds source:	Various
Implementing agency:	SJRWMD
Potential water made available:	5-10 mgd
Current water made available:	0 mgd

SJRWMD DWSP page:	153
WBS reference:	2.2.1
FY 2010-2011 budget page:	N/A

**FUNDING AND EXPENDITURES FOR LAKE APOPKA BASIN WATER RESOURCE DEVELOPMENT PROJECT**

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							
	Prior Years	2011	2012	2013	2014	2015	Future	Total Cost
<b>Sources</b>								
SJ-Ad Valorem								
SJ-FF Const.								
SJ-FF Land Acq.								
SFWMD								
Cooperators								
<b>Total</b>								
<b>Disbursements</b>								
Internal								
Contract								

Note: No funds have been designated in budget. If and when the project moves forward, a future budget request or budget amendment will be requested.

## LOWER LAKE LOUISE WATER CONTROL STRUCTURE PROJECT

### BACKGROUND

SJRWMD and Volusia County worked cooperatively on a project near Baker Pond, in Seville, Florida. The project entitled “Lower Lake Louise Water Control Structure Project” was undertaken as an element of the recovery strategy for Lower Lake Louise, which is not meeting its established Minimum Flow and Levels. Specifically, the “Minimum Average Level” is not being met primarily due to a pre-existing outlet canal. SJRWMD worked cooperatively with the Volusia County Council to design and construct an operable weir that will slightly raise the water level of the lake so that the “Minimum Average Level” will be met.

### UPDATE

In FY 2008 the weir was constructed by Volusia County with oversight by Quentin L Hampton and Associates, Inc. The project will be monitored by the SJRWMD with operation and maintenance conducted by the county.

**Florida Forever Discussion:** SJRWMD proposes the use of FF funds cooperatively to purchase larger tracts of land and perform the construction necessary to complete regionally significant recharge enhancement projects as identified through Phase II of this project. This use of FF funds is consistent with the following subparagraphs of the *Florida Statutes*:

259.03(6)—It increases the amount of water available to meet the needs of natural systems and the citizens of the state by enhancing or restoring aquifer recharge, facilitating the capture and storage of excess flows in surface waters, and promoting reuse.

259.105(3)—The budget for this project falls within the prescribed percentage distribution limits of this subparagraph.

259.105(4)(d)—This project is one component of a regional water supply plan that will help ensure that sufficient quantities of water are available to meet the current and future needs of natural systems and the citizens of the state, as measured by:

The quantity of water made available through the water resource development component of a district water supply plan for which a water management district is responsible; and possibly

The number of acres acquired of groundwater recharge areas critical to springs, sinks, aquifers, other natural systems, or water supply.

259.105(6)—No significant harm is predicted as a result of the project; the project will comply with all applicable permitting requirements; and the project is consistent with the District’s regional water supply plan.

**FUNDING AND ADDITIONAL INFORMATION**

This project was completed in FY 2008 with no future expenditures planned.

Cooperative funds source:	Volusia County
Implementing agency:	SJRWMD
Potential water made available:	0.18 mgd <sup>1</sup>
Current water made available:	0.18 mgd <sup>1</sup>

SJRWMD DWSP page:	154
WBS reference:	2.2.1
FY 2010-2011 budget page:	N/A

Note 1: This number represents the current CUP allocation for permits under review for Lower Lake Louise withdrawals.

**FUNDING AND EXPENDITURES FOR LOWER LAKE LOUISE WATER CONTROL STRUCTURE PROJECT**

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							
	Prior Years	2011	2012	2013	2014	2015	Future	Total Cost
<b>Sources</b>								
SJ-Ad Valorem								
SJ-FF Const.	\$0.042							\$0.042
SJ-FF Land Acq.								
SFWMD								
Cooperators								
<b>Total</b>	<b>\$0.042</b>							<b>\$0.042</b>
<b>Disbursements</b>								
Internal								
Contract	\$0.042							\$0.042

## TREATABILITY OF ALGAL TOXINS USING OXIDATION AND ADSORPTION

### BACKGROUND

Algal blooms produced by cyanobacteria (blue-green algae) and the subsequent release of algal toxins is an emerging water supply issue. Previous studies have indicated the presence of both cyanobacteria and algal toxins in Florida surface waters. A study to determine the treatability of the St. Johns River was conducted from 2001 through 2004 but did not include testing for the treatability of algal toxins. This \$665k study is a tailored collaboration among the District, the American Water Works Association Research Foundation (AWWARF), the Cities of Cocoa and Melbourne and CH2M Hill. This study has two parts:

- Raw water cyanobacteria and algal toxin occurrence
- Treatment of the algal toxins

The raw water testing included enumeration and characterization of the blue-green algae during algal bloom events as well as characterization of the algal toxin produced during the bloom. The treatment portion of the study evaluated removal of algal toxins through membranes, oxidation with ozone, and adsorption to granular activated carbon (GAC). The toxin treatment studies were conducted on a bench-scale level. The study identified which of the 3 advanced technologies works best for algal toxin treatment as well as reported the typical design parameters necessary to achieve the desired level of toxin removal.

### UPDATE

The project was completed in mid-FY 2009, at a total cost of \$665,000, of which SJRWMD contributed \$300,000. The final report was published in FY 2010 and is available from the Water Research Foundation (formerly the American Water Works Research Foundation)\* at the following link: <http://www.waterresearchfoundation.org/research/TopicsAndProjects/projectSnapshot.aspx?pn=2839>

The report title is “Treating Algal Toxins Using Oxidation, Adsorption, and Membrane Technologies #2839”, ISBN978-1-60573-082-0.

\*Printed Foundation reports are available to Water Research Foundation subscribers only. PDF versions of the reports are also available to subscribers and some designated groups, such as health regulators.

### FUNDING AND ADDITIONAL INFORMATION

Cooperative funds source:	
Implementing agency:	SJRWMD
Potential water made available:	22-173 mgd <sup>1</sup>
Current water made available:	0 mgd <sup>2</sup>

SJRWMD DWSP page:	154
WBS reference:	2.2.1
FY 2010-2011 budget page:	N/A

Notes:

1. These projects will not directly make more water available. Quantities are for projects that are expected to be undertaken as outcomes of these projects. Projects which will directly make the specified quantities of water available will be included in future updates of the WRDWP. This range is based on projects currently identified in the DWSP 2005, first update, Table 15, and includes surface water projects for potable use.
2. Currently there are approximately 16 mgd of St. Johns River withdrawals authorized under the CUP process. This completed work will provide data for those seeking permits to withdraw and treat additional water from the St. Johns River.

### FUNDING AND EXPENDITURES FOR TREATABILITY OF ALGAL TOXINS USING OXIDATION AND ADSORPTION

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							Total Cost
	Prior Years	2011	2012	2013	2014	2015	Future	
<b>Sources</b>								
SJ-Ad Valorem	\$0.300							\$0.300
SJ-FF Const.								
SJ-FF Land Acq.								
SFWMD								
Cooperators	\$0.365							\$0.365
<b>Total</b>	<b>\$0.665</b>							<b>\$0.665</b>
<b>Disbursements</b>								
Internal								
Contract	\$0.665							\$0.665

## UPPER ST. JOHNS RIVER BASIN PROJECT

### BACKGROUND

The Upper St. Johns River Basin extends from the headwaters of the St. Johns River in Indian River and Okeechobee counties to the confluence of the St. Johns and Econlockhatchee rivers in Seminole County. The basin originally contained more than 400,000 acres of floodplain marsh. The Upper St. Johns River Basin Project began in the 1950s as a flood control project. By the early 1970s, 62 percent of the original floodplain marsh area had been drained for agricultural and flood control purposes. Canals had been constructed to divert floodwaters from the basin to the Indian River Lagoon. Impacts included a loss of water storage areas, diminished water quality, excessive freshwater going into the Indian River Lagoon, and significant decreases in fish and wildlife populations. The marsh that remained was further degraded by hydrologic alterations and nutrients in agricultural runoff.

Concerns about environmental degradation led to a comprehensive review of the project beginning in the early 1970s. Environmental restoration goals were added to the project in the 1980s. The upper basin project is now a semi-structural system of water management areas, marsh conservation areas, and marsh restoration areas covering 166,500 acres in Indian River and Brevard counties. The system is designed to reduce damage from floods, improve water quality, reduce freshwater discharges to the Indian River Lagoon, provide additional water supplies, and restore or enhance wetland habitat.

SJRWMD has expanded the Upper St. Johns River Basin Project into a multi-objective water resource development project. SJRWMD anticipates that it will need to complete a number of tasks in conjunction with this effort. The scope of the effort has not been fully developed, but it is anticipated that the work will include:

- Evaluation of the yield of the St. Johns River under current management practices
- Identification of alternative management strategies, including operating schedules and storage options
- Optimization of alternative management strategies
- Coordination with federal, state, and local government agencies
- Environmental analyses and permitting
- Addition of storage, structural improvements, and operating capacity

Current work for the Upper Basin is budgeted as part of restoration efforts for Upper St. Johns River Basin as well as the Indian River Lagoon Basin. Additional funding needs for water resource development in the Upper Basin are anticipated as details of the SJR/TCR Water Supply Project are developed.

### UPDATE

Future activities may involve a modest amount of funding as other strategies are developed. As future projects and funding are identified, they will be added to the water resource development work program document.

**Florida Forever Discussion:** This use of FF funds is consistent with the following subparagraphs of the *Florida Statutes*:

259.03(6)—It increases the amount of water available to meet the needs of natural systems and the citizens of the state by enhancing or restoring aquifer recharge, facilitating the capture and storage of excess flows in surface waters, and promoting reuse.

259.105(3)—The budget for this project falls within the prescribed percentage distribution limits of this subparagraph.

259.105(4)(d)—This project is one component of a regional water supply plan that will help ensure that sufficient quantities of water are available to meet the current and future needs of natural systems and the citizens of the state, as measured by:

The quantity of water made available through the water resource development component of a district water supply plan for which a water management district is responsible; and possibly

The number of acres acquired of groundwater recharge areas critical to springs, sinks, aquifers, other natural systems, or water supply.

259.105(6)—No significant harm is predicted as a result of the project; the project will comply with all applicable permitting requirements; and the project is consistent with the District’s regional water supply plan.

### FUNDING AND ADDITIONAL INFORMATION

Cooperative funds source: None	SJRWMD DWSP page: 155
Implementing agency: SJRWMD	WBS reference: 2.2.1
Potential water made available: 25 MGD <sup>1</sup>	FY 2010-2011 budget page: N/A
Current water made available: None	

Note 1: This value was taken from DWSP 2005, but more recent estimates indicate that the yield may be lower.

### FUNDING AND EXPENDITURES FOR UPPER ST. JOHNS RIVER BASIN PROJECT

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							
	Prior Years	2011	2012	2013	2014	2015	Future	Total Cost
<b>Sources</b>								
SJ-Ad Valorem	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000
SJ-FF Const.								
SJ-FF Land Acq.	\$67.610	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$67.610
SFWMD								
Cooperators	\$14.933	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$14.933
<b>Total</b>	<b>\$82.543</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$0.000</b>	<b>\$82.543</b>
<b>Disbursements</b>								
Internal								
Contract	\$82.543	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$82.543

Note: Expenditures include identifiable Florida Forever and cooperative funding utilized to purchase land for water resource development purposes. However, internal programmatic expenses and land exchanges are not included. Funding for future projects is contingent on identification and acquisition of suitable land and will be identified as land purchases occur.

## WETLAND AUGMENTATION DEMONSTRATION

### BACKGROUND

Augmentation of water to wetlands is one approach to avoiding wetland impacts resulting from lowering of water levels in the underlying surficial aquifer. However, the effectiveness of this approach has not been adequately demonstrated because operational experience with wetland augmentation projects is limited. The purpose of the wetland augmentation demonstration project is to obtain key information necessary to evaluate the effectiveness of this approach as an alternative water supply development strategy. The key information needed is being obtained by monitoring hydration results at four project sites. The project plan includes the following:

- Conduct baseline hydrological and ecological monitoring (including amphibian monitoring) for one year and performing hydrological monitoring continuously through the operational term of the project
- Install systems (pumping systems or weirs) to augment water supply to project wetlands.
- Continue augmentation by pumping or operation of a weir for a target period of five years
- After the start of augmentation, recommence ecological and amphibian monitoring and continue this monitoring, with annual progress reports, through end of project
- After augmentation has been completed, produce a final report summarizing the work and evaluating the effectiveness of the approach

There are four demonstration projects under way as cooperative efforts between SJRWMD and water supply utilities:

<b><u>PROJECT</u></b>	<b><u>STUDY STATUS</u></b>
Tillman Ridge wellfield, St. Johns County	Complete
Bennett Swamp, Volusia County	Complete
Port Orange wellfield, City of Port Orange	Complete
Parkland Wetland wellfield, City of Titusville	Complete

All projects were conducted through cooperative agreements between SJRWMD and the participating cooperators.

### UPDATE

Augmentation monitoring is complete for all four projects. The entire project, including the final summary report for all four sites, was completed in September 2008. The project demonstrated the potential benefits of both active and passive augmentation of wetlands, including significant potential cost saving compared to the mitigation bank option.

### FUNDING AND ADDITIONAL INFORMATION

Data collection for this study was complete with the final report published in FY 2009 at a total cost of \$2.10 million. The specific quantity of additional groundwater that may be made available for withdrawal and use as a result of this demonstration project will be a function of wetland location relative to proposed groundwater withdrawals and must be determined on a case-by-case basis as this proposed mitigation strategy is considered. Following final review and publication, results will be available at the SJRWMD website

Cooperative funds source: Volusia Cty.	SJRWMD DWSP page: 157
Implementing Agency: SJRWMD	WBS reference: 2.2.1
Potential water made available: Indeterminate	FY 2010-2011 budget page: N/A
Current water made available: Indeterminate	

### FUNDING AND EXPENDITURES FOR WETLAND AUGMENTATION DEMONSTRATION

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							Total Cost
	Prior Years	2011	2012	2013	2014	2015	Future	
<b>Sources</b>								
SJ-Ad Valorem	\$2.096							\$2.096
SJ-FF Const.								
SJ-FF Land Acq.								
SFWMD								
Cooperators								
<b>Total</b>	<b>\$2.096</b>							<b>\$2.096</b>
<b>Disbursements</b>								
Internal								
Contract	\$2.096							\$2.096

## WATER RESOURCE DEVELOPMENT COMPONENTS OF WATER SUPPLY DEVELOPMENT PROJECTS

### BACKGROUND

This water resource development effort is a new addition to the workplan. SJRWMD recognizes that many of the water supply development projects identified in DWSP 2005 will include components that may be eligible for funding pursuant to the Florida Forever Act. Section 259.03(6), F.S., defines projects that are eligible for funding under the Act:

*“Water resource development project” means a project eligible for funding pursuant to s. 259.105 that increases the amount of water available to meet the needs of natural systems and the citizens of the state by enhancing or restoring aquifer recharge, facilitating the capture and storage of excess flows in surface waters, or promoting reuse. The implementation of eligible projects under s. 259.105 includes land acquisition, land and water body restoration, aquifer storage and recovery facilities, surface water reservoirs, and other capital improvements. The term does not include construction of treatment, transmission, or distribution facilities.*

Based on the statutory definition, SJRWMD has identified five categories of water resource development components that appear to be eligible for funding under the Florida Forever Act. These categories are:

- Surface water intake facilities to capture excess surface water flows
- Storage reservoirs to store excess surface water flows
- Aquifer storage and recovery facilities
- Groundwater recharge facilities
- Land acquisitions associated with these water resource development facilities

SJRWMD anticipates that a number of the water supply development projects included in this DWSP will include one or more of these water resource development components. A summary of the potential water resource development components associated with each of the water supply development projects is provided in Table 20 of the 2005 District Water Supply Plan.

### UPDATE

Cooperators were solicited and two projects were selected for cooperative funding in FY 2008. The City of Palm Coast storage basin was completed in early fall 2008 and the City of Rockledge- ASR project has completed drilling of ASR-1 and associated monitoring wells and reached substantial completion of their project in mid-2009 and is awaiting final FDEP permits.

**Florida Forever Discussion:** This use of FF funds is consistent with the following subparagraphs of the *Florida Statutes*:

259.03(6)—It increases the amount of water available to meet the needs of natural systems and the citizens of the state by enhancing or restoring aquifer recharge, facilitating the capture and storage of excess flows in surface waters, and promoting reuse.

259.105(3)—The budget for this project falls within the prescribed percentage distribution limits of this subparagraph.

259.105(4)(d)—This project is one component of a regional water supply plan that will help ensure that sufficient quantities of water are available to meet the current and future needs of natural systems and the citizens of the state, as measured by:

The quantity of water made available through the water resource development component of a district water supply plan for which a water management district is responsible; and possibly

The number of acres acquired of groundwater recharge areas critical to springs, sinks, aquifers, other natural systems, or water supply.

259.105(6)—No significant harm is predicted as a result of the project; the project will comply with all applicable permitting requirements; and the project is consistent with the District’s regional water supply plan.

### FUNDING AND ADDITIONAL INFORMATION

Implementation began in FY 2007. Specifically identified projects account for the total projected cost of \$2.950 million over the planning period for construction of feasible projects. Currently due to limited funding from Florida Forever Program and increased use of Water Protection and Sustainability Program (WPS) funds there is reduced inquiries for use of this project. Future projects will be considered as funding becomes available.

Cooperative funds source:	Various
Implementing agency:	SJRWMD
Potential water made available:	Indeterminate
Current water made available:	Indeterminate

SJRWMD DWSP page:	158
WBS reference:	2.2.1
FY 2010-2011 budget page:	N/A

### FUNDING AND EXPENDITURES FOR WATER RESOURCE DEVELOPMENT COMPONENTS OF WATER SUPPLY DEVELOPMENT PROJECTS

Fund Sources and Disbursements	Prior Years	Funds Needed/Expended -- \$ Million						Total Cost
		2011	2012	2013	2014	2015	Future <sup>1</sup>	
<b>Sources</b>								
SJ-Ad Valorem								
SJ-FF Const.	\$1.158							\$1.158
SJ-FF Land Acq.								
SFWMD								
Cooperators	\$1.792							\$1.792
<b>Total</b>	<b>\$2.950</b>							<b>\$2.950</b>
<b>Disbursements</b>								
Internal								
Contract	\$2.950							\$2.950

## GENERAL PROGRAM COSTS

### BACKGROUND

Formerly called project support services, this item encompasses those activities required to implement the WRDWP. Specifically, project management, engineering services and peer review are not identified in the 2005 DWSP but are critical for successfully accomplishing all identified projects. This element has existed since the inception of WRDWP and will continue to be needed in future years. The work effort covered in this element comprises:

- Staff project managers
- Staff subject area experts
- Contract project managers
- Contract subject area experts
- Contracts to develop Preliminary Design Reports

### UPDATE

Currently there are multiple countywide efforts involving numerous local governments to develop Preliminary Design Reports for developing the St. Johns River and the Atlantic Ocean as a water supply source. Project management services continue to be critical components of the effort to implement many of the projects previously described in the WRDWP document.

In addition to the categories eligible for Florida Forever funding, listed above, other opportunities exist for cooperative funding. Federal STAG (State and Tribal Assistance Grants) program funds are being used to accomplish preliminary design and federally-required environmental studies associated with the St Johns River Taylor Creek Reservoir (TCR) Water Supply Project. These funds are captured in the table below under cooperative funding.

As noted previously and restated below there are three separate projects involving TCR.

- ◆ The TCR Improvement Project, undertaken by SJRWMD is designed to change the current operating schedule, with improvements that will allow an increase of 3 ft in the year round operating pool level. Raising the pool level creates a potential water supply yield from the reservoir of about 30 mgd using the existing watershed. The design is currently underway.
- ◆ The Enhanced TCR Project capitalizes on the increased potential yield afforded by the TCR Improvement Project. The City of Cocoa is spearheading the effort and several utility partners are currently in talks to develop and use the additional yield from the watershed—the City of Titusville, Orange County Utilities, Orlando Utilities Commission, Tohopekaliga (Toho) Water Authority and East Central Florida Services Inc. (ECFS). The plan is to treat the water to potable standards and transport it to partners' existing systems. Expected capacity will likely be in the 12-24 mgd range of additional supply and treatment capacity. While timing is still undecided, customer demands, economic conditions, permit and agreement conditions and planned changes to the Central Florida Coordinating Area Rule all will affect the schedule.

- ♦ The SJR/TCR Water Supply Project was begun in 2003 by these same six partners, together with the SJRWMD and financial assistance from the South Florida Water Management District, to develop the St. Johns River for potable water production using the TCR for storage. Because of the TCR Improvement Project and in addition to the Enhanced Taylor Creek Reservoir Project, the opportunity exists to capitalize further on the available storage space in the TCR by holding water at a higher level and diverting water from the St. Johns River into the reservoir. This project together with other measures could potentially increase the volume of water available for water supply to approximately 54 mgd.

The project included the preliminary design, and federally mandated environmental assessments necessary to proceed with final facility construction design, transmission systems and permitting. A preliminary design report and environmental information document were completed. At this point, the individual participants are evaluating their options to determine when and if this project meets their future water supply demands.

### FUNDING AND ADDITIONAL INFORMATION

SJRWMD's project management costs are typically less than 3 percent of project value. It is expected that project management, engineering services and peer review efforts will be necessary beyond FY 2011.

Cooperative funds source: N/A	SJRWMD DWSP page: N/A
Implementing agency: SJRWMD	WBS reference: 2.2.1
Potential water made available: N/A	FY 2010-2011 budget pages: 134
Current water made available: N/A	

### FUNDING AND EXPENDITURES FOR PROJECT SUPPORT SERVICES

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							
	Prior Years	2011	2012	2013	2014	2015	Future	Total Cost
<b>Sources</b>								
SJ-Ad Valorem	\$10.239	\$1.970	\$1.000	\$1.000	\$1.000	\$1.000	\$1.000	\$17.209
SJ-FF Const.								
SJ-FF Land Acq.								
SFWMD								
Cooperators	\$1.890	\$0.145	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$2.035
<b>Total</b>	<b>\$12.129</b>	<b>\$2.115</b>	<b>\$1.000</b>	<b>\$1.000</b>	<b>\$1.000</b>	<b>\$1.000</b>	<b>\$1.000</b>	<b>\$19.244</b>
<b>Disbursements</b>								
Internal	\$2.986	\$0.212	\$0.200	\$0.200	\$0.200	\$0.200	\$0.200	\$4.198
Contract	\$9.143	\$1.903	\$0.800	\$0.800	\$0.800	\$0.800	\$0.800	\$15.046

Notes:

1. Previous years budgets were calculated as a portion of other programs not dedicated entirely to WRDWP. Beginning in FY 2008, the specific budget item General Program Costs will be used to identify the services used to support the program.
2. Beginning in FY 2009, the St. Johns River Taylor Creek Reservoir Water Supply Project (Federal Funding) will be accounted for under this project. In previous years it was accounted for under WRD Components line item, however since the preliminary design reports (PDRs) are budgeted and managed under this project and the Federal Funding directly supports the PDR effort, accounting for this item under this location is more appropriate.

## **B. ALTERNATIVE WATER SUPPLY ANNUAL REPORT**

### **INTRODUCTION**

In response to the requirements of Subsection 373.1961(2), F.S., the St. Johns River Water Management District (SJRWMD or District) initiated in 1996 the Alternative Water Supply Construction Cost Sharing Program to fund the construction of alternative water supply facilities. Alternative water supplies are defined by statute as “water that has been reclaimed after one or more public supply, municipal, industrial, commercial, or agricultural uses or are suppliers of stormwater, brackish, or salt water, that have been treated in accordance with applicable rules and standards sufficient to supply the intended use.” The statutes further require that cost sharing funds be available to all water suppliers and users, including local governments; water, wastewater and reuse utilities; industrial and agricultural water users; and other public and private users.

In past years, the District was required by paragraph 373.1961(2)(k), F.S., to submit an annual report to the Governor, the President of the Senate, and the Speaker of the House of Representatives for the disbursement of all budgeted amounts for the construction of Alternative Water Supply (AWS) facilities. Legislation passed in 2005 (subparagraph 373.036(7)(b)2., F.S.), requires the annual report be presented as a separate chapter in the Consolidated Annual Report.

### **WP&SP ANNUAL REPORT**

The Water Protection and Sustainability Trust Funds (WP&STF) created under Section 403.890, F.S. provides the District with funds up to \$25.0 million in the first year (FY 2005-2006), \$15 million in FY 2006-2007, \$13 million in 2007-2008 for alternative water supply development projects. In order to meet a 50 percent matching requirement under Subsection 373.196(6)(b), F.S., the District has established a new Water Protection and Sustainability Program (WP&SP) and developed a 5-year funding plan to utilize and match these funds as a process for the selection of eligible Alternative Water Supply (AWS) projects. As required by Section 373.1961(3)(n), this annual report describes all AWS funded as well as the quantity of new water to be created as a result of these AWS projects. In addition, this report accounts for funding provided by SJRWMD and WP&STF.

### **STRATEGY FOR IMPLEMENTING THE WP&SP**

The District provides qualified AWS projects with cost share funding on a fiscal year basis. The cost-share ranges from 20 percent to 40 percent of the AWS project construction cost, with one half from WP&STF and the other half from the District’s ad valorem revenues. Projects that span more than one fiscal year are considered for continuing funding if appropriate progress has been made in the prior year. This method provides project sponsors an incentive to manage their projects efficiently and within projected timelines to completion.

WP&SP projects are prioritized based upon their contribution to meeting future water needs. First priority projects are regionally significant multijurisdictional projects that provide significant quantities of new sources of water to address projected demands, such as the St. Johns River/Taylor Creek Reservoir Water Supply Project. The District plans to provide a 40 percent match in construction funds for these projects. The District has implemented several county-level water supply planning

efforts that are expected to result in identification of additional regional multi-jurisdictional projects within the next year.

Second priority projects are smaller projects that are ready to construct, that help sustain current supplies, and that extend the time until larger projects come online. These projects receive 30 percent cost share for reuse augmentation or 20 percent cost share for reclaimed water.

Project sponsors bear the bulk of the construction costs to build these projects and are expected to contribute a minimum of 60 percent of the construction costs. These may be a combination of sponsor funds and Federal funds, but must exclude other State of Florida funds. In a few cases, project sponsors have not been able to follow through on initiating their projects because of a lack of funds. The State and District funding assistance helps ensure that sponsored projects are completed as planned and encourages the sponsor to fully commit to the project.

The District used the twelve evaluation factors provided in the *Florida Statutes* plus additional factors approved by the District’s Governing Board, including construction start date, construction duration, county level planning endorsement, and type of project. The construction start date and duration are used to plan and program the project funds into the appropriate fiscal year. In areas where the District is sponsoring county-level water supply planning efforts, endorsement of projects by the planning partners is considered. Finally, projects that involve new sources of water for potable uses, such as surface water projects and brackish groundwater projects, are given consideration for higher cost share percentages (up to 40 percent) than reclaimed water projects (generally 20 percent).

### APPROVED PROJECTS AND FUNDING

The District’s Governing Board has approved 59 AWS projects for funding, with a total projected cost share of \$113.8 million, of which \$96.3 million was authorized and awarded. As indicated in Table 4-3, these projects represent \$1.218 billion in total construction costs. The amount of cost-shares is a combination of WP&STF and District ad valorem funds and will result in approximately 196 mgd total yield when the approved projects are complete. As of December 31, 2010, the District has paid out a total of \$53.8 million to local governments and water utilities on 38 AWS projects. The total amount of water production capacity created by these projects was 64.3 MGD. Tables 4-3 through 4-7 on the following pages provide more detailed information on the approved projects by fiscal years.

Table 4-3. Summary of AWS projects funded by WP&STF and the District by fiscal year

Year	Total Cost	WP&STF	SJRWMD Match	Water Created (mgd)		Amount Awarded	Amount Distributed
				Created	To be Created		
FY 2005-2006	\$176,528,000	\$22,730,083	\$22,730,083	55.38	21.50	\$45,460,166	\$44,336,153
FY 2006-2007	\$194,630,000	\$17,275,330	\$17,275,330	8.68	43.50	\$34,550,660	\$9,317,546
FY 2007-2008	\$846,840,000	\$12,994,587	\$3,278,384	0.25	66.55	\$16,272,971	\$175,676
FY 2008-2009	\$0	\$0	\$0	-	-	\$0	\$0
<b>Total</b>	<b>\$1,217,998,000</b>	<b>\$53,000,000</b>	<b>\$43,283,797</b>	<b>64.31</b>	<b>131.55</b>	<b>\$96,283,797</b>	<b>\$53,829,375</b>

Table 4-4. FY 2005-2006 approved AWS projects list

#	Project Name	Project Type	Total Cost	WP&STF Amount	SJRWMD Match	Project Sponsor Match	Total Amount Awarded	Total Amount Disbursed	Project Status	Water Created (mgd)
1	District Brackish Groundwater Project	Brackish Groundwater	\$ 7,000,000	\$ 1,342,853	\$ 1,342,853	\$ 4,314,294	\$ 2,685,706	\$ 2,685,706	Completed	0.65
2	East Putnam Regional Water System Project	Brackish Groundwater	15,700,000	3,140,000	3,140,000	9,420,000	6,280,000	6,280,000	Completed	0.63
4	Ormond Beach Water Treatment Plant Expansion	Brackish Groundwater	14,618,000	2,923,600	2,923,600	8,770,800	5,847,200	5,847,200	Completed	4.00
5	St. Augustine Water Supply Project	Brackish Groundwater	11,800,000	2,325,927	2,325,927	7,148,146	4,651,854	4,651,854	Completed	6.00
6	St. Johns County Water Supply Project	Brackish Groundwater	16,350,000	3,270,000	3,270,000	9,810,000	6,540,000	6,540,000	Completed	8.00
16	Storage and High Service Pump Project	Reclaimed Water	1,400,000	140,000	140,000	1,120,000	280,000	280,000	Completed	0.41
16a	Alafaya Utilities Reclaimed Water Line Installation	Reclaimed Water	700,000	52,638	52,638	594,724	105,276	105,276	Completed	-
19	Course Reclaimed Water System Expansion Project	Reclaimed Water	1,460,000	125,176	125,176	1,209,648	250,352	250,352	Completed	1.00
20	Reclaimed Water and Stormwater Reuse Project, Phase II	Reclaimed Water	-	-	-	-	-	-	Cancelled	
23	Daytona Beach Reclaimed Water System Project	Reclaimed Water	750,000	24,454	24,454	701,092	48,908	48,908	Completed	0.20
24	Surface Water Augmentation Project	Reclaimed Water	-	-	-	-	-	-	Cancelled	
25	Eastern Orange and Seminole Counties Regional Reuse Project	Reclaimed Water	32,990,000	3,290,000	3,290,000	26,410,000	6,580,000	6,270,788	Underway	
27	Expansion and Augmentation Project	Reclaimed Water	400,000	40,000	40,000	320,000	80,000	80,000	Completed	1.10
28	Flagler County Bulow Reclaimed Water System Project	Reclaimed Water	-	-	-	-	-	-	Cancelled	
30	Lady Lake Reclaimed Water System Project, Phase II	Reclaimed Water	2,000,000	200,000	200,000	1,600,000	400,000	400,000	Completed	0.50
31	Inc. of Florida) Lake Groves WWTF Reclaimed Water System	Reclaimed Water	4,900,000	490,000	490,000	3,920,000	980,000	980,000	Completed	1.00
32	Leesburg Reclaimed Water Reuse Project	Reclaimed Water	22,370,000	1,331,421	1,331,421	19,707,158	2,662,842	2,662,842	Completed	7.05
33	Melbourne Reclaimed Water System Expansion Project	Reclaimed Water	6,600,000	660,000	660,000	5,280,000	1,320,000	505,199	Underway	

Table 4-4. FY 2005-2006 approved AWS projects list (cont.)

#	Project Name	Project Type	Total Cost	WP&STF Amount	SJRWMD Match	Project Sponsor Match	Total Amount Awarded	Total Amount Disbursed	Project Status	Water Created (mgd)
34	Minneola Reclaimed Water Reuse Project	Reclaimed Water	7,780,000	780,000	780,000	6,220,000	1,560,000	1,560,000	Completed	1.00
36	Water & Surface Water Optimization System Expansion	Reclaimed Water	8,150,000	771,000	771,000	6,608,000	1,542,000	1,542,000	Completed	7.3
37	Ocoee Reuse System Expansion Project	Reclaimed Water	2,550,000	163,060	163,060	2,223,880	326,120	326,120	Completed	0.60
38	Water Interconnect from Conserv to NWWRF	Reclaimed Water	-	-	-	-	-	-	Cancelled	
39	Orange County EWRf Reuse Pumping and Storage Project	Reclaimed Water	3,400,000	340,000	340,000	2,720,000	680,000	680,000	Completed	2.50
39a	Orange County ICP Reuse Transmission System	Reclaimed Water	4,200,000	227,631	227,631	3,744,738	455,262	455,262	Completed	4.00
41	Ormond Beach North Peninsula Reclaimed Water Storage Project	Reclaimed Water	2,900,000	290,000	290,000	2,320,000	580,000	580,000	Completed	0.49
43	Palm Coast Reclaimed Water System Expansion Project	Reclaimed Water	5,110,000	511,000	511,000	4,088,000	1,022,000	1,022,000	Completed	6.09
46	Reservoir and Recharge Basin Project	Reclaimed Water	1,300,000	130,000	130,000	1,040,000	260,000	260,000	Completed	2.70
47	Rockledge Reclaimed Water Storage Project	Reclaimed Water	2,100,000	161,323	161,323	1,777,354	322,646	322,646	Completed	0.16
49	South Daytona Reclaimed Water System Expansion Project	Reclaimed Water	-	-	-	-	-	-	Cancelled	
60	Irrigation Rainwater Collection System Project	Reclaimed Water	-	-	-	-	-	-	Cancelled	
	<b>Total</b>		<b>\$ 176,528,000</b>	<b>\$ 22,730,083</b>	<b>\$ 22,730,083</b>	<b>\$ 131,067,834</b>	<b>\$ 45,460,166</b>	<b>\$ 44,336,153</b>		<b>55.38</b>

Table 4-5. FY 2006-2007 approved AWS projects list

#	Project Name	Project Type	Total Cost	WP&SF Amount	SJRWMD Match	Project Sponsor Match	Total Amount Awarded	Total Amount Disbursed	Project Status	Water Created (mgd)
12	St. Johns River/Taylor Creek Reservoir Water Supply Project	Surface Water	\$ 125,000,000	\$ 8,752,965	\$ 8,752,965	\$ 107,494,070	\$ 17,505,929	\$ -	TBD	
17	Altamonte Springs and Apopka Project RENEW APRICOT	Reclaimed Water	-	-	-	-	-	-	Cancelled	
21	City of Clermont East Side WRF Improvements	Reclaimed Water	3,000,000	300,000	300,000	2,400,000	600,000	600,000	Completed	4
21.a	City of Clermont Reclaimed and Stormwater System Expansion Project	Reclaimed Water	3,400,000	203,618	203,618	2,992,764	407,236	407,236	Completed	0.8
23.a	City of Daytona Beach Reclaimed Water Pipeline	Reclaimed Water	-	-	-	-	-	-	Cancelled	
23.b	City of Daytona Beach Reclaimed Water Reservoir	Reclaimed Water	-	-	-	-	-	-	Cancelled	
24.a	DeLand Brandy Trails Wastewater Treatment Plant (WWTP) Reuse Conversion and System Interconnection Project	Reclaimed Water	-	-	-	-	-	-	Cancelled	
26	Edgewater Reclaimed Water System Interconnection to Southeast Volusia County	Reclaimed Water	-	-	-	-	-	-	Cancelled	
29	Holly Hill and Ormond Beach Reclaimed Water System Expansion Project	Reclaimed Water	400,000	21,249	21,249	357,502	42,498	42,498	Completed	0.60
42	Ormond Beach South Peninsula Reclaimed Water System Improvement Project	Reclaimed Water	-	-	-	-	-	-	Cancelled	
43.a	City of Palm Coast Reclaimed Water ASR Well at WWTF #1	Reclaimed Water	-	-	-	-	-	-	Cancelled	
44	Port Orange Airport Road Reclaimed Water Transmission	Reclaimed Water	-	-	-	-	-	-	Cancelled	
48	Rockledge Reclaimed Water System Expansion – ASR Project	Reclaimed Water	3,360,000	224,886	224,886	2,910,228	449,772	449,772	Completed	0.55
50	Tavares Reclaimed Water System Expansion Project	Reclaimed Water	6,330,000	570,000	570,000	5,190,000	1,140,000	-	Underway	
51	Volusia County Southwest Reclaimed Water System Project	Reclaimed Water	2,000,000	200,000	200,000	1,600,000	400,000	400,000	Completed	0.25

Table 4-5. FY 2006-2007 approved AWS projects list (cont.)

#	Project Name	Project Type	Total Cost	WP&SF Amount	SJRWMD Match	Project Sponsor Match	Total Amount Awarded	Total Amount Disbursed	Project Status	Water Created (mgd)
12	St. Johns River/Taylor Creek Reservoir Water Supply Project	Surface Water	\$ 125,000,000	\$ 8,752,965	\$ 8,752,965	\$ 107,494,070	\$ 17,505,929	\$ -	TBD	
52	West Melbourne Above Ground Reclaimed Water Storage Tank Project	Reclaimed Water	3,000,000	300,000	300,000	2,400,000	600,000	600,000	Completed	2.48
53	Winter Garden Reclaimed Water Pumping and Transmission	Reclaimed Water	6,700,000	487,612	487,612	5,724,776	975,225	975,225	Completed	
54	Lake Apopka Reuse Augmentation Project	Reclaimed Water	16,340,000	2,450,000	2,450,000	11,440,000	4,900,000	-	Underway	
55	Seminole County Yankee Lake Reclaimed Water System Augmentation Project	Reclaimed Water	25,100,000	3,765,000	3,765,000	17,570,000	7,530,000	5,842,815	Underway	
56	University of Central Florida (UCF) Reclaimed Water and Stormwater Integration Project	Reclaimed Water	-	-	-	-	-	-	Cancelled	
57	Winter Park Windsong Stormwater Reuse	Reclaimed Water	-	-	-	-	-	-	Cancelled	
	<b>Total</b>		<b>\$ 194,630,000</b>	<b>\$ 17,275,330</b>	<b>\$ 17,275,330</b>	<b>\$ 160,079,340</b>	<b>\$ 34,550,660</b>	<b>\$ 9,317,546</b>		8.68

Table 4-6. FY 2007-2008 approved AWS projects list

#	Project Name	Project Type	Total Cost	WP&SF Amount	SJRWMD Match	Project Sponsor Match	Total Amount Awarded	Total Amount Disbursed	Project Status	Water Created (mgd)
17a	City of Altamonte Springs Project Renew Apricot Project B	Surface Water	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Cancelled	
21b	City of Clermont Reclaimed Water Distribution Transmission Improvements Project	Reclaimed Water	-	-	-	-	-	-	Cancelled	
22	Cocoa and Rockledge Reclaimed Water Line Connection Project	Reclaimed Water	1,530,000	87,838	87,838	1,354,324.00	175,676	175,676	Completed	0.25
45	Port Orange Pioneer Trail Storage and Pumping Project	Reclaimed Water	-	-	-	-	-	-	Cancelled	
58	Winter Springs Lake Jessup Reclaimed Water Augmentation Project	Reuse Augmenta	6,310,000	640,000	640,000	5,030,000.00	1,280,000	-	Underway	
66	Coquina Coast Seawater Desalination	Seawater	839,000,000	12,266,749	2,550,546	824,182,705.00	14,817,295	-	TBD	
	<b>Total</b>		<b>\$ 846,840,000</b>	<b>\$ 12,994,587</b>	<b>\$ 3,278,384</b>	<b>\$ 830,567,029</b>	<b>\$ 16,272,971</b>	<b>\$ 175,676</b>		0.25

Table 4-7. FY 2008-2009 approved AWS projects list

#	Project Name	Project Type	Total Cost	WP&SF Amount	SJRWMD Match	Project Sponsor Match	Total Amount Awarded	Total Amount Disbursed	Project Status	Water Created (mgd)
3	Melbourne RO Water Treatment Plant Expansion Project	Brackish Ground	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	Cancelled	
	<b>Total</b>		<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>		

## APPENDIX A: WRDWP FUNDING AND EXPENDITURE SUMMARY

Table 4-8 below contains the total values of the funding sources and expenditures provided for all projects in the WRDWP during the planning period.

Table 4-8. Water resource development work program funding and expenditure summary

Fund Sources and Disbursements	Funds Needed/Expended -- \$ Million							Total Cost
	Prior Years <sup>1</sup>	2011	2012	2013	2014	2015	Future <sup>2</sup>	
<b>Sources</b>								
SJ-Ad Valorem	\$68.955	\$7.159	\$8.146	\$8.146	\$8.111	\$8.111	\$8.111	\$116.739
SJ-FF Const.	\$34.920	\$0.530	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$35.450
SJ-FF Land Acq.	\$73.596	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$73.596
SFWMD	\$0.150	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.000	\$0.150
Cooperators	\$45.944	\$0.301	\$0.015	\$0.015	\$0.015	\$0.015	\$0.015	\$46.320
<b>Total</b>	<b>\$223.565</b>	<b>\$7.990</b>	<b>\$8.161</b>	<b>\$8.161</b>	<b>\$8.126</b>	<b>\$8.126</b>	<b>\$8.126</b>	<b>\$272.255</b>
<b>Disbursements</b>								
Internal	\$25.587	\$3.248	\$3.811	\$3.811	\$3.811	\$3.811	\$3.811	\$47.890
Contract	\$197.978	\$4.742	\$4.350	\$4.350	\$4.315	\$4.315	\$4.315	\$224.365

Notes:

1. "Prior Years" and "Total Costs" columns include completed projects not shown in the current WRDWP: Adaptive Management, Investigation of Areas Where Domestic Self-Supply Wells Are Sensitive to Water Level Fluctuation, Regional Aquifer Management Plan, and Surface Water In-Stream Monitoring & Treatability Studies.

2: Not all projects are forecast into future years, because they either are continuing programs that would skew the data, already have been completed, or they have not yet been programmed beyond FY 2015. Therefore, the forecast column is not a complete accounting of future work.

## APPENDIX B: WRDWP TOTAL PROGRAM FUNDING AND COST

The estimated total cost of all current and completed projects in the SJRWMD Water Resource Development Work Program is \$272.26 million. The distribution of this cost is shown by funding source in Figure 4-1 and by type of project in Figure 4-2. Descriptions of completed projects are presented in Appendix C.

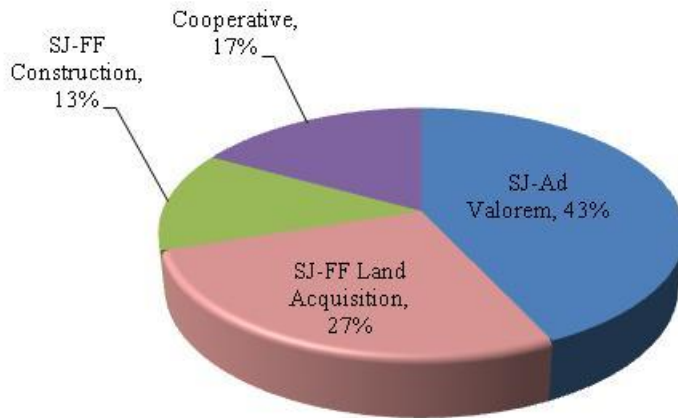


Figure 4-1. Water resource development funding sources

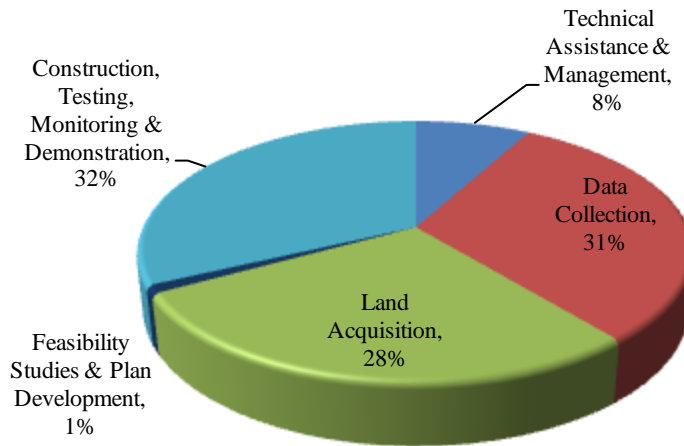


Figure 4-2. Water resource development spending by project type

## **APPENDIX C: WRDWP COMPLETED PROJECTS**

### **ADAPTIVE MANAGEMENT**

Adaptive management is long-term hydrologic and environmental monitoring, and hydrologic modeling and analysis, with integration of the results into future water supply planning processes and the consumptive use permitting process. These activities are ongoing but must be coordinated and integrated into a continual process of monitoring, modeling, evaluation, and change, as appropriate. The objective of adaptive management is to monitor the resources of concern (aquifers, wetlands, lakes, streams, springs, etc.) to make better-informed water management decisions. SJRWMD will continue to develop and adjust its monitoring plan as necessary, with major focus on the priority water resource caution areas. Approximately \$0.25 million was spent on this project through FY 2004. This activity has been discontinued as a separate project because it has been integrated into other projects where appropriate. No estimate has been made of the amount of water that will become available as a result of this activity.

### **INVESTIGATION OF AREAS WHERE DOMESTIC SELF-SUPPLY WELLS ARE SENSITIVE TO WATER LEVEL FLUCTUATION**

Certain areas of SJRWMD have high concentrations of domestic self-supply wells. As growth has continued and demands on the aquifers have increased, regional lowering in the aquifers has occurred. This regional lowering, in combination with natural or induced seasonal fluctuations, has caused loss of flow to some self-supply installations. Installations relying upon free-flowing wells to supply a household are particularly susceptible to this problem. Also, pumps or drop pipes designed for historically higher water levels may no longer be adequate for the fluctuations that now occur. This investigation identified areas where high concentrations of domestic self-supply wells exist and hydrologic conditions are such that the potential for loss of flow is high. Management strategies were developed for these areas to prevent interference with these self-supply wells. SJRWMD completed this investigation in FY 2004 at a cost of \$0.14 million. No estimate has been made of the amount of water that well owners will be able to access as a result of this project.

### **REGIONAL AQUIFER MANAGEMENT PROJECT (RAMP)**

In response to projected unacceptable impacts due to 2020 groundwater withdrawals for public supply in Volusia County, the RAMP project was begun in 2003 and was designed to accomplish plan development; feasibility assessments and demonstration projects; design and construction; and operation and maintenance. The Volusian Water Alliance (VWA) completed the planning documents in 2004. Implementation of some project elements is underway through partnerships with New Smyrna Beach Utilities Commission, Volusia County, and the cities of DeLand, Ormond Beach, and Port Orange. Design of RAMP elements, including finished water interconnections, began in FY 2003. VWA was replaced with a newly formed entity, the Water Authority of Volusia (WAV). WAV completed a Master Water Facilities Plan (MFP) in 2006. This MFP includes many of the initiatives identified in the RAMP plan. As a result, RAMP has been integrated into the WAV MFP and phased out as a separate and distinct water resource development project (current projects underway are slated for completion in FY 2009). Member utilities may seek potential funding for future water resource development projects identified in the RAMP and MFP through the new Water Resource Development Components of Water Supply Development Project.

## **SURFACE WATER INSTREAM MONITORING AND TREATABILITY STUDIES**

Surface water is an alternative water supply source in SJRWMD. Its current use for public supply is limited to withdrawal by the City of Melbourne from Lake Washington on the upper St. Johns River, and to withdrawal by the City of Cocoa from the Taylor Creek Reservoir. DWSP 2000 identified several opportunities for development of additional surface water resources, including the St. Johns River between Cocoa and DeLand, the upper and lower Ocklawaha River basins, and the C-1 Canal watershed in Brevard County. Surface water in-stream monitoring and treatability studies were performed to determine withdrawal and treatment system conditions necessary to develop water from the St. Johns River. These studies were completed in FY 2003 at a total cost of \$0.71 million, including \$0.10 million of cooperative funding from the U.S. Geological Survey (USGS). These studies concluded that it is technically and economically feasible to treat water from the St. Johns River to potable standards. Data and results from these studies may be used by utilities to design treatment facilities. SJRWMD estimates that between 22 mgd and 173 mgd can be made available as a result of these studies and others.

## **APPENDIX E: WP&SP PROJECT DESCRIPTION BY PROJECT TYPE**

All WP&SP eligible projects are briefly described below by project type. The status of each project is indicated as Completed, Cancelled, No Sponsor, To Be Determined (TBD), or Underway as of December 2010.

### **Brackish Groundwater**

#### **1. Dunes Community Development District Brackish Groundwater Project (Completed)**

The project provides a consistent and reliable potable water supply to the Dunes Community Development District (DCDD). It replaces water purchased from the City of Palm Coast, which uses a combination of fresh water from the Floridan and surficial aquifers as a source of supply. The proposed DCDD project will be supplied with new wells that withdraw brackish water from the Floridan aquifer. A reverse osmosis plant will be constructed with concentrate disposal into the Intracoastal Waterway. The project includes pipelines, pumps, tanks, and an emergency generator. Project construction will be implemented in two phases:

#### **2. East Putnam Regional Water System Project (Completed)**

The East Putnam Regional Water System Project will provide potable water to serve customers in East Palatka, San Mateo, and surrounding areas. A reverse osmosis water treatment facility will be constructed to treat brackish water from the Floridan aquifer. Phase I is expected to be completed by 2006.

#### **4. Ormond Beach Water Treatment Plant Expansion (Completed)**

The City of Ormond Beach will construct a low pressure reverse osmosis facility at its current water treatment plant location to expand its use of brackish groundwater wells. The plant will have an estimated gross capacity of 4.0 MGD, or a net of 3.2 MGD. The combined water treatment plant capacity will serve a population of approximately 37,000 Ormond Beach residents.

#### **5. St. Augustine Water Supply Project (Completed)**

The proposed project limits impacts to wetland vegetation that would be expected to result if projected water use increases are met from the City's existing surficial aquifer wellfield. Initially the project will develop 2.0 MGD through a Low Pressure RO treatment plant supplied by brackish groundwater from the Floridan aquifer. The project includes two new Floridan aquifer wells and a demineralization concentrate transmission main that will connect with the City's wastewater collection system. This project will be implemented in several phases and have an ultimate capacity of 6.0 MGD.

#### **6. St. Johns County Water Supply Project (Completed)**

The St. Johns County Water Supply Project includes construction of an estimated 8.0 MGD Low Pressure Reverse Osmosis plant supplied by brackish groundwater from the Floridan aquifer. It expands the Tillman Ridge Wellfield by four new Floridan aquifer wells, and provides a demineralization concentrate collection main to transport the concentrate to the St. Johns County wastewater collection system. This project was originally identified in the District Water Supply Plan

(DWSP) of 2000 and the DWSP 2004 interim update. The purpose of this project is to avoid unacceptable wetland impacts in the vicinity of the County's Tillman Ridge Wellfield.

### **Surface Water Projects**

#### **12. St. Johns River/Taylor Creek Reservoir Water Supply Project (TBD)**

This project involves expansion of the existing Taylor Creek Reservoir water supply system, which is owned and operated by the City of Cocoa. The water supply system expansion is a cooperative effort involving several water supply utilities and will greatly expand the existing system water supply yield and service area. The facilities expansion includes the addition of raw water withdrawal from the nearby St. Johns River to supplement reservoir inflow currently generated by the Taylor Creek watershed. Treatment, transport and treated water ASR systems will also be expanded. Expected maximum increased production is 40.0 MGD.

### **Reclaimed Water**

#### **16, 16a. Alafaya Reclaimed Water Storage and High Service Pump Project (Completed)**

This project will provide additional storage volume of 1.0 MG and a high service pumping capacity which will allow the utility to serve new users and avoid landscape irrigation with water withdrawn from the Floridan aquifer. The utility anticipates the activation of new residential and commercial reclaimed water sites.

#### **19. Belleview and Spruce Creek Golf Course Reclaimed Water System Expansion Project (Completed)**

This project is part of a planned expansion of the City's advanced secondary wastewater treatment facility. Currently effluent is pumped to either the City's restricted public access spray field (20 acres) or the Baseline Golf Course for irrigation. Part of the plant expansion is the construction of a 22,000 LF reclaimed water main to transmit public access reclaimed water from the treatment plant to Spruce Creek Golf Course (200 acres) for irrigation, off-setting the use of groundwater for non-potable purposes.

#### **22. Cocoa and Rockledge Reclaimed Water Line Connection Project (Completed)**

The Cocoa and Rockledge Reclaimed Water Line Connection Project will allow both utilities to expand their reclaimed water distributions by making more water available during high demand periods. The project includes the construction of a 12-in. diameter system interconnection which will allow the City of Cocoa to serve the US 1 corridor south of the Cocoa city limits. The interconnect project will be constructed concurrently with an F.D.O.T. project, which will reduce restoration cost for this project. This project provides reclaimed water supply in lieu of groundwater for non-potable use.

#### **23, 23a, 23b. Daytona Beach Reclaimed Water System Project (Completed)**

The Daytona Beach reclaimed water system project is comprised of three major components that will achieve beneficial use of all available reclaimed water derived from the Daytona Beach service area. The combined elements will utilize reclaimed water treated at the Bethune Point WWTP and the

Westside Regional WWTP. The project will contribute to a reduction in groundwater withdrawals for landscape irrigation. New development within Daytona Beach will be able to connect to this transmission system. Components include ground storage tanks, pump stations, and pipelines.

### **25. Eastern Orange and Seminole Counties Regional Reuse Project (Underway)**

The purpose of this project is to effectively utilize large quantities of reclaimed water from the Iron Bridge Regional Water Reclamation Facility, which is operated by the City of Orlando. The project will provide reclaimed water to a planning area of 230 square miles as an alternative supply that will replace potable water for uses such as landscape irrigation, golf course irrigation and certain industrial processes.

### **27. Eustis Reclaimed Water System Expansion and Augmentation Project (Completed)**

This project will increase reuse capacity and provide transmission to proposed developments. The Eastern WWTP upgrade includes filtration and high level disinfection. Flow from the Eastern WWTP is stored in ponds and used for golf course irrigation. Excess flow will be used for residential irrigation. The City will construct pumping, filtration, and re-chlorination facilities to upgrade the stored effluent prior to residential distribution.

### **30. Lady Lake Reclaimed Water System Project, Phase II (Completed)**

The project consists of the expansion of the existing WWTF and upgrade to public access reuse by the extension of the 12-in. reclaimed water main to provide service to the east and southwest regions of the Town service area. Other components of the project include the construction of an effluent filter, ground storage tank, and high service pumps.

### **31. Lake Utility Services (Utilities Inc. of Florida) Lake Groves WWTF Reclaimed Water System Expansion Project (Completed)**

The proposed improvements will upgrade and expand the Lake Groves WWTF. The upgrade will allow the plant to treat wastewater to public access reuse standards. The utility will then provide reclaimed water to four existing residential subdivisions. It includes the cost of the upgrade for the full 1.0 MGD capacity as well as effluent storage and pumping facilities. The residential subdivisions were constructed with (dry line) reclaimed water distribution mains and this project will activate those dry lines.

### **32. Leesburg Reclaimed Water Reuse Project (Completed)**

The City of Leesburg Reclaimed Water project is a comprehensive program to maximize the city's beneficial use of all available reclaimed water. It is a long-term project with three major components including 1) upgrades to the existing Canal Street Wastewater Treatment Facility, 2) expansion of the existing Turnpike Wastewater Treatment Facility, and 3) construction of a reclaimed water transmission system.

### **33. Melbourne Reclaimed Water System Expansion Project (Underway)**

The project provides improvements to the Grant Street WWTP reuse production and distribution facilities. Overall system capacity will increase from 4.5 MGD to 6.0 MGD. The proposed

improvements will include the relocation of an existing 1.0 MGD filter to the new facility area, the addition of a new 1.0 MGD filter, new disinfection facilities, a 2.0 MG reclaimed water storage/chlorine contact tank, and a new high service pump station.

#### **34. Minneola Reclaimed Water Reuse Project (Completed)**

The Minneola Reclaimed Water Reuse Project includes a Wastewater Reclamation Facility and a Collection System and Pump Stations. The alternative water supply portions of this comprehensive project include the treatment facilities required to upgrade secondary effluent to public access reuse standards and the transmission of the reuse water to irrigation service areas and rapid infiltration basins (RIBs).

#### **36. North Seminole Regional Reclaimed Water and Surface Water Optimization System Expansion and Optimization Project (Completed)**

The project is comprised of eight major components involving the City of Sanford, the City of Lake Mary, and Seminole County. The project includes a surface water augmentation system of approximately 8.0 MGD, reclaimed water system improvements, additional storage, reclaimed water main transmission lines, and interconnections to Altamonte Springs and Winter Springs.

#### **37. Ocoee Reuse System Expansion Project (Completed)**

The Ocoee Reuse System Expansion Project includes five sub-projects to install reclaimed water mains. The reclaimed water source for the proposed projects will be the City's wastewater treatment plant (WWTP), Water CONSERV II (Orange County and City of Orlando) through a new interconnection, and the City of Winter Garden through a new interconnection. The interconnection with Water CONSERV II will supply reclaimed water along Maguire Road and the southern reuse service area. The interconnection with the City of Winter Garden will supply reclaimed water to Forest Lakes Golf Course, thereby increasing the City's ability to supply reclaimed water to residential and commercial customers and reduce the potable water demand for irrigation.

#### **39 (39 a, b). Orange County Southeast Reclaimed Water System Expansion Project (Completed)**

The Southeast Reclaimed Water System Expansion project will increase the availability of reclaimed water in the County's rapidly growing southeast reclaimed water service area. The project would offset groundwater use by providing reclaimed water for green space irrigation and power plant cooling water supply. The project includes construction of reclaimed water mains, booster pump stations, conversion of rapid infiltration basins to storage basins, ground storage tanks, a high service pump station, and expansion of the Eastern Water Reclamation Facility (EWRf) reclaimed water pumping capacity for increased supply capacity to the OUC Curtis Stanton Energy Center. The combined results of the projects will provide approximately 12.5 MGD of reclaimed water to the east/southeast Orange County service area and Stanton Energy Center.

#### **41. Ormond Beach North Peninsula Reclaimed Water Storage Project (Completed)**

This project involves the construction of a reclaimed water storage basin capable of storing 4.0 MG of reclaimed water. The project will serve the Ormond Beach north peninsula reclaimed water service area. The storage basin shall be constructed on city-owned property in the vicinity of Neptune

Avenue, centrally located within the peninsula reclaimed water service area. Reclaimed water will be provided to the Oceanside Golf Course and surrounding areas.

**43, 43a, 43b. Palm Coast Reclaimed Water System Expansion Project (Completed)**

The northern extension of the City of Palm Coast reclaimed water system along Old Kings Road will serve two golf courses, residential sites, and a high school. The reclaimed main has a total length of 35,000 ft and it includes both 16-in. and 20-in. pipe. Projected reuse in the area served by the northern extension is approximately 400 million gallons per year (MGY). The primary users are Hammock Dunes Creek Golf Course and Ginn-La Hammock Beach Golf Course.

The southern extension of the City's reclaimed water system along Old Kings Road will enable the City to serve proposed development south of the airport, near Colbert Lane and Town Center. This project includes new reclaimed transmission mains, ground storage and a high service pump station. The City will require developers to install the reclaimed water distribution mains within this service area. The anticipated proposed demand at full development is approximately 1,900 MGY. The reclaimed water ASR well at WWTF # 1 will allow storage of significant amounts of reclaimed water during wet periods which is currently discharged to the Intracoastal Waterway and RIBs, and will enable the system to meet reuse demands, increase recharge, and reduce groundwater withdrawals.

**46. Port Orange Reclaimed Water Reservoir and Recharge Basin Project (Completed)**

The project includes construction of a 3.0 MG storage tank, two reservoir / recharge basins, 8,500 LF of horizontal recovery wells, recovery pumps / controls, and high-service distribution pumps. The project also includes the harvest of stormwater to be transferred to and stored in the basins as a source of reclaimed water supply augmentation and recharge.

**47. Rockledge Reclaimed Water Storage Project (Completed)**

The Rockledge Water Storage Project consists of the construction of a 6.0 MG storage tank to be used as a reservoir for the City's reclaimed water system. It also includes a high service pump station. It will allow the City to store effluent that is currently disposed via a deep injection well. The estimated volume of water saved by this project is 60.0 MGY based upon ten refill cycles during the 60-day period where demand exceeded supply.

**52. West Melbourne Above-Ground Reclaimed Water Storage Tank Project (Completed)**

The project consists of the construction of a 3.0 MG ground storage tank, a transfer pump station and reclaimed high service pump station expansion. Expansion of the City's reclaimed water transmission and distribution piping facilities will occur as flows increase sufficiently to provide reliable service to West Melbourne's customers.

**53. Winter Garden Reclaimed Water Pumping and Transmission Project (Completed)**

The proposed project will establish reclaimed water service within Winter Garden and Ocoee. It includes reclaimed water storage tanks at Fuller Cross Road, Louis Dreyfus Citrus site, and at the wastewater treatment facility. Reclaimed water transmission mains will be extended from the treatment plant to the Louis Dreyfus site and to subdivisions with reclaimed dry lines in Winter

Garden. The connection with the City of Ocoee will extend reclaimed service to Westyn Bay, Forest Brooke, Vineyards, and Eagles Landing.

### **Reuse Augmentation Projects**

#### **54. Lake Apopka Reuse Augmentation Project (Underway)**

The purpose of this project is to supplement the City of Apopka reclaimed water reuse system with water withdrawn from Lake Apopka and treated to public reuse standards. Water will 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. Significant implementation of reuse, storage, recharge, and/or conservation of water will contribute to the sustainability of regional water sources.

#### **55. Seminole County Yankee Lake Reclaimed Water System Augmentation Project (Underway)**

The project involves the construction of a surface water treatment plant to treat water from the St Johns River for removal of color and total suspended solids (TSS). The treatment process will include chemical coagulation, high-rate clarification, and high-level disinfection and provide water treated to public access reclaimed water standards and will supplement existing reuse supplies. This project will reduce the demand for fresh groundwater. The treatment plant will be located at the County's Yankee Lake Water Reclamation Facility, near Lake Monroe. Initial design capacity is 10.0 MGD with surface water intake and infrastructure expandable to 20.0 MGD.

### **Other Projects**

#### **66. Coquina Coast Seawater Desalination (TBD)**

The Coquina Coast Seawater Desalination Project, as currently proposed, is a seawater desalination project that includes five main components including: intake, treatment, concentrate management, storage, and transmission. The source of water will be the Atlantic Ocean with a likely point of withdrawal off shore of Flagler County. A reverse osmosis (RO) treatment facility is proposed to treat the seawater to drinking water standards. Distribution of potable water from the facility to users will take place using existing infrastructure to the extent possible but will require construction of some additional transmission and storage facilities.