TECHNICAL PUBLICATION SJ2006-2E

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
DISTRICT WATER SUPPLY PLAN
2005

FIFTH ADDENDUM
APRIL 11, 2017

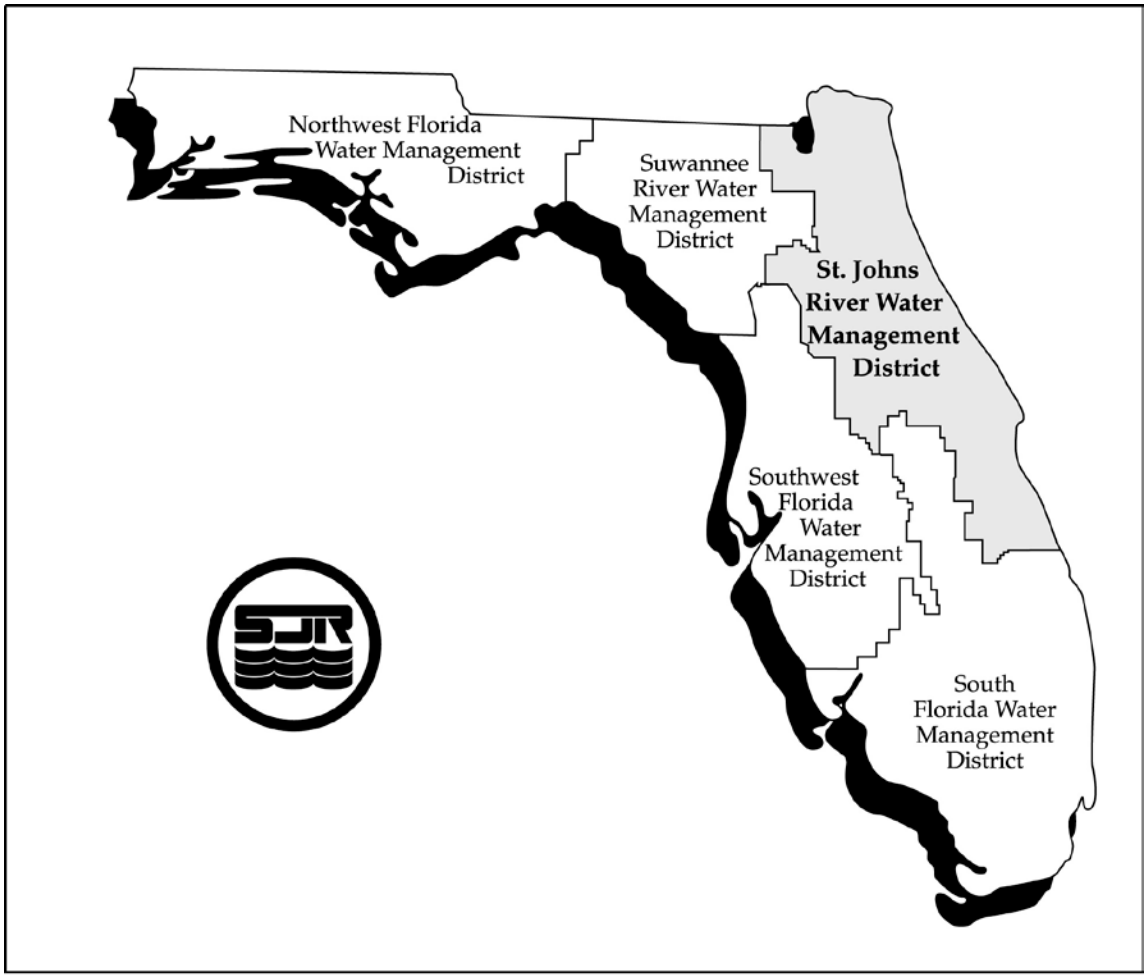
Technical Publication SJ2006-2E

St. Johns River Water Management District
District Water Supply Plan
2005

Fifth Addendum
April 11, 2017

St. Johns River Water Management District
Palatka, Florida

2017



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

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

Library
St. Johns River Water Management District
4049 Reid Street • P.O. Box 1429
Palatka, FL 32178-1429

Phone: (386) 329-4132

DISTRICT WATER SUPPLY PLAN
2005

FIFTH ADDENDUM
APRIL 11, 2017

The St. Johns River Water Management District (SJRWMD) approved its *District Water Supply Plan 2005* (*DWSP 2005*) on February 7, 2006. *DWSP 2005* has been published by SJRWMD as Technical Publication SJ2006-2. The SJRWMD Governing Board approved an addendum (first addendum) to *DWSP 2005* on October 10, 2006. A second addendum to *DWSP 2005* was approved on December 11, 2007, a third addendum to *DWSP 2005* was approved on May 13, 2008, and a fourth addendum to *DWSP 2005* was approved on May 13, 2009. Except as described below, this fifth addendum to *DWSP 2005* incorporates by reference *DWSP 2005*. It has been prepared for the purposes of adding two additional projects that have been identified in the District's *2017 Prevention Strategy for the Implementation of Silver Springs Minimum Flows and Levels*. The project descriptions for the new water supply development and water resource projects are included in Appendix N. The revised information contained within this fifth addendum is essential in SJRWMD's efforts to develop technical assistance documents for local governments to use in updating their comprehensive plans to address water supply issues, including the identification of alternative and traditional water supply projects necessary for meeting the water supply needs within their jurisdictions.

This fifth addendum to *DWSP 2005* appends the fourth addendum. Following are enumerated changes to *DWSP 2005* associated with this fifth addendum.

Water supply development projects: Appends the list of water supply development projects, beginning on page vi of the Executive Summary and on page 116 in *DWSP 2005*, to include two new projects (project numbers 85 and 85 as shown on List 1, attached).

Figure 6. Single-entity water supply development projects 2005. As presented in this addendum, Figure 6 shows the location of single-entity projects. Figure 6 in this addendum supersedes Figure 6 appearing in *DWSP 2005* and the first, second, third, fourth addenda to *DWSP 2005*.

Table 13. Quantities and estimated costs of alternative water supply development projects. As presented in this addendum to *DWSP 2005*, Table 13 reflects the addition of two projects. Table 13 in this addendum appends Table 13 appearing in *DWSP 2005* fourth addendum to *DWSP 2005*.

Table 14. SJRWMD — Public water supply entities and associated alternative water supply development projects. As presented in this addendum, Table 14 reflects the addition of

two City of Ocala projects (Project Numbers 85 and 86). Table 14 in this addendum appends Table 14 appearing in the fourth addendum to *DWSP 2005*.

Appendix N: This appendix contains detailed project descriptions for the new water supply development and water resources projects. This appendix contains project descriptions for both projects included in this fifth addendum.

List 1 (Addendum): Projects included in *DWSP 2005,* as amended by fifth addendum

DWSP Project Number	Project Name
Brackish Groundwater Source for Potable Use	
85	City of Ocala Lower Floridan Aquifer Conversion
Reclaimed Water Source	
86	Pine Oaks Wetland Recharge Park

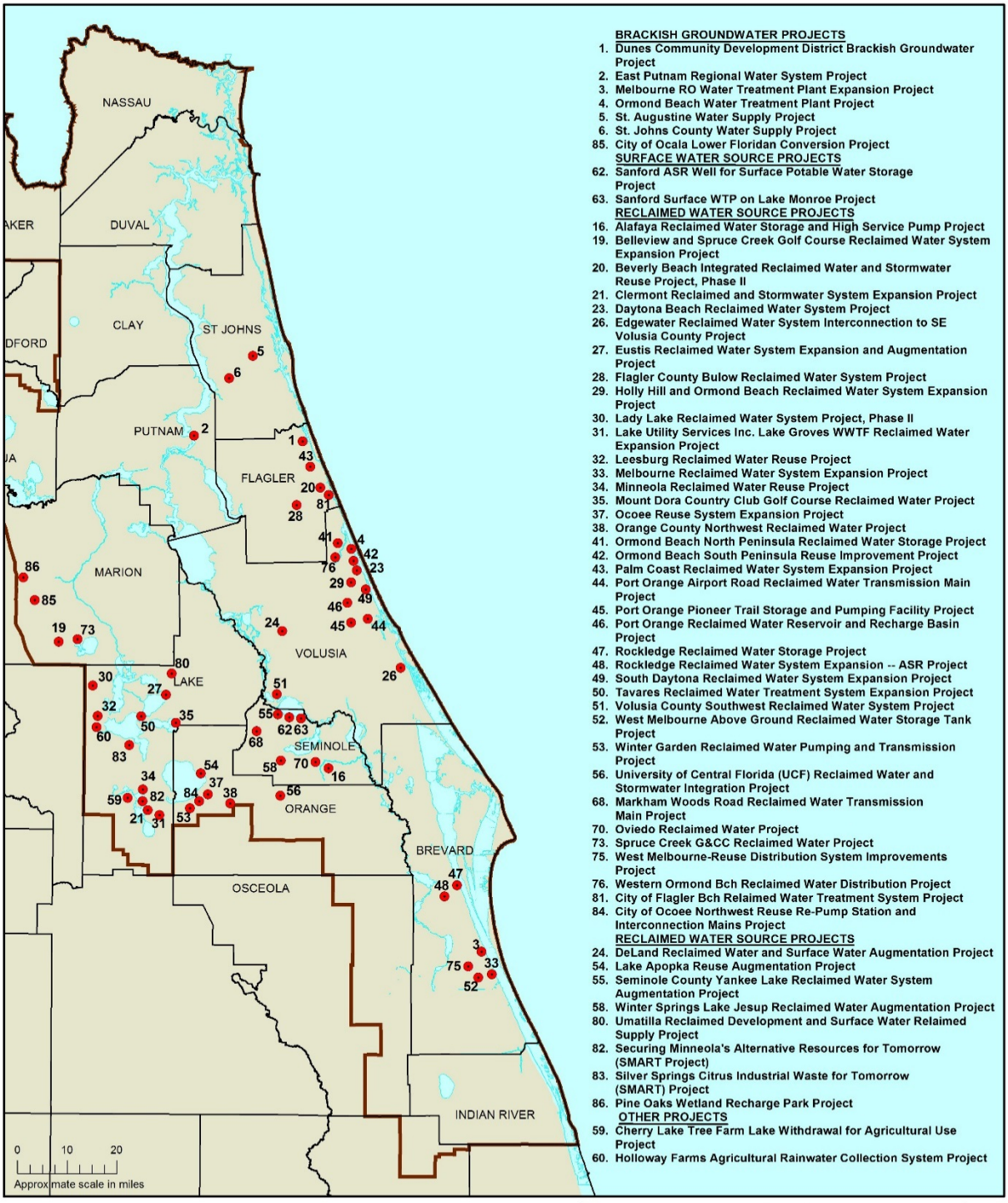


Figure 6. Single Entity Water Supply Development Projects

Note: Numbers refer to numbers on Water Supply Development Project Options List, in DWSP 2005 as set forth in the fifth addendum

Table 13 (Addendum). Quantities and estimated costs of alternative water supply development projects

DWSP Project Number	Project Name	Capacity Average Daily Flow (mgd)	Estimated Costs			
			Construction $M	Total Capital $M	O&M $M/yr	Unit Production $/1,000 gallons
Brackish Groundwater Source for Potable Use						
85	City of Ocala Lower Floridan Aquifer Conversion	7.50	$6.7 - $31.7	$8.7 - $32.7	$4.193	$2.63
Reclaimed Water Source						
86	Pine Oaks Wetland Recharge Park	2.80	$8- $10	$9.6 - $12	$0.429	N/A

Table 14 (Addendum). SJRWMD public water supply entities and associated alternative water supply development projects

Water Supply Entities	City of Ocala Lower Floridan Aquifer Conversion	Pine Oaks Wetland Recharge Park	*Single Water Supply Entity Project Number
Marion Area			
Ocala, City of	●	●	85, 86

APPENDIX N.—DETAILED DESCRIPTIONS OF WATER SUPPLY DEVELOPMENT PROJECTS

Appendix N contains planning-level, project-specific information for alternative water supply development projects identified in *District Water Supply Plan 2005 (DWSP 2005)*, as amended. The project descriptions included in Appendix N should be considered planning-level and conceptual in nature because final planning, design, permitting, and construction of these projects is incomplete. For these conceptual projects, St. Johns River Water Management District (SJRWMD) recognizes that the details of the project descriptions (including, but not limited to, estimated quantities of water produced, anticipated time frames, project costs and components, and the number and identity of water supply entities involved in these projects) may change as these projects progress.

Brackish Groundwater Source Project Descriptions (Addendum)

Name of project option and project number:

Project name: City of Ocala Lower Floridan Aquifer Conversion

Project number: 85

Traditional or an alternative water supply option:

This project is an alternative water supply option.

Type of alternative water supply (AWS) project option:

This project will develop a brackish groundwater source from the Lower Floridan aquifer and will supply water from a nontraditional source. (Note: SJRWMD considers all sources other than fresh groundwater to be nontraditional.)

Description of project:

A conceptual-level project description was developed by SJRWMD in cooperation with participating water suppliers during the planning process of the Silver Springs Prevention Strategy in early 2015. The diagram developed for the conceptual project developed in 2016 is shown on Figure 85-1. The source of water for this project is the Lower Floridan aquifer. The conceptual-level project includes two 24-inch diameter production wells, membrane treatment plant, and potable water transmission line to connect this new wellfield to the existing potable water supply system. The project cost estimates are based on the construction of two Lower Floridan aquifer production wells with a combined capacity of approximately 7.5 mgd located at the City of Ocala new wellfield approximately six miles southwest of Silver Springs. Membrane treatment may be required to meet all primary and secondary drinking water standards.

Amount of water estimated to become available through the project option expressed as average daily flow (measured in million gallons per day [mgd]):

The conceptual-level project description is based on an estimated average daily flow of 7.5 mgd of product water.

Time frame in which project option should be implemented:

By May 2017, the aquifer performance test and final report will be complete and the City will develop a schedule for implementation of this new source. It is anticipated that the first Lower Floridan aquifer well will be in production by 2022 and the second well by 2027.

Estimated planning-level costs:

The following planning-level costs were developed for a conceptual-level project description that was completed in late 2016 and early 2017.

a. Total capital: $8,700,000 to $32,700,000
b. Construction: $6,700,000 to $31,700,000
c. Operation and maintenance: $4,193,000 per year
d. Unit production cost: $2.63 per 1,000 gallons

Basis for planning-level costs:

Estimated planning-level costs were based on costing information available in 2010 and earlier costing information adjusted to 2016 dollars pursuant to methods described in SJRWMD Special Publication SJ2005-SP1, *Cost Estimating and Economic Criteria for 2005 District Water Supply Plan*. Specific publications employed include: *Black and Veatch, Inc. 2008. Engineering Assistance in Updating Information on Water Supply and Reuse System Component Costs Prepared for St. Johns River Water Management District, Palatka FL. Special Publication SJ2008-SP10*, and *Water Supply Solutions, Inc. 2008. Water Supply Facilities Cost Equations for Application to Alternative Water Supply Projects Investigations and Regional Water Supply Planning Prepared for St. Johns River Water Management District, Palatka FL. Special Publication SJ2008-SP13.*

Additional comments on project costs and capacity data:

Data for this project is from the *2017 Prevention Strategy for the Implementation of Silver Springs Minimum Flows and Levels*. No changes have been submitted.

Have any minimum flows or levels (MFLs) been established that would apply if a consumptive use permit (CUP) were sought for a project implementing the project option:

MFLs are being established for Silver Springs which would be applicable when a CUP is sought for this project option.

Consideration of any applicable existing water resource constraints such as MFLs, any recovery or prevention strategy, or water use reservation:

There are currently MFLs proposed, but not yet adopted for the Silver Springs. Based on current and projected water use conditions, the SJRWMD determined that the MFLs would not be achieved over the next 20 years; therefore, a prevention strategy was required. The prevention strategy will be approved concurrently with the recommended MFLs.

Name of entity or entities that should implement the project option and current status of project option's implementation:

The following water supply entity should consider implementation of this project: City of Ocala.

Project feasibility and permittability:

Feasibility: This project involves similar water treatment technologies as those used currently by other utilities within the SJRWMD, and therefore the project is considered technically and financially feasible. Planning-level information developed by SJRWMD indicates that projects of this type are financially feasible (Burton and Associates, Inc. 2004, 2005).

Permittability: SJRWMD has investigated the availability of water from the Lower Floridan aquifer. Currently the SJRWMD is conducting a 7-day aquifer performance test to determine the

sustainable yield of this wellfield and the potential water quality to ascertain the level of water treatment required. Once this test is complete, the amount of water estimated to become available (7.5 mgd) will be determined. The project is environmentally feasible and, therefore, appears to be reasonably permittable based on a planning-level analysis.

This link between environmental feasibility and permittability is based on the relationship between the water resource constraints used in SJRWMD's water supply planning process and the environmental protection criteria used in the consumptive use permitting process; these constraints and criteria are conceptually consistent. However, consistency of the project's impacts with the water resource constraints should not be interpreted as the determination or application of the SJRWMD's consumptive use permitting criteria. Before such a determination can be made, all details of the project's design and operation must be prepared by a permit applicant and submitted to SJRWMD in a permit application. The application must then be reviewed for consistency with the SJRWMD's consumptive use permitting criteria applicable to the project, including established MFLs and other environmental protection criteria. The proposed project may be further refined during the permit application review process to address different permitting criteria. The Governing Board will also consider the factors in Subsection 373.223(3), *Florida Statutes* (F.S.), as part of the completed permit application for a specific project, in making a determination of whether the project is consistent with the public interest pursuant to Subsection 373.223(5), F.S. As required by Subsection 373.223(3), F.S., SJRWMD will use the information in *DWSP 2005* as the basis for its consideration of the special public interest criteria ("local sources first") during its review of the permit application.

Analysis of funding needs and sources of possible funding options:

Significant funds will be required to support implementation of this project. (See estimated planning-level costs as described elsewhere in this project description.) Pursuant to subsection 373.805(4)(b), F.S., which defines the guidelines for prevention and recovery strategies for OFS MFLs, the SJRWMD will provide financial assistance for the implementation of projects and measures identified in the Strategy totaling no less than 25% for each project. Based on the estimated cost of Strategy implementation, the SJRWMD will be responsible for providing a minimum of $6.9M to $14.0M in financial assistance for the projects identified in this Strategy.

The SJRWMD primarily provides funding assistance through the Districtwide Annual Cost-Share Program, which is administered annually and supports projects that benefit one or more of the District's four core missions; water supply (alternative water supply, non-traditional sources, and water conservation), water quality, natural systems restoration (including projects that provide a significant percent recovery for an MFL waterbody whose status is in prevention or recovery), and flood protection. This funding assistance is exclusively available for construction-related costs with the District's percent match typically at 33% or 50% (conservation projects only). However, cost-share projects that benefit springs may be eligible to receive additional funding through the Florida Department of Environmental Protection (FDEP). The scoring criteria is geared such that projects that benefit an MFL waterbody that is determined to be in prevention or recovery receive the highest score in the core mission benefit ranking criterion,

thereby giving weight to projects with demonstrated benefits that are listed within a prevention or recovery strategy.

With the passage of the 2016 Legacy Florida legislation, $50 million from the Land Acquisition Trust Fund was earmarked for the next 20 years for springs restoration. These funds are typically administered through FDEP to the water management districts to increase the percent match for springs-related projects selected for funding through each Districts' cost share program. This often results in a 50% total cost-share match, 25% from FDEP and 25% from SJRWMD. It is anticipated that the Districts, local governments and public supply utilities will continue to partner with the state of Florida through FDEP to aggressively implement springs protection projects well into the future.

Consideration of how the public interest is served by the project option or how the project option will save costs overall by preventing the loss of natural resources or avoiding greater future expenditures for water resource development or water supply development:

This is a local project that will supplement existing traditional groundwater supplies with water from an alternative water source. This project will serve the public interest by providing water to meet basic public health, safety, and welfare needs of those it serves as well as provide water for commercial, industrial, institutional, recreational, and other typical public supply system needs within the public supply service areas of the project partners. This project will contribute to meeting the Florida Legislature's declared policy to promote the availability of sufficient water for all existing and future reasonable-beneficial uses and natural systems, as described in Subsection 373.701(1), F.S. This project will also contribute to meeting the *2017 Prevention Strategy for the Implementation of Silver Springs Minimum Flows and Levels*.

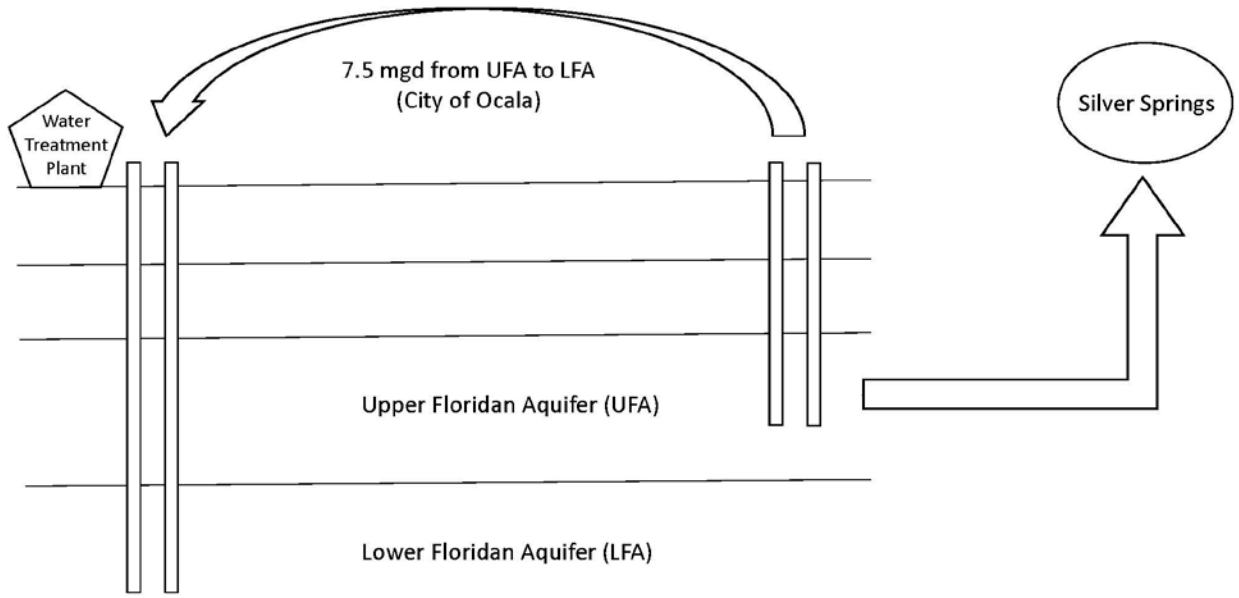


Figure 85-1. Conceptual-level diagram showing the conversion of 7.5 mgd of Upper Lower Floridan aquifer withdrawals to the Lower Floridan aquifer (not to scale)

Reclaimed Water Source Project Descriptions (Addendum)

Name of project option and project number:

Project name: Pine Oaks Wetland Recharge Park
Project number: 86

Traditional or an alternative water supply option:

This project is an alternative water supply option.

Type of alternative water supply (AWS) project option:

This project will develop reclaimed and stormwater sources, both nontraditional sources, for recharge to the Upper Floridan aquifer. (Note: SJRWMD considers all sources other than fresh groundwater to be nontraditional.)

Description of project:

The project is being designed by the City of Ocala. Initial planning level cost estimates were developed during the planning process of the Silver Springs Prevention Strategy in early 2015. The diagram developed for the conceptual project developed in 2016 is shown on Figure 86-1. The source of water for this project is from reclaimed and stormwater generated at City-owned facilities. The project will have two primary functions: water quality and water resource development. The project will achieve its water quality function through biological assimilation of nutrients within the constructed treatment wetland, and the water resource development function through recharge of advance treated reclaimed water and stormwater that will replenish the Upper Floridan aquifer. The design of the 33-acre treatment wetland project has been initiated and will consist of construction berms, pumps, conveyance pipes, gates and inlet structures. The planning level cost estimates are based on the construction of an integrated treatment wetland utilizing reclaimed and stormwater sources to recharge approximately 2.8 mgd of water into the Upper Floridan aquifer.

Amount of water estimated to become available through the project option expressed as average daily flow (measured in million gallons per day [mgd]):

The conceptual-level project description is based on an estimated average daily input of approximately 2.8 mgd that will recharge the Upper Floridan aquifer.

Time frame in which project option should be implemented:

The construction of the Pine Oaks Wetland Recharge project is scheduled to commence in 2018 with an anticipated operational phase starting in the winter of 2018.

Estimated planning-level costs:

The following planning-level costs were developed for a conceptual-level project description that was completed in late 2016 and early 2017.

a. Total capital: $9,600,000 to $12,000,000
b. Construction: $8,000,000 to $10,000,000
c. Operation and maintenance: $42,900 per year

Basis for planning-level costs:

Estimated planning-level costs were provided by the City of Ocala's design consultant, CH2M.

Additional comments on project costs and capacity data:

Preliminary data for this project is from the *2017 Prevention Strategy for the Implementation of Silver Springs Minimum Flows and Levels*. No changes have been submitted.

Have any minimum flows or levels (MFLs) been established that would apply if a consumptive use permit (CUP) were sought for a project implementing the project option:

A consumptive use permit will not be required for the implementation of this project option.

Consideration of any applicable existing water resource constraints such as MFLs, any recovery or prevention strategy, or water use reservation:

There are currently MFLs proposed, but not yet adopted for the Silver Springs. Based on current and projected water use conditions, the SJRWMD determined that the MFLs would not be achieved over the next 20 years; therefore, a prevention strategy was required. The prevention strategy will be approved concurrently with the recommended MFLs.

Name of entity or entities that should implement the project option and current status of project option's implementation:

The following water supply entity should consider implementation of this project: City of Ocala.

Project feasibility and permittability:

Feasibility: This project involves similar water treatment technologies as those used currently by other entities within the SJRWMD and throughout the State, and therefore the project is considered technically and financially feasible. Planning-level information developed by the City of Ocala indicates that projects of this type are financially feasible.

Permittability: The City of Ocala is in the process of obtaining a ERP permit through the Florida Department of Environmental Protection. The project is environmentally feasible with no wetland impacts contemplated; therefore, it appears to be reasonably permittable based on a planning-level analysis. Before such a determination can be made, all details of the project's design and operation must be prepared by a permit applicant and submitted to FDEP in a permit application. The application must then be reviewed for consistency with the environmental resource permitting criteria applicable to the project, including established MFLs and other

environmental protection criteria. The proposed project may be further refined during the permit application review process to address different permitting criteria.

Analysis of funding needs and sources of possible funding options:

Significant funds will be required to support implementation of this project. (See estimated planning-level costs as described elsewhere in this project description.) Pursuant to subsection 373.805(4)(b), F.S., which defines the guidelines for prevention and recovery strategies for OFS MFLs, the SJRWMD will provide financial assistance for the implementation of projects and measures identified in the Strategy totaling no less than 25% for each project. Based on the estimated cost of Strategy implementation, the SJRWMD will be responsible for providing a minimum of $6.9M to $14.0M in financial assistance for the projects identified in this Strategy.

The SJRWMD primarily provides funding assistance through the Districtwide Annual Cost-Share Program, which is administered annually and supports projects that benefit one or more of the District's four core missions; water supply (alternative water supply, non-traditional sources, and water conservation), water quality, natural systems restoration (including projects that provide a significant percent recovery for an MFL waterbody whose status is in prevention or recovery), and flood protection. This funding assistance is exclusively available for construction-related costs with the District's percent match typically at 33% or 50% (conservation projects only). However, cost-share projects that benefit springs may be eligible to receive additional funding through the Florida Department of Environmental Protection (FDEP). The scoring criteria is geared such that projects that benefit an MFL waterbody that is determined to be in prevention or recovery receive the highest score in the core mission benefit ranking criterion, thereby giving weight to projects with demonstrated benefits that are listed within a prevention or recovery strategy.

With the passage of the 2016 Legacy Florida legislation, $50 million from the Land Acquisition Trust Fund was earmarked for the next 20 years for springs restoration. These funds are typically administered through FDEP to the water management districts to increase the percent match for springs-related projects selected for funding through each Districts' cost share program. This often results in a 50% total cost-share match, 25% from FDEP and 25% from SJRWMD. It is anticipated that the Districts, local governments and public supply utilities will continue to partner with the state of Florida through FDEP to aggressively implement springs protection projects well into the future.

Consideration of how the public interest is served by the project option or how the project option will save costs overall by preventing the loss of natural resources or avoiding greater future expenditures for water resource development or water supply development:

This is a local project that will allow for the beneficial utilization of reclaimed water and stormwater. This project will serve the public interest by utilizing reclaimed water and stormwater to replenish the Upper Floridan aquifer, the source water for Silver Springs. This project will contribute to meeting the Florida Legislature's declared policy to promote the availability of sufficient water for all existing and future reasonable-beneficial uses and natural

systems, as described in Subsection 373.701(1), F.S. This project will also contribute to meeting the *2017 Prevention Strategy for the Implementation of Silver Springs Minimum Flows and Levels.*

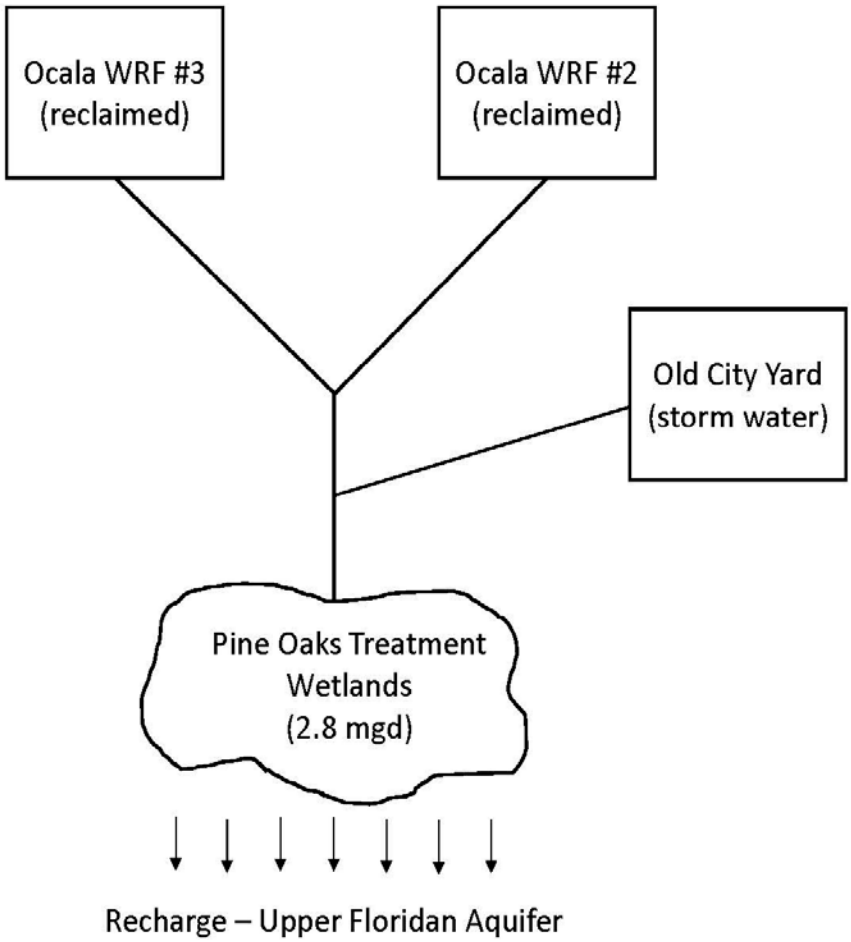


Figure 86-1. Conceptual diagram showing Pine Oaks Wetland Recharge Park in the City of Ocala (not to scale)