PROJECT DEFINITION REPORT

RESTORATION STRATEGIES

STA-1W EXPANSION #2 PROJECT

PS ID 100864

DATE NOVEMBER 3, 2017

REVISION #0

sfwmd.gov

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Approvals

The signatures in this section of the project definition report should be revised to represent the various areas providing significant resources to the project.

MA

Alan Shirkey, P.E., Bureau Chief, Engineering and Construction	**Date** 11-6-17
Thomas DeBold, Bureau Chief, Field Operations Region 3	**Date** 12-19-17

Document prepared by: Alexis San-Miguel, Extension: 2546

Project Location

This is the second phase of the overall Stormwater Treatment Area 1 West (STA-1W) expansion project. This second phase, Expansion #2, is approximately 2,127 acres and is located south of the existing STA-1W and STA-1W Expansion #1 complex, in the vicinity of the property referred to as the Snail Farm (see **Figure 1**).

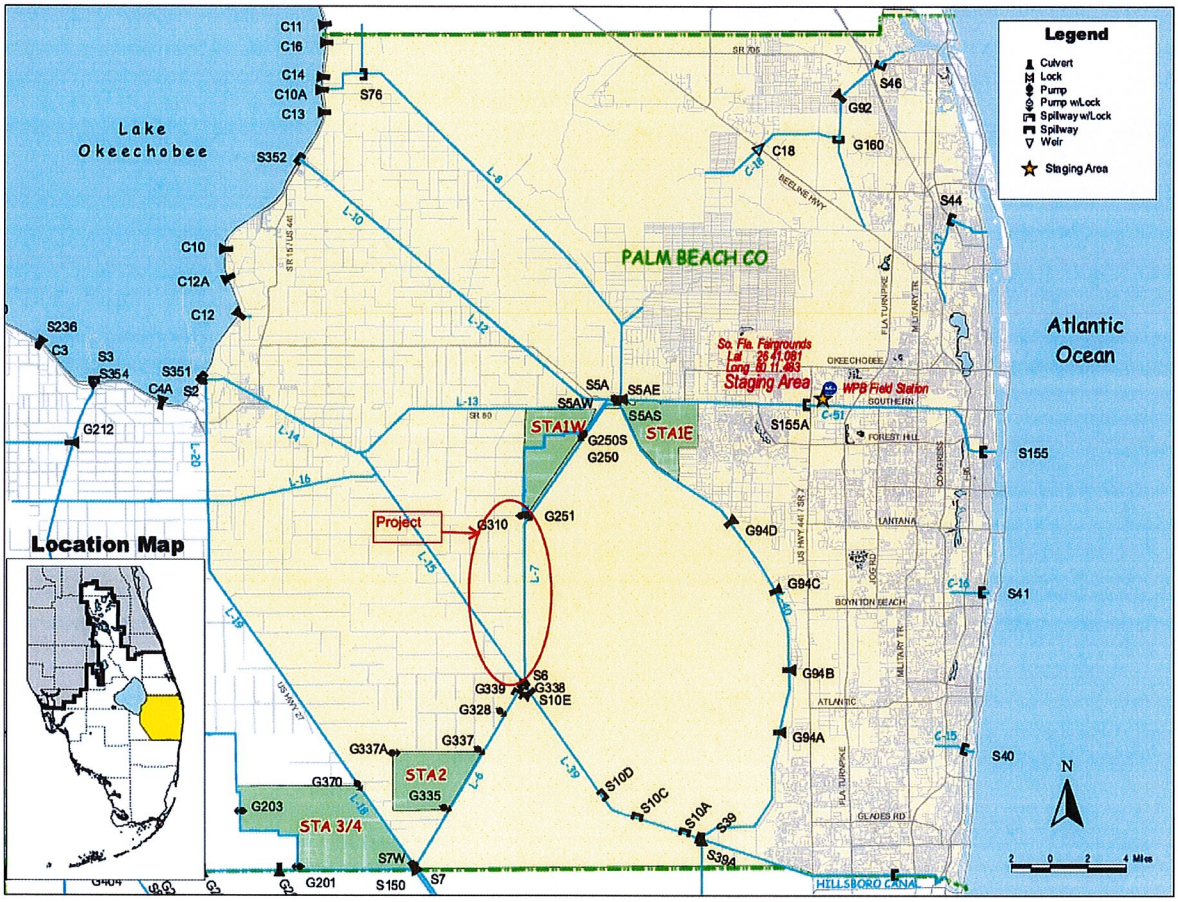

Figure 1 - General Location Map

Project Description

The STA-1W Expansion (STA-1WX) project is a ~6,500 acre STA expansion (5,900 acres of effective treatment area) to assist in treating existing flows from the Eastern Flow Path (consisting of the S-5A and C-51 West Basins). At the current time, STA-1W Expansion #1 (4,300 acres of effective treatment area on 4,600 acres of land), which is located immediately west of STA-1W, is under construction and expected to be complete by December 31, 2018. While a final footprint has not yet been determined, Expansion #2, which must consist of at least 1,600 acres of effective treatment area, is anticipated to be constructed on approx. 2,127 acres of land located south of STA-1W between the Refuge and the Hillsboro Canal just north of Pump Station S-6. The conceptual design originally developed in 2012 is generally described below. Upon final identification of the lands available for the project, multiple conceptual designs will be

required to determine the most cost-effective treatment layout to meet the requirements of the Water Quality Based Effluent Limit (WQBEL) for total phosphorus.

The conceptual design of Expansion #2 is one of many options that could be considered depending on hydraulics and available land. Modifications to the physical configuration or operational protocols of the existing STA-1W as well as the design of Expansions #1 may need to be considered. The final design will incorporate the best available information to ensure appropriate vegetation partitioning and water depths. In addition, a canal connecting STA-1W and Expansion #2 was also planned to convey STA-1W outflows to Expansion #2. Other conveyance alternatives may also need to be explored as part of the design, especially if there are potential impacts to implementing the original conveyance concept.

Project Scope

The conceptual design assumed availability of 1,800 acres of land located southwest of STA-1W, in the vicinity of the property called the Snail Farm (**Figure 2**). In determining the use of the lands that are not contiguous with the existing STA-1W complex, it will be assumed that Expansion #2 is developed in series with STA-1W, meaning that water received by Expansion #2 has been pre-treated by existing STA 1W.

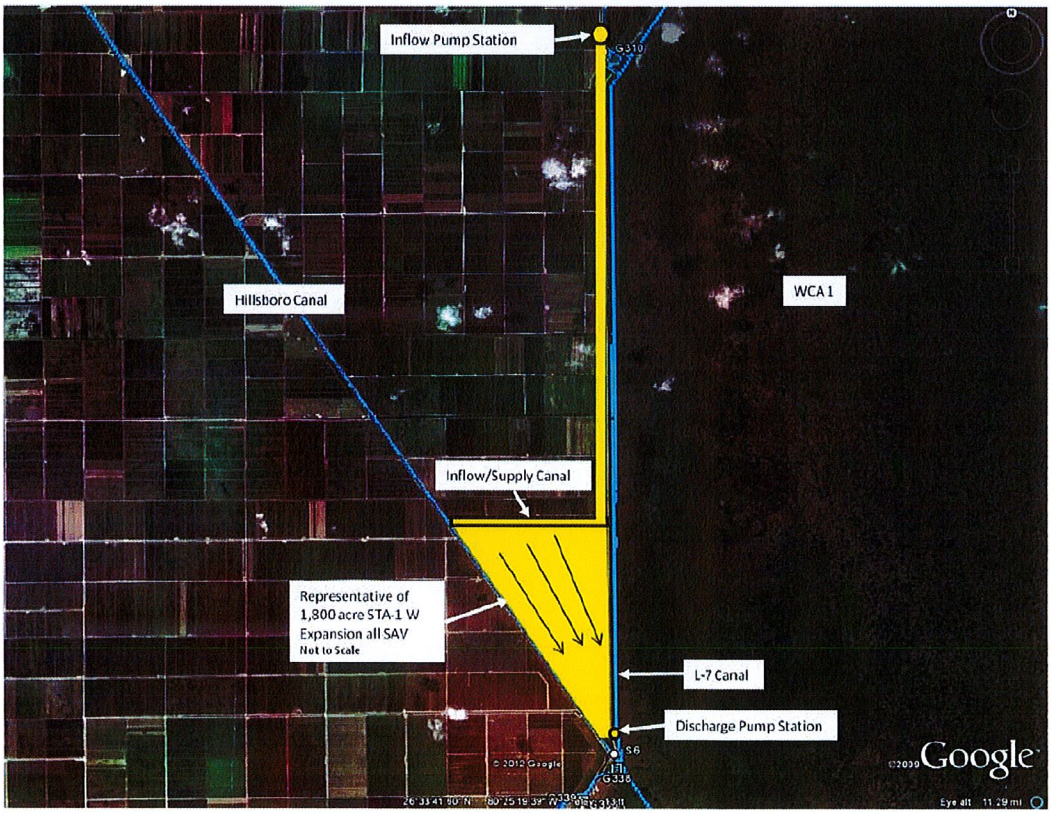

Figure 2 – Original STA 1W Expansion #2 Concept

The current design of STA-1W was constrained by the available land and the need to maximize treatment areas while maintaining the necessary hydraulics to move the water through the system for both

treatment and flood control purposes. In the new project design, the existing footprint will be evaluated to determine if the area can be utilized more effectively. The evaluation will consider the vegetation distribution across cells and whether reorientation of flow paths would be beneficial if adjacent land is available for the STA expansion.

The scope of work for this project includes Land Acquisition of the STA 1W Expansion #2 proposed site. Hydraulic modeling of Expansion #2 and canal conveyance concepts connecting STA-1W with Expansion #2 as well as other concepts will be part of this scope of work. Analysis of the modeling will help define the different alternatives for the most effective STA configurations. Based on the alternatives selected, survey and geotechnical studies will be conducted to have enough details to perform the Detailed Design and Construction.

Background

The Eastern Flow Path consists primarily of the C-51 West and S-5A Basins. The flows from these drainage basins are currently routed to STA-1W and STA-1E for treatment prior to discharging into Water Conservation Area (WCA) 1 (**Figure 3**). The S-5A and S-319 Pump Stations will continue to provide the existing level of flood protection to the S-5A Basin and the C-51 West Basin.

The Eastern Flow Path projects are intended to manage basin runoff in a more advantageous manner, by reducing the impacts of storm event driven inflows on the existing STAs, as well as expanding the effective stormwater treatment area. This is accomplished by redirecting a portion of the STA inflows to the L-8 Flow Equalization Basin (FEB), which provides approximately 45,000 acre-feet of storage, located west of and adjacent to the L-8 Canal, for flow attenuation, prior to conveyance to STAs for treatment; increasing the spatial extent of STA-1W by adding approximately 5,900 acres of effective treatment area to the existing STA-1W for additional phosphorus treatment capacity; and modifying the system to allow the G-341 structure to function consistent with its design intent as a divide between the S-5A and S-6 Basins.

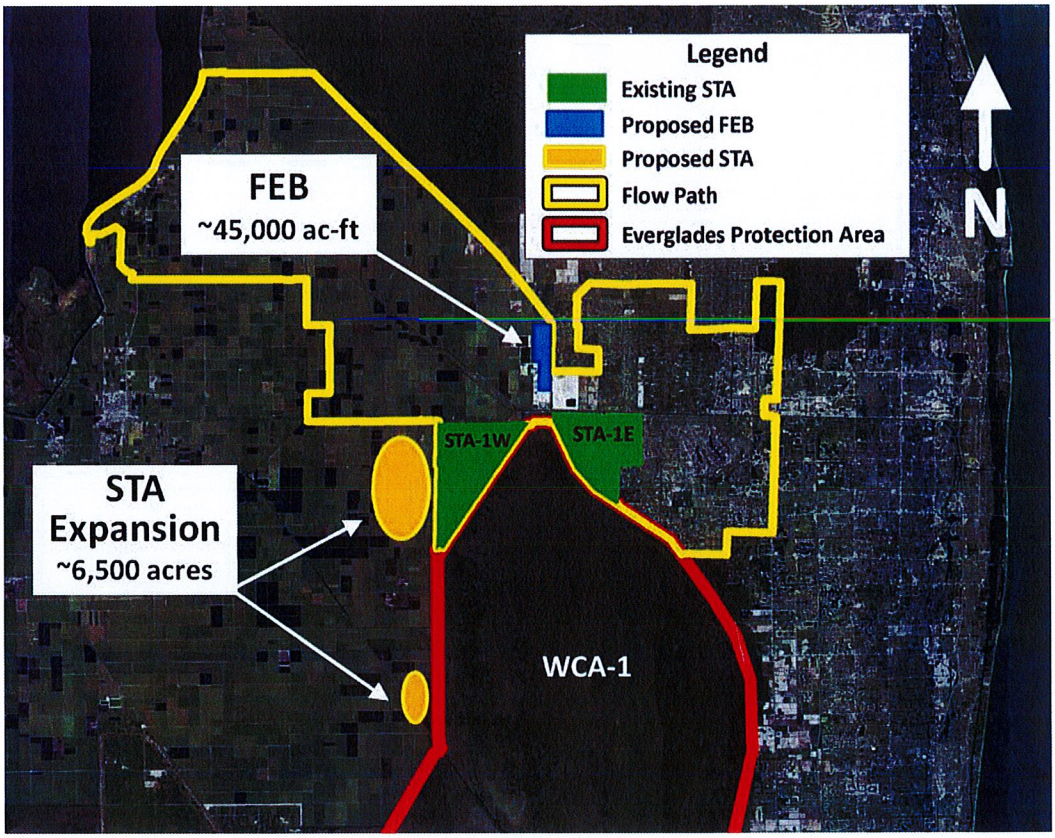

Figure 3 – Eastern Flow Path

Permitting

The STA-1W Expansion project is mandated as part of the Eastern Flow Path corrective actions under the Florida Department of Environmental Protection's (FDEP or Department) National Pollutant Discharge Elimination System (NPDES) Consent Order No. 12-1148 and Everglades Forever Act (EFA) Consent Order No. 12-1149 and is anticipated to require a modification to the existing NPDES Permit No: FL0778451-003 and EFA Permit No: 0311207-006 and obtain a Section 404 permit from the U.S. Army Corps of Engineers (USACE or Corps). The STA-1W Expansion #2 project may alter or change the Central and Southern Florida (CS&F) project. A Corps 408 approval may be necessary prior to obtaining a Clean Water Act (CWA) 404 permit.

It is the contractor's responsibility to apply for and obtain any dewatering permits from the South Florida Water Management District (SFWMD or District) and any applicable local permits from Palm Beach County. Coordination with the District's Permit Acquisition and Compliance Section staff will be required prior to and during permit acquisition.

Right of Way

The project will likely impact or alter right of way permits with the Florida Power and Light Company (FPL). Existing transmission lines (**Figure 4**) are inside the footprint of the proposed land for Expansion #2. Coordination with FPL will be necessary.

Figure 4 - FPL Transmission Lines

Real Estate

The District is in the process of acquiring the proposed land as shown on **Figure 2**. As part of this process the District has completed the Environmental Assessment Phase 1 and Phase 2 for the ~1,300-acre Snail Farm property and is in the process of a Cultural Resources survey. Land use or zoning changes may be required prior to construction.

Public Use/Outreach

Public use associated with this project will be consistent with public use within other Stormwater Treatment Areas. This includes trail connections between the two expansion projects. These features will be determined during the design and permitting process. Public outreach will include but is not limited to

Agricultural Stakeholders, Environmental Nonprofit Organizations, U.S. Fish and Wildlife Service, permitting agencies, and FPL.

Stakeholder Considerations

The project lies within the West Palm Beach (WPB) Field Station's area of responsibility. Public stakeholders may include, but are not limited to, Palm Beach County, the Corps, and the U.S. Department of the Interior (DOI).

Operations and Modeling

Coordination with District Operations is required and will be ongoing. Preliminary planning discussions occurred with operations during the initial modeling when formulating the Restoration Strategies projects and during the design of Expansion #1, but detailed discussions have not yet taken place for Expansion #2. As this project goes into conceptual and preliminary design, close coordination between the project team and Operations needs to occur to ensure modeled operations can be achieved with the features included in the design of Expansion #2 and hydraulic capacity is sufficient with existing structures, STA-1W, and Expansion #1.

Operations and Maintenance

STA-1W, Expansion #1, and the proposed site for Expansion #2 are located within the WPB Field Station's area of responsibility. The project will need to be coordinated with the Field Station to ensure there are appropriate resources to operate and maintain this project in perpetuity.

SCADA, Instrumentation, Telemetry, Information Technology

The STA-1W Expansion #2 project will include multiple structures, including pump stations and gated culvert structures which will require SCADA, instrumentation and telemetry. The location and number of structures has not yet been determined and this will be further defined during design. Power will be required for the pump stations and the gated structures. The Expansion #2 project is located near the following towers: S-6 (Primary) and G-310 (Secondary).

Security and Safety

Multiple pump stations and water control structures are part of the overall project scope. Security design considerations shall be incorporated during design and coordination with Facilities will be required.

Environmental

The Environmental Assessment (EA) prepared by the Corps during Expansion #1 identified Expansion # 2 as a proposed future project. The purpose and need for the expansions continues to be the increase in spatial extent of STA-1W, improving the phosphorus treatment capacity and to assist in achieving the

WQBEL for existing flows to the Refuge. A revised EA, capturing the specific effects of Expansion # 2 , will likely be prepared by the Corps .

In addition, A Phase I and Limited Phase II Environmental Site Assessment was prepared for the Snail Farm property. The results of the Phase 1 and Limited Phase 2 Environmental Site Assessment work and probable additional field work will need to be coordinated with the U.S. Fish and Wildlife Service and the FDEP. A wetland assessment will be needed for the project as it is anticipated that this project will temporarily affect existing wetlands or sensitive areas during construction. Other parcels within the anticipated project limits consist of agricultural parcels in active sugar cane cultivation.

Threatened and endangered species may be present in the project area and coordination with the Permit Acquisition and Compliance section will be required prior to construction. District field surveys should be conducted to determine wildlife presence. The CONTRACTOR shall abide by the requirements of the environmental permits issued for the Project. All staff will be required to take District issued Wildlife Training (Protected Species Awareness Training, Eastern Indigo Snake Qualified Observer Trainings, Ground Nesting Bird Training) prior to commencement of work within the project. Trained wildlife observers shall survey the work fronts in advance of mechanical clearing and grubbing activities. All sightings shall be reported to the District utilizing the District's Wildlife Sighting Log.

Coordination with the State Historic Preservation Office and Native American Tribes would be initiated by permitting agencies through the permit application review process. Early coordination between the Tribes and District should be initiated by the USACE's Cultural Resources Coordinator and the District's Tribal and Federal Affairs Liaison Armando Ramirez.

Monitoring

Turbidity monitoring will be required for the project during and after construction. Water sampling and other types of monitoring will be required during construction and operations, including phosphorus levels to measure if the STA is complying with the WQBEL. Monitoring of wildlife as required by permits will be conducted.

Commissioning

Commissioning will be required for the STA-1W Expansion #2 project including the structures within the project and as a system.

Lessons Learned

Lessons learned from previous STAs including Expansion #1, STA-1W, STA-1E, STA-2, STA-3/4, and STA-5/6 will be taken into account including all aspects or phases of design, construction, vegetation establishment, etc.

Conceptual Alternative Options

Conceptual Alternative Options will need to be identified and reviewed, if required, during detailed design.

Cost Estimates

The following is a conceptual estimate provided by ADA Engineering, Inc. as part of the Hydraulic Study:

AREA 2				
Grade Cells	AC	1,825	$ 1,500.00	$ 2,737,500.00
Inflow Canal (and associated levee) same cross section as STA-1W	MI	10.57	$ 1,640,000.00	$ 17,334,800.00
Spreader Canal (and associated levee) same cross section as STA-1W	MI	4.46	$ 924,000.00	$ 4,121,040.00
Collection Canal (and associated levee) same cross section as STA-1W	MI	3.78	$ 924,000.00	$ 3,492,720.00
Discharge Canal (and associated levee) same cross section as STA-1W	MI	3.99	$ 1,386,000.00	$ 5,530,140.00
Seepage Canal (and associated levee) same cross section as STA-1W	MI	1.90	$ 924,000.00	$ 1,755,600.00
Levee (14' wide, 3:1 H:V Slopes) not associated with a Canal (FPL & Cell Divider)	MI	1.95	$ 924,000.00	$ 1,801,800.00
8' Wide x 6' High Slide Gates with Actuator (Inflow)	EA	27	$ 340,000.00	$ 9,180,000.00
6.5' Wide x 6' High Slide Gates with Actuator (Outflow)	EA	10	$ 320,000.00	$ 3,200,000.00
Inflow Pump (2 Pumps at 1,130 CFS Each)	CFS	2,260	$ 20,000.00	$ 45,200,000.00
Discharge Pump	CFS	1,000	$ 20,000.00	$ 20,000,000.00
72" Diameter Steel Pipe under Discharge Canal (3 each X 300 LF)	LF	900	$ 1,800.00	$ 1,620,000.00
40 CFS Seepage Pump	CFS	40	$ 20,000.00	$ 800,000.00
FPL Distribution	LS	1	$ 750,000.00	$ 750,000.00
Raise FPL Pedestals 18" Above High Water Elevation	EA	20	$ 115,000.00	$ 2,300,000.00
SUBTOTAL				**$ 119,823,600.00**
Bonds and Insurance (2%)				$ 2,396,472.00
Mobilization (6%)				$ 7,189,416.00
Overhead & Profit (15%)				$ 17,973,540.00
Contingency (30%)				$ 35,947,080.00
AREA 2 TOTAL				**$ 183,330,108.00**

Recommendations

The project described in this document is conceptual and the preferred project features will be further detailed during design.

Project Milestones

The below activities and deadlines are from the FDEP Consent Orders associated with the EFA and NPDES permits.

STA-1W Expansion #2	
Activity	**Deadline**
Complete land acquisition	3/31/2018
Initiate design	10/01/2018
Submit state and federal permit applications	8/01/2019
Complete design	7/31/2020
Initiate construction	11/30/2020
Construction status report	3/01/2021
Construction status report	3/01/2022

Complete construction	12/31/2022
Initial flooding and optimization period complete	12/31/2024

Resource Requirements

The resources needed for this project will be mainly for land acquisition, real estate, and policy during the planning stage. Design of the project will be external. During design, there will be the need for technical review by water quality treatment technology, vegetation management, operations, modeling, engineering and Everglades policy staff. Permit acquisition, Everglades policy and modeling staff may also be needed to assist with coordination and development of an EA, if required.

Project Deliverable and Schedule

The above project milestones must be met.

Deliverable	Conceptual Completion Date	Schedule Notes
Complete land acquisition Milestone	**3/31/2018**	**Snail Farm and Land for canal connection**
Survey	4/30/2018	There could be Lidar and regular Survey
Geotechnical	4/30/2018	There could be 2 rounds of geotechnical
Hydraulic Modeling	4/30/2018	Additional Hydraulic and Water Quality Modeling
Biological Assessments	5/30/2018	Wetland evaluations and Listed Species Use
Preliminary Design	5/31/2019	Need this complete for permit applications
Submit state and federal permit applications Milestone	**8/1/2019**	**Federal, and State**
Initiate design Milestone	**10/01/2018**	
Intermediate Design	12/31/2019	
Final Design	4/30/2020	
Corrected Final/Ready to Advertise	6/30/2020	
Obtain Permits	6/30/2020	Federal and State
Complete design Milestone	**7/31/2020**	
Right of Way Coordination	Ongoing	FPL and potentially farmers for connection canal
Public Outreach	Ongoing	298 District Shawano
Bid Process	9/8/2020	Governing Board approval required
Award Construction Contract	9/8/2020	Governing Board approval required
Initiate construction Milestone	**11/30/2020**	
Construction status report Milestone	**3/01/2021**	

Construction status report Milestone	**3/01/2022**	
Complete Construction Milestone	**12/31/2022**	
Initial flooding and optimization period complete Milestone	**12/31/2024**	

Project Funding Sources

Funding source for this project will be from multiple funds within the B199 functional area. The STA-1W Expansion #2 project will include new capital assets requiring coordination with asset accounting.

References

1. STA-1W Expansion #1 Project Corrected Final Design
2. STA-1W Expansion Hydraulic Study
3. Restoration Strategies Regional Water Quality Plan, April 27, 2012
4. Everglades Forever Act Consent Order, August 15, 2012
5. National Pollutant Discharge Elimination System Consent Order, August 15, 2012